

**ANTELOPE VALLEY COMMUNITY COLLEGE DISTRICT
BID AND CONTRACT DOCUMENTS**

**BOILER REPLACEMENT CAMPUS WIDE
TABLE OF CONTENTS**

Section Number	Document Description
00 01 00	Table of Contents
00 01 07	Certifications/Seals Page
00 01 12	DSA Form 103 Statement of Structural Tests & Inspections
00 11 13	Notice Calling for Bids
00 21 13	Instructions for Bidders
00 24 13	Bid Packages Scope Descriptions
00 31 13	Bid Time Project Schedule
00 41 00	Bid Proposal
00 43 22	Composite Unit Price Bid Proposal
00 42 23	Alternate Bid Items Proposal Form
00 43 24	Pre-Bid Inquiry Form
00 43 36	Subcontractors List
00 45 10	Verification of Contractor and Subcontractors' DIR Registration
00 45 13	Statement of Qualifications
00 45 19	Non-Collusion Affidavit
00 45 26	Certificate of Workers Compensation Insurance
00 45 27	Drug-Free Workplace Certification
00 45 50	Community Workforce Agreement and Letter of Assent
00 52 00	Agreement
00 61 10	Bid Bond
00 61 13	Performance Bond
00 61 14	Labor and Material Payment Bond
00 62 95	Asbestos and Other Hazardous Materials Certification
00 65 36	Guarantee Form
00 65 37	Contractor Certification of Subcontractor Claim
00 72 00	General Conditions
00 73 00	Special Conditions CWA Subcontractor Summary Conditional Waiver and Release on Progress Payment Unconditional Waiver and Release on Progress Payment Conditional Waiver and Release on Final Payment Unconditional Waiver and Release on Final Payment
00 74 00	Community Workforce Agreement
01011	Work Scope Special Conditions
01028	Change Order Procedure
01040	Project Coordination
01045	Cutting and Patching
01050	Field Engineering
01210	Allowances
01300	Submittals

01310	Construction Schedule
01311	Schedules and Payments
01323	Construction Photographs
01400	Contractor Quality Control
01500	Temporary Construction Facilities
01600	Materials and Equipment
01631	Products and Substitutions
01655	Product Handling
01700	Project Closeout
01740	Cleaning
230000	General Mechanical
230519	Meters and Gages for HVAC Piping
230523.12	Ball Valves for HVAC Piping
230523.14	Check Valves for HVAC Piping
230529	Hangers and Supports for HVAC Piping and Equipment
230553	Identification for HVAC Piping and Equipment
230593	Testing, Adjusting, and Balancing for HVAC
230719	HVAC Piping Insulation
230900	Direct Digital Controls for HVAC
230993.11	Sequence of Operations for HVAC DDC
231123	Facility Natural Gas Piping
232113	Hydronic Piping
232116	Hydronic Piping Specialties
232123	Hydronic Pumps
232513	Water Treatment for Closed-Loop Hydronic Systems
235123	Gas Vents
235216	Condensing Boilers
260519	Low-Voltage Electrical Power Conductors and Cables
260526	Grounding and Bonding for Electrical Systems
260529	Hangers and Supports for Electrical Systems
260533	Raceways and Boxes for Electrical Systems
260553	Identification for Electrical Systems

[THIS PAGE INTENTIONALLY BLANK]

CERTIFICATIONS/SEALS PAGE

[THIS PAGE INTENTIONALLY BLANK]

DSA – FORM 103 STATEMENT OF STRUCTURAL TESTS & INSPECTIONS

[THIS PAGE INTENTIONALLY BLANK]

NOTICE TO CONTRACTORS CALLING FOR BIDS

DISTRICT	ANTELOPE VALLEY COMMUNITY COLLEGE DISTRICT
PROJECT DESCRIPTION	BOILER REPLACEMENT CAMPUS WIDE
LATEST TIME/DATE FOR SUBMISSION OF BID PROPOSALS	See Paragraph 3 below.
LOCATION FOR SUBMISSION OF BID PROPOSALS	ANTELOPE VALLEY COMMUNITY COLLEGE DISTRICT 3041 West Ave K Lancaster, California 93536-5426 Building: Facilities Services Office/Room: FS102
LOCATION FOR OBTAINING BID AND CONTRACT DOCUMENTS	Bid and Contract Documents are available in electronic digital format by contacting the Construction Manager Ledesma & Meyer Construction Co. Inc. Attn: Jenny Johnson at jenniferj@lmcci.com .

NOTICE IS HEREBY GIVEN that the above-named California Community College District, through its Board of Trustees (“the District”) will accept Bid Proposals for the Contract for **Boiler Replacement Campus Wide** (“the Work” or “the Project”). Bid procedures are pursuant to the Uniform Public Construction Cost Accounting Act, Public Contract Code §22032.

1. Submittal of Bid Proposals. All Bid Proposals shall be submitted at or prior to the date and time set forth above on forms furnished by the District in a sealed envelope bearing on the outside the Bidder’s name and address along with the Project Name and an identification of the Bid Package for which the Bid Proposal is submitted.

2. The Project and the Project Scope.

BE Building – Demolish and replace the existing boiler with a new boiler. Disconnect and reconnect all of the mechanical, plumbing and electrical connections that are required as a result of replacing the boiler. Properly dispose of removed boiler.

Administration Building – Demolish and replace the existing boiler along with the hot water pumps and the associated piping, expansion tanks, air separators, valves, flue etc. and provide and install new items so as to provide a complete and operable system. Disconnect and reconnect all of the mechanical, electrical and plumbing items that are required as a result of replacing the boiler and aforementioned items. Properly dispose of all demoed items.

3. Project Construction Schedule:

Notice to Proceed anticipated April 16, 2018
 Project Duration: 120 Calendar Days
 Project Construction Estimate: \$TBD

4. Multiple Prime Contractors Project Delivery. The District will utilize a multiple prime contractor delivery method to complete Project construction. The District’s Construction Manager (“CM”) for Project construction is Ledesma & Meyer Construction Co., Inc. The District will award separate prime contracts for the scopes of work necessary to complete the Project. The Contractors awarded a Contract for a Bid Package will be required to work at the Project Site that is shared by other Contractors, to cooperate with such other Contractors, and to coordinate their Bid Package work with the work of the other Bid Packages. The following are the Bid Packages for the Project:

Bid Package No.	Bid Package Description	Contractors' License	Bid Proposal Due Date and Time
21	HVAC	C-20 Warm-Air Heating, Ventilating and Air-Conditioning	2:00 PM Thursday, March 22, 2018

5. Bid and Contract Documents. The Bid and Contract are available to Bidders in electronic digital format. The District will not furnish or provide physical “hard” copies of any portion of the Bid or Contract Documents. A Bidder may, at its sole cost and expense, print physical “hard” copies of any portion of the Bid or Contract Documents for the Bidder’s use.
6. Documents Accompanying Bid Proposal. Each Bid Proposal shall be accompanied by: (i) the required Bid Security; (ii) Subcontractors List; (iii) Non-Collusion Affidavit; (iv) Statement of Bidder’s Qualifications; (v) Verification of Contractor and Subcontractor DIR Registration; and (vi) CWA Letter of Assent.
7. Prevailing Wage Rates. The Contractor and all Subcontractors shall pay not less than the applicable prevailing wage rate for the classification(s) of labor provided by their respective workers; prevailing wage rates are available for review at http://www.dir.ca.gov/dlsr/statistics_research.html. During the Work, the Department of Industrial Relations (“DIR”) will monitor compliance with prevailing wage rate requirements and enforce the Contractor’s prevailing wage rate obligations.
8. Bidder and Subcontractors DIR Registered Contractor Status. Each Bidder must be a DIR Registered Contractor when submitting a Bid Proposal. The Bid Proposal of a Bidder who is not a DIR Registered Contractor will be rejected for non-responsiveness. All Subcontractors identified in a Bidder’s Subcontractors’ List must be DIR Registered contractors at the time the Bid Proposal is submitted. The foregoing notwithstanding, a Bid Proposal is not subject to rejection for non-responsiveness for listing Subcontractor(s) on the Subcontractors List who is/are not DIR Registered contractors if such Subcontractor(s) complete DIR Registration pursuant to Labor Code §1771.1(c)(1) or (2). If any listed Subcontractor(s) who is/are not DIR Registered contractors and such Subcontractor(s) do not become DIR Registered pursuant to Labor Code §1771.1(c)(1) or (2), but the Bidder, if awarded the Contract, must request consent of the District to substitute a DIR Registered Subcontractor for the non-DIR Registered Subcontractor pursuant to Labor Code §1771.1(c)(3), without adjustment of the Contract Price or the Contract Time.
9. Contractors’ License Classification. The District requires that Bidders possess the classification(s) of California Contractors License designated above for each Bid Package.
10. Contract Time. Substantial Completion of the Work shall be achieved as set forth in the Contract Documents; Liquidated Damages will be assessed for delayed Substantial Completion.
11. Bid Security. Each Bid Proposal shall be accompanied by Bid Security in an amount not less than ten percent (10%) of the maximum amount of the Bid Proposal, inclusive of the pricing proposed for any additive Alternate Bid Item(s). A Bid Proposal not accompanied by the required Bid Security is non-responsive and will be rejected by the District.
12. Alternate Bid Items. If the bidding for a Bid Package include(s) Alternate Bid Items, each Bidder for such a Bid Package must propose pricing for each Alternate Bid Item. If Alternate Bid Items are included in the bidding for a Bid Package, the District’s selection of Alternate Bid Items for determination of the lowest priced bid proposal for such Bid Packages will be the lowest priced Bid Proposal shall be the lowest bid price proposed for the base contract without consideration of prices proposed for additive or deductive alternate items.

13. No Withdrawal of Bid Proposals. Bid Proposals shall not be withdrawn by any Bidder for ninety (90) days after the opening of Bid Proposals. During this time, all Bidders shall guarantee prices quoted in their respective Bid Proposals.
14. Job-Walk. The District will conduct a Non-Mandatory Job Walk on Thursday, March 08, 2018 beginning at 10:00 AM. Bidders are to meet at Facilities Services, 3041 West Avenue K, Lancaster, CA 93536 for the Job Walk. If the Job Walk is mandatory, the Bid Proposal submitted by a Bidder whose representative(s) did not attend the entirety of the Mandatory Job Walk will be rejected by the District as being non-responsive.
15. Pre-Bid Inquiries. Bidders may submit pre-bid inquiries or clarification requests no later than 3:00 PM, March 12, 2018. Pre-bid inquiries or clarification requests shall be submitted to: Jenny Johnson at jenniferj@lmcci.com.
16. Copies of Agreement and Bonds. The number of required executed copies of the Agreement are FOUR (4). The number of required executed copies of the Performance Bond and the Labor & Materials Payment Bond are FOUR (4).
17. Community Workforce Agreement. The District has entered into the "Community Workforce Agreement" with the Los Angeles and Orange Counties Building and Construction Trades Council which can be accessed and viewed on-line at: [https://www.boarddocs.com/ca/avc/Board.nsf/files/AK8STV7447E8/\\$file/Antelope%20Valley%20College%202.2.17%20clean%20draft.pdf](https://www.boarddocs.com/ca/avc/Board.nsf/files/AK8STV7447E8/$file/Antelope%20Valley%20College%202.2.17%20clean%20draft.pdf). The Bidder awarded the Contract for the Work and all Subcontractors must agree to be bound by the CWA during performance of the Work. Each Bidder must submit a completed and executed Letter of Assent with its Bid Proposal; failure of a Bid Proposal to be accompanied by the Bidder's completed and executed Letter of Assent will render the Bid Proposal non-responsive and rejected. If awarded a Contract for a Bid Package, the successful Bidder shall comply with provisions of the Contract Documents relating to the CWA, including without limitation: (i) craft labor hiring practices; (iii) alternative dispute resolution procedures for Site grievances and jurisdictional disputes; and (iii) prevailing wage rate responsibilities.
18. Award of Bid Package Contracts; Waiver of Irregularities. The Contract for each Bid Package, if awarded, will be by action of the District's Board of Trustees to the responsible Bidder submitting the lowest priced responsive Bid Proposal for the Bid Package. If Alternate Bid Items are included in the bidding for a Bid Package, the lowest priced Bid Proposal will be determined in accordance with Paragraph 11 above. The District reserves the right to reject all Bid Proposals or to waive any irregularities or informalities in any Bid Proposal or in the bidding.

Advertisement publication dates:

Monday, March 05, 2018 (Newspaper advertisement)

Tuesday, February 20, 2018 (Trade Journals notice)

[END OF SECTION]

[THIS PAGE INTENTIONALLY BLANK]

INSTRUCTIONS FOR BIDDERS

1. Bid Proposal. Bid Proposals not conforming to these Instructions for Bidders and the Notice to Contractors Calling for Bids (“Call for Bids”) may be deemed non-responsive and rejected.
 - 1.1. Completion of Bid Proposal. Where required, numbers shall be stated by words and figures; conflicts between numbers stated in words and in figures are governed by the words. Bid Proposals are non-responsive and will be rejected if: (i) partially completed; (ii) submitted on forms other than those required by the District; (iii) erasures, interlineations or other corrections are not suitably authenticated by the initials of the person(s) signing the Bid Proposal adjacent to such erasure, interlineations or correction; (iv) a Bid Proposal, or portions thereof, is/are determined by the District to be illegible, ambiguous or inconsistent.
 - 1.2. Submittal. Bid Proposals shall be submitted in sealed envelopes bearing on the outside the Bidder’s name and address along with the Project Name and an identification of the Bid Package for which the Bid Proposal is submitted. A Bid Proposal is deemed submitted only if the outer envelope containing the Bid Proposal is stamped by the District’s date/time stamp machine at the location where Bid Proposals are to be submitted.
 - 1.3. Separate Bid Proposals for Separate Bid Packages. A Bidder may submit Bid Proposals for multiple Bid Packages by submitting separate Bid Proposals for each Bid Package. A Bid Proposal incorporating proposed pricing for multiple Bid Packages will be rejected for non-responsiveness.
 - 1.4. Withdrawal; Modification. No oral modification or withdrawal of a submitted Bid Proposal will be considered; a written request to modify or withdraw a submitted Bid Proposal will be considered only if the written request is received by the District before the public opening of Bid Proposals.
2. Contractors’ License. No Bid Proposal will be considered from a Bidder who, at the time Bid Proposals are opened, is not licensed to perform the Work of a Bid Package in accordance with licensing requirements set forth in the Call for Bids. This requirement will not be waived by the District or its Board of Trustees.
3. Bidder’s Qualifications. Each Bidder shall submit with its Bid Proposal the form of Statement of Qualifications, which is included within the Contract Documents. All information required by Statement of Qualifications shall be completely and fully provided. Any Bid Proposal not accompanied by the Statement of Qualifications completed with all information required and bearing the signature of the Bidder’s duly authorized representative under penalty of perjury will render the Bid Proposal non-responsive and rejected. The Bid Proposal of a Bidder whose response to any question in the Essential Requirements section of the Statement of Qualifications resulted in a “Not Qualified” status will be rejected for non-responsiveness. If the District determines that any information provided by a Bidder in the Statement of Qualifications is false or misleading, or is incomplete so as to be false or misleading, the District may reject the Bid Proposal submitted by such Bidder as being non-responsive.
4. Bid Security. Each Bid Proposal shall be accompanied by Bid Security in the form of: (i) cash; (ii) certified or cashier’s check payable to the District; or (iii) a Bid Bond, in the form and content incorporated into the Contract Documents (the “Bid Security”) in an amount not less than ten percent (10%) of the maximum amount of the Bid Proposal. Bid Bonds must conform to the following: (i) the Bid Bond is in the form and content included herein; and (ii) the Surety is an Admitted Surety Insurer under Code of Civil Procedure §995.120; (iii) authorized employees or representatives of the Bidder and Surety execute the Bid Bond and their signatures are duly notarized; (iv) the Surety’s representative’s authority to bind the Surety is attached to the Bid Bond and duly attested to by the Surety; and (v) all other information required by the form of the Bid Bond is completely and accurately provided.
5. Job-Walk. The District will conduct a Job-Walk at the time(s) and place(s) designated in the Call

for Bids. Attendance by representatives of the Bidder's Subcontractors at a Mandatory Job Walk without attendance by a representative of the Bidder is not sufficient to meet the Bidder's obligations hereunder and will render the Bid Proposal of such Bidder to be non-responsive. Notwithstanding the non-compulsory attendance of Bidders at a Non-Mandatory Job Walk, all Bidders are encouraged to attend Non-Mandatory Job Walks.

6. Examination of Site and Contract Documents. Each Bidder shall, at its sole cost and expense, inspect the Site and to become fully acquainted with the Contract Documents and conditions affecting the Work. The submission of a Bid Proposal is prima facie evidence of the Bidder's full compliance with the foregoing requirements.
7. Pre-Bid Questions; Contract Document Interpretation and Modifications. Any Bidder in doubt as to the true meaning of any part of the Contract Documents; finds discrepancies, errors or omissions therein; or finds variances in any of the Contract Documents with the Laws ("Pre-Bid Questions"), shall submit a request for an clarification, interpretation or correction thereof using the form of Pre-Bid Inquiry included with the Contract Documents. Bidders are solely and exclusively responsible for submitting Pre-Bid Questions no later than the time/date designated in the Call for Bids. Responses to Pre-Bid Questions will be by written addendum issued by, or on behalf of, the District. A copy of any such addendum will be mailed or otherwise delivered to each Bidder receiving a set of the Contract Documents. Failure to request interpretation or clarification of any portion of the Contract Documents pursuant to the foregoing is a waiver of any discrepancy, defect or conflict therein.
8. Interpretation of Drawings, Specifications or Contract Documents. Interpretations, modifications or corrections of the Contract Documents will be by written addendum issued by or on behalf of the District. No person is authorized to render an oral interpretation or correction of any portion of the Contract Documents to any Bidder, and no Bidder is authorized to rely on any such oral interpretation or correction.
9. Bidder's Assumptions. The District is not responsible for any assumptions made or used by the Bidder in calculating its Bid Proposal Amount including, without limitation, assumptions regarding costs of labor, materials, equipment or substitutions/alternatives for any material, equipment, product, item or system incorporated into or forming a part of the Work which have not been previously expressly approved and accepted by the District. Unless the District has accepted proposed substitution of any materials, equipment, product, item or system specified in the Contract Documents ("Specified Items") prior to the latest date/time for submittal of Bid Proposals, the submission of a Bid Proposal is deemed the Bidder's agreement to furnish and install Specified Materials. If the District has accepted a proposed substitution of any Specified Items prior to the latest date/time for submittal of Bid Proposals, Bid Proposals must specifically indicate if the Bid Proposal is based on the Specified Items or the District accepted substitution of Specified Items. The successful Bidder, upon award of the Contract by the District, if any, will be required to complete the Work for the amount bid in the Bid Proposal within the Contract Time and in accordance with the Contract Documents.
10. District's Right to Modify Contract Documents. Before the public opening and reading of Bid Proposals, the District may modify the Work, the Contract Documents, or portion(s) thereof by the issuance of written addenda disseminated to all Bidders who have obtained the Bid and Contract Documents pursuant to the Call for Bids. Failure of a Bidder to acknowledge addenda in its Bid Proposal will render the Bid Proposal non-responsive and rejected. The foregoing notwithstanding, the District may, in the sole discretion of the District, waive rejection of a Bid Proposal for non-responsiveness if the Bid Proposal does not acknowledge an addenda issued by the District that has no effect on the scope of the Bid Package, the requirements of the Bid Package or the proposed pricing to complete the Work of a Bid Package.

11. Erasures; Inconsistent or Illegible Bid Proposals. Bid Proposals must not contain any erasures,

interlineations or other corrections unless the same are suitably authenticated by affixing in the margin immediately opposite such erasure, interlineations or correction the initials of the person(s) signing the Bid Proposal. If a Bid Proposal, or portions thereof, are determined by the District to be illegible, ambiguous or inconsistent, whether by virtue of any erasures, interlineations, corrections or otherwise, the District may reject such a Bid Proposal as being non-responsive.

12. Bidders Interested in More Than One Bid Proposal; Non-Collusion Affidavit. No person, firm, corporation or other entity shall submit or be interested in more than one Bid Proposal for the same Work; provided, however, that a person, firm or corporation that has submitted a sub-proposal to a Bidder or who has quoted prices for materials to a Bidder is not thereby disqualified from submitting a sub-proposal, quoting prices to other Bidders or submitting a Bid Proposal for the proposed Work to the District. Failure of a Bidder to submit a completed and executed Non-Collusion Affidavit with its Bid Proposal will render the Bid Proposal non-responsive.

13. Subcontractors.

13.1. Subcontractors List. In accordance with Public Contract Code §4104, the Subletting and Subcontracting Fair Practices Act (California Public Contract Code §§4100 et seq.), each Bidder shall submit, on the form of Subcontractors List included with the Contract Documents, a list of its proposed Subcontractors for the Work of a Bid Package, including any Alternate Bid Items, who will perform/provide portions of the Work valued at or more than one-half (1/2) of one percent (1%) of the price proposed by the Bidder for the Work of a Bid Package. The Subcontractors List consists of four (4) columns, each of which requires the Bidder's disclosure of information relating to each listed Subcontractor as follows:

- Column A Name of Subcontractor
- Column B Subcontractor Address
- Column C Subcontractor California Contractors' License
- Column D Subcontractor Portion of the Work

All information in Columns A-D of the Subcontractors List must be completed for each listed Subcontractor; failure to do so will render the Bid Proposal non-responsive and rejected.

13.2. Work of Subcontractors. All Bidders are referred to the Contract Documents and the notation therein that all Contract Documents are intended to be complimentary and that the organization or arrangements of the Specifications and Drawings shall not limit the extent of the Work of the Contract Documents. Accordingly, all Bidders are encouraged to disseminate all of the Specifications, Drawings and other Contract Documents to all persons or entities submitting sub-bids to the Bidder. The omission of any portion or item of Work from the Bid Proposal or from the sub-bidders' sub-bids which is/are necessary to produce the intended results and/or which are reasonably inerrable from the Contract Documents is not a basis for adjustment of the Contract Price or the Contract Time. Dissemination of the Contract Documents to sub-bidders and dissemination of addenda issued during the bidding process is solely the responsibility of each Bidder.

13.3. Subcontractor Bonds. Pursuant to California Public Contract Code §4108, if a Bidder requires a bond or bonds of its Subcontractor(s), whether the expense of procuring such bond or bonds are to be borne by the Bidder or the Subcontractor(s), such requirements shall be specified in the Bidder's written or published request for sub-bids. Failure of the Bidder to comply with these requirements shall preclude the Bidder from imposing bonding requirements upon its Subcontractor(s) or rejection of a Subcontractor's bid under California Public Contract Code §4108(b).

14. Award of Contract. The District reserves the right to reject all Bid Proposals or to waive any irregularities or informalities in any Bid Proposal or in the bidding. Award of the Contract for a Bid Package, if made by the District through action of its Board of Trustees, will be to the responsible

Bidder submitting the lowest priced responsive Bid Proposal on the basis of the Base Bid Proposal or the Base Bid Proposal and Alternate Bid Items, if any, selected in accordance with the Call for Bids.

15. Alternate Bid Items.

15.1. Selection. Selection of Alternate Bid Items for determining the lowest priced Bid Proposal shall be as set forth in the Call for Bids. The Bid Proposal of a Bidder will be rejected for non-responsiveness if the Bidder fails to submit the completed/executed Alternate Bid Items Proposal in a sealed envelope separate from the Bid Proposal and other documents submitted with the Bid Proposal.

15.2. Alternate Bid Items Not Included in Award of Contract. Bidders are referred to the provisions of the Contract Documents permitting the District, during performance of the Work, add or delete from the scope of the Work any or all of the Alternate Bid Items with the cost or credit of the same being the amount(s) set forth by the successful Bidder in its Alternate Bid Items Proposal.

16. Unit Price Items. If the Bid Proposal for the Work includes proposal(s) for Unit Price Item(s), during Contractor's performance of the Work, the District may elect to add or delete any such Unit Price Item(s). If the District elects to add or delete any such Unit Price Item(s) pursuant to the foregoing, the debit or credit for such Unit Price Item(s) shall be in accordance with the amount(s) set forth in the Contractor's Unit Price Item(s) Proposal.

17. Responsive/Responsible Bids

17.1. Responsive Bid Proposal. A responsive Bid Proposal is a Bid Proposal which conforms, in all material respects, to requirements of the Bid and Contract Documents.

17.2. Hearing re Rejected Bid. If a Bidder's Bid Proposal is rejected by the District for non-responsiveness, but the Bidder contends that the basis of rejection is for Bidder responsibility, and not Bid Proposal responsiveness, the Bidder may request a responsibility hearing on that rejection: (i) if the District issues a notice of intent to award the Contract for a Bid Package to a Bidder with proposed pricing higher than pricing proposed in the rejected Bid Proposal; and (ii) the Bidder strictly complies with the following provisions relating to time limitations for requesting a responsibility hearing. To be considered by the District, such a request for a responsibility hearing must be in writing and submitted to the District's Chief Business Officer and must be actually received by the District's Chief Business Officer by the earlier of: (i) 5:00 PM one (1) business day after the District's notice to the Bidder of the District's rejection of the Bidder's Bid Proposal; or (ii) 5:00 PM one (1) business day after the date of the District's notice of intent to award a contract. If a Bidder does not request a responsibility hearing in strict conformity with the foregoing, such Bidder shall be deemed to have knowingly and voluntarily waive rights to a hearing. The District will grant or deny such request for a hearing based on the holding of the California Court of Appeal in *Great West Contractors, Inc. v. Irvine Unified School District* (2010) 187 Cal. App. 4th 1425. If a Bidder timely requests a hearing pursuant to the foregoing, the District will notify such Bidder in writing by 5:00 PM two (2) business days after the date of the Bidder's request for hearing is submitted of the District grant or denial of such a hearing. If the District grants a hearing, the District will schedule the hearing for a date not less than three (3) business days after the date of such notice to the Bidder requesting a hearing. If the District holds such a hearing, any Bidder may at its own expense: (i) be represented at the hearing by legal counsel; (ii) record the proceedings by court reporter; (iii) present oral and/or written statements and/or other documents.

17.3. Responsible Bidder.

17.3.1. Bidder Capacity. Factors affecting the Bidder's capacity to perform and complete the Work will be assessed, including: (i) Bidder's access to labor, materials and other resources necessary to complete the Work; (ii) Bidder's ability to complete the Work

within the time established for completion of the Work, or portions thereof; and (iii) Bidder's ability to complete warranty obligations.

17.3.2. Bidder Character, Integrity. Factors reflecting the character and integrity of the Bidder, including: (i) other public agency finding/determination, within the past five (5) years, that the Bidder is not responsible; (ii) currently debarred from bidding public works projects or debarment from bidding within past five (5) years; and (iii) false claims liability within the past five (5) years under local, state or federal laws.

17.3.3. Bidder Financial Capability. Factors considered include: (i) sufficiency of the Bidder's financial resources; (ii) whether the Bidder is current in payment of debts and performance of other financial obligations; and (iii) bankruptcy or insolvency proceedings have been instituted within the past five (5) years.

17.3.4. Bidder Prior Performance. The Bidder's prior performance on prior public works contracts, including without limitation: (i) cost overruns; (ii) compliance with general conditions and other contractual requirements, including schedule development, schedule updates and coordination of labor, material/equipment procurements and subcontractors; (iii) completion within allocated time; (iv) submittal of unsubstantiated, unsupported or excessive cost proposals, claims or contract adjustment requests; (v) completion of a project by a surety; (vi) owner's exercise of default remedies; and (vii) finding or determination by any public agency that the Bidder is not a responsible bidder.

17.3.5. Safety. Factors include: (i) findings of serious or willful safety violations of safety laws, regulations or requirements by any local, state or federal agency within the past five (5) years; (ii) adequacy and implementation of safety plans, programs for on-site and off-site construction and construction related activities; and (iii) Workers Compensation Insurance EMR rating exceeding 1.25.

18. Notice of Intent to Award Contract. Following the public opening and reading of Bid Proposals, the District will issue a Notice of Intent to Award the Contract for a Bid Package, identifying the Bidder to whom the District intends to award the Contract and the date/time/place of the District's Board of Trustees meeting at which award of the Contracts for Bid Packages will be considered.

19. Agreement and Bonds Upon Award of Contract. If the Bidder submitting a Bid Proposal is awarded the Contract for a Bid Package, the undersigned will execute and deliver to the District the Contract in the form attached hereto within five (5) calendar days after notification of award of the Contract. Concurrently with delivery of the executed Agreement to the District, the Bidder awarded the Contract shall deliver to the District: (i) Certificates of Insurance evidencing all insurance coverage required under the Contract Documents; (ii) the Performance Bond; (iii) the Labor and Material Payment Bond; (iv) the Certificate of Workers' Compensation Insurance; and (v) the Drug-Free Workplace Certificate. Failure of the Bidder awarded the Contract to strictly comply with the preceding may result in the District's rescission of the award of the Contract and/or forfeiture of the Bidder's Bid Security. In such event, the District may, in its sole and exclusive discretion elect to award the Contract to the responsible Bidder submitting the next lowest priced Bid Proposal, or to reject all Bid Proposals. The required number of executed copies of the Agreement and the form and content of the Performance Bond and the Payment Bond and other documents or instruments required at the time of execution of the Agreement are specified in the Contract Documents.

20. Workers' Compensation Insurance. Pursuant to California Labor Code §3700, the successful Bidder shall secure Workers' Compensation Insurance for its employees engaged in the Work of the Contract. The successful Bidder shall sign and deliver to the District the Certificate of Workers Compensation Insurance incorporated into the Contract Documents.

21. Drug Free Workplace Certificate. The successful Bidder will be required to execute a Drug Free Workplace Certificate pursuant to California Government Code §§8350 et seq., concurrently with execution of the Agreement.
22. Bid Security Return. The Bid Security of the Bidders submitting the three (3) lowest priced responsive Bid Proposals for each Bid Package will be held by the District for ten (10) days after the period for which Bid Proposals must be held open, as set forth the Call for Bids, or until posting by the successful Bidder(s) of the bonds, certificates of insurance required and return of executed copies of the Agreement, whichever first occurs, at which time the Bid Security of such other Bidders will be returned to them.
23. Forfeiture of Bid Security. If the Bidder awarded a Contract for a Bid Package fails or refuses to execute the Agreement within five (5) calendar days from the date of receiving notification that it is the Bidder to whom the Contract has been awarded, the District may declare the Bidder's Bid Security forfeited as damages caused by the failure of the Bidder to enter into the Contract and may thereupon award the Contract for the Bid Package to the responsible Bidder submitting the next lowest priced Bid Proposal or may call for new bids, in its sole and exclusive discretion.
24. Non-Discriminatory Employment Practices. It is the policy of the District that there be no discrimination against any prospective or active employee engaged in the Work because of race, color, ancestry, national origin, religious creed, sex, age, marital status or other legally protected classification. All Bidders agree to comply with the District's non-discrimination policy and all applicable Federal and California anti-discrimination laws including but not limited to the California Fair Employment & Housing Act beginning with California Government Code §§ 12940 et seq. and California Labor Code § 1735. In addition, all Bidders agree to require like compliance by any Subcontractor employed by them on the Work of the Contract.
25. Sexual Harassment. It is the policy of the District to ensure that everyone complies with Education Code, Government Code, Title V of the Administrative Code, and all other related statutes related to the prevention of Sexual Harassment. All Bidders agree to comply with the District's Sexual Harassment Prevention Program and all applicable Federal and California laws including but not limited to the California Fair Employment & Housing Act commencing with California Government Code §12950, *et seq.* In addition, all Bidders agree to require like compliance by any Subcontractor employed by them on the Work of the Contract.
26. Public Records. Bid Proposals and other documents responding to the Call for Bids become the exclusive property of the District upon submittal to the District. At such time as the District issues the Notice of Intent to award the Contract pursuant to these Instructions for Bidders, all Bid Proposals and other documents submitted in response to the Call for Bids become a matter of public record and shall be thereupon be considered public records, except for information contained in such Bid Proposals deemed to be Trade Secrets (as defined in California Civil Code §3426.1) confidential or proprietary. The District is not liable or responsible for the disclosure of such records, including those exempt from disclosure if disclosure is deemed required by law, by an order of Court, or which occurs through inadvertence, mistake or negligence on the part of the District or its officers, employees or agents. When Bid Proposals are deemed a matter of public record, pursuant to the above, any Bidder or other party shall be afforded access for inspection and/or copying of such Bid Proposals pursuant to the California Access to Public Records Act, California Government Code §§6250, *et seq.* If the District is required to defend or otherwise respond to any action or proceeding wherein request is made for the disclosure of the contents of any portion of a Bid Proposal deemed exempt from disclosure hereunder, the Bidder submitting the materials sought by such action or proceeding agrees to defend, indemnify and hold harmless the District in any action or proceeding from and against any liability, including without limitation attorneys' fees arising there from. The party submitting materials sought by any other party shall be solely responsible for the cost and defense in any action or proceeding seeking to compel

disclosure of such materials; the District's sole involvement in any such action shall be that of a stakeholder, retaining the requested materials until otherwise ordered by a court of competent jurisdiction.

27. **Bid Protest.** Any Bidder submitting a Bid Proposal to the District may file a protest of the District's intent to award the Contract provided that each and all of the following are complied with: (i) the bid protest is in writing; (ii) the bid protest is filed and received by the District's Chief Business Officer, not more than five (5) calendar days following the date of issuance of the District's Notice of Intent to Award the Contract; and (iii) the written bid protest sets forth, in detail, all grounds for the bid protest, including without limitation all facts, supporting documentation, legal authorities and argument in support of the grounds for the bid protest; any matters not set forth in the written bid protest shall be deemed waived. All factual contentions must be supported by competent, admissible and credible evidence. Any bid protest not conforming to the foregoing shall be rejected by the District as invalid. Provided that a bid protest is filed in strict conformity with the foregoing, the District's Chief Business Officer, or such individual(s) as may be designated by him/her, shall review and evaluate the basis of the bid protest. Either the Chief Business Officer, or other individual designated by him/her shall provide the bidder submitting the bid protest with a written statement concurring with or denying the bid protest. The rendition of a written statement by the District's Chief Business Officer, (or his/her designee) is an express conditions precedent to the institution of any judicial proceedings relative to the bidding process, the District's intent to award the Contract, the District's disposition of any bid protest or the District's decision to reject all Bid Proposals. If any such judicial proceedings are instituted and the District is named as a party thereto, the prevailing party(ies) shall recover from the other party(ies), as costs, all attorneys' fees and costs incurred in connection with any such proceeding, including any appeal arising there from.

[END OF SECTION]

[THIS PAGE INTENTIONALLY BLANK]

BID PACKAGES SCOPE DESCRIPTIONS

Bid Package descriptions and a general description of the scope of Work incorporated into each Bid Package are set forth in attachments to the Special Conditions.

Singular Bid Package under HVAC Contractor for Boiler Replacement Campus Wide.

[THIS PAGE INTENTIONALLY BLANK]

BID TIME PROJECT SCHEDULE

The Bid Time Construction Schedule is set forth in attachments to the Special Conditions.

Refer to Specification Section 01310 Project Construction Schedule.

[THIS PAGE INTENTIONALLY BLANK]

BID PROPOSAL

PROJECT: Boiler Replacement Campus Wide

Bid Package No. _____ ; **Bid Package Description:** _____

Bidder Name	_____	
Bidder Representative(s)	Name and Title _____	
	Name and Title _____	
Bidder Representative(s) Contact Information	Email _____	Phone/Fax _____
	_____	(_____) Telephone _____
Bidder Mailing Address	_____	
	Address _____	
California Contractors' License	_____	
	Number _____	
	Classification and Expiration Date _____	

1. Bid Proposal.

1.1. Bid Proposal Price. The undersigned Bidder proposes and agrees to furnish and install the Work of the above-identified Bid Package including, without limitation, providing and furnishing any and all labor, materials, tools, equipment and services necessary to complete, in a workmanlike manner in accordance with the Contract Documents for the sum of:

\$, , . Dollars

(in words; printed or typed)

The Bid Proposal Amount includes all Allowances set forth in Paragraph 1.3, below and the total Composite Unit Price, if any, set forth in Paragraph 1.4 and detailed in Attachment A. The Bidder confirms that it has checked all of the above figures and understands that neither the District nor any of its agents, employees or representatives shall be responsible for any assumptions, errors or omissions on the part of the undersigned Bidder in preparing and submitting this Bid Proposal.

1.2. Acknowledgment of Bid Addenda. The Bidder confirms that this Bid Proposal incorporates and is inclusive of, all items or other matters contained in Bid Addenda, if any, issued by or on behalf of the District.

_____ **Addenda Nos.** _____ received, acknowledged
(initial) and incorporated into this Bid Proposal.

1.3. Allowance. The Bidder and District acknowledge that the Bid Proposal Price set forth above includes an Allowance Amount in the aggregate amount of _____ Dollars (\$ _____), which is allocated as follows:

Allowance Description	Allowance Amount
	Dollars (\$ _____)
	Dollars (\$ _____)
	Dollars (\$ _____)

Although included in the Bid Proposal Price, Allowances belong solely to the District and shall be expended only upon written direction by the District in the sole discretion of the District. Any Allowance amount not fully consumed shall belong solely to the District and shall be credited against the Contract Price by a Deductive Change Order. By submitting this Bid Proposal, the Bidder confirms that the Bid Price proposed in Paragraph 1.1 is inclusive of all Allowances.

- 1.4. Unit Price Items. If applicable, the Bidder’s price proposals for Unit Price Items are set forth in the form of a Composite Unit Price Item Proposal included herewith as Attachment A hereto. The amount of the Composite Unit Price Proposal in Attachment A hereto is included in the Bid Proposal Price set forth above in Paragraph 1.1. Although the Unit Price Items will be considered in the determination of the lowest priced Bid Proposal, Unit Price Items will not form the basis for the District’s Contract Price for any Contract awarded. During performance of the Work, the District may elect to add or delete any Unit Price Item set forth in Attachment A. If the District elects to add or delete any Unit Price Item set forth below, the debit or credit for such Unit Price Item shall be in accordance with the Unit Prices set forth in Attachment A hereto.
- 1.5. Alternate Bid Items. The Bidder’s proposed pricing for each Alternate Bid Item, if any, are set forth in the accompanying form of Alternate Bid Items Proposal, Attachment B. Failure of a Bidder to propose pricing for each Alternate Bid Item set forth in the accompanying Alternate Bid Items Proposal will result in the Bid Proposal being deemed non-responsive and rejected.
2. Documents Accompanying Bid Proposal. The Bidder has submitted with this Bid Proposal the following: (i) Bid Security; (ii) Subcontractors List; (iii) Statement of Qualifications; (iv) Non-Collusion Affidavit; (v) DIR Registration Verification; and (vi) CWA Letter of Assent. The Bidder acknowledges that if this Bid Proposal and the foregoing documents are not fully in compliance with applicable requirements set forth in the Call for Bids, the Instructions for Bidders and in each of the foregoing documents, the Bid Proposal may be rejected for non-responsiveness.
3. Community Workforce Agreement (CWA). By submitting this Bid Proposal, the Bidder acknowledges and agrees that if it is awarded the Contract for the Bid Package, the Bidder and its Subcontractors of any tier each agree to comply with the terms and conditions of the CWA.
4. Award of Contract. Within five (5) days after notification of award of the Contract, the Bidder awarded the Contract shall execute and deliver to the District the Contract in the form attached hereto along with: (i) Certificates of Insurance evidencing all insurance coverages required under the Contract Documents; (ii) the Performance Bond; (iii) the Labor and Material Payment Bond; (iv) the Certificate of Workers’ Compensation Insurance; and (v) the Drug-Free Workplace Certificate. Failure of the Bidder awarded the Contract to strictly comply with the preceding may result in the District’s recession of the award of the Contract and/or forfeiture of the Bidder’s Bid Security. In such event, the District may, in its sole and exclusive discretion elect to award the Contract to the responsible Bidder submitting the next lowest priced Bid Proposal, or to reject all Bid Proposals.
5. Contractors’ License. The Bidder certifies that: (i) it is duly licensed, in the necessary class(es),

for performing the Work of the Contract Documents, as designated by the District; (ii) that such license shall be in full force and effect throughout the duration of the performance of the Work under the Contract Documents; and (iii) that all Subcontractors providing or performing any portion of the Work are properly licensed to perform their respective portions of the Work at the time of submitting this Bid Proposal and shall remain properly licensed at all times during their performance of the Work.

6. Agreement to Bidding Requirements and Attorneys' fees. The undersigned Bidder acknowledges and confirms its receipt, review and agreement with, the contractual requirements set forth in this Bid Proposal and the Contract Documents. By executing this Bid Proposal hereinbelow, the Bidder expressly acknowledges and agrees that if the Bidder institutes any legal or equitable proceedings in connection with this Bid Proposal and the District is named as a party thereto, the prevailing party(ies) shall recover from the other party(ies), as costs, all attorneys' fees and costs incurred in connection with any such proceeding, including any appeal arising therefrom. This provision is a binding attorneys' fee agreement in accordance with and pursuant to California Civil Code §1717 which shall be enforceable against the Bidder and the District. This attorneys' fee provision shall be solely limited to legal or equitable proceedings arising out of a bid protest or the bidding process and shall not extend to or have any force and effect on the Contract for the Work or to modify the terms of the Contract Documents for the Work.
7. Acknowledgment and Confirmation. The undersigned Bidder acknowledges its receipt, review and understanding of the Drawings, the Specifications and other Contract Documents pertaining to the proposed Work. By submitting this Bid Proposal, the undersigned Bidder certifies that the Contract Documents are, in its opinion, adequate, feasible, accurate and complete for the Bidder to complete the Work in a workmanlike manner within the Contract Time and for the price proposed herein. The undersigned Bidder warrants and represents to the District that it has, or has available, all necessary equipment, personnel, materials, facilities and technical and financial ability to complete the Work for the amount bid herein, within the Contract Time and in accordance with the Contract Documents.

Dated: _____

By: _____
(Signature of Bidder's Authorized Officer or Representative)

(Typed or Printed Name)

Title: _____

**ATTACHMENT A
COMPOSITE UNIT PRICE BID PROPOSAL**

PROJECT: Boiler Replacement Campus Wide

Bid Package No. _____ ; **Bid Package Description:** _____

If applicable, Bidders shall provide a Composite Unit Price Proposal by completing this Attachment A fully and completely, and shall insert the amount of said Composite Unit Price Proposal in the Bid Proposal Amount at Paragraph 1.1 of this Bid Proposal; a Bidder's failure to do so will result in rejection of the Bid Proposal for non-responsiveness.

During performance of the Work, the District may elect to add or delete any Unit Price Item set forth below. The Unit Price shall be the total cost for addition or deletion of the item, inclusive of all costs of labor, materials, equipment and services necessary to complete the Unit Price work, together with any and all indirect costs, overhead and profit. No additional mark-up shall be allowed on any Unit Price Item. If the District elects to add or delete any Unit Price Item set forth below, the debit or credit for such Unit Price Item shall be in accordance with the Unit Prices set forth below.

The Multiplier set forth below for each Unit Price Item is **not** an estimate of the number of units required for the Work. The Multiplier set forth below for each Unit Price Item is to be used solely for the purpose of calculating a Composite Unit Price Proposal.

Bidders shall insert a Unit Price in the table below for each Unit Price Item. To compute a Unit Price Proposal for a Unit Price Item, multiply the Unit Price by the Multiplier for that Unit Price Item. The Composite Unit Price is the cumulative value of the Unit Price Proposal for all Unit Price Items identified above.

	Unit Price Item	Unit Price	Unit	Multiplier	Unit Price Proposal
1.					
2.					
3.					
4.					
5.					
6.					

Composite Unit Price Proposal Total: \$ _____

Bidder shall include the foregoing Composite Unit Price Proposal into the Bid Proposal Price at Paragraph 1.1 of this Bid Proposal.

[END OF SECTION]

ALTERNATE BID ITEMS PROPOSAL

PROJECT: Boiler Replacement Campus Wide

Bid Package No. _____; **Bid Package Description:** _____

Bidder Name: _____

Bidders must provide a proposal price for each Alternate Bid Item set forth herein; failure to do so will result in rejection of the Bid Proposal for non-responsiveness. The amount proposed for each Alternate Bid Item by the above-identified Bidder is set forth hereinbelow:

Alternate Bid Item No. 1. [DESCRIPTION]

Bid Package No. _____; **Bid Package Description:** _____

Check one of the following and indicate the additive or deductive proposed price for the foregoing Alternate Bid Item.

- Add _____ Dollars (\$) to Base Bid Proposal Price.
- Deduct _____ Dollars (\$) from Base Bid Proposal Price.

Alternate Bid Item No. 2. [DESCRIPTION]

Bid Package No. _____; **Bid Package Description:** _____

Check one of the following and indicate the additive or deductive proposed price for the foregoing Alternate Bid Item.

- Add _____ Dollars (\$) to Base Bid Proposal Price.
- Deduct _____ Dollars (\$) from Base Bid Proposal Price.

Alternate Bid Item No. 3. [DESCRIPTION]

Bid Package No. _____; **Bid Package Description:** _____

Check one of the following and indicate the additive or deductive proposed price for the foregoing Alternate Bid Item.

- Add _____ Dollars (\$) to Base Bid Proposal Price.
- Deduct _____ Dollars (\$) from Base Bid Proposal Price.

Dated _____

By: _____
(Signature of Bidder's Authorized Officer or Representative)

(Typed or Printed Name)

Title: _____

[THIS PAGE INTENTIONALLY BLANK]

PRE-BID INQUIRY FORM

Project: **Boiler Replacement Campus Wide**

Bid Package No: _____

Bid Package Description: _____

Submittal Date _____

Bidder inquiries will be responded to only if: (i) submitted on this Pre-Bid Inquiry Form; (ii) this completed Pre-Bid Inquiry Form is submitted prior to the latest date/time for submittal of pre-bid inquiries as set forth in the Call for Bids; and (ii) this completed Pre-Bid Inquiry Form is submitted to the person or entity noted in the Call for Bids.

Item No.	Item Description	Drawing Sheet No. & Detail No. Reference	Specifications Section and Paragraph No. Reference

Submitted By:

(Bidder Name)

(Signature of Bidder's Authorized Employee, Officer or Representative)

Bidder Contact Information:

(Bidder Contact Name)

(Phone and Fax)

(Email Address)

[THIS PAGE INTENTIONALLY BLANK]

SUBCONTRACTORS LIST

Project ("the Work")	Boiler Replacement Campus Wide	
Bid Package No. and Description	Bid Package No. _____	Bid Package Description: _____
Bidder Name	_____	
Bidder's Representative Signature	_____ (Signature) _____ (Typed or Printed Name)	

(A) Subcontractor Licensed Name	(B) Address of Office, Mill or Shop	(C) CSLB License No.	(D) Trade or Portion of Work

DUPLICATE THIS FORM FOR ADDITIONAL SUBCONTRACTORS]

[THIS PAGE INTENTIONALLY BLANK]

**VERIFICATION OF CONTRACTOR AND
SUBCONTRACTORS' DIR REGISTRATION**

I am the _____ of _____ ("Bidder")
(Title/Position) (Bidder Name)

submitting the accompanying Bid Proposal for the Work described as **Boiler Replacement Campus Wide.**

1. The Bidder is submitting a Bid Proposal for Bid Package No. _____, Bid Package Description: _____.
2. The Bidder is currently registered as a contractor with the Department of Industrial Relations ("DIR").
3. The Bidder's DIR Registration Number is: _____. The expiration date of the Bidder's DIR Registration is _____, 20____.
4. If the expiration date of the Bidder's DIR Registration will occur prior to expiration of the Contract Time for the Work and the Bidder is awarded the Contract for the Work, prior to the Bidder's DIR Registration expiration, the Bidder will take all measures necessary to renew the Bidder's DIR Registration so that there is no lapse in the Bidder's DIR Registration.
5. The Bidder, if awarded the Contract for the Work will remain a DIR registered contractor for the entire duration of the Work.
6. The Bidder has independently verified that each Subcontractor identified in the Subcontractors List is a DIR registered contractor.
7. The Bidder's solicitation of Subcontractor bids included notice to prospective Subcontractors that: (i) all sub-tier subcontractors must be DIR registered contractors at all times during performance of the Work; and (ii) prospective subcontractors may only solicit sub-bids from and contract with lower-tier subcontractors who are DIR registered contractors.
8. If any of the statements herein are false or omit material facts rendering a statement to be false or misleading, the Bidder's Bid Proposal is subject to rejection for non-responsiveness.
9. I have personal first hand-knowledge of all of the foregoing.

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

Executed this ____ day of _____, 20__ at _____
(City and State)

(Signature)

(Name, typed or printed)

[THIS PAGE INTENTIONALLY BLANK]

STATEMENT OF QUALIFICATIONS

PROJECT: Boiler Replacement Campus Wide

Bid Package No. _____ ; **Bid Package Description:** _____

Bidder Name: _____

1. Bidder Information.

1.1. Contact Information

Mailing Address	Street Address
	City, State, Zip Code
Physical Location (if different from mailing address)	Street Address
	City, State, Zip Code
Telephone/Fax	(____) _____ Telephone
	(____) _____ Fax

1.2. Bidder Contacts.

Name	_____
Contact Information	Telephone: (____) _____
	Fax (____) _____
	Email _____

1.3. California Contractors' License.

License Number(s)	_____
License Classification(s)	_____
Responsible Managing Employee; Responsible Managing Officer	_____
Expiration Date(s)	_____

1.4. Bidder Form of Entity.

- Corporation
- General Partnership
- Limited Partnership
- Limited Liability Company
- Limited Liability Partnership
- Joint Venture
- Sole Proprietorship

2. **Revenue.** Complete the following for the Bidder's construction operations; if any portion of the revenue disclosed is generated by non-construction operations or activities, the Bidder must identify the portion of revenue attributed to construction operations and generally describe business activities of the Bidder that generates non-construction operations related revenue.

Calendar Year/ Fiscal Year	Annual Gross Revenue	Annual Net Revenue	Average Dollar Value of all Contracts	Dollar Value of Largest Contract
2017				
2016				
2015				

3. **References.**

DSA Project Inspectors			
Firm Name	Address	Telephone No.	Contact Name
Owners (K-12 School Districts or Community College Districts preferred)			
Owner Name	Address	Telephone No.	Contact Name
Architects (K-12 School District or Community College District Projects only)			
Architect Firm Name & Architect Firm Contact Name	Address	Telephone No.	Contact Name

[CONTINUED NEXT PAGE]

4. Insurance.

<p>Commercial General Liability Insurance</p>	<p>Insurer: _____ Policy No. _____ Broker _____</p>
<p>Commercial General Liability Insurance Broker</p>	<p>_____ (Contact Name) _____ (Street Address) _____ (City, State & Zip Code) (_____) _____ (_____) _____ Telephone Fax _____ (Email address)</p>
<p>Bid, Performance and Labor & Materials Payment Bond Surety</p>	<p>Surety: _____ (Surety Name) Surety Broker _____ (Surety Broker Contact Name) _____ (Street Address) _____ (City, State & Zip Code) (_____) _____ (_____) _____ Telephone Fax _____ (Email address)</p>
<p>Workers Compensation Insurance</p>	<p>Insurer: _____ Policy No. _____ Broker _____</p>
<p>Workers Compensation Insurance Broker</p>	<p>_____ (Contact Name) _____ (Street Address) _____ (City, State & Zip Code) (_____) _____ (_____) _____ Telephone Fax _____ (Email address)</p>

[CONTINUED NEXT PAGE]

5. Essential Requirements. A Bidder will not be deemed qualified if the answer to any of the following questions results in a “not qualified” response and the Bid Proposal submitted by such a Bidder will be rejected for failure of the Bidder to meet minimum qualifications for the Work.

- 5.1. Bidder possesses a valid and currently in good standing California Contractors’ license for the Classification(s) of Contractors’ License required by the Call for Bids.
 Yes No (Not Qualified)
- 5.2. Bidder is currently a DIR Registered Contractor?
 Yes No (Not Qualified)
- 5.3. Bidder has a current commercial general liability insurance policy with coverage limits of at least \$1,000,000 per occurrence and \$2,000,000 in the aggregate.
 Yes No (Not Qualified)
- 5.4. Bidder has a current workers’ compensation insurance policy as required by the Labor Code or is legally self-insured pursuant to Labor Code §3700.
 Yes No (Not Qualified)
 Bidder is exempt from this requirement, because it has no employees
- 5.5. The Bidder is ineligible or debarred from submitting Bid Proposals for public works projects or public works contracts pursuant Labor Code §1777.1 or Labor Code §1777.7.
 Yes (Not Qualified) No
- 5.6. A public agency, within the past five (5) years, has conducted proceedings that resulted in a finding that the Bidder, or any predecessor to the Bidder, is not a “responsible” bidder for a public works project or a public works contract.
 Yes (Not Qualified) No
- 5.7. During the last five (5) years, the Bidder or any predecessor to the Bidder, or any of the equity owners of the Bidder has been convicted of a federal or state crime involving fraud, theft, or any other act of dishonesty?
 Yes (Not Qualified) No
- 5.8. During the past five (5) years a Surety has completed any project or the Bidder’s obligations under a construction contract?
 Yes (Not Qualified) No
- 5.9. The Bidder’s Worker’s Compensation Insurance average EMR over the past five (5) years is more than 1.25.
 Yes (Not Qualified) No

6. Performance/Experience. A Bidder must receive a minimum of 70 points out of a possible 90 points in this section to be deemed “Qualified.” The Bid Proposal of a Bidder who is not deemed “Qualified” will be rejected for non-responsiveness.

- 6.1. Within the past two (2) years has your organization performed work on public works projects where the value of your work was at least \$500,000?
 Yes No

If yes, number of such projects: _____

If yes, was your organization the general contractor or a subcontractor?

_____ General Contractor _____ Subcontractor

- Yes 1-5 Projects: 3 points
- Yes 6-10 Projects: 5 points
- Yes 10 or more Projects 10 points
- No 0 points

6.2. Within the past ten (10) years, has a complaint been filed against your organization's California Contractors' License with the California Contractors' State License Board?

- Yes No
Yes: 0 points
No: 10 points

6.3. Within the past ten (10) years, has your organization asked to be relieved of or refused to sign a contract for construction services awarded to it?

- Yes No
Yes: 0 points
No: 5 points

6.4. Within the past ten (10) years, has your organization failed to complete a construction contract?

- Yes No
Yes: 0 points
No: 10 points

6.5. Within the past ten (10) years, has your organization been declared in default of a construction contract?

- Yes No
Yes: 0 points
No: 10 points

6.6. Within the past ten (10) years, has your organization failed to complete a public works construction contract within the authorized time?

- Yes No
Yes: 0 points
No: 10 points

6.7. Within the past ten (10) years, has your organization been assessed and paid liquidated damages under a construction contract with either a public or private owner?

- Yes No
Yes: 0 points
No: 10 points

6.8. Within the past ten (10) years, has your organization been denied an award of a public works contract based upon a finding by a public agency that your organization was not a responsible bidder?

- Yes No
Yes: 0 points
No: 10 points

6.9. Within the past ten (10) years, has your organization or any principal of your organization been found guilty of violating any federal, state or local law, rule or regulation regarding a construction contract?

- Yes No
Yes: 0 points
No: 5 points

6.10. Within the past ten (10) years, has any insurance carrier, for any policy of insurance, refused to renew an insurance policy for your organization?

- Yes No
If yes, on how many occasions? _____
No occasions 10 points
1 occasion 3 points

More than 1 occasion 0 points

6.11. During the past five (5) years, has a surety declined to issue a surety bond for your organization in connection with a construction project?

Yes No

If yes, on how many occasions? _____

No occasions 10 points

1 occasion 3 points

More than 1 occasion 0 points

7. Safety. Bidder must receive a minimum of 23 points out of a possible 35 points in this section.

7.1. Has CAL OSHA cited and assessed penalties against your firm for any "serious," "willful" or "repeat" violations of its safety or health regulations in the past five (5) years?

Yes No

or less occasion - 5 points

2 occasions - 3 points

More than 2 occasions - 0 points

7.2. Has the Federal Occupational Safety and Health Administration ("OSHA") cited and assessed penalties against your firm in the past five (5) years?

Yes No

1 or less occasion - 5 points

2 occasions - 3 points

More than 2 occasions - 0 points

7.3. Has the EPA, any Air Quality Management District or any Regional Water Quality Control Board cited and assessed penalties against either your firm or the owner of a project on which your firm was the contractor in the past five years?

Yes No

1 or less occasion - 5 points

2 occasions - 3 points

More than 2 occasions - 0 points

7.4. How often do you require documented safety meetings to be held for construction employees and field supervisors during the course of a project? _____

Once a week or more often - 5 points

Any other answer - 0 points

7.5. List your firm's Workers' Compensation Insurance Experience Modification Rate (EMR) for each of the past three (3) premium years: (Note: An Experience Modification Rate is issued to your firm annually by your workers' compensation insurance carrier).

Current year: _____

Previous year: _____

Year prior to previous year: _____

Three-year average EMR of .95 or less - 5 points

Three-year average EMR between .95 and 1.25 - 3 points

Any other EMR - 0 points

7.6. Has there been more than one occasion during the last five (5) years on which your firm was required to pay either back wages or penalties for your own firm's failure to comply with California's prevailing wage laws? (Note: This question refers only to your own firm's violation of prevailing wage laws, not to violations of the prevailing wage laws by a subcontractor to your firm.)

Yes No

2 or less occasions - 5 points

3 occasions - 3 points
More than 3 occasions - 0 points

7.7. At any time during the last five (5) years, has your firm been found to have violated any provision of California apprenticeship laws or regulations, or the laws pertaining to use of apprentices on public works?

Yes No

If yes, provide the date(s) of such findings, and attach copies of the Department's final decision(s): _____

2 or less occasions - 5 points
3 occasions - 3 points
More than 3 occasions - 0 points

8. Legal/Administrative Proceedings and Surety. If the response to any of the following questions is a "yes" complete and accurate details must be attached; failure to attach such details will render the Bid Proposal of the Bidder to be non-responsive and rejected. Responses to the following will be used to evaluate Bidder responsibility.

8.1. Have legal, arbitration or administrative proceedings been brought construction project owner against the Bidder or any of the principals, officers or equity owners of the Bidder within the past ten (10) years which arise out of or are related to any construction project?

Yes No

If "yes," on a separate attachment, include the following details: (i) name of party initiating proceedings against the Bidder; (ii) contact name, address, phone and email address of party initiating proceedings; (iii) circumstances resulting in the initiation of proceedings; (iv) amount or other relief demanded; and (v) outcome of proceedings.

8.2. Has the Bidder brought any legal, arbitration or administrative proceedings against the owner of a construction project within the past ten (10) years which arise out of or are related to the construction project, excluding claims for personal injury?

Yes No

If "yes," on a separate attachment, include the following details: (i) name of owner; (ii) contact name, address, phone and email address of contact person for owner; (iii) circumstances resulting in the initiation of proceedings; (iv) amount or other relief demand; and (v) outcome of proceedings.

8.3. Has the Bidder brought any legal, arbitration or administrative proceedings against the architect or design professional for a construction project within the past ten (10) years which arise out of or are related to the construction project?

Yes No

If "yes," on a separate attachment, include the following details: (i) name of architect; (ii) contact name, address, phone and email address of contact person for architect or design professional; (iii) circumstances resulting in the initiation of proceedings; (iv) amount or other relief demand; and (v) outcome of proceedings.

8.4. Has the Bidder brought any legal, arbitration or administrative proceedings against the construction/project manager for a construction project within the past ten (10) years which arise out of or are related to the construction project?

Yes No

If "yes," on a separate attachment, include the following details: (i) name of construction/project manager; (ii) contact name, address, phone and email address of contact person for construction/project manager; (iii) circumstances resulting in the initiation of proceedings; (iv) amount or other relief demand; and (v) outcome of proceedings.

8.5. At any time during the past five (5) years, has any surety company made any payments on behalf the Bidder to satisfy any claims made against a bid, performance or payment bond issued to the Bidder, in connection with a construction project, either public or private?

Yes No

If "yes," on a separate attachment set forth: (i) the amount of each such claim; (ii) the name and telephone number of the claimant; (iii) the date of the claim; (iv) the grounds for the claim; (v) the present status of the claim; (vi) the date of resolution of such claim if resolved; (vii) the method by which such was resolved if resolved; (viii) the nature of the resolution; and (ix) the amount, if any, at which the claim was resolved.

8.6. During the past five (5) years, has a surety declined to issue a surety bond for your organization in connection with a construction project?

Yes No

If "yes" on a separate attachment provide details of the denial of bond coverage and the name of the company or companies which denied coverage.

8.7. At any time during the past five (5) years, has any surety company made any payments on behalf the Bidder to satisfy any claims made against a bid, performance or payment bond issued to the Bidder, in connection with a construction project, either public or private?

Yes No

If "yes," on a separate attachment set forth: (i) the amount of each such claim; (ii) the name and telephone number of the claimant; (iii) the date of the claim; (iv) the grounds for the claim; (v) the present status of the claim; (vi) the date of resolution of such claim if resolved; (vii) the method by which such was resolved if resolved; (viii) the nature of the resolution; and (ix) the amount, if any, at which the claim was resolved.

8.8. In the last five (5) years has any insurance carrier, for any policy of insurance, refused to renew the insurance policy for your firm?

Yes No

8.9. Within the past five (5) years, has the Bidder been required to pay either back wages or penalties for the Bidder's failure to comply with California prevailing wage laws? This question refers only to the Bidder's violation of prevailing wage laws, not to violations of the prevailing wage laws by a subcontractor.

Yes No

If "yes," on a separate attachment: (i) describe each instance of prevailing wage rate violation; (ii) identify the project on which a prevailing wage rate violation occurred; (iii) the public agency owner of the project; (iv) the number of employees affected by each prevailing wage rate violation; and (v) amount of back wages and penalties the Bidder was required to pay.

8.10. Within the past five (5) years, has there been more than one occasion in which the Bidder was penalized or required to pay back wages for failure to comply with the Federal Davis-Bacon prevailing wage requirements?

Yes No

If "yes," on a separate attachment: (i) describe each instance of prevailing wage rate violation; (ii) identify the project on which a prevailing wage rate violation occurred; (iii) the number of employees affected by each prevailing wage rate violation; and (iv) amount of back wages and penalties the Bidder was required to pay.

8.11. Within the past five (5) years, has the Bidder been found to have violated any provision

of California apprenticeship laws or regulations, or the laws pertaining to use of apprentices on public works projects?

_____ Yes _____ No

If "yes," provide the date(s) of such findings, and attach copies of the Apprenticeship Counsel's final decision(s).

9. Experience. Bidders must duplicate the summary table forms in Paragraphs 9.1, 9.2 and 9.3 below and attach completed summary table forms describing the Bidder's prior project experience. The completed summary table forms must be attached to this Statement of Qualifications.

9.1. Similar Completed Projects. Provide the following for three (3) projects the Bidder has completed within the past five (5) years similar in size, scope, function and construction value as the Work:

Project Name	
Project Owner; Contact Information	
Function/Use of Project	
Original Contract Duration	
Actual Project Completion Duration	
Original Contract Price	
Final Adjusted Contract Price	

9.2. All Completed Projects. On a separate attachment, identify all projects the Bidder has completed within the three (3) years, including the following information:

Project Name	
Project Owner; Contact Information	
Architect Name and Contact Information	
Original Contract Duration	
Actual Project Completion Duration	
Original Contract Price	
Final Adjusted Contract Price	

9.3. Projects In Progress. On a separate attachment, identify all projects the Bidder currently has in progress, including the following information:

Project Name	
Project Owner; Contact Information	
Architect Name and Contact Information	
Original Contract Duration	
Projected Completion Duration	
Original Contract Price	
Current Adjusted Contract Price	

10. Accuracy and Authority. The undersigned is duly authorized to execute this Statement of Qualifications under penalty of perjury on behalf of the above-identified Bidder. The undersigned warrants and represents that he/she has personal knowledge of each of the responses to this Statement of Qualifications and/or that he/she has conducted all necessary and appropriate inquiries to determine the truth, completeness and accuracy of responses to this Statement of Qualifications. The undersigned declares and certifies that the responses to this Statement of Qualifications are complete and accurate; there are no omissions of material fact or information that render any response to be false or misleading and there are no misstatements of fact in any of the responses. The above-identified Bidder acknowledges and agrees that if the District determines that any response herein is false or misleading or contains misstatements of fact so

as to be false or misleading, the Bidder's Bid Proposal may be rejected by the District for non-responsiveness.

Executed this ___ day of _____ 20__ at _____.
(City and State)

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

By: _____
(Signature of Bidder's Authorized Officer or Representative)

(Typed or Printed Name)

Title: _____

NON-COLLUSION AFFIDAVIT

STATE OF CALIFORNIA)
COUNTY OF _____)

PROJECT: Boiler Replacement Campus Wide

Bid Package No: _____; **Bid Package Description:** _____

I, _____, being first duly sworn, deposes and says that I am the
(Typed or Printed Name)
_____ of _____, the party submitting the
(Title) (Bidder Name)

foregoing Bid Proposal ("the Bidder"). In connection with the foregoing Bid Proposal, the undersigned declares, states and certifies that:

1. The Bid Proposal is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization or corporation.
2. The Bid Proposal is genuine and not collusive or sham.
3. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any other bidder or anyone else to put in sham bid, or to refrain from bidding.
4. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price, or that of any other bidder, or to fix any overhead, profit or cost element of the bid price or that of any other bidder, or to secure any advantage against the public body awarding the contract or of anyone interested in the proposed contract.
5. All statements contained in the Bid Proposal and related documents are true.
6. The bidder has not, directly or indirectly, submitted the bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any person, corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Executed this ____ day of _____, 20__ at _____
(City, County and State)

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

Dated _____

By: _____
(Signature of Bidder's Authorized Officer or Representative)

(Typed or Printed Name)

Title: _____

[THIS PAGE INTENTIONALLY BLANK]

CERTIFICATE OF WORKERS' COMPENSATION INSURANCE

I, _____ the _____ of
(Name) (Title)

_____, declare state and certify that:
(Contractor Name)

1. I am aware that California Labor Code §3700(a) and (b) provides:

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

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

(b) By securing from the Director of Industrial Relations a certificate of consent to self-insure either as an individual employer, or 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.”

2. I am aware that the provisions of California Labor Code §3700 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 this Contract.

3. I am authorized to execute this Certificate of Workers Compensation Insurance on behalf of the above-identified Contractor.

Dated: _____

By: _____

(Name Printed or Typed)

Title: _____

[THIS PAGE INTENTIONALLY BLANK]

DRUG-FREE WORKPLACE CERTIFICATION

I, _____, am the _____ of _____
(Print Name) (Title) (Contractor Name)

I declare, state and certify to all of the following:

1. I am aware of the provisions and requirements of California Government Code §§8350 et seq., the Drug Free Workplace Act of 1990.
2. I am authorized to certify, and do certify, on behalf of Contractor that a drug free workplace will be provided by Contractor by doing all of the following:
 - 2.1. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in Contractor's workplace and specifying actions which will be taken against employees for violation of the prohibition.
 - 2.2. Establishing a drug-free awareness program to inform employees about all of the following: (i) the dangers of drug abuse in the workplace; (ii) Contractor's policy of maintaining a drug-free workplace; (iii) the availability of drug counseling, rehabilitation and employee-assistance programs; and (iv) the penalties that may be imposed upon employees for drug abuse violations.
 - 2.3. Requiring that each employee engaged in the performance of the Contract be given a copy of the statement required by Paragraph 2.1 above, and that as a condition of employment by Contractor in connection with the Work of the Contract, the employee agrees to abide by the terms of the statement.
3. Contractor agrees to fulfill and discharge all of Contractor's obligations under the terms and requirements of California Government Code §8355 by, inter alia, publishing a statement notifying employees concerning: (i) the prohibition of any controlled substance in the workplace, (ii) establishing a drug-free awareness program, and (iii) requiring that each employee engaged in the performance of the Work of the Contract be given a copy of the statement required by California Government Code §8355(a) and requiring that the employee agree to abide by the terms of that statement.
4. Contractor and I understand that if the District determines that Contractor has either: (i) made a false certification herein, or (ii) violated this certification by failing to carry out and to implement the requirements of California Government Code §§8355, the Contract awarded herein is subject to termination, suspension of payments, or both. Contractor and I further understand that, should Contractor violate the terms of the Drug-Free Workplace Act of 1990, Contractor may be subject to debarment in accordance with the provisions of California Government Code §§8350, et seq.
5. Contractor and I acknowledge that Contractor and I are aware of the provisions of California Government Code §§8350, et seq. and hereby certify that Contractor and I will adhere to, fulfill, satisfy and discharge all provisions of and obligations under the Drug-Free Workplace Act of 1990.

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

(City and State)

By: _____
(Signature of Bidder's Authorized Officer or Representative)

(Typed or Printed Name)

Title: _____

[THIS PAGE INTENTIONALLY BLANK]

COMMUNITY WORKFORCE AGREEMENT

The CWA is incorporated herein by this reference as if set forth in full. A complete and executed copy of the CWA is posted on-line at:

[https://www.boarddocs.com/ca/avc/Board.nsf/files/AK8STV7447E8/\\$file/Antelope%20Valley%20College%202.2.17%20clean%20draft.pdf](https://www.boarddocs.com/ca/avc/Board.nsf/files/AK8STV7447E8/$file/Antelope%20Valley%20College%202.2.17%20clean%20draft.pdf).

**COMMUNITY WORKFORCE AGREEMENT
LETTER OF ASSENT**

[Contractor's Letterhead]

Community Workforce Coordinator
C/O Antelope Valley College
3041 West Ave K
Lancaster, CA 93536

Attn: Community Workforce Coordinator

Re: Community Workforce Agreement - Letter of Assent

Dear Sir:

This is to confirm that [name of company] agrees to be party to and bound by the Antelope Valley College Community Workforce Agreement effective _____, 2017, as such Agreement may, from time to time, be amended by the negotiating parties or interpreted pursuant to its terms. Such obligation to be a party and bound by this Agreement shall extend to all work covered by the Agreement undertaken by this Company on the project and this Company shall require all of its contractors and subcontractors of whatever tier to be similarly bound for all work within the scope of the Agreement by signing and furnishing to you an identical Letter of Assent prior to their commencement of work.

Sincerely,

[Name of Construction Company]

By: _____

Name: _____

Title: _____

Contractor State License No. _____

[THIS PAGE INTENTIONALLY BLANK]

AGREEMENT

THIS AGREEMENT is entered into as of _____ in the City of Lancaster, County of Los Angeles, State of California, by and between ANTELOPE VALLEY COMMUNITY COLLEGE DISTRICT, a California Community College District hereinafter "District" and _____ ("Contractor").

WITNESSETH, that the District and the Contractor in consideration of the mutual covenants contained herein agree as follows:

1. **The Work.** Within the Contract Time and for the Contract Price, subject to adjustments thereto pursuant to the Contract Documents, the Contractor shall perform and provide all necessary labor, materials, tools, equipment, utilities, services and transportation to complete in a workmanlike manner all of the Work required in connection with the work of improvement commonly referred to as **Boiler Replacement Campus Wide, Bid Package No:** _____; **Bid Package Description:** _____. The Contractor shall complete all Work covered by the Contract Documents, including without limitation, the Drawings and Specifications prepared by the Architect and other Contract Documents enumerated in Paragraph 6 of this Agreement, along with all modifications and addenda thereto issued in accordance with the Contract Documents. The Architect for the Work is PS2 Engineering, Inc.
2. **Contract Time.** The Work shall be commenced on the date stated in the District's Notice to Proceed. The Contractor shall achieve Substantial Completion of the Work _____ (___) days after the commencement date of the Work set forth in the Notice to Proceed. The Contract Time shall be the number of days between the date specified for the commencement of the Work in the Notice to Proceed issued by or on behalf of the District and the calendar date specified in the Special Conditions for Project Substantial Completion. By executing this Agreement, the Contractor represents to the District that the Contract Time is reasonable for completion of the Work and the Contractor will fully complete the Work within the Contract Time, including any portions of the Work necessary to maintain the Construction Schedule and achieve Interim Milestones defined in the Special Conditions.
3. **Contract Price.** The District shall pay the Contractor as full consideration for the Contractor's full, complete and faithful performance of the Contractor's obligations under the Contract Documents, subject to adjustments of the Contract Price in accordance with the Contract Documents, the Contract Price of _____ Dollars (\$_____). The District's payment of the Contract Price shall be in accordance with the Contract Documents. The Contract Price is based upon the Contractor's Base Bid Proposal, authorized Allowances and the following Alternate Bid Items, if any: _____.
4. **Allowances.** The Contractor and District acknowledge that the Contract Price set forth above includes an Allowance Amount in the aggregate amount of _____ Dollars (\$_____), which is allocated as follows:

Allowance Description	Allowance Amount
	_____ Dollars (\$_____)
	_____ Dollars (\$_____)
	_____ Dollars (\$_____)

Although included in the Contract Price, Allowances belong solely to the District and shall be

expended only upon written direction by the District, to be granted or denied in its sole discretion. Contractor shall submit cost data and other descriptive data to establish basis used by Contractor for determining costs associated with designated work attributable to each Allowance. Any Allowance amount not fully consumed shall belong solely to the District and shall be credited against the Contract Price by a Deductive Change Order. Should the Contractor's actual costs exceed the specified Allowance, the Contractor's Contract Price will be adjusted by change order in accordance with Contract General Conditions, Article 9.5.

- 5. Unit Price Items.** If the Bid Proposal for the Work includes a proposal(s) for Unit Price Item(s), during Contractor's performance of the Work, the District may elect to add or delete any such Unit Price Item(s). If the District elects to add or delete any such Unit Price Item(s) pursuant to the foregoing, the debit or credit for such Unit Price Item(s) shall be in accordance with the amount(s) set forth in the Contractor's Unit Price Item(s) Proposal, attached as Attachment A to the Contractor's Bid Proposal.
- 6. Liquidated Damages.** The Contractor shall be subject to assessment of Liquidated Damages if the Contractor: (i) fails to achieve Substantial Completion of the Work within the Contract Time, including adjustments thereto authorized by the Contract Documents; (ii) fails to submit Submittals in accordance with the Submittal Schedule; or (iii) fails to complete Punchlist items noted upon Substantial Completion within the time established to complete the Punchlist items. The per diem rate of Liquidated Damages assessed for each of the foregoing events is set forth in the Special Conditions.
- 7. Limitation on Damages.** If the District breaches or defaults in its performance of its obligations under the Contract Documents, the damages, if any, recoverable by the Contractor shall be limited to general damages which are directly and proximately caused by said breach or default of the District and shall exclude any and all special or consequential damages. By executing this Agreement, the Contractor expressly acknowledges the foregoing limitation to the recovery only of general damages from the District if the District is in breach or default of its obligations under the Contract Documents. The Contractor expressly waives any right to and foregoes the recovery of any special or consequential damages from the District including, without limitation, damages for: (i) lost or impaired bonding capacity; and/or, (ii) lost profits arising out of or in connection with any past, present, or future work of improvement, except for the Project which is the subject of the Contract Documents.
- 8. The Contract Documents.** The documents forming a part of the Contract Documents consist of the following, all of which are component parts of the Contract Documents:

<ul style="list-style-type: none"> 00 01 00 Table of Contents 00 01 07 Certifications/Seals Page 00 01 12 DSA Form 103 Statement of Structural Tests & Inspections 00 11 13 Notice Calling for Bids, including Bid Addenda 00 21 13 Instructions for Bidders 00 24 13 Bid Packages Scope Descriptions 00 31 13 Bid Time Project Schedule 00 41 00 Bid Proposal 00 43 22 Composite Unit Price Bid Proposal 00 42 23 Alternate Bid Items Proposal Form 00 43 24 Pre-Bid Inquiry Form 00 43 36 Subcontractors List 00 45 13 Statement of Qualifications 00 45 19 Non-Collusion Affidavit 00 45 26 Certificate of Workers Compensation Insurance 00 45 27 Drug-Free Workplace Certification 	<ul style="list-style-type: none"> 00 45 50 Community Workforce Agreement and CWA Letter of Assent 00 52 00 Agreement 00 61 10 Bid Bond 00 61 13 Performance Bond 00 61 14 Labor and Material Payment Bond 00 62 90 Verification of Certified Payroll Records Submittal to Labor Commission 00 62 95 Asbestos and Other Hazardous Materials Certification 00 65 36 Guarantee Form 00 65 37 Contractor Certification of Subcontractor Claims 00 72 00 General Conditions 00 73 00 Special Conditions Conditional and Unconditional Waivers and Releases on Progress Payments Conditional and Unconditional Waivers and Releases on Final Payment Project Documents including Specifications and Drawings
---	---

9. Notices. Notices of the District and Contractor to the other shall be transmitted in accordance with the Contract Documents. The effective date of notices transmitted in accordance with the Contract Documents shall be as set forth in the Contract Documents. Notices under the Contract Documents shall be addressed as follows:

If to the District:

Executive Director of Business Services,
Chief Business Official
Antelope Valley Community College District
3041 West Ave K
Lancaster, California 93536-5426

If to the Contractor:

10. Authority to Execute. The individual(s) executing this Agreement on behalf of the Contractor is/are duly and fully authorized to execute this Agreement on behalf of Contractor and to bind the Contractor to each and every term, condition and covenant of the Contract Documents.

CONTRACTORS ARE REQUIRED BY LAW TO BE LICENSED AND REGULATED BY THE CONTRACTORS' STATE LICENSE BOARD. ANY QUESTIONS CONCERNING A CONTRACTOR MAY BE REFERRED TO THE REGISTRAR, CONTRACTORS' STATE LICENSE BOARD, P.O. BOX 2600, SACRAMENTO, CALIFORNIA 95826

IN WITNESS WHEREOF, this Agreement has been duly executed by the District and the Contractor as of the date set forth above

"DISTRICT"

Antelope Valley Community College District

By: _____

(Name Printed or Typed)

Title: _____

"CONTRACTOR"

[Contractor Name]

By: _____

(Name Printed or Typed)

Title: _____

[THIS PAGE INTENTIONALLY BLANK]

BID BOND

KNOW ALL MEN BY THESE PRESENTS that we, _____, as Surety and _____, as Principal, are jointly and severally, along with their respective heirs, executors, administrators, successors and assigns, held and firmly bound unto ANTELOPE VALLEY COMMUNITY COLLEGE DISTRICT (“the Obligee”) for payment of the penal sum hereof in lawful money of the United States, as more particularly set forth herein.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Principal has submitted the accompanying Bid Proposal to the Obligee for the Work commonly described as **Boiler Replacement Campus Wide, Bid Package No: _____; Bid Package Description: _____.**

WHEREAS, subject to the terms of this Bond, the Surety and the Principal are jointly and severally firmly bound unto the Obligee in the penal sum equal to Ten Percent (10%) of the maximum amount of the Bid Proposal submitted by the Principal to the Obligee, inclusive of amounts proposed for Alternate Bid Items, if any.

NOW THEREFORE, if the Principal shall not withdraw said Bid Proposal within the period specified therein after the opening of the same, or, if no period be specified, for sixty (60) days after opening of said Bid Proposal; and if the Principal is awarded the Contract, and shall within the period specified therefore, or if no period be specified, within five (5) days after the prescribed forms are presented to him for signature, enter into a written contract with the Obligee, in accordance with the Bid Proposal as accepted and give such bond(s) with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such Contract and for the payment for labor and materials used for the performance of the Contract, or in the event of the withdrawal of said Bid Proposal within the period specified for the holding open of the Bid Proposal or the failure of the Principal to enter into such Contract and give such bonds within the time specified, if the Principal shall pay the Obligee the difference between the amount specified in said Bid Proposal and the amount for which the Obligee may procure the required Work and/or supplies, if the latter amount be in excess of the former, together with all costs incurred by the Obligee in again calling for Bids, then the above obligation shall be void and of no effect, otherwise to remain in full force and effect.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or the Call for Bids, the Work to be performed there under, the Drawings or the Specifications accompanying the same, or any other portion of the Contract Documents shall in no way affect its obligations under this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of said Contract, the Call for Bids, the Work, the Drawings or the Specifications, or any other portion of the Contract Documents.

In the event suit or other proceeding is brought upon this Bond by the Obligee, the Surety and Principal shall be jointly and severally liable for payment to the Obligee all costs, expenses and

[CONTINUED NEXT PAGE]

fees incurred by the Obligee in connection therewith, including without limitation, attorneys' fees.

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

(Bidder-Principal Name)

By: _____
(Signature)

(Typed or Printed Name)

Title: _____

(Attach Notary Public Acknowledgement of Principal's Signature)

(Surety Name)

By: _____
(Signature of Attorney-In-Fact for Surety)

(Typed or Printed Name of Attorney-In-Fact)

(Attach: (i) Attorney-In-Fact Certification; (ii) Notary Public Acknowledgment of Authorizing Signature on Attorney-Fact Certification; and (iii) Notary Public Acknowledgement of Attorney-In-Fact's Signature)

Contact name, address, telephone number and email address for notices to the Surety

(Contact Name)

(Street Address)

(City, State & Zip Code)

(_____) _____ (_____) _____
Telephone Fax

(Email address)

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS that we, _____, as Surety and _____, as Principal, are jointly and severally, along with their respective heirs, executors, administrators, successors and assigns, held and firmly bound unto ANTELOPE VALLEY COMMUNITY COLLEGE DISTRICT (“the Obligee”) for payment of the penal sum of _____ Dollars (\$_____) in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Obligee, by resolution of its Board of Trustees has awarded to the Principal a Contract for the Work described as **Boiler Replacement Campus Wide, Bid Package No: _____; Bid Package Description: _____.**

WHEREAS, the Principal, has entered into an agreement with the Obligee for performance of the Work; the Agreement and all other Contract Documents set forth therein are incorporated herein and made a part hereof by this reference.

WHEREAS, by the terms of the Contract Documents, the Principal is required to furnish a bond ensuring the Principal’s prompt, full and faithful performance of the Work of the Contract Documents.

NOW THEREFORE, if the Principal shall promptly, fully and faithfully perform each and all of the obligations and things to be done and performed by the Principal in strict accordance with the terms of the Contract Documents as they may be modified or amended from time to time; and if the Principal shall indemnify and save harmless the Obligee and all of its officers, agents and employees from any and all losses, liability and damages, claims, judgments, liens, costs, and fees of every description, which may be incurred by the Obligee by reason of the failure or default on the part of the Principal in the performance of any or all of the terms or the obligations of the Contract Documents, including all modifications, and amendments, thereto, and any warranties or guarantees required thereunder; then this obligation shall be void; otherwise, it shall be, and remain, in full force and effect.

The Surety, for value received, hereby stipulates and agrees that no change, adjustment of the Contract Time, adjustment of the Contract Price, alterations, deletions, additions, or any other modifications to the terms of the Contract Documents, the Work to be performed thereunder, or to the Specifications or the Drawings shall limit, restrict or otherwise impair Surety’s obligations or Obligee’s rights hereunder; Surety hereby waives notice from the Obligee of any such changes, adjustments of Contract Time, adjustments of Contract Price, alterations, deletions, additions or other modifications to the Contract Documents, the Work to be performed under the Contract Documents, or the Drawings or the Specifications.

In the event of the Obligee’s termination of the Contract due to the Principal’s breach or default of the Principal’s obligations thereunder, within twenty (20) days after written notice from the Obligee to the Surety of the Principal’s breach or default of the Contract Documents and Obligee’s termination of the Contract, the Surety shall notify Obligee in writing of Surety’s assumption of obligations hereunder by its election to either remedy the default or breach of the Principal or to take charge of the Work of the Contract Documents and complete the Work at its own expense (“the Notice of Election”); provided, however, that the procedure by which the Surety undertakes to discharge its obligations under this Bond shall be subject to the advance written approval of the Obligee, which

[CONTINUED NEXT PAGE]

approval shall not be unreasonably withheld, limited or restricted. The insolvency of the Principal or the Principal's denial of a failure of performance or default under the Contract Documents shall not by itself, without the Surety's prompt, diligent inquiry and investigation of such denial, be justification for Surety's failure to give the Notice of Election or for its failure to promptly remedy the failure of performance or default of the Principal or to complete the Work.

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

In the event suit or other proceeding is brought upon this Bond by the Obligee, the Surety and Principal shall be jointly and severally liable for payment to the Obligee of all costs, expenses and fees incurred by the Obligee therewith, including without limitation, attorneys' fees.

IN WITNESS WHEREOF, the Principal and Surety have executed this instrument this ____ day of _____, 20__ by their duly authorized agent or representative.

(Contractor-Principal Name)

By: _____

(Signature)

(Typed or Printed Name)

Title: _____

(Attach Notary Public Acknowledgement of Principal's Signature)

(Surety Name)

By: _____

(Signature of Attorney-In-Fact for Surety)

(Typed or Printed Name of Attorney-In-Fact)

(Attach: (i) Attorney-In-Fact Certification; (ii) Notary Public Acknowledgment of Authorizing Signature on Attorney-Fact Certification; and (iii) Notary Public Acknowledgement of Attorney-In-Fact's Signature)

Contact name, address, telephone number and email address for notices to the Surety

(Contact Name)

(Street Address)

(City, State & Zip Code)

(_____) _____ (_____) _____

Telephone Fax

(Email address)

LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS that we, _____, as Surety and _____, as Principal, are jointly and severally, along with their respective heirs, executors, administrators, successors and assigns, held and firmly bound unto ANTELOPE VALLEY COMMUNITY COLLEGE DISTRICT (“the Obligee”) for payment of the penal sum the penal sum of _____ Dollars (\$_____) in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Obligee, by resolution of its Board of Trustees has awarded to the Principal a Contract for the Work described as **Boiler Replacement Campus Wide, Bid Package No: _____; Bid Package Description: _____.**

WHEREAS, the Principal, has entered into an Agreement with the Obligee for performance of the Work, the Agreement and all other Contract Documents set forth therein are incorporated herein by this reference and made a part hereof.

WHEREAS, by the terms of the Contract Documents, the Principal is required to furnish a bond for the prompt, full and faithful payment to any Claimant, as hereinafter defined, for all labor materials or services used, or reasonably required for use, in the performance of the Work.

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

The term “Claimant” shall refer to any person, corporation, partnership, proprietorship or other entity including without limitation, all persons and entities described in California Civil Code §9100, providing or furnishing labor, materials or services used or reasonably required for use in the performance of the Work under the Contract Documents, without regard for whether such labor, materials or services were sold, leased or rented. This Bond shall inure to the benefit of all Claimants so as to give them, or their assigns and successors, a right of action upon this Bond.

In the event suit is brought on this Bond by any Claimant for amounts due such Claimant for labor, materials or services provided or furnished by such Claimant, the Surety shall pay for the same and reasonable attorneys’ fees pursuant to California Civil Code §9554.

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

[CONTINUED NEXT PAGE]

IN WITNESS WHEREOF, the Principal and Surety have executed this instrument this _____ day of _____, 20__ by their duly authorized agent or representative.

(Contractor-Principal Name)

By: _____
(Signature)

(Typed or Printed Name)

Title: _____

(Attach Notary Public Acknowledgement of Principal's Signature)

(Surety Name)

By: _____
(Signature of Attorney-In-Fact for Surety)

(Typed or Printed Name of Attorney-In-Fact)

(Attach: (i) Attorney-In-Fact Certification; (ii) Notary Public Acknowledgment of Authorizing Signature on Attorney-Fact Certification; and (iii) Notary Public Acknowledgement of Attorney-In-Fact's Signature)

Contact name, address, telephone number and email address for notices to the Surety

(Contact Name)

(Street Address)

(City, State & Zip Code)

(_____) _____ (_____) _____
Telephone Fax

(Email address)

ASBESTOS AND OTHER HAZARDOUS MATERIALS CERTIFICATION

This Asbestos and Other Hazardous Materials Certification form is part of the Contract made by and between Antelope Valley Community College District ("District") and _____ ("Contractor") for the work of improvement commonly referred to as Boiler Replacement Campus Wide (hereinafter referred to as the "Project").

To the best of my knowledge, information and belief, in completing the Work of the Project, no materials, equipment or other items furnished, installed or incorporated into the Project contains, or in itself be composed of, any asbestos, polychlorinated biphenyl (PCB), any material listed by the federal or state EPA or federal or state health agencies as a hazardous material, or defined as being hazardous under federal or state laws, rules or regulations.

The undersigned is duly authorized to complete, execute and submit this Asbestos and Other Hazardous Materials Certification on behalf of the Contractor. The undersigned has personal knowledge of the substantive representations set forth hereinabove or has made appropriate diligent inquiry to ascertain that the substantive representations set forth hereinabove are complete, true and accurate and do not omit material facts rendering such representations to be false or misleading.

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

Executed on this _____ day of _____, 20__ at _____.

By: _____
Signature

Print Name

Title

[THIS PAGE INTENTIONALLY BLANK]

GUARANTEE

Project: Boiler Replacement Campus Wide

Bid Package No: _____; **Bid Package Description:** _____

The Contractor hereby warrants and guarantees to the District that all work, materials, equipment and workmanship provided, furnished or installed by or on behalf of Contractor in connection with the above referenced Project (the "Work") have been provided, furnished and installed in strict conformity with the Contract Documents for the Work, including without limitation, the Drawings and the Specifications. Contractor further warrants and guarantees that all work, materials, equipment and workmanship as provided, furnished and/or installed are fit for use as specified and fulfill all applicable requirements of the Contract Documents including without limitation, the Drawings and the Specifications. Contractor shall, at its sole cost and expense, repair, correct and/or replace any or all of the work, materials, equipment and/or workmanship of the Work, together with any other items which may be affected by any such repairs, corrections or replacement, that may be unfit for use as specified or defective within a period of one (1) year from the date of the District's Final Acceptance of the Work, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of the Contractor's failure and/or refusal to comply with the provisions of this Guarantee, within the period of time set forth in the Contract Documents after the District's issuance of the Notice to the Contractor of any defect(s) in the Work, materials, equipment or workmanship, Contractor authorizes the District, without further notice to Contractor, to repair, correct and/or replace any such defective item at the expense of the Contractor. The Contractor shall reimburse the District for all costs, expenses or fees incurred by the District in providing or performing such repairs, corrections or replacements within ten (10) days of the District's presentation of a demand to the Contractor for the same.

The provisions of this Guarantee and the provisions of the Contract Documents for the Work relating to the Contractor's Guarantee(s) and warranty(ies) relating to the Work shall be binding upon the Contractor's Performance Bond Surety and all successors or assigns of Contractor and/or Contractor's Performance Bond Surety.

The provisions of this Guarantee are in addition to, and not in lieu of, any provisions of the Contract Documents for the Work relating to the Contractor's guarantee(s) and warranty(ies) or any guarantee(s) or warranty(ies) provided by any material supplier or manufacturer of any equipment, materials or other items forming a part of, or incorporated into the Work, or any other guarantee or warranty obligation of the Contractor, prescribed, implied or imposed by law.

The undersigned individual executing this Guarantee on behalf of Contractor warrants and represents that he/she is duly authorized to execute this Guarantee on behalf of Contractor and to bind Contractor to each and every provision hereof.

Contractor

(Contractor Name)

(Signature of Contractor's Authorized Employee, Officer Or Representative)

(Printed Name and Title)

(Date)

[THIS PAGE INTENTIONALLY BLANK]

CONTRACTOR CERTIFICATION OF SUBCONTRACTOR CLAIM

TO: ANTELOPE VALLEY COMMUNITY COLLEGE DISTRICT

RE: Boiler Replacement Campus Wide (Project); Bid Package No. _____

(Contractor)

(Subcontractor)

This Contractor Certification of Subcontractor Claim is submitted by the above-identified Contractor relating to to the District on behalf of the above-identified Subcontractor. I am the _____
(Title)

of the Contractor.

The Subcontractor has submitted the accompanying Subcontractor Claim to the Contractor for presentation to the District pursuant to Public Contract Code §9204.

1. I have personally reviewed the entirety of the Subcontractor Claim and all substantiating documentation in support of the Subcontractor Claim.
2. The Subcontractor Claim is made by the Subcontractor in good faith.
3. The Subcontractor Claim is supported by reasonable documentation establishing entitlement to the relief requested and District liability therefor.
4. The Subcontractor Claim does not incorporate any request constituting a False Claim under applicable law, including the California False Claim Act (Government Code §12650 et. seq.).
5. I am authorized: (i) to execute this Certification on behalf of the Contractor; and (ii) to submit this Certification and the accompanying Subcontractor Claim to the District.
6. I have personal first-hand knowledge of all of the foregoing.

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

Executed at _____, California, on _____, 20__.

(Signature)

(Print Name)

(Title)

[THIS PAGE INTENTIONALLY BLANK]

GENERAL CONDITIONS

**GENERAL CONDITIONS
TABLE OF CONTENTS**

<p>1. Definitions</p> <p>1.1. The Work.</p> <p>1.2. Surety.</p> <p>1.3. Contractor and Subcontractors.</p> <p>1.4. Material Supplier.</p> <p>1.5. Drawings and Specifications.</p> <p>1.6. Intent and Correlation of Contract Documents.</p> <p>1.7. Shop Drawings; Samples; Product Data (“Submittals”).</p> <p>1.8. Division of State Architect (“DSA”).</p> <p>1.9. Project Inspector.</p> <p>1.10. Contract Document Terms.</p> <p>1.11. Record Drawings.</p> <p>1.12. Construction Manager.</p> <p>1.13. Construction Equipment. “</p> <p>1.14. Site.</p> <p>1.15. Field Clarifications.</p> <p>1.16. Defective or Non-Conforming Work.</p> <p>1.17. Notice to Proceed.</p> <p>1.18. Progress Reports; Verified Reports.</p> <p>1.19. Laws.</p> <p>2. District</p> <p>2.1. Information Required of District.</p> <p> 2.1.1. Surveys; Site Information.</p> <p> 2.1.2. Drawings and Specifications.</p> <p>2.2. District’s Right to Stop the Work.</p> <p>2.3. Partial Occupancy or Use.</p> <p>2.4. The Project Inspector.</p> <p> 2.4.1. Authority.</p> <p> 2.4.2. Information for the Project Inspector.</p> <p>2.5. Communications Software.</p> <p>2.6. Multiple Contractors; Construction Manager.</p> <p>3. Architect</p> <p>3.1. Architect’s Administration of the Contract.</p> <p>3.2. Periodic Site Inspections.</p> <p>3.3. Contractor Responsibility for Construction Means, Methods and Sequences.</p> <p>3.4. Submittals.</p> <p>3.5. Changes; Change Orders.</p> <p>3.6. Interpretation of Contract Documents.</p> <p>3.7. Contractor Request for Information.</p> <p>3.8. Communications; Architect’s Role.</p> <p>4. The Contractor</p> <p>4.1. Contractor Review of Contract Documents.</p> <p> 4.1.1. Examination of Contract Documents.</p> <p> 4.1.2. Measurements, Layouts and Field Engineering.</p> <p> 4.1.3. Drawings; Dimensions.</p> <p> 4.1.4. Work in Accordance With Contract Documents.</p> <p>4.2. Site Investigation; Subsurface Conditions.</p> <p> 4.2.1. Subsurface Data.</p> <p> 4.2.2. Subsurface Conditions.</p> <p>4.3. Supervision and Construction Procedures.</p> <p> 4.3.1. Supervision of the Work.</p> <p> 4.3.2. Noise and Dust Control.</p> <p> 4.3.3. Clean-Up.</p> <p> 4.3.4. Cutting and Patching.</p>	<p>4.3.5. Construction Utilities.</p> <p>4.3.6. Existing Utilities; Removal, Relocation and Protection.</p> <p>4.4. Conferences and Meetings.</p> <p>4.5. Labor and Materials.</p> <p> 4.5.1. Payment for Labor, Materials and Services.</p> <p> 4.5.2. Employee Discipline and Competency.</p> <p> 4.5.3. Contractor’s Superintendent.</p> <p> 4.5.4. Prohibition on Harassment.</p> <p> 4.5.5. Taxes.</p> <p>4.6. Permits, Fees and Notices; Compliance With Laws.</p> <p> 4.6.1. Payment of Permits, Fees.</p> <p> 4.6.2. Compliance With Laws.</p> <p> 4.6.3. Notice of Variation From Laws.</p> <p> 4.6.4. DIR Registration.</p> <p>4.7. Submittals.</p> <p> 4.7.1. Contractor’s Submittals.</p> <p> 4.7.1.1. Prompt Submittals.</p> <p> 4.7.1.2. Contractor Approval of Subcontractor Submittals.</p> <p> 4.7.1.3. Contractor Responsibility for Deviations.</p> <p> 4.7.1.4. No Performance of Work Without Architect Review.</p> <p> 4.7.2. Architect Review of Submittals.</p> <p> 4.7.3. Deferred Approval Items.</p> <p>4.8. Materials and Equipment.</p> <p> 4.8.1. Approval of Substitutions or Alternatives.</p> <p> 4.8.2. Rejected Alternative Products.</p> <p> 4.8.3. District Standard Products; “Sole Source” Products.</p> <p> 4.8.4. Placement of Material and Equipment Orders.</p> <p> 4.8.5. District’s Right to Place Orders for Materials and/or Equipment.</p> <p>4.9. Safety.</p> <p>4.10. Hazardous Materials; Prohibition on Use of Asbestos Construction Building Materials (“ACBMs”).</p> <p>4.11. Maintenance of Record Drawings.</p> <p>4.12. Use of Site.</p> <p>4.13. Access to the Work.</p> <p>4.14. Patents and Royalties. .</p> <p>4.15. Wage Rates; Employment of Labor.</p> <p> 4.15.1. Payment of Prevailing Rates.</p> <p> 4.15.2. Prevailing Rate Penalty.</p> <p> 4.15.3. Certified Payroll Records.</p> <p> 4.15.4. Hours of Work.</p> <p>4.16. Apprentices.</p> <p>4.17. Assignment of Antitrust Claims.</p> <p>4.18. Employment of Independent Contractors.</p> <p>4.19. Progress Reports; DSA Verified Reports.</p> <p> 4.19.1. DSA Verified Reports; Contractor Actions.</p> <p> 4.19.2. District Withholdings From Final Payment.</p> <p> 4.19.3. Progress Reports.</p> <p>4.20. Community Workforce Agreement (CWA).</p> <p> 4.20.1. Application of CWA.</p> <p> 4.20.2. Subcontractor Summary.</p> <p> 4.20.3. Subcontractors’ Letters of Assent.</p>
---	---

- 4.20.4. Contractor/Subcontractor Employees and CWA Labor Referral Requirements.
- 4.20.5. Site Labor Relations.
- 4.20.6. CWA Coordinator.

5. Subcontractors.

- 5.1. Subcontracts.
- 5.2. Subcontractor DIR Contractor Registration.
 - 5.2.1. No Subcontractor Performance of Work Without DIR Registration.
 - 5.2.2. Contractor Obligation to Verify Subcontractor DIR Registration Status.
 - 5.2.3. Contractor Obligation to Request Substitution of Listed Subcontractor Who Is Not DIR Registered Contractor.
- 5.3. Substitution of Listed Subcontractor.
 - 5.3.1. Substitution Process.
 - 5.3.2. Responsibilities of Contractor Upon Substitution of Subcontractor.
- 5.4. Subcontractors' Work.

6. Insurance, Indemnity and Bonds.

- 6.1. Workers' Compensation Insurance; Employer's Liability Insurance.
- 6.2. Commercial General Liability and Property Insurance.
- 6.3. Automobile Liability
- 6.4. Builder's Risk "All-Risk" Insurance.
- 6.5. Minimum Coverage Limits.
- 6.6. Evidence of Insurance; Subcontractor's Insurance.
 - 6.6.1. Certificates of Insurance.
 - 6.6.2. Subcontractors' Insurance.
 - 6.6.3. Insurer Requirements.
- 6.7. Contractor's Insurance Primary; Contractor Liability for Deductibles.
- 6.8. Indemnity.
- 6.9. Payment Bond; Performance Bond.

7. Contract Time

- 7.1. Substantial Completion of the Work Within Contract Time.
- 7.2. Progress and Completion of the Work.
 - 7.2.1. Time of Essence.
 - 7.2.2. Substantial Completion.
 - 7.2.3. Correction or Completion of the Work After Substantial Completion.
 - 7.2.3.1. Punchlist.
 - 7.2.3.2. Time for Completing Punchlist Items.
 - 7.2.3.3. Final Completion.
 - 7.2.3.4. Contractor Responsibility for Multiple Inspections.
 - 7.2.4. Final Acceptance.
- 7.3. Construction Schedule.
 - 7.3.1. Construction Schedule Terms Defined.
 - 7.3.1.1. Bid Schedule.
 - 7.3.1.2. Preliminary Baseline Construction Schedule.
 - 7.3.1.3. Baseline Construction Schedule.
 - 7.3.1.4. Updated Construction Schedule.
 - 7.3.1.5. Recovery Schedule.
 - 7.3.1.6. Construction Schedule(s).
 - 7.3.1.7. Three (3) Week Look Ahead Schedules.
 - 7.3.2. Bid Schedule.
 - 7.3.3. Preliminary Baseline Schedules.
 - 7.3.4. Baseline Construction Schedules.

- 7.3.5. Updated Construction Schedules.
- 7.3.6. Contractor Preparation of Recovery Schedules.
- 7.3.7. Three (3) Week Look Ahead Schedules.
- 7.3.8. Cost of Scheduling.
- 7.3.9. Scheduling Software & Requirements.
- 7.4. Adjustment of Contract Time.
 - 7.4.1. Excusable Delays.
 - 7.4.2. Compensable Delays.
 - 7.4.3. Inexcusable Delays.
- 7.5. Liquidated Damages.

8. Contract Price

- 8.1. Cost Breakdown of Contract Price.
 - 8.1.1. General.
 - 8.1.2. Allowance Items; Allowance Amounts.
 - 8.1.3. Unit Price Items; Unit Prices.
- 8.2. Progress Payments.
 - 8.2.1. Applications for Progress Payments ("Payment Applications").
 - 8.2.2. District's Review of Payment Applications.
 - 8.2.3. Review of Payment Applications.
 - 8.2.4. Allowance Items.
 - 8.2.5. Unit Price Items.
- 8.3. District's Disbursement of Progress Payments.
 - 8.3.1. Timely Disbursement of Progress Payments.
 - 8.3.2. Untimely Disbursement of Progress Payments.
 - 8.3.3. District's Right to Disburse Progress Payments by Joint Checks.
 - 8.3.4. No Waiver of Defective or Non-Conforming Work.
 - 8.3.5. Progress Payments for Changed Work.
 - 8.3.6. Materials or Equipment Not Incorporated Into the Work.
 - 8.3.7. Title to Work.
- 8.4. Substitute Security for Retention.
- 8.5. Final Payment.
 - 8.5.1. Application for Final Payment.
 - 8.5.2. Conditions Precedent to Disbursement of Final Payment.
 - 8.5.3. Disbursement of Final Payment.
 - 8.5.4. Waiver of Claims.
 - 8.5.5. Claims Asserted After Final Payment.
- 8.6. Withholding of Payments.
- 8.7. Payments to Subcontractors.

9. Changes

- 9.1. Changes to the Work.
- 9.2. Oral Order of Change in the Work.
- 9.3. Contractor Submittal of Data.
- 9.4. Adjustment to Contract Price on Account of Changes to the Work.
 - 9.4.1. Mutual Agreement.
 - 9.4.2. Determination by the District.
 - 9.4.3. Basis for Adjustment of Contract Price.
 - 9.4.3.1. Labor.
 - 9.4.3.2. Materials and Equipment.
 - 9.4.3.3. Construction Equipment.
 - 9.4.4. Mark-up on Costs of Changes to the Work.
 - 9.4.5. Contractor Maintenance of Records.
- 9.5. Adjustment to Contract Time.
- 9.6. Addition or Deletion of Alternate Bid Item(s).
- 9.7. Change Orders.
- 9.8. Unilateral Change Order.

- 9.9. Construction Change Directive.
- 9.10. Contractor Notice of Changes.
- 9.11. Disputed Changes.
- 9.12. Minor Changes in the Work.
- 9.13. Unauthorized Changes.
- 10. Separate Contractors**
 - 10.1. District's Right to Award Separate Contracts.
 - 10.2. District's Coordination of Separate Contractors.
 - 10.3. Mutual Responsibility.
 - 10.4. Discrepancies or Defects.
- 11. Tests; Inspections; Observations**
 - 11.1. Contractor's Notice.
 - 11.2. Cost of Tests and Inspections.
 - 11.3. Testing/Inspection Laboratory.
 - 11.4. Additional Tests, Inspections and Approvals.
 - 11.5. Delivery of Certificates.
 - 11.6. Timeliness of Tests, Inspections and Approvals.
- 12. Uncovering and Correction of Work**
 - 12.1. Uncovering of Work.
 - 12.2. Rejection of Work.
 - 12.3. Correction of Work.
 - 12.4. Removal of Non-Conforming or Defective Work.
 - 12.5. Failure of Contractor to Correct Work.
 - 12.6. Acceptance of Defective or Non-Conforming Work.
- 13. Warranties**
 - 13.1. Workmanship and Materials.
 - 13.2. Warranty Work.
 - 13.3. Guarantee.
 - 13.4. Survival of Warranties.
- 14. Suspension of Work**
 - 14.1. District's Right to Suspend Work.
 - 14.2. Adjustments to Contract Price and Contract Time.
- 15. Termination**
 - 15.1. Termination for Cause.
 - 15.1.1. District's Rights Upon Termination.
 - 15.1.2. Completion by the Surety.
 - 15.1.3. Assignment and Assumption of Subcontracts.
 - 15.1.4. Costs of Completion.
 - 15.1.5. Conversion to Termination for Convenience.
 - 15.1.6. District's Rights Cumulative.
 - 15.2. Termination for Convenience of the District.
- 16. Miscellaneous**
 - 16.1. Governing Law; Interpretation.
 - 16.2. Successors and Assigns.
 - 16.3. Cumulative Rights and Remedies; No Waiver.
 - 16.4. Severability.
 - 16.5. No Assignment by Contractor
 - 16.6. Time of Essence.
 - 16.7. Independent Contractor Status.
 - 16.8. Notices.
 - 16.9. Disputes; Continuation of Work.
 - 16.10. Claims Resolution.
 - 16.10.1. Public Contract Code §9204 Claims Resolution Procedures.
 - 16.10.1.1. Claim Submittal and Documentation.
 - 16.10.1.2. District Claim Review Statement.
 - 16.10.1.3. Meet and Confer.
 - 16.10.1.3.1. Meet and Confer Demand.
 - 16.10.1.3.2. Meet and Confer Statement.
 - 16.10.2. Non-Binding Mediation.
 - 16.10.2.1. Contractor Initiation.
 - 16.10.2.2. Mediator Selection.
 - 16.10.2.3. Mediation Procedures.
 - 16.10.2.4. Mediation Costs.
 - 16.10.2.5. Post-Mediation Disputed Claims.
 - 16.10.2.6. Waiver.
 - 16.10.3. Payments of Undisputed Claims.
 - 16.10.4. Subcontractor Claims.
 - 16.10.4.1. Subcontractor Claim Submittal.
 - 16.10.4.2. Contractor Certification of Subcontractor Claim.
 - 16.10.4.3. District Review of Subcontractor Claim.
 - 16.10.4.4. Disputed Subcontractor Claims.
 - 16.10.5. Government Code Claim Requirements.
 - 16.10.6. Section 20104.4 Dispute Resolution Procedures; Claims Less than \$375,000.
 - 16.10.7. Binding Arbitration of Claims Exceeding \$375,000.
 - 16.10.7.1. JAMS Arbitration.
 - 16.10.7.2. Demand for Arbitration.
 - 16.10.7.3. Discovery.
 - 16.10.7.4. Arbitration Award.
 - 16.10.7.5. Arbitration Fees and Expenses.
 - 16.10.7.6. Limitation on Arbitrator.
 - 16.10.8. Inapplicability to Bid Bond.
 - 16.11. Attorneys' Fees.
 - 16.12. Provisions Required by the Laws Deemed Inserted.
 - 16.13. Days.
 - 16.14. Entire Agreement.

GENERAL CONDITIONS

1. Definitions

- 1.1. The Work. The "Work" is the construction and services required by the Contract Documents, and includes all labor, materials, equipment or services to fulfill the Contractor's obligations under the Contract Documents.
- 1.2. Surety. The Surety is the person or entity that executes, as surety, the Contractor's Labor and Material Payment Bond and/or Performance Bond.
- 1.3. Contractor and Subcontractors. Unless otherwise expressly provided in the Contract Documents, references to Contractor in the Contract Documents are references to each Contractor awarded a Contract for a Bid Package. A Subcontractor is a person or entity who has a direct contract with a Contractor for a portion of the Work; Subcontractors include lower tier subcontractors, who are in direct privity of contract with a Subcontractor.
- 1.4. Material Supplier. A Material Supplier only furnishes materials, equipment or supplies for the Work without fabricating, installing or consuming them in the Work.
- 1.5. Drawings and Specifications. The Drawings are the graphic and pictorial portions of the Contract Documents, showing generally, the design, location and dimensions of the Work and may include plans, elevations, sections, details, schedules or diagrams. The Specifications are the written requirements for materials, equipment, construction systems, standards, criteria and workmanship.
- 1.6. Intent and Correlation of Contract Documents. The Contract Documents are complementary and what is required by one portion shall be by all; performance by the Contractor is required to the extent consistent with the Contract Documents and reasonably inferable therefrom as being necessary to produce the intended results. If a portion of the Contract Documents is silent and information appears elsewhere in the Contract Documents, such other portions of the Contract Documents shall control. Words or terms with well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Conflicts, inconsistencies or ambiguities in the Contract Documents shall be resolved by the Architect based on the following standards: the Drawings are intended to describe matters relating to placement, type, quantity and the like; the Specifications are intended to describe matters relating to quality, materials, compositions, manufacturers and the like. If conflicts exist between parts of the Contract Documents regarding the quality of any product, equipment or materials, the Contractor shall provide the product, equipment or material of the highest or more stringent quality.
- 1.7. Shop Drawings; Samples; Product Data ("Submittals"). Shop Drawings are diagrams, schedules and other data specially prepared for the Work to illustrate the installation, assembly or similar matters for a portion of the Work. Samples are physical examples of materials, equipment or workmanship to be incorporated into the Work. Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information to illustrate materials or equipment for a portion of the Work. Shop Drawings, Samples and Product Data prepared by the Contractor or any Subcontractors/Material Suppliers are collectively referred to as "Submittals."
- 1.8. Division of State Architect ("DSA"). DSA is the California Division of the State Architect; references to "DSA" include its offices, employees and agents. The authority of the DSA over the Work and the performance thereof shall be as set forth in the Contract Documents and the Laws.
- 1.9. Project Inspector. The Project Inspector is employed by the District in accordance with the requirements of Title 24 of the California Code of Regulations. The Project Inspector is authorized to act on behalf of the District as provided for in the Contract Documents and in Title 24 of the California Code of Regulations.
- 1.10. Contract Document Terms. The term "provide" means "provide complete in place" or to "furnish and install" such item. Unless otherwise provided in the Contract Documents, the terms "approved," "directed," "satisfactory," "accepted," "acceptable," "proper," "required," "necessary" and "equal" means as approved, directed, satisfactory, accepted, acceptable, proper, required, necessary and equal, in the opinion of the Architect. The term "typical" as used in the Drawings shall require the installation or furnishing of such item(s) of the Work designated as "typical" in all other areas similarly marked as "typical"; Work in such other areas shall conform to that shown as "typical" or as reasonably inferable therefrom.
- 1.11. Record Drawings. The Record Drawings are the Drawings marked by the Contractor during the Work to indicate completely and accurately actual as-built conditions of the Work.
- 1.12. Construction Manager. The Construction Manager, if any, is designated in the Special Conditions and is authorized to act on behalf of the District in accordance with the Contract Documents. If a Construction Manager is not designated in the Special Conditions, the District may designate a Construction Manager during performance of the Work without adjustment of the Contract Price or the Contract Time or otherwise affect, limit or restrict Contractor's obligations hereunder.
- 1.13. Construction Equipment. "Construction Equipment" is equipment utilized for the performance of any portion of the

Work, but which is not incorporated into the Work.

- 1.14. Site. The Site is the physical area designated in the Contract Documents for Contractor's performance, construction and installation of the Work.
- 1.15. Field Clarifications. A written or graphic document consisting of supplementary details, instructions or information issued on behalf of the District which clarifies or supplements the Contract Documents and which becomes a part of the Contract Documents upon issuance. Field Clarifications do not constitute Changes, unless a Change Order relating to a Field Clarification is authorized and issued.
- 1.16. Defective or Non-Conforming Work. Defective or Non-Conforming Work is any Work which is unsatisfactory, faulty or deficient by: (i) not conforming to the requirements of the Contract Documents; (ii) not conforming to the standards of workmanship of the applicable trade; (iii) not in compliance with the requirements of any inspection, reference, standard, test, or approval required by the Contract Documents; or (iv) damage occurring prior to Final Acceptance.
- 1.17. Notice to Proceed. The Notice to Proceed is the written notice issued by or on behalf of the District to the Contractor authorizing the Contractor to proceed with commencement of the Work and which establishes the date for commencement of the Contract Time.
- 1.18. Progress Reports; Verified Reports. Progress Reports are written reports prepared by the Contractor and its Subcontractors on a daily basis. Progress Reports must include: (i) the number of labor and supervising personnel at the Site; (ii) the labor/work classification of each laborer; (iii) a detailed description of the Work in progress and completed; (iv) weather/environmental conditions; and (v) problems encountered with a potential impact to the Contract Time or the Contract Price. Verified Reports are periodic written reports prepared by the Contractor and submitted to the DSA; Verified Reports shall be in such form and content as required by Title 24 of the California Code of Regulations.
- 1.19. Laws. "Laws" refer to all laws, ordinances, codes, rules and/or regulations promulgated by any governmental or quasi-governmental agency with jurisdiction over any portion of the Work and which apply to any portion of the Work, including those in effect as of the execution of the Agreement, amendments thereto and subsequently enacted Laws that take effect during the performance of the Work. No adjustment of the Contract Time or the Contract Price shall be allowed for the Contractor's compliance with the Laws.

2. District

- 2.1. Information Required of District.
 - 2.1.1. Surveys; Site Information. Information, if any, concerning physical characteristics of the Site, including without limitation, surveys, soils reports, and utility locations is set forth in the Contract Documents. Information not provided by the District but required to complete the Work shall be obtained by Contractor without adjustment to the Contract Price or the Contract Time. The Contractor shall verify all information provided by the District. Variations between conditions or existing improvements depicted in the Contract Documents and those actually encountered in the performance of the Work shall not result in any District liability therefor, nor shall any such variations result in an adjustment of the Contract Time or the Contract Price.
 - 2.1.2. Drawings and Specifications. The District shall furnish the Contractor, without cost to the Contractor, electronic digital files of the Drawings and Specifications. The Contractor is solely responsible for completing the following at the Contractor's cost and expense: (i) distribution of electronic digital files of the Drawings and Specifications to Subcontractors, Material Suppliers and other performing any portion of the Work, as necessary; and (ii) reproduction of any portion of the Drawings or Specifications. All of the Drawings and the Specifications provided by the District to the Contractor remain the property of the District; the Contractor shall not use the Drawings or the Specifications other than the Work of the Project.
- 2.2. District's Right to Stop the Work. The District may, by written order, direct the Contractor to stop any portion of the Work if the Contractor: (i) fails to correct Defective or Non-Conforming Work; or (ii) fails to carry out the Work in conformity to the Contract Documents. The right of the District to stop the Work hereunder shall not: (i) be deemed a duty of the District to exercise such right for the benefit of the Contractor; (ii) waive or limit the exercise of any other right or remedy of the District under the Contract Documents or the Laws; or (iii) result in adjustment of the Contract Time or the Contract Price.
- 2.3. Partial Occupancy or Use. The District may occupy or use any completed or partially completed portion of the Work. Immediately prior to such partial occupancy or use of the Work, the District, Project Inspector, Contractor, Construction Manager and Architect shall jointly inspect the portion of Work to be used or occupied by the District to record the condition of the Work. Corrective action noted in such inspection shall be promptly performed and completed by the Contractor so the Work conforms to requirements of the Contract Documents and the District's occupancy or use thereof is not impaired. The District's use or occupancy of the Work or portions thereof is not "completion" of the Work pursuant to Public Contract Code §7107 nor constitute the District's acceptance Defective or Non-Conforming Work.

2.4. The Project Inspector.

2.4.1. Authority. All Work shall be performed under the observation of the Project Inspector, whose authority is established by the Laws and the Contract Documents. Duties of the Project Inspector shall not relieve or limit the Contractor's performance of its obligations under the Contract Documents. The Project Inspector does not have authority: (i) to interpret the Contract Documents or to modify the Work depicted in the Contract Documents; or (ii) relating to the Contractor's safety plan. Upon the Project Inspector's issuance of a report or other similar statement identifying Defective or Non-Conforming Work, the Contractor shall promptly repair, replace or correct the same so that it conforms to requirements of the Contract Documents. If the Contractor fails or refuses to promptly remedy Defective or Non-Conforming Work, the District may remedy such Defective or Non-Conforming Work at the expense of the Contractor.

2.4.2. Information for the Project Inspector. The Contractor shall provide to the Project Inspector all information, data and similar materials as necessary or appropriate for the Project Inspector's purposes of fulfilling the Project Inspector's obligations relating to observations and inspections of the Work.

2.5. Communications Software. The District reserves the right to implement electronic data and/or communications software (such as Primavera Expedition®) for data and communications relating to the Work ("Communications Software"). The Contractor's use of Communications Software will be as directed by the District without charge or expense to the Contractor and without adjustment of the Contract Price or the Contract Time.

2.6. Multiple Contractors; Construction Manager. The Work of the Contractor is identified and generally described by the Bid Package Number and Bid Package Description set forth in the Agreement ("Bid Package"). The Contractor acknowledges that construction of the Project will be completed by separate contracts between the District and multiple Contractors, each for a specific scope of Work. Each Contractor is responsible for the timely and complete performance of the Work of its Bid Package in accordance with requirements of its contract with the District for the Contractor's Bid Package. Each Contractor's Work will be scheduled, coordinated and generally directed by the Construction Manager, provided that the foregoing is not deemed assumption of the Contractor's responsibility for: (i) means and methods to complete Bid Package Work; (ii) implementing safety measures and programs required by Site conditions and as required by the Laws; and (iii) supervision, coordination and direction of the Bid Package Work.

3. Architect

3.1. Architect's Administration of the Contract. The Architect will provide administration of the Contract and will be one of the District's representatives during construction until the time that Final Payment is due the Contractor under the Contract Documents. The Architect is authorized to act on behalf of the District as provided for in the Contract Documents and shall have the responsibilities and authority over the Work as established by the Laws.

3.2. Periodic Site Inspections. The Architect will visit the Site at intervals appropriate to the stage of construction to: (i) become generally familiar with the progress and quality of the completed Work; and (ii) determine if the Work is being performed so that when completed will be in accordance with the Contract Documents. On the basis of Site observations as an architect, the Architect will keep the District informed of the progress of the Work, and endeavor to guard the District against defects and deficiencies in the Work. The Architect is authorized to reject Defective or Non-Conforming Work. The Architect may require additional inspections or tests, whether or not the Work is fabricated, installed or completed.

3.3. Contractor Responsibility for Construction Means, Methods and Sequences. The Architect will not have control over or charge of and will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, these being solely the Contractor's responsibility.

3.4. Submittals. The Architect will review and accept or take other appropriate action relating to Submittals for the limited purpose of checking for general conformance with information given and the design concept expressed in the Contract Documents. The Architect's review of Submittals shall not: (i) relieve the Contractor of its obligations under the Contract Documents; (ii) constitute approval of safety measures, programs or precautions; or (iii) constitute the direction of construction means, methods, techniques, sequences or procedures. The Architect's review and return of reviewed Submittals will conform to the time limits set forth in the Specifications, the Construction Schedule or other provisions of the Contract Documents. If no time limits are established in the foregoing, the Architect shall have five (5) days for review and return of Submittals.

3.5. Changes; Change Orders. The Architect will prepare Change Orders, and may authorize minor Changes in the Work which do not result in adjustment of the Contract Time or the Contract Price. The Architect may issue Field Clarifications and Construction Change Directives.

3.6. Interpretation of Contract Documents. The Architect will interpret and decide matters concerning the requirements of the Contract Documents on written request of either the District or the Contractor. The Architect's response to such requests will be made promptly and within the time limits agreed upon; if agreement establishing the time for the Architect's review and response to requests is not reached, the Architect shall have fifteen (15) days after receipt

of such request to respond thereto. Interpretations and decisions of the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. The Architect's decisions on matters relating to aesthetic effect are final if consistent with the intent expressed in the Contract Documents.

- 3.7. Contractor Request for Information. If the Contractor encounters any condition which the Contractor believes, in good faith and with reasonable basis, is the result of an ambiguity, conflict, error or omission in the Contract Documents (collectively "the Conditions"), the Contractor must request information from the Architect necessary to address and resolve any such Conditions before proceeding with any portion of the Work affected or which may be affected by such Conditions. If the Architect reasonably determines that any of Contractor's request(s) for information: (i) does not reflect adequate or competent supervision or coordination by the Contractor or any Subcontractor; or (ii) does not reflect the Contractor's adequate or competent knowledge of the requirements of the Work or the Contract Documents; or (iii) is not justified for any other reason, Contractor shall be liable to the District for all costs incurred by the District to process, review, evaluate and respond to such request for information, including without limitation, fees of the Architect.
- 3.8. Communications; Architect's Role. All communications regarding the Work, the performance thereof or the Contract Documents shall be in writing; verbal communications shall be reduced to writing. Communications between the Contractor and the District shall be through the Construction Manager. All written communications between the Contractor and any Subcontractor, Material Supplier or others shall be available to the District or Construction Manager for review, inspection and reproduction as requested from time to time.

4. The Contractor

4.1. Contractor Review of Contract Documents.

- 4.1.1. Examination of Contract Documents. The Contractor shall carefully study Contract Documents and information furnished by the District and shall immediately notify the Architect in writing of errors, inconsistencies or omissions discovered. If the Contractor performs any Work knowing, or with reasonable diligence should have known that, it involves an error, inconsistency or omission in the Contract Documents without prior notice to the Architect, the Contractor shall bear the costs for correction of the same.
- 4.1.2. Measurements, Layouts and Field Engineering. The Contractor shall take field measurements and verify field conditions at the Site. All field engineering required for laying out the Work and establishing grades for earthwork operations shall be by an engineer registered under the Laws and without adjustment of the Contract Price. The Contractor shall complete all surveys necessary for performance of the Work and for establishment, location, maintenance and preservation of benchmarks, reference points and stakes for the Work.
- 4.1.3. Drawings; Dimensions. Unless otherwise expressly provided, dimensions indicated in the Drawings are: (i) intended for reference only; and (ii) diagrammatic and schematic in nature. The Contractor is solely responsible for dimensioning and coordinating the Work of the Contract Documents. No Contract Price adjustment will be allowed on account of differences between actual dimensions and the dimensions indicated on the Drawings.
- 4.1.4. Work in Accordance With Contract Documents. The Contractor shall perform all of the Work in strict conformity with the Contract Documents and the Laws.

4.2. Site Investigation; Subsurface Conditions.

- 4.2.1. Subsurface Data. By executing the Agreement, the Contractor acknowledges that it has examined the boring data and other available subsurface data and has satisfied itself as to the character, quality and quantity of surface and subsurface materials, including without limitation, obstacles which may be encountered in performance of the Work. Subsurface data or other soils investigation report provided by the District hereunder are not a part of the Contract Documents. Information contained in such data or report regarding subsurface conditions, elevations of existing grades, or below grade elevations are approximate only and is neither guaranteed or warranted by the District to be complete and accurate. The District assumes no responsibility for any conclusions or interpretations of the Contractor on the basis of available subsurface data or other information furnished by District under the Contract Documents.
- 4.2.2. Subsurface Conditions. If the Work involves digging trenches or other excavations that extend deeper than four (4) feet below the surface, the Contractor shall promptly and before the following conditions are disturbed, notify the Project Inspector, in writing, of any: (i) material that the Contractor believes may be material that is hazardous waste, as defined in California Health and Safety Code §25117, that is required to be removed to a Class I or Class II or Class III disposal site in accordance with provisions of existing law; (ii) subsurface or latent physical conditions at the site differing from those indicated; or (iii) unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in the Work or the character provided for in the Contract Documents. If the District determines that the conditions so materially differ or involve such hazardous materials requiring an adjustment to the Contract Price or the Contract Time, the District shall issue a Change Order in

accordance with Article 9 hereof. Pursuant to California Public Contract Code §7104, disputes between the Contractor and the District as to any of the conditions listed in (i), (ii) or (iii) above, shall not excuse the Contractor from the completion of the Work within the Contract Time and the Contractor shall proceed with all Work to be performed under the Contract Documents.

4.3. Supervision and Construction Procedures.

4.3.1. Supervision of the Work. The Contractor shall supervise and direct performance of the Work, using the Contractor's best skill and attention. The Contractor is responsible to the District for acts and omissions of the employees, agents and representatives of the Contractor and Subcontractors.

4.3.2. Noise and Dust Control. The Contractor shall implement all measures necessary for noise and dust control during Work at the Site, including specific care to avoid deposits of airborne dust or airborne elements.

4.3.3. Clean-Up. The Contractor shall at all times keep the Site and all adjoining areas free from the accumulation of any waste material or rubbish. The Contractor shall maintain the Site in a "rake-clean" standard on a daily basis. The Project Inspector or Construction Manager may direct the Contractor's clean-up obligations hereunder. If the Contractor fails to clean up as provided for in the Contract Documents, the District may do so at the Contractor's expense.

4.3.4. Cutting and Patching. The Contractor is responsible for cutting, fitting or patching required to complete the Work or to make the component parts thereof fit together properly. The Contractor shall not damage or endanger any portion of the Work, or the fully or partially completed construction of the District or separate contractors by cutting, patching, excavation or other alteration.

4.3.5. Construction Utilities. The District will furnish and pay the costs of utility services for the Work as set forth in the Special Conditions; all other utilities necessary to complete the Work shall be obtained by the Contractor without adjustment of the Contract Price. Temporary distributions of utilities at the Site as necessary for the Work, including utilities furnished by the District will be by the Contractor assigned such responsibilities in its Bid Package Scope of Work. The costs of utility services obtained by the Contractor and are included in the Contract Price.

4.3.6. Existing Utilities; Removal, Relocation and Protection. Pursuant to California Government Code §4215, the District assumes responsibility for timely removal, relocation, or protection of existing main or trunkline utility facilities located on the Site which are not identified in the Contract Documents. The Contractor shall be compensated for the costs of locating, repairing damage not due to the Contractor's failure to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Contract Documents with reasonable accuracy and for Construction Equipment on the Site necessarily idled during such work. The Contractor shall not be assessed Liquidated Damages for delay in completion of the Work when such delay is caused by the failure of the District or the utility owner to provide for removal or relocation of such utility facilities. The District is not required to indicate existing service laterals or appurtenances if presence of such utilities on the Site can be inferred from the presence of other visible facilities, such as buildings, meters and junction boxes, on or adjacent to the Site. If the Contractor encounters utility facilities not identified in the Contract Documents, the Contractor shall immediately notify, in writing, the District, Project Inspector, Architect, Construction Manager and the utility owner. If such utility facilities are owned by a public utility, the public utility shall have the sole discretion to perform repairs or relocation work or permit the Contractor to do such repairs or relocation work at a reasonable price.

4.4. Conferences and Meetings. A material obligation of the Contractor is the attendance by the Contractor's supervisory and/or management personnel (who shall be authorized to act on behalf of the Contractor) at meetings relating to the Work, including weekly progress meetings. The Contractor is responsible for arranging for attendance by Subcontractors, Material Suppliers at meetings and conferences relating to the Work as necessary, appropriate or as requested by the District. All costs, expenses, charges or fees incurred by the Contractor in connection with attendance and participation meetings relating to the Work shall be without adjustment of the Contract Time or the Contract Price. The Architect or Construction Manager will prepare and distribute minutes reflecting the items addressed and actions taken at a meeting or conference. The Contractor shall have five (5) days after the date of distribution of minutes to notify the Construction Manager and Architect in writing of objections to such minutes. Failure of the Contractor to interpose objections within said five (5) days will result the minutes as distributed constituting the official record of the meeting or conference. Objections of Subcontractors or Material Suppliers to minutes shall be submitted to the Architect or Construction Manager through the Contractor. If the Contractor timely interposes objections or notes corrections, the resolution of such matters shall be addressed at the next scheduled meeting.

4.5. Labor and Materials.

4.5.1. Payment for Labor, Materials and Services. The Contractor shall provide and pay for labor, materials, equipment, tools, Construction Equipment and machinery, water, heat, utilities, transportation, and other facilities and/or services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated in the Work.

- 4.5.2. Employee Discipline and Competency. The Contractor shall enforce strict discipline and good order among employees of the Contractor, Subcontractors and all other persons performing any part of the Work at the Site. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. The Contractor shall dismiss from its employ and direct any Subcontractor to dismiss from their employment any person deemed by the District to be unfit or incompetent to perform Work.
- 4.5.3. Contractor's Superintendent. The Contractor's superintendent shall be present at the Site at all times during the Work. The superintendent shall represent the Contractor and communications given to the superintendent shall be binding as if given to the Contractor. The Contractor shall submit to the District a written statement of the qualifications of the Contractor's proposed Superintendent. Acceptance of the Contractor's proposed Superintendent is subject to establishing the Superintendent's: (i) skills, experience and other capabilities of the proposed Superintendent to supervise, coordinate and manage the Work; (ii) fluent verbal and written English language capabilities; (iii) competency in reading, comprehending and understanding Drawings, Specifications and other technical construction-related materials; and (iv) recent experience in completing construction projects similar to the Work within the budget and time established for such other construction projects. Upon acceptance of the Contractor's Superintendent, the Contractor shall not be change the Superintendent without prior consent of the District, unless the Superintendent: (i) is unsatisfactory to the Contractor; or (ii) is determined by the District to be unfit, incompetent or incapable of performing functions and responsibilities assigned.
- 4.5.4. Prohibition on Harassment. Any person engaging in a prohibited form of harassment is subject to immediate removal and thereafter excluded from the Site. Upon the District's receipt of any notice or complaint that a person performing Work at the Site has engaged in a prohibited form of harassment ("Worker"), the District will promptly undertake an investigation of such notice or complaint. If the District, after such investigation, reasonably determines that a prohibited form of harassment has occurred, the District will notify the Contractor of the same and direct that the Worker be immediately removed from the Site. Unless the District's determination is grossly negligent or without reasonable cause, District shall have no liability for directing the removal of any Worker determined to have engaged in a prohibited form of harassment nor shall the Contract Price or the Contract Time be adjusted on account thereof. The Contractor and the Surety shall defend, indemnify and hold harmless the Indemnified Parties from any and all claims, liabilities, judgments, awards, actions or causes of actions, including without limitation, attorneys' fees, which arise out of, or pertain in any manner to: (i) the assertion by any Worker that the direction of the District pursuant to the foregoing was improper; or (ii) the assertion by any person that a Worker has engaged in a prohibited form of harassment directed to or affecting such person.
- 4.5.5. Taxes. The Contractor shall pay, without adjustment of the Contract Price, all sales, consumer, use and other taxes for the Work or portions thereof provided by the Contractor under the Contract Documents.
- 4.6. Permits, Fees and Notices; Compliance With Laws.
- 4.6.1. Payment of Permits, Fees. Unless otherwise provided in the Contract Documents, the District shall secure and pay for the building permits, other permits, governmental fees, licenses and inspections necessary or required for the proper execution and completion of the Work. The foregoing notwithstanding: (i) the Contractor shall pay all fees, costs or other expenses associated with or arising in connection with Deferred Approval Items without adjustment of the Contract Price; and (ii) the Contractor shall obtain the following permits/approvals if applicable to the Work without adjustment of the Contract Price: (a) Temporary Fire Department plan check and permits for temporary material handling, storage and/or dispensing facilities for fuel, oil, liquid or gases; (b) industrial waste and AQMD permits relating to temporary facilities used in connection with any portion of the Work; (c) local business license; (d) traffic control, OSHA and offsite improvement permits; and (e) sewer, water, storm drain, gas tie plan check permits.
- 4.6.2. Compliance With Laws. The Contractor shall comply with and give notices required by the Laws and other orders of public authorities bearing on performance of the Work. All Work completed by the Contractor shall be in compliance with the Laws.
- 4.6.3. Notice of Variation From Laws. If the Contractor knows, or has reason to believe, that any portion of the Contract Documents are at variance with applicable Laws, the Contractor shall promptly notify the Architect, Construction Manager and the Project Inspector, in writing, of the same. If the Contractor performs Work knowing, or with reasonable diligence should have known, it to be contrary to the Laws without such notice to the Architect, Construction Manager and the Project Inspector, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs arising or associated therefrom, including without limitation, the removal, replacement or correction of the same.
- 4.6.4. DIR Registration. At all times during the Work, the Contractor shall be a DIR registered contractor. Performance of any Work by the Contractor without the Contractor being a DIR registered contractor at the time Work is performed is the Contractor's default in performance of a material obligation of the Contractor under the Contract Documents.

4.7. Submittals. Submittals are not part of the Contract Documents. Submittals shall demonstrate, for those portions of the Work for which Submittals are required, the manner in which the Contractor proposes to furnish, install or incorporate such Work in conformity with the information given and the design concept expressed in the Contract Documents.

4.7.1. Contractor's Submittals.

4.7.1.1. Prompt Submittals. All Submittals required by the Contract Documents shall be prepared, assembled and submitted by the Contractor to the Architect in a timely manner or within the time indicated in the Submittal Schedule incorporated into the Baseline Construction Schedule.

4.7.1.2. Contractor Approval of Subcontractor Submittals. All Submittals prepared by Subcontractors or Material Suppliers shall bear the written approval of the Contractor prior to submission to the Architect for review, with the approval indicating that the Contractor has verified materials, field measurements, field construction criteria, catalog numbers and similar data related thereto and has verified that the information contained within such Submittals conform to the requirements the Contract Documents. Any Submittal submitted without the Contractor's written approval will be returned to the Contractor for re-submittal in conformity herewith, with the same being deemed to not have been submitted. Submittals shall be numbered consecutively and include the following: (i) date of submission; (ii) project name; (iii) name of submitting Subcontractor; and (iv) if applicable, the revision number. The foregoing information is in addition to, and not in lieu of, any other information required for the Architect's review of Submittals.

4.7.1.3. Contractor Responsibility for Deviations. The Contractor is not relieved of responsibility for correcting deviations from the Contract Documents by the Architect's review of Submittals unless the Contractor specifically informs the Architect in writing of such deviation at the time of submission of the Submittal and the Architect accepts the specific deviation.

4.7.1.4. No Performance of Work Without Architect Review. The Contractor shall perform no portion of the Work requiring the Architect's review of Submittals until the Architect has completed its review and accepted the Submittal. The Contractor shall not perform any portion of the Work affected by a related Submittal until the related Submittal is reviewed and accepted by the Architect.

4.7.2. Architect Review of Submittals. If the Architect returns a Submittal as rejected or requiring correction(s) with re-submission, the Contractor shall promptly resubmit a Submittal conforming to the requirements of the Contract Documents; the resubmitted Submittal shall indicate the portions thereof modified in accordance with the Architect's direction. When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the Architect may rely on the accuracy and completeness of such calculations and certifications accompanying Submittals. The following notations or notations of a similar nature noted on a reviewed Submittal will require the Contractor action noted below.

Submittal Notation	Required Contractor Action
No Exceptions Taken	No formal revision required
Make Corrections Noted	Make revision noted; re-submission of revised Submittal not required.
Revise and Re-Submit	Revise Submittal in accordance with notations and re-submit for review.
Rejected Re-Submit	Prepare new alternative Submittal and re-submit for review.

4.7.3. Deferred Approval Items. If any portion of the Work is designated in the Contract Documents as a "Deferred Approval" item, Contractor is responsible for preparing Submittals for Deferred Approval Items. Where required by the Laws or the nature of a Deferred Approval, the Deferred Approval Design shall be completed and stamped by a California licensed architect or California registered engineer. The Deferred Approval Design shall: (i) incorporate all requirements of the Deferred Approval as set forth in the Contract Documents; (ii) be coordinated with other portions of the Work; (iii) be completed in a timely manner so as not to delay, disrupt or interfere with completion of the Work within the Contract Time; and (iv) be completed in accordance with the applicable professional standard of care. The Contractor shall submit each completed Deferred Approval Design to the Architect for review and acceptance. Upon the Architect's acceptance of a Deferred Approval Design, the Contractor shall be responsible for: (i) submittal of the Deferred Approval Design to DSA for review and approval; (ii) modifications to the Deferred Approval Design as necessary to obtain DSA approval; and (iii) payment of fees or charges imposed by DSA for review and approval of a Deferred Approval Design without adjustment of the Contract Price. Notwithstanding review and acceptance of a Deferred Approval Design by the Architect or DSA issuance of approval to construct pursuant to the Contractor's Deferred Approval Design, the Contractor remains liable to the District for all losses, damages, costs, or other consequences of the failure of any Contractor's Deferred Approval Design to: (i) conform to the applicable design professional standard of care; (ii) conform to design intent and/or aesthetic requirements established in the Contract Documents; or (iii) perform and function in accordance with requirements established in the Contract Documents.

4.8. Materials and Equipment.

4.8.1. Approval of Substitutions or Alternatives. The Contractor may propose alternatives or substitutes for items specified in the Contract Documents ("Alternative Products"), provided that: (i) the Alternative Products comply with the requirements of the specified item; (ii) the Contractor certifies that the quality, performance capability and functionality (including aesthetics) of the Alternative Products meet or exceed the quality, performance capability and functionality of the specified item; and (iii) use of the Alternative Product will not delay completion of the Work or increase the Contract Price. The Contractor shall submit engineering, construction, dimension, visual, aesthetic and performance data ("Substantiating Data") to the Architect to permit evaluation of the Alternative Products. The Contractor shall not furnish or install any Alternative Products without the Architect's acceptance of the Alternative Products. The Architect's decision evaluating the Contractor's proposed Alternative Products shall be final. Neither the Contract Time nor the Contract Price shall be increased on account of any Alternative Products accepted by the Architect. The Contract Price shall be reduced by the actual cost savings realized by the Contractor's furnishing and/or installation of accepted Alternative Products. The Contractor is solely responsible for all costs and fees incurred by the District to review proposed Alternative Products, including without limitation fees of the Architect, design consultants to the Architect and/or governmental agencies to review and/or approve any proposed substitution or alternative. All requests for the Architect's review and approval of any Alternative Products and all Substantiating Data shall be submitted by Contractor not later than seven (7) days following the date of the District's award of the Contract to Contractor; any request for approval of Alternative Products submitted thereafter may be rejected summarily. The foregoing process and time limits shall apply to any proposed Alternative Products regardless of whether the Alternative Products are furnished or installed by the Contractor, a Subcontractor or Material Supplier.

4.8.2. Rejected Alternative Products. If the Architect does not approve a Contractor proposed Alternative Product, the Contractor shall furnish and install the specified item without adjustment of the Contract Price or Contract Time.

4.8.3. District Standard Products; "Sole Source" Products. If any material, equipment, product or other item ("Product") is designated in the Contract Documents as a "District Standard" or by similar words/terms, the District is deemed to have made a finding that such Product is designated and specified to match other Products in use in a completed or to be completed work of improvement and not subject to Alternative Products.

4.8.4. Placement of Material and Equipment Orders. The Contractor and Subcontractors shall promptly place all orders for materials and/or equipment for completion of the Work so that delivery of the same shall be made without delay or interruption to the Work. When requested by or on behalf of the District, the Contractor shall furnish written evidence of the placement of orders for materials and/or equipment necessary for completion of the Work, including without limitation, orders for materials and/or equipment to be provided, furnished or installed by any Subcontractor.

4.8.5. District's Right to Place Orders for Materials and/or Equipment. If the District determines, in its sole discretion, that orders for materials and/or equipment have not been placed in a manner so Substantial Completion is achieved within the Contract Time, the District shall have the right, but not the obligation, to place such orders on behalf of the Contractor. The Contractor shall reimburse the District for all costs and fees incurred by the District in placing such orders.

4.9. Safety. The Contractor is solely responsible for initiating, maintaining and supervising all safety programs required by the Laws or by the type or nature of the Work and for initiating and maintaining reasonable safety precautions to prevent damage, injury or loss to: (i) employees on the Work and other persons who may be affected thereby; (ii) the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site or in transit; and (iii) other property or items at the Site, or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The foregoing includes, without limitation, posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities. Duties of the Contractor's Superintendent include prevention of accidents and the implementation of safety precautions and programs. In an emergency, the Contractor shall take necessary action to prevent or mitigate threatened damage, injury or loss.

4.10. Hazardous Materials; Prohibition on Use of Asbestos Construction Building Materials ("ACBMs"). If the Contractor or any Subcontractor uses, at the Site, or incorporates into the Work, any material or substance deemed to be hazardous or toxic under the Laws (collectively "Hazardous Materials"), the Contractor shall comply with the Laws relating to the use, storage or disposal thereof. It is the intent of the District that ACBMs not be used or incorporated into any portion of the Work. If any product or material forming a part of the Work or incorporated into the Work if found to contain ACBMs, the Contractor shall at its sole cost and expense: (i) remove such product or material in accordance with the Laws; (ii) replace such product or material with non-ACBM products or materials; and (iii) return the affected portion(s) of the Work to the finish condition depicted in the Contract Documents relating to such portion(s) of the Work. The foregoing obligations shall survive the termination of the Contract, the warranty period

provided under the Contract Documents, completion of the Work or the District's acceptance of the Work. If the Contractor fails or refuses, for any reason, to commence the removal and replacement of any material or product containing ACBMs forming a part of, or incorporated into the Work, within ten (10) days of the date of the District's written notice to the Contractor, the District may thereafter proceed to cause the removal and replacement of such materials or products; all costs, expenses and fees, including without limitation fees and costs of consultants and attorneys, shall be the joint and several responsibility of the Contractor and the Surety.

- 4.11. Maintenance of Record Drawings. During the Work, the Contractor shall continuously maintain Record Drawings consisting of a set of the Drawings marked to indicate all field changes to adapt the Work depicted in the Drawings to field conditions, Change Orders and all concealed or buried installations, including without limitation, piping, conduit and utility services. Record Drawings relating to the Structural, Mechanical, Electrical and Plumbing portions of the Work shall indicate without limitation, circuiting, wiring sizes, equipment/member sizing and shall depict the entirety of the as built conditions of such portions of the Work. If the District reasonably determines that the Contractor has not been, or is not, continuously maintaining the Record Drawings pursuant to the foregoing, the District may take appropriate action to cause the continuous maintenance of complete and accurate Record Drawings, at the Contractor's expense. Prior to receipt of the Final Payment, Contractor shall deliver the Record Drawings to the Architect.
- 4.12. Use of Site. The Contractor shall confine operations at the Site to areas permitted the Laws and the Contract Documents and shall not unreasonably encumber the Site or adjoining areas with materials or equipment. The Contractor is solely responsible for providing security at the Site with all such costs included in the Contract Price. Except in an emergency, no construction activities shall be permitted at or about the Site except during the hours and days set forth in the Special Conditions; Work performed at hours or on days not noted in the Special Conditions will not result in adjustment of the Contract Time or the Contract Price.
- 4.13. Access to the Work. The Contractor shall provide DSA, District, Construction Manager, the Project Inspector and Architect with access to the Work, whether in place, preparation and progress and wherever located.
- 4.14. Patents and Royalties. The Contractor and the Surety shall defend, indemnify and hold harmless the District and its agents, employees and officers from any claim, demand or legal proceeding arising out of or pertaining, in any manner, to any actual or claimed infringement of patent rights in connection with performance of the Work under the Contract Documents.
- 4.15. Wage Rates; Employment of Labor.
- 4.15.1. Payment of Prevailing Rates. There shall be paid each worker of the Contractor and Subcontractors engaged in the Work, not less than the general prevailing wage rate, regardless of any contractual relationship which may be alleged to exist between the Contractor or any Subcontractor and such worker. During the Work and pursuant to the CWA, the CWA Coordinator will monitor and enforce the obligation of the Contractor and Subcontractors to pay laborers at least the Prevailing Wage Rate established for the classification of work/labor performed. The CWA Coordinator is responsible for and authorized to: (i) receive complaints alleging violations of prevailing wage rate obligations; (ii) process, investigate and resolve prevailing wage rate violation complaints; and (iii) if not resolved, refer the prevailing wage rate violation complaints to the Labor Commissioner for further review, hearing and/or enforcement.
- 4.15.2. Prevailing Rate Penalty. If a worker of the Contractor or a Subcontractor is paid less than the prevailing wage rate for the work or craft provided by the worker, the Contractor and/or Subcontractor shall be subject all penalties and assessments established by the Laws.
- 4.15.3. Certified Payroll Records. The Contractor and all Subcontractors shall prepare and submit Certified Payroll Records to District with the Contractor's Pay Applications. The form and content of Certified Payroll Records shall be as established by the Labor Commissioner. Pursuant to California Labor Code §1776, the Contractor and each Subcontractor shall keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each person employed for the Work. The payroll records shall be certified and available for inspection at all reasonable hours at the principal office of the Contractor in accordance with the Laws. If the Contractor and/or Subcontractor fail or refuse to produce payroll records as required by the Laws, the Contractor and/or Subcontractor shall be subject to all penalties and assessments under the Laws as a result of such failure or refusal.
- 4.15.4. Hours of Work. The Contractor and Subcontractors shall limit the hours of work by their respective workers to those permitted by the Laws and the CWA. Hours of work exceeding those permitted by the Laws shall be subject to additional premium wage payments as required by the Laws. Failure of the Contractor or Subcontractors to comply with the foregoing will subject the Contractor and/or Subcontractor to all penalties and assessments under the Laws.
- 4.16. Apprentices. Apprentices for the Work shall be in strict conformity with the Laws, including without limitation, Labor Code §§1777.5 through 1777.7, the provisions of which are incorporated herein by this reference. The responsibility

for compliance with apprenticeship requirements is solely and exclusively that of the Contractor. If the Contractor willfully fails to comply with these provisions and California Labor Code §1777.5, pursuant to California Labor Code §1777.7, the Contractor shall be subject to all penalties and assessments established by the Laws.

- 4.17. Employment of Independent Contractors. Pursuant to California Labor Code §1021.5, Contractor shall not willingly and knowingly enter into any agreement with any person, as an independent contractor, to provide services for the Work where the services provided or to be provided requires the person to hold a valid California Contractors' license and such person does not meet the burden of proof of his/her independent contractor status pursuant to California Labor Code §2750.5. Employment of any person in violation of the foregoing, will subject the Contractor to the civil penalties under California Labor Code §1021.5 and any other penalty provided by the Laws. All Subcontractors shall comply with the foregoing.
- 4.18. Assignment of Antitrust Claims. The Contractor and all Subcontractors assign to the District all rights, title and interest in and to all causes of action they may have under Section 4 of the Clayton Act, (15 U.S.C. §15) or under the Cartwright Act (California Business and Professions Code §§16700 et seq.) pursuant to California Government Code §4551. This assignment shall be made and become effective at the time the District tenders Final Payment to the Contractor, without further acknowledgment by the parties.
- 4.19. Progress Reports; DSA Verified Reports.
- 4.19.1. DSA Verified Reports; Contractor Actions. A material obligation of the Contractor is completion of all actions and activities which by the Contract Documents or by the Laws are the responsibility of the Contractor relating to DSA reporting requirements pursuant to Education Code §81141 (including amendments thereto) and issuance of DSA's Certificate of Compliance for the Project pursuant to Education Code §81147 (including amendments thereto) upon completion of the Work. The foregoing shall include without limitation, the timely preparation, completion and filing of Verified Reports during Project construction and the filing of the Final Verified Report with DSA within ten (10) days of the determination of Final Completion. Concurrently with submittal to DSA, the Contractor shall provide the District, Project Inspector and Architect with copies of all Verified Reports completed by the Contractor and submitted to DSA.
- 4.19.2. District Withholdings From Final Payment. The completion and filing of the DSA Final Verified Report is an express condition precedent to the District's disbursement of the Final Payment. If the Contractor fails to prepare and file the Final Verified Report within ten (10) days of the determination of Final Completion, the District may retain and withhold an amount not to exceed ten percent (10%) of the Final Payment from disbursement to the Contractor as damages for the failure of the Contractor to have timely and completely discharged its obligations hereunder. The Contractor acknowledges and agrees that the foregoing withholdings by the District is a reasonable estimate of the damages and other losses the District will sustain due to the failure of the Contractor to have timely and fully discharged its obligations hereunder.
- 4.19.3. Progress Reports. Progress Reports shall be submitted to the District or Construction Manager not later than 9:00 A.M. of the ensuing business day.
- 4.20. Community Workforce Agreement ("CWA"). The CWA is an agreement between the District and the Los Angeles-Orange Counties Building and Construction Trades Council, entitled "Antelope Valley College Community Workforce Agreement For New Construction and Modernization" which is applicable to the Work.
- 4.20.1. Application of CWA. The Contractor and all Subcontractors of any tier are bound by and subject to the terms of the CWA.
- 4.20.2. Subcontractor Summary. Within five (5) days of the date of the District's issuance of the Notice to Proceed for the Work, the Contractor shall complete and submit the form of Subcontractor Summary incorporated into these Special Conditions. The Contractor acknowledges and agrees that the Contractor is under a continuing obligation during performance of the Work to complete and submit to the District updates of the Subcontractor Summary for additional or different Subcontractors and/or Sub-Subcontractors.
- 4.20.3. Subcontractors' Letters of Assent. Prior to any Subcontractor of any tier performing any Work, each Subcontractor shall execute and deliver to the District the Letter of Assent incorporated into Section 00 45 50 of the Contract Documents. No Subcontractor will be permitted to perform Work without the Subcontractor's prior completion, execution and submittal of a Letter of Assent. The Contract Time is not subject to adjustment for delayed submittal of a Subcontractor's Letter of Assent.
- 4.20.4. Contractor/Subcontractor Employees and CWA Labor Referral Requirements. Except for "core employees" as that term is used and defined in the CWA, labor resources necessary for the Contractor and Subcontractors' completion of the Work shall be pursuant to the employment referral process and procedures set forth in the CWA. During the Work, the Contractor, Subcontractors and laborers employed by them are subject to applicable provisions of the applicable collective bargaining agreements of the union signatories to the CWA, in accordance with provisions of the CWA relating to such collective bargaining

agreements.

- 4.20.5. Site Labor Relations. The CWA establishes certain standards and requirements relating to labor and labor relations at the Site, including without limitation, hours/days of Work at the Site, wages and benefits, use of apprentices, prohibitions on strikes/lock-outs and procedures for resolution of grievances and disputes. Provisions of the CWA relating to Site labor relations govern and control.
- 4.20.6. CWA Coordinator. Pursuant to the terms of the CWA, the District has retained a CWA Coordinator. The duties, responsibilities and authority of the CWA Coordinator shall be as set forth in the CWA.

5. Subcontractors.

- 5.1. Subcontracts. Work performed by Subcontractors shall be pursuant to a written agreement between the Contractor and each Subcontractor which specifically incorporates by reference the Contract Documents and which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents, including without limitation, the policies of insurance required under Article 6 of these General Conditions and obligates the Subcontractor to assume toward the Contractor and Architect all the obligations and responsibilities of the Contractor which the Contractor assumes toward the District and the Architect. No contractual relationship shall exist, or deemed to exist, between any Subcontractor and the District, unless the Contract is terminated and District, in writing, elects to assume the Subcontract. Each Subcontract shall provide that such Subcontract may be assigned to the District if the Contract is terminated by the District pursuant to these General Conditions, subject to the prior rights, if any, of the Surety.
- 5.2. Subcontractor DIR Contractor Registration.
 - 5.2.1. No Subcontractor Performance of Work Without DIR Registration. No portion of the Work is permitted to be performed by a Subcontractor unless the Subcontractor is a DIR Registered contractor. The foregoing DIR contractor registration requirement is applicable for all Subcontractors, including without limitation, lower tier Subcontractors and Subcontractors who are not identified in the Contractor's Subcontractors List.
 - 5.2.2. Contractor Obligation to Verify Subcontractor DIR Registration Status. An affirmative and on-going obligation of the Contractor under the Contract Documents is the Contractor's verification that all Subcontractors are at all times during performance of the Work in full and strict compliance with DIR contractor registration requirements. The Contractor shall not permit or allow any Subcontractor to perform any Work without the Contractor's verification that the Subcontractor is in full and strict compliance with DIR contractor registration requirements.
 - 5.2.3. Contractor Obligation to Request Substitution of Listed Subcontractor Who Is Not DIR Registered Contractor. If any Subcontractor identified in the Contractor's Subcontractors List submitted with the Contractor's proposal for the Work is not a DIR registered contractor at the time of opening of proposals for the Work or if a Subcontractor's DIR contractor registration lapses prior to or during a Subcontractor's performance of Work, the Contractor shall request the District's consent to substitute the Subcontractor who is not a DIR registered contractor pursuant to Labor Code §1771.1(c)(3) and/or Labor Code §1771.1(d).
- 5.3. Substitution of Listed Subcontractor.
 - 5.3.1. Substitution Process. Any request of the Contractor to substitute a listed Subcontractor must be in strict conformity with this Article 5.3 and California Public Contract Code §4107. All costs, fees or expenses incurred by the District, including, those of the Project Inspector, Architect and/or Construction Manager or attorneys in review, evaluation or hearing relating to a request to substitute a listed Subcontractor shall be borne by the Contractor.
 - 5.3.2. Responsibilities of Contractor Upon Substitution of Subcontractor. The District's consent to Contractor's substitution of a listed Subcontractor shall not result in any increase of the Contract Price or the Contract Time.
- 5.4. Subcontractors' Work. Whenever the Work of a Subcontractor is dependent upon the Work of the Contractor or another Subcontractor, the Contractor shall require the Subcontractor to: (i) coordinate its Work with the dependent Work; (ii) provide necessary dependent data and requirements; (iii) supply and/or install items to be built into the dependent Work of others; (iv) make appropriate provisions for dependent Work of others; (v) carefully examine and understand the portions of the Contract Documents (including Drawings, Specifications and Field Clarifications) and Submittals relating to the dependent Work; and (vi) examine the existing dependent Work and verify that the dependent Work is in proper condition for the Subcontractor's Work.

6. Insurance, Indemnity and Bonds.

- 6.1. Workers' Compensation Insurance; Employer's Liability Insurance. The Contractor shall purchase and maintain: (i) Workers' Compensation Insurance covering claims under workers' or workmen's compensation, disability benefit and other similar employee benefit acts; and (ii) Employer's Liability Insurance covering bodily injury (including death) by accident or disease to any employee which arises out of the employee's employment by Contractor.
- 6.2. Commercial General Liability and Property Insurance. The Contractor shall purchase and maintain Commercial

General Liability and Property Insurance covering the types of claims set forth below which may arise out of or result from Contractor's operations under the Contract Documents and for which the Contractor may be legally responsible: (i) claims for damages because of bodily injury, sickness or disease or death of any person other than the Contractor's employees; (ii) claims for damages insured by usual personal injury liability coverage which are sustained (a) by a person as a result of an offense directly or indirectly related to employment of such person by the Contractor, or (b) by another person; (iii) claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom; (iv) claims for damages because of bodily injury, death of a person or property damages arising out of ownership, maintenance or use of a motor vehicle; (v) contractor's pollution liability, if required for the Work; (vi) contractual liability insurance applicable to the Contractor's obligations under the Contract Documents; and (vii) Completed Operations. If the Contract Documents require the Contractor to obtain Contractor's Pollution Liability Insurance covering environmental liabilities including, without limitation, those resulting from construction, abatement and remediation operations, whether performed by the Contractor or Subcontractor, the Contractor's Pollution Liability insurance may be by endorsement to the Contractor's General Liability insurance policy or a separate policy of insurance. If the Contractor's General Liability insurance policy does not cover risks of loss arising out of the ownership, maintenance or use of motor vehicles, the Contractor shall obtain a separate Automobile Liability insurance policy with minimum coverage requirements established by the Contract Documents.

- 6.3. Automobile Liability Insurance. The Contractor shall purchase and maintain Automobile Liability insurance covering risks of loss on a combined single limit for personal injury (including death) or property damage arising out of the use or operation of any owned, non-owned or hired motor vehicle.
- 6.4. Builder's Risk "All-Risk" Insurance. The District will, at the District's cost and expense, obtain Builder's Risk "All-Risk" Insurance covering vandalism and malicious mischief, fire, sprinkler leakage, civil authority, sonic boom, collapse and flood upon the entire Work, including completed Work and Work in progress to the full insurable value thereof. The foregoing notwithstanding, if the Contractor or employees, agents, representatives or Subcontractors of the Contractor cause or contribute to a loss covered by the Builders Risk insurance policy, the Contractor is solely responsible for payment of the deductible relating to such loss; the District may deduct the deductible from the Contract Price then or thereafter due the Contractor.
- 6.5. Minimum Coverage Limits. The insurance required of the Contractor hereunder shall be written for not less than any limits of liability specified in the Contract Documents, or required by the Laws, whichever is greater.
- 6.6. Evidence of Insurance; Subcontractor's Insurance.
- 6.6.1. Certificates of Insurance. Prior to commencing the Work, Contractor shall deliver Certificates of Insurance to the District evidencing the insurance coverages required by the Contract Documents. The Certificates of Insurance shall contain a provision that coverages under such policies will not be canceled or expire until at least thirty (30) days prior written notice has been given to the District. The insurance policies required of Contractor hereunder shall also name the District as an additional insured as its interests may appear.
- 6.6.2. Subcontractors' Insurance. Each Subcontractor shall obtain and maintain the policies of insurance set forth in Articles 6.1, 6.2 and 6.3 with minimum coverage limits as set forth in the Special Conditions. The policies of insurance to be obtained and maintained by Subcontractors hereunder are in addition to, and not in lieu of, the Contractor's insurance obligations. Each policy of insurance of a Subcontractor shall conform to the requirements of this Article 6. The Contractor shall promptly deliver Certificates of Insurance to the District evidencing that the Subcontractors have obtained and maintained policies of insurance in conformity with the requirements of this Article 6.
- 6.6.3. Insurer Requirements. Policies of insurance required of the Contractor and Subcontractors hereunder shall be acceptable to the District only if the insurer issuing each such policy of insurance is A.M. Best rated at least A-/VII and authorized by the Laws to issue policies of insurance in California.
- 6.7. Contractor's Insurance Primary; Contractor Liability for Deductibles. All insurance coverages maintained by Contractor hereunder, if overlapping with any policy of insurance maintained by the District, shall be deemed to be primary and non-contributing with any policy maintained by the District and any policy or coverage thereunder maintained by District shall be deemed excess insurance. If the District maintains a policy of insurance covering property damage arising out of the perils of fire or other casualty covered by the Contractor's Builder's Risk Insurance or the Comprehensive General Liability Insurance of the Contractor or any Subcontractor, the District, Contractor and all Subcontractors waive rights of subrogation against the others. The costs for obtaining and maintaining the insurance coverages required of the Contractor and Subcontractors shall be included in the Contract Price. The Contractor is solely and exclusively responsible for payment of deductibles under any policy of insurance obtained and maintained by the Contractor or any Subcontractor.
- 6.8. Indemnity. The Contractor shall indemnify, defend and hold harmless the Indemnified Parties who are: (i) the District, its Board of Trustees and each individual member thereof, and the officers, employees, agents and representatives of the District; (ii) the Architect and its consultants for the Work and their respective agents and employees; (iii) the Project Inspector; and (iv) the Construction Manager and its agents and employees. The

Contractor's obligations hereunder includes indemnity, defense and hold harmless of the Indemnified Parties from and against any and all damages, losses, claims, demands or liabilities whether for damages, losses or other relief, including, without limitation attorneys' fees and costs (collectively "Indemnity Claims") which arise out of the negligent, grossly negligent or willful acts, omissions or other conduct of the Contractor, Subcontractor or any person or entity engaged by them for the Work. The Contractor's obligations under the foregoing include without limitation: (i) injuries to or death of persons; (ii) property damage; (iii) theft, loss or destruction of property; (iv) Stop Payment Notice claims asserted in connection with the Work; and (v) other losses, liabilities, damages or costs sustained by the Indemnified Parties, including without limitation, losses, liabilities, damages or costs asserted by other contractors against the Indemnified Parties due to the Contractor's failure to complete the Bid Package Work in a timely, complete and workmanlike manner. If any action or proceeding is commenced on account of any Indemnity Claims, and any of the Indemnified Parties are a party thereto, the Contractor shall, at its sole cost and expense, defend the Indemnified Parties in such action or proceeding with counsel reasonably satisfactory to the named Indemnified Parties. If there is any judgment, award, ruling, settlement, or other relief arising out of any such action or proceeding to which any of the Indemnified Parties are bound by, the Contractor shall timely and fully pay, satisfy or otherwise discharge any such judgment, award, ruling, settlement or relief. Contractor shall indemnify and hold harmless the Indemnified Parties from any and all liability or responsibility arising out of any such judgment, award, ruling, settlement or relief. The Contractor's obligations hereunder are binding upon Contractor's Performance Bond Surety and these obligations shall survive notwithstanding Contractor's completion of the Work or the termination of the Contract, until barred by the applicable Statute of Limitations.

- 6.9. Payment Bond; Performance Bond. Prior to commencing the Work, the Contractor shall obtain and deliver to the District a Performance Bond and a Labor and Material Payment Bond each in a penal sum equal to one hundred percent (100%) of the Contract Price and in the form and content set forth in the Contract Documents. The Surety issuing bonds shall be an Admitted Surety Insurer as defined in California Code of Civil Procedure §995.120 and A.M. Best rated at least A-/VII. Obligations of the Surety under the Performance Bond include without limitation, the Contractor's post-construction obligations, including timely and complete performance of warranty/guarantee obligations.

7. Contract Time

- 7.1. Substantial Completion of the Work Within Contract Time. The Contract Time is the period of time, including authorized adjustments thereto, for achieving Substantial Completion of the Work. The date for commencement of the Work is the date established in the Notice to Proceed issued by the District pursuant to the Agreement, which shall not be postponed by the failure to act of the Contractor or of persons or entities for which the Contractor is responsible. The date of Substantial Completion is the date certified by the Architect, Construction Manager and Project Inspector.
- 7.2. Progress and Completion of the Work.
- 7.2.1. Time of Essence. Time limits stated in the Contract Documents are of the essence. The Contractor shall employ and supply a sufficient force of workers, material and equipment, and prosecute the Work with diligence so as to maintain progress, to prevent Work stoppage and to achieve Substantial Completion of the Work within the Contract Time.
- 7.2.2. Substantial Completion. Substantial Completion is when the Work is complete in accordance with the Contract Documents so the District can occupy or use the Work for its intended purpose. Substantial Completion shall be determined by the Architect, Construction Manager and Project Inspector upon request by the Contractor. The good faith and reasonable determination of Substantial Completion by the Project Inspector, Construction Manager and the Architect shall be controlling and final.
- 7.2.3. Correction or Completion of the Work After Substantial Completion.
- 7.2.3.1. Punchlist. Upon achieving Substantial Completion of the Work, the District, The Project Inspector, Construction Manager, Architect and Contractor shall jointly inspect the Work and prepare a comprehensive list of items of the Work to be corrected or completed by the Contractor ("the Punchlist"). The exclusion of an item on the Punchlist shall not limit the Contractor's obligation to complete or correct any portion of the Work in accordance with the Contract Documents.
- 7.2.3.2. Time for Completing Punchlist Items. The Construction Manager, Contractor and Architect shall, establish a reasonable time for Contractor's completion of the Punchlist. If mutual agreement is not reached, the Architect shall determine such time, which is final and binding upon the District and Contractor so long as the Architect's determination is made in good faith. The Contractor shall promptly and diligently complete all Punchlist items within the time established. If the Contractor fails to complete the Punchlist within the time established, the Contractor shall be subject to assessment of Liquidated Damages and the District may in its sole and exclusive discretion, without further notice to Contractor, elect to cause the completion of all remaining Punchlist items provided, however, that such election by the District is in addition to and not in lieu of any other right or remedy of the District under the Contract Documents or the Laws, including assessment of Liquidated Damages. If the District elects to complete Punchlist items of the Work, pursuant to the foregoing, the Contractor shall be

responsible for all costs incurred by the District in connection herewith. If these costs exceed the remaining Contract Price due to the Contractor, the Contractor and the Performance Bond Surety are jointly and severally liable to District for any such excess costs.

7.2.3.3. Final Completion. Final Completion is when all Work has been completed in accordance with the Contract Documents, including without limitation, completion of the Punchlist, the Contractor's close-out responsibilities under the Contract Documents have been fully performed. Final Completion shall be determined by the Architect, Construction Manager and Project Inspector upon request of the Contractor. The good faith and reasonable determination of Final Completion by the Project Inspector, Construction Manager and Architect shall be controlling and final.

7.2.3.4. Contractor Responsibility for Multiple Inspections. If the Contractor requests determination of Substantial Completion or Final Completion and the Project Inspector, Construction Manager or Architect determine that the Work does not then justify certification of Substantial Completion or Final Completion and re-inspection is required at a subsequent time to make such determination, the Contractor shall be responsible for all costs of such re-inspection, including without limitation, the fees of the Architect, Construction Manager and Project Inspector.

7.2.4. Final Acceptance. Final Acceptance of the Work shall occur upon acceptance of the Work by the District's Board of Trustees; such acceptance shall be submitted for consideration at a regularly scheduled meeting of the District's Board of Trustees after the determination of Final Completion. The commencement of any warranty or guarantee period under the Contract Documents the date of Final Acceptance.

7.3. Construction Schedule.

7.3.1. Construction Schedule Terms Defined.

7.3.1.1. Bid Schedule. The term "Bid Schedule" refers to the Construction Schedule issued with the Bid Documents, which shall be used by Bidders and their respective Subcontractors for preparation of Bidders' Bid Proposals.

7.3.1.2. Preliminary Baseline Construction Schedule. The "Preliminary Baseline Construction Schedule" refers the Construction Schedule issued by the Construction Manager, within ten (10) days after a NTP is issued by or on behalf of the District to a Contractor. The Preliminary Baseline Construction Schedule may incorporate modifications to the Bid Schedule, which do not affect critical path activity durations, but may adjust the date(s) for achieving Substantial Completion and Final Completion of the Work if the date of the issuance of the Notice to Proceed has varied from that indicated in the Bid Schedule.

7.3.1.3. Baseline Construction Schedule. The "Baseline Construction Schedule" refers to the Construction Schedule developed and prepared by the Construction Manager based upon the proposed modifications or other comments of each Contractor for a Bid Package to the Preliminary Baseline Construction Schedule. The Baseline Construction Schedule, upon issuance by the Construction Manager, shall be used to manage and coordinate the Work of each Contractor for a Bid Package and to monitor the progress of construction activities until an Updated Construction Schedule is issued.

7.3.1.4. Updated Construction Schedule. An "Updated Construction Schedule" is the Construction Schedule prepared and issued by the Construction Manager after issuance of the Baseline Construction Schedule. Work of each Contractor for a Bid Package shall conform to the then most recent issuance of the Updated Construction Schedule. Actions of the Contractor necessary to conform the progress of the Contractor's Work with the then current Updated Construction Schedule shall be undertaken and completed as directed by the Construction Manager without adjustment of the Contract Price or the Contract Time.

7.3.1.5. Recovery Schedule. The "Recovery Schedule" refers to a Construction Schedule for the Work of a Bid Package prepared by the Contractor for the Bid Package to identify and establish the activities and other actions necessary for such Contractor to recover lost time due to delays to the progress of the Contractor's Work, ability to meet Milestones and/or Project completion dates/requirements. A material obligation of each Contractor for a Bid Package is its preparation of a Recovery Schedule as directed by the Construction Manager, including without limitation, the incorporation of requirements therein as directed by the Construction Manager. If directed by the Construction Manager to prepare a Recovery Schedule, the Contractor's submittal of the Recovery Schedule for review and acceptance by the Construction Manager within the time established by the Construction Manager is a material obligation of the Contractor under the Contract Documents. If a Contractor is directed by the Construction Manager to prepare a Recovery Schedule, the Contractor shall modify the Recovery Schedule as necessary to obtain the Construction Manager's acceptance of the entirety thereof. If a Contractor fails or refuses to prepare a Recovery Schedule as directed by the Construction Manager, the Construction Manager may, at the cost and expense of the Contractor, develop a Recovery Schedule on behalf of such Contractor. In such event, a material obligation of the Contractor shall be its implementation of all measures necessary to conform to the rate of progress to that indicated in the

Recovery Schedule prepared by the Construction Manager; and the Contractor's reimbursement to the District of the costs and expenses incurred to prepare such Recovery Schedule, provided that in lieu of such reimbursement and at the sole election and discretion of the District such costs and expenses may be deducted from any portion of the Contract Price then or thereafter due the Contractor. Neither the preparation of Recovery Schedules nor the actions of the Contractor necessary to comply and conform to the progress indicated in a Recovery Schedule accepted by the Construction Manager (or prepared by the Construction Manager upon failure or refusal of the Contractor to prepare a Recovery Schedule) shall result in adjustment of the Contract Time or the Contract Price.

7.3.1.6. Construction Schedule(s). "Construction Schedule(s)" as used in the Contract Documents refers collectively to the Bid Schedule, Preliminary Baseline Construction Schedule, Baseline Construction Schedule, and Updated Construction Schedule.

7.3.1.7. Three (3) Week Look Ahead Schedules. The "Three Week Look Ahead Schedules" refers to the detailed schedule of construction activities prepared by each Contractor for a Bid Package for the ensuing three (3) week period; construction activities indicated in each Contractor's Three Week Look Ahead Schedules shall conform to the then current Updated Construction Schedule.

7.3.2. Bid Schedule. The Bid Schedule is for bidding purposes to establish preliminary contract durations of various activities necessary to complete the Work of each Bid Package and the Work of the Project within the Project Time. The Project will be constructed by separate contractors, each under direct contract with the District for a specific scope of Work of the Project, as further defined in the Bid Package descriptions incorporated into the Contract Documents. The scheduling and coordination of the Work of each Bid Package and the overall Work of the Project shall be by the Construction Manager. Without adjustment of the Contract Price or the Contract Time, each Contractor for a Bid Package shall comply with the Construction Manager's directives regarding the scheduling, sequencing and coordination of the Work of each Bid Package. The District expressly reserves the right to modify the Bid Schedule based upon input from each Contractor or other Project requirements. The Contractor acknowledges and agrees that modifications to the Bid Schedule after award of the Contract shall not be a basis for adjustment of the Contract Time or the Contract Price.

7.3.3. Preliminary Baseline Schedules. Within fourteen (14) days following issuance of the Notice to Proceed for a majority of the Bid Packages, the Construction Manager shall arrange a Project Schedule meeting with all Contractors to review a Preliminary Baseline Schedule. This Preliminary Baseline Schedule shall include any modifications incorporated since development of the Bid Schedule. Within seven (7) days after the Project Schedule meeting, each Contractor shall prepare and submit to the Construction Manager all revisions and recommendations to the Preliminary Baseline Schedule indicating, in graphic form, the estimated rate of progress, dates for submission of Submittals to the Architect, manpower required (estimated men per day) and sequence of all Work of the Bid Package as required under the Contract Documents. Each Contractor for a Bid Package acknowledges and agrees that its proposed modifications to the Preliminary Baseline Schedule are subject to acceptance by the District and the Construction Manager in the sole and exclusive discretion of the District and the Construction Manager. Contractors may submit proposed revisions to the Preliminary Baseline Schedule depicting completion of the Work of the Contractor's Bid Package in a duration shorter than the Contract Time established for the Bid Package; provided that if such proposed modifications to the Preliminary Baseline Schedule are accepted, such acceptance shall not be a basis for adjustment to the Contract Price in the event that completion of the Work of the Bid Package shall occur after the time depicted therein, nor shall revisions to the Preliminary Baseline Schedule be the basis for any extension of the Contract Time. If a Contractor does not propose modifications or other recommendations relating to the Preliminary Baseline Schedule within seven (7) days after the Project Schedule meeting, the Preliminary Baseline Schedule shall be deemed to be accepted by the Contractor. The Construction Manager shall review, incorporate, or reject the proposed modifications to the Preliminary Baseline Schedules and issue the Baseline Construction Schedule within fourteen (14) days of receipt of Contractor's information stated herein.

7.3.4. Baseline Construction Schedule. Based upon the approved input to the Preliminary Baseline Schedule for the entirety of the Project, the Construction Manager will develop and issue the Baseline Construction Schedule. The Baseline Construction Schedule shall control and govern over the sequencing and scheduling noted in the Bid Schedule. The Work of each Bid Package shall conform to the Baseline Construction Schedule, including updates and/or revisions thereto. The Baseline Construction Schedule shall be reviewed and updated at Project meeting(s) held periodically during the progress of the Work. If the Work of any Bid Package appears to be delayed such that the Work of the Bid Package will not comply with required milestone dates, the Bid Package Substantial Completion date and/or the Project completion date set forth in the Baseline Construction Schedule(s), the Contractor whose activity is on the critical path and/or who has caused the delay(s) shall be liable and assessed Liquidated Damages in accordance with the terms and provisions of the Agreement and these General Conditions. The District shall not be liable

nor obligated to any Contractor for the payment of any costs, charges, fees, or expenses arising out of or related in any manner to extended overhead, general conditions, impact costs, home-office costs, out-of-sequence Work money or any other type of compensation, by any name or characterization, for any delay to any activity not designated as a critical path item on the latest approved Construction Schedule(s). If any delay occurs to any critical path item, compensation to the Contractor, if any, impacted by delays to a critical path item shall only be in strict conformity with applicable provisions of the Contract Documents.

- 7.3.5. Updated Construction Schedules. If the progress of the Work of a Bid Package or the sequencing of the activities of the Work of a Bid Package shall materially differ from that indicated in the Baseline Construction Schedule, the Construction Manager may direct the Contractor for a Bid Package to propose revisions to update the approved Baseline Construction Schedule. The Contractor shall prepare and submit, within two (2) days of the Construction Manager's directive, to the Construction Manager revised input, in graphic form, to the Baseline Construction Schedule. The Contractor may request consent of the Construction Manager to revise the approved Baseline Construction Schedule. Any such request shall be considered by the Construction Manager and District only if in writing setting forth the Contractor's proposed revision(s) to the Baseline Construction Schedule and the reason(s) therefore. The Construction Manager and District may consent to, or deny, any such request of the Contractor to revise the Baseline Construction Schedule in its reasonable discretion. Also, the Construction Manager may incorporate elements of the Three (3) Week Look Ahead Schedules, as described below, into the Updated Construction Schedule. The Construction Manager will incorporate accepted revisions to the Baseline Construction Schedule and issue an Updated Construction Schedule.
- 7.3.6. Contractor Preparation of Recovery Schedules. The Contractors working on critical path items or whose progress of Work is behind the progress indicated in the current Updated Construction Schedule shall monitor and update the most recently approved Updated Construction Schedule on a monthly basis, (or more frequently as required) by the conditions or progress of the Work, or as may be requested by the Construction Manager. The Contractor for such Bid Packages shall provide the Construction Manager with updated Recovery Schedules indicating utilized and projected manpower, progress achieved and activities commenced or completed within the prior Updated Construction Schedule. The Contractor must also provide a written and/or graphic plan to the Construction Manager, within 48 hours of request, that recovers lost time to achieve the milestone dates and sequencing of activities established in the most recent Updated Construction Schedule. The Construction Manager may direct the sequence in which the various portions of Work within a Bid Package or between Bid Packages shall be performed and may adjust the Construction Schedule(s) at any time the Construction Manager considers the completion date to be in jeopardy because of "activities behind schedule". Without adjustment of the Contract Time or the Contract Price, the Contractor for a Bid Package shall comply and perform in accordance with revisions to the Construction Schedule(s) issued by the Construction Manager hereunder. If requested by the Construction Manager, the Contractor shall also submit, with its updates, a narrative statement including a description of current and anticipated problem areas of the Work, delaying factors and their impact, and an explanation of corrective action taken or proposed by the Contractor. The District may, from time to time, and in the District's sole and exclusive discretion, transmit to the Contractor's Performance Bond Surety the Construction Schedule, any updates thereof and the narrative statement described hereinabove. The District's election to transmit, or not to transmit such information, to the Contractor's Performance Bond Surety shall not limit the Contractor's obligations under the Contract Documents.
- 7.3.7. Three (3) Week Look Ahead Schedule. The Contractor shall prepare and submit at each Weekly Construction Meeting, a Three (3) Week Look Ahead Schedule for its portion of the Work. The Three (3) Week Look Ahead Schedule shall provide additional definition of manpower, activities and sequencing to that identified on the then current updated Construction Schedule. The form, content and extent of detail in the Contractor's Three (3) Week Look Ahead Schedules in accordance with the directives and instructions of the Construction Manager. The Construction Manager shall assimilate each of the various Contractors' Three (3) Week Look Ahead Schedules into an overall Project Three (3) Week Look Ahead Schedule and issue it at the following Weekly Construction Meeting to utilize as a comparison of progress against the most recent Updated Construction Schedule. Failure of the Contractor to provide a Three (3) Week Look Ahead Schedule may be deemed by the District as the Contractor's default in the performance of a material obligation of the Contractor under Contract Documents.
- 7.3.8. Cost of Scheduling. Any and all costs or expenses required or incurred to prepare, submit, maintain, and update the Construction, Recovery or Three (3) Week Look Ahead Schedules shall be solely at the expense of the Contractor without adjustment to the Contract Price. The Contract Price shall not be subject to adjustment on account of costs, fees or expenses incurred or associated with the Contractor's preparation, submittal, and maintenance or updating of the Construction Schedules. If the Contractor does not comply with the District's request for an Updated Construction Schedule, the District may have the update completed by others at the Contractor's expense. In such event, the updated Construction Schedule shall be deemed binding upon the Contractor and the District may deduct all costs, fee or expenses in preparing such updated

Construction Schedule(s) from any portion of the Contract Price then or thereafter due the Contractor.

- 7.3.9. Scheduling Software & Requirements. Unless otherwise provided in the Special Conditions, the Construction Schedules required under this Article 7 shall; (i) be prepared with a commercially available computer software program in a critical path format; (ii) indicate the date(s) for commencement and completion of various portions of the Work of the Bid Package including without limitation, procurement, fabrication and delivery of major items, materials or equipment; (iii) indicate manpower (estimated men or manpower per day) and other resources required for completion of each schedule activity; (iv) indicate costs for completion of each schedule activity; and (v) identify each Submittal required by the Contract Documents, the date for the Contractor's submission of each Submittal and the date for the return of the reviewed Submittal to the Contractor.
- 7.4. Adjustment of Contract Time. If Substantial Completion is delayed, adjustment, if any, to the Contract Time on account of such delay shall be in accordance with this Article 7.4.
- 7.4.1. Excusable Delays. If Substantial Completion of the Work is delayed by Excusable Delays, the Contract Time shall be subject to adjustment for such reasonable period of time as determined by the Architect; Excusable Delays shall not result in any increase in the Contract Price. Excusable Delays are unforeseeable and unavoidable casualties or causes beyond the control, and without fault or neglect, of the Contractor, or other person directly or indirectly engaged by the Contractor for any portion of the Work, including unanticipated and unavoidable labor disputes, unusual and unanticipated delays in transportation of equipment, materials or Construction Equipment reasonably necessary for completion and proper execution of the Work, unanticipated unusually severe weather conditions or DSA directive to stop the Work which is not the result of the failure of the Contractor to comply with the Contract Documents. The financial resources of the Contractor or any person or entity directly or indirectly engaged by the Contractor for the Work are not conditions beyond the control of the Contractor. If an Excusable Delay occurs, the Contract Time shall be subject to adjustment hereunder only if the Contractor establishes: (i) full compliance with all applicable provisions of the Contract Documents for Contractor's notice and request for adjustment of the Contract Time; (ii) that the event(s) justifying adjustment of the Contract Time are outside the reasonable control and without any fault or neglect of the Contractor or any person or entity directly or indirectly engaged by the Contractor or a for any portion of the Work; and (iii) that the event(s) justifying adjustment of the Contract Time directly and adversely impacted the progress of the Work on the critical path of the then current Accepted Construction Schedule relative to the date(s) of the claimed event(s) of Excusable Delay. If the Special Conditions set forth a number of "Rain Days" to be anticipated during performance of the Work, the Contract Time shall not be adjusted for rain-related unusually severe weather conditions until the actual number of Rain Days during performance of the Work exceeds those noted in the Special Conditions and such additional Rain Days shall have directly and adversely impacted the progress of the Work on the critical path of the then current Accepted Construction Schedule relative to the date(s) of such additional Rain Days.
- 7.4.2. Compensable Delays. If Substantial Completion of the Work is delayed by the acts or omissions of the District, the Construction Manager, the Architect, or separate contractor employed by the District (collectively "Compensable Delays"), upon Contractor's request and notice, in strict conformity with Articles 7 and 9 of these General Conditions, the Contract Time will be adjusted for such reasonable period of time as determined by the Construction Manager and District. Pursuant to California Public Contract Code §7102, if the Contractor's progress is delayed by any of the events described in the preceding sentence, Contractor shall not be precluded from the recovery of damages directly and proximately resulting therefrom, provided that the District is liable for the delay, the delay is unreasonable under the circumstances involved and the delay was not within the reasonable contemplation of the District and the Contractor at the time of execution of the Agreement. In such event, Contractor's damages, if any, shall be limited to direct, actual and unavoidable additional costs of labor, materials, equipment or Construction Equipment directly resulting from such delay, and shall exclude indirect or other consequential damages. Except as expressly provided for herein, Contractor shall not have any other claim, demand or right to adjustment of the Contract Price arising out of delay, interruption, hindrance or disruption to the progress of the Work. Adjustments to the Contract Price and the Contract Time, if any, on account of Changes to the Work or Suspension of the Work shall be governed by the applicable provisions of the Contract Documents.
- 7.4.3. Inexcusable Delays. Inexcusable Delays refer to any delay to the progress of the Work caused by events or factors other than those specifically identified in Articles 7.4.1 and 7.4.2 above. Neither the Contract Price nor the Contract Time shall be adjusted on account of Inexcusable Delays.
- 7.5. Liquidated Damages. If the Contractor fails to: (i) submit Submittals in accordance with the Baseline Construction Schedule or in a timely manner; (ii) achieve Substantial Completion of the Work within the Contract Time, (subject to adjustments authorized under the Contract Documents); or (iii) complete Punchlist items within the time established, the Contractor shall be liable to the District for per diem Liquidated Damages set forth in the Special Conditions, not as a penalty but as Liquidated Damages which are agreed upon because of the difficulty of fixing the District's actual damages. The Contractor and the District agree that said amounts are reasonable estimates

of the District's damages in such event, and that such amounts do not constitute a penalty. The Contractor and the Surety shall be jointly and severally liable to the District for any Liquidated Damages liability of the Contractor exceeding the Contract Price then held or retained by the District. The Contractor and the District acknowledge and agree that the provisions of this Article 7.5 are reasonable under the circumstances existing at the time of the Contractor's execution of the Agreement.

8. Contract Price

8.1. Cost Breakdown of Contract Price.

8.1.1. General. Within fifteen (15) days of the execution of the Agreement by Contractor, Contractor shall furnish, on forms provided by the District, a detailed estimate and complete Cost Breakdown of the Contract Price. The Cost Breakdown shall be subject to the District's review and acceptance of the content thereof. If the District objects to any portion of the Cost Breakdown, within five (5) days of the Contractor's receipt of the District's written objection(s), Contractor shall submit a revised Cost Breakdown to the District for review and acceptance. The foregoing procedure shall continue until the District has accepted of the entirety of the Cost Breakdown. The Cost Breakdown accepted by the District shall not be modified by the Contractor without the prior consent of the District, which may be granted, conditioned or denied in the sole discretion of the District.

8.1.2. Allowance Items; Allowance Amounts. If Allowance Items are incorporated into the Contract Documents, each Allowance Amount designated in the Contract Documents for application to an Allowance Item is incorporated into the Contract Documents. The Cost Breakdown of the Contract Price shall include each Allowance Item identified in the Contract Documents along with the Allowance Amount designated for each Allowance Item. Each Allowance Amount is inclusive of all costs, overhead and profit to furnish and install the Allowance Item; there is no additional mark-up to the Allowance Amount. During performance of the Work, the Contractor shall maintain an Allowance Log, indicating each Allowance Item completed and the debit from each Allowance Amount for the completed Allowance Item. If the Allowance Amount designated for an Allowance Item has not been fully expended upon completion of the Allowance Item, the District will issue a credit Change Order for the unused balance of the Allowance Amount and such unused balance of the Allowance Amount will be deducted from the Contract Price. If the Allowance Amount designated for an Allowance Item is insufficient to complete the Allowance Item, the Contract Price will be adjusted by Change Order for the additional costs, determined in accordance with applicable provisions of the Contract Documents, to complete an Allowance Item.

8.1.3. Unit Price Items; Unit Prices. If the Contract Documents identify Unit Price Items and the Bid Proposal for the Work required Unit Price proposals for Unit Price Items, the Contract Price is inclusive of the quantity of each Unit Price Item identified in the Contract Documents as being included in the scope of Work ("Unit Price Item Base Scope") at the Unit Price proposed by the Contractor. The Contractor's cost breakdown of the Contract Price shall include Unit Price Item Base Scopes and Unit Price extensions thereof. If upon completion of a Unit Price Item, the actual Unit Price Item Base Scope completed is less than the Unit Price Item Base Scope established in the Contract Documents, the Contract Price will be reduced by the Unit Price cost for the Unit Price Item Base Scope not completed. If completion of a Unit Price Item exceeds the Unit Price Item Base Scope, the Contract Price is subject to adjustment for the additional Unit Price Item Base Scope actually completed multiplied by the Unit Price established in the Contract Documents for the Unit Price Item.

8.2. Progress Payments.

8.2.1. Applications for Progress Payments ("Payment Applications"). During performance of the Work, the Contractor shall submit monthly Payment Applications, on the first (1st) working day of each month, or such other time established by the District, to the Construction Manager, Project Inspector and Architect, on forms approved by the District, setting forth an itemized estimate of Work completed in the preceding month for the purpose of the District's making of Progress Payments thereon. Values utilized in Payment Applications shall be based upon the District accepted Cost Breakdown.

8.2.2. District's Review of Payment Applications. In accordance with Public Contract Code §20104.50, upon receipt of a Payment Application, the District shall cause the same to be reviewed by the Project Inspector, Construction Manager and Architect, as soon as is practicable, for the purpose of determining that the Payment Application is a proper Payment Application. A Payment Application is "proper" only if it is submitted on the form approved by the District, with all of the information completely and accurately provided and such completed Payment Application is accompanied by: (i) Certified Payroll Records Submittal to Labor Commissioner for the Contractor and all Subcontractors for the period of time covered by the Payment Application; (ii) a breakdown identifying each Subcontractor/Material Supplier to be disbursed a portion of the requested Progress Payment and the amount of the Progress Payment to be disbursed to each Subcontractor/Material Supplier so identified; (iii) duly completed and executed forms of Conditional Waiver and Release of Rights Upon Progress Payment in accordance with California Civil Code §8132 of the Contractor, all Subcontractors and Material Suppliers covering the Progress Payment requested; (iv) duly

completed and executed forms of Unconditional Waiver and Release of Rights upon Progress Payment in accordance with California Civil Code §8134 of the Contractor, Subcontractors and Material Suppliers covering the Progress Payment received by the Contractor under the prior Payment Application; and (v) a certification by the Contractor that it has continuously maintained the Record Drawings. Submittal of all of the foregoing is an express condition precedent to the District's obligation to disburse any Progress Payment. If a Payment Application is determined by the District not to be a "proper" Payment Application, the Payment Application will be returned by the District to the Contractor (along with a written document setting forth the reason(s) why the Payment Application is not proper) as soon as is practicable after receipt of the same from the Contractor, but in no event not more than seven (7) days after the District's receipt thereof.

- 8.2.3. Review of Payment Applications. Upon receipt of Payment Application, the Architect, Construction Manager and Project Inspector shall inspect and verify the Work to determine whether it has been performed in accordance with the terms of the Contract Documents and to determine the portion of the Payment Application which is properly due to the Contractor under the terms of the Contract Documents.
- 8.2.4. Allowance Items. Payment Applications may include request for payment of the portion of an Allowance Amount due for the portion of an Allowance Item completed in the prior month. If a Payment Application incorporates any Allowance Amount, the Contractor shall submit its Allowance Log as part of the substantiating data supporting a Payment Application which establishes the portion of the Allowance Amount requested by the Payment Application.
- 8.2.5. Unit Price Items. Unit Price Items included in a Payment Application shall be based on the quantity of the Unit Price Item completed in the prior month multiplied by the Unit Price established in the Contract Documents for the Unit Price Item.
- 8.3. District's Disbursement of Progress Payments.
- 8.3.1. Timely Disbursement of Progress Payments. In accordance with Public Contract Code §20104.50, within thirty (30) days after the District's receipt of a proper Payment Application, the District will pay the Contractor ninety five percent (95%) of the value of the Work indicated in the Payment Application which is actually in place as of the date of the Payment Application and as verified and approved by the Project Inspector, Construction Manager and Architect, along with the pro rata portion of the Contractor's overhead, supervision and general conditions costs and profit for that month; provided, however, that the District's obligation to disburse any Progress Payment shall be subject to the Contractor's submission of a "proper" Payment Application as defined hereinabove. If a Payment Application is not "proper" due to the failure or refusal of the Contractor to comply with conditions precedent to the District's obligation to disburse a Progress Payment, or incompleteness or inaccuracies in any such documents submitted, the thirty (30) day period for the District's timely disbursement of a Progress Payment shall commence on the date that the District is actually in receipt of documents not submitted with the Payment Application, or corrections to documents with the Payment Application so as to render them complete and accurate.
- 8.3.2. Untimely Disbursement of Progress Payments. Pursuant to Public Contract Code §20104.50, if the District fails to make any Progress Payment within thirty (30) days after receipt of an undisputed and proper Payment Application, the District shall pay the Contractor interest on the undisputed amount of such Payment Application equal to the legal rate of interest set forth in California Code of Civil Procedure §685.010(a).
- 8.3.3. District's Right to Disburse Progress Payments by Joint Checks. The District may in its sole discretion issue joint checks to the Contractor and Subcontractors or Material Suppliers in satisfaction of its obligation to make Progress Payments or the Final Payment due hereunder. The Contractor shall cooperate with the District and subcontractors/Material Suppliers in the issuance or processing of joint checks.
- 8.3.4. No Waiver of Defective or Non-Conforming Work. The approval of any Payment Application or the disbursement of any Progress Payment to the Contractor shall not be deemed nor constitute acceptance of Defective or Non-Conforming Work.
- 8.3.5. Progress Payments for Changed Work. The Contractor's Payment Applications may include requests for payment for Changes which have been authorized and approved by the District, Construction Manager, Project Inspector, Architect and all other governmental agencies with jurisdiction over such Change. Except as provided for herein, no other payment shall be made by the District for Changes.
- 8.3.6. Materials or Equipment Not Incorporated Into the Work. No Progress Payments will be made for materials or equipment not incorporated into the Work at the time a Payment Application is submitted.
- 8.3.7. Title to Work. The Contractor warrants that title to all Work covered by a Payment Application will pass to the District no later than the time of payment.
- 8.4. Substitute Security for Retention. Eligible and equivalent securities may be substituted for Retention at the request and expense of the Contractor pursuant to California Public Contract Code §22300. The foregoing and the provisions of California Public Contract Code §22300 notwithstanding, failure of the Contractor to request

substitution of eligible and equivalent securities for Retention prior to the Contractor's submission of the first Payment Application is the Contractor's waiver of rights under Public Contract Code §22300.

8.5. Final Payment.

8.5.1. Application for Final Payment. When the Contractor has achieved Final Completion of the Work and has otherwise fully performed its obligations under the Contract Documents, the Contractor shall submit an Application for Final Payment on such form as approved by the District. Thereupon, the Architect, Construction Manager and Project Inspector will promptly make a final inspection of the Work and when the Architect, Construction Manager and Project Inspector find the Work acceptable under the Contract Documents and that the Contractor has completed all other obligations of the Contractor, the Architect, Construction Manager and Project Inspector will approve the Application for Final Payment, stating that to the best their knowledge, information and belief, the Work has been completed in accordance with the Contract Documents and that the Contractor is entitled to receipt of Final Payment. The Final Payment shall include the remaining balance of the Contract Price and Retention previously withheld by the District, less offsets and deductions thereto.

8.5.2. Conditions Precedent to Disbursement of Final Payment. Submittal of the following are express conditions precedent to the District's obligation to disburse the Final Payment: (i) duly completed and executed forms of Conditional or Unconditional Waivers and Releases of rights upon Final Payment of the Contractor, Subcontractors of any tier and Material Suppliers in accordance with California Civil Code §§8136 or 8138, with each of the same stating that there are, or will be, no claims for additional compensation after disbursement of the Final Payment; (ii) Operations and Maintenance manuals and separate warranties provided by any manufacturer or distributor of any materials or equipment incorporated into the Work; (iii) the Record Drawings; (iv) the form of Guarantee included in the Contract Documents duly executed by an authorized representative of the Contractor; (v) all other items or documents required by the Contract Documents to be delivered to the District upon completion of the Work; and (vi) written evidence of the Contractor's filing of the DSA Final Verified Report.

8.5.3. Disbursement of Final Payment. Provided that the District is then in receipt of all materials set forth in Article 8.5.2 above as conditions precedent to the District's obligation to disburse Final Payment, not later than sixty (60) days following Final Acceptance, the District shall disburse the Final Payment to the Contractor. Pursuant to California Public Contract Code §7107, if there is any dispute between the District and the Contractor at the time that disbursement of the Final Payment is due, the District may withhold from disbursement of the Final Payment an amount not to exceed one hundred fifty percent (150%) of the amount in dispute. If the Contractor complies with all of the conditions precedent to the District's disbursement of the Final Payment, except for written evidence of the Contractor's filing of the DSA Final Verified Report, the District may withhold and retain ten percent (10%) of the Final Payment in accordance with Article 4.22.2 of these General Conditions. In such event, provided that the Contractor has fully complied with and satisfied all other conditions precedent set forth in Article 8.5.2, the District will disburse the remaining balance of the Final Payment to the Contractor; such disbursement shall constitute the District's full and complete performance of payment obligations to the Contractor hereunder.

8.5.4. Waiver of Claims. The Contractor's acceptance of the Final Payment is a waiver and release by the Contractor of any and all claims against the District for compensation or otherwise in connection with the Contractor's performance of the Contract.

8.5.5. Claims Asserted After Final Payment. Any stop payment notice or other claim filed or asserted after the Contractor's acceptance of the Final Payment by any Subcontractor, Material Supplier or others in connection with or for Work is the sole and exclusive responsibility of the Contractor who shall indemnify, defend and hold harmless the Indemnified Parties from and against any claims, demands or judgments arising or associated therewith, including without limitation attorneys' fees.

8.6. Withholding of Payments. The District may withhold and retain the Contract Price, in whole or in part, on account of: (i) uncorrected Defective or Non-Conforming Work; (ii) failure of the Contractor to make payments when due laborers, Subcontractors or Material Suppliers; (iii) claims filed or reasonable evidence of the probable filing of claims by Subcontractors, laborers, Material Suppliers, or others performing any portion of the Work under the Contract Documents for which the District may be liable or responsible including, without limitation, Stop Payment Notice Claims and Claims of other contractors for a Bid Package arising out of the Contractor's actions, failures to act, or hindrance to progress of such other contractor; (iv) reasonable doubt that the Contract can be completed for the then unpaid balance of the Contract Price; (v) tax demands filed in accordance with California Government Code §12419.4; (vi) other claims, penalties and/or forfeitures for which the District is required or authorized to retain funds otherwise due the Contractor, including any amounts due from the Contractor to the District under the Contract Documents; or (vii) the Contractor's failure to perform any of its obligations under the Contract Documents, its default under the Contract Documents or its failure to maintain adequate progress of the Work. In addition to the foregoing, the District shall not be obligated to process any Application for Progress Payment or Final Payment, nor shall Contractor be entitled to any Progress Payment or Final Payment so long as any lawful or proper direction

concerning the Work or the performance thereof or any portion thereof, given by the District, the Construction Manager, Project Inspector, Architect or any public authority having jurisdiction over the Work, or any portion thereof, shall not be fully and completely complied with by the Contractor. When the District is reasonably satisfied that the Contractor has remedied any such deficiency, payment shall be made of the amount withheld. The foregoing notwithstanding, if the District withholds: (i) ten percent (10%) of the Final Payment pursuant to Articles 4.22.2 and 8.5.3 of these General Conditions; or (ii) any amount incurred to complete an obligation of the Contractor hereunder, the Contractor shall not be entitled to receipt or payment of any portion of such withholdings.

- 8.7. Payments to Subcontractors. The Contractor shall pay all Subcontractors on account of Work performed by Subcontractors in accordance with the terms of their respective subcontracts and pursuant to Business & Professions Code §7108.5 and Public Contract Code §7201.

9. Changes

- 9.1. Changes to the Work. The District, at any time, by written order, may make Changes within the general scope of the Work or issue additional instructions, require additional Work or direct deletion of Work. The Contractor shall not proceed with any Change without prior written authorization from the District. The Contractor shall promptly commence and diligently complete any District authorized Change; the Contractor shall not be relieved or excused from its prompt commencement and diligent completion of any Change authorized by the District due to the inability of the Contractor and the District to agree upon the adjustment to the Contract Time or the Contract Price on account of such Change. The issuance of a Change Order in connection with any Change authorized by the District is not a condition precedent to Contractor's obligation to promptly commence and diligently complete any Change authorized by the District hereunder. The District's right to make Changes shall not invalidate the Contract nor relieve the Contractor of its obligations under the Contract Documents. Any requirement of notice of Changes to the Surety shall be the responsibility of the Contractor. Changes shall be subject to DSA approval.
- 9.2. Oral Order of Change in the Work. Any oral order, direction, instruction, interpretation, or determination (collectively "Instruction Order") from the District, Construction Manager, Project Inspector or Architect which Contractor believes is a change to the Work, or requires an adjustment to the Contract Price or the Contract Time, shall be treated as a Change only if the Contractor gives the Architect, Construction Manager and Project Inspector written notice within ten (10) days of the Instruction Order and prior to acting in accordance therewith. Time is of the essence in Contractor's written notice pursuant to the preceding sentence and the Contractor acknowledges that its failure to give written notice within ten (10) days of the date of an Instruction Order is deemed Contractor's waiver of any right to adjustment of the Contract Time or the Contract Price on account of such Instruction Order. The written notice shall state the date, circumstances, extent of adjustment to the Contract Price or the Contract Time, if any, requested, and the source of the Instruction Order that the Contractor regards as a Change. Unless the Contractor acts in strict accordance with this procedure, no Instruction Order shall not be treated as a Change and the Contractor waives any adjustment to the Contract Price or the Contract Time on account thereof.
- 9.3. Contractor Submittal of Data. Within thirty (30) days after receipt of a written order directing a Change or furnishing the written notice regarding any Instruction Order, the Contractor shall submit to the Architect, Project Inspector, Construction Manager and District a detailed written statement setting forth the general nature of the Change, the amount of any adjustment to the Contract Price on account thereof, properly itemized and supported by sufficient substantiating data to permit evaluation of the same, and the extent of adjustment of the Contract Time, if any, required by such Change. No claim or adjustment to the Contract Price or the Contract Time shall be allowed if not asserted by the Contractor in strict conformity herewith or if asserted after Final Payment is made.
- 9.4. Adjustment to Contract Price on Account of Changes to the Work. Adjustments to the Contract Price due to Changes in the Work shall be determined by application of one of the following methods, in the following order of priority:
- 9.4.1. Mutual Agreement. By negotiation and mutual agreement, on a lump sum basis, between the District and the Contractor on the basis of the estimate of the actual and direct increase or decrease in costs on account of the Change. Upon request of the District or the Architect, the Contractor shall provide a detailed estimate of increase or decrease in costs directly associated with performance of the Change along with cost breakdowns of the components of the Change and supporting data and documentation.
- 9.4.2. Determination by the District. By the District, whether or not negotiations are initiated pursuant to Article 9.4.1 above, based upon actual and necessary costs incurred by the Contractor as determined by the District. If the procedure set forth in this Article 9.4.2 is utilized to determine the extent of adjustment to the Contract Price on account of Changes to the Work, promptly upon determining the extent of adjustment to the Contract Price, the District shall notify the Contractor in writing of the same; the Contractor shall be deemed to have accepted the District's determination of the amount of adjustment to the Contract Price on account of a Change to the Work unless Contractor shall notify the District, Architect and Construction Manager, in writing, not more than fifteen (15) days from the date of the District's written notice, of any objection to the District's determination. Failure of the Contractor to timely notify the District, Architect and Construction Manager of Contractor's objections to the District's determination of the Contract Price adjustment is deemed Contractor's acceptance of the District's determination and a waiver of any right of the Contractor to

thereafter protest or otherwise object to the District's determination. Notwithstanding any objection of the Contractor to the District's determination of the adjustment to the Contract Price pursuant to this Article 9.4.2, Contractor shall promptly commence and diligently complete any such Change.

- 9.4.3. Basis for Adjustment of Contract Price. If Changes in the Work require an adjustment of the Contract Price pursuant to Articles 9.4.1 or 9.4.2 above, the basis for adjustment of the Contract Price shall be as follows:
- 9.4.3.1. Labor. The Contractor shall be compensated for the costs of field labor actually and directly utilized in the performance of the Change. Labor costs shall be limited to field labor for labor classification(s) necessary to perform the Change. Use of a labor classification which increases labor costs associated with any Change shall not be permitted. Labor costs shall exclude costs incurred by the Contractor in preparing estimate(s) of the costs of the Change, in the maintenance of records relating to the costs of the Change, coordination and assembly of materials and information relating to the Change or performance thereof, or the supervision and other overhead and general conditions costs associated with the Change or performance thereof.
- 9.4.3.2. Materials and Equipment. Contractor shall be compensated for the costs of materials and equipment necessarily and actually used or consumed in connection with the performance of Changes. Costs shall be the then lowest wholesale price at which identical or similar materials/equipment are available in the quantities required to perform the Change. The District may furnish materials and/or equipment for Changes, in which event the Contractor shall not be compensated for any mark-up thereon.
- 9.4.3.3. Construction Equipment. The Contractor shall be compensated for the actual cost of the necessary and direct use of Construction Equipment in the performance of Changes in increments of fifteen (15) minutes. No costs or compensation shall be allowed for time while Construction Equipment is inoperative, idle or on standby, for any reason. The Contractor shall not be entitled to compensation for Construction Equipment or tools used for Changes with a replacement value of \$500.00 or less. Construction Equipment costs shall not exceed rental rates established by construction equipment rental agencies in the locality of the Site. The allowable rate for Construction Equipment includes compensation for rental costs, fuel, power, oil, lubrication, supplies, necessary attachments, repairs or maintenance of any kind, depreciation, storage, insurance, labor (exclusive of labor costs of the Construction Equipment operator), and any all other costs incidental to the use of such Construction Equipment.
- 9.4.4. Mark-up on Costs of Changes to the Work. The allowance for mark-ups on the costs of the Change for all overhead (including home office, supervision and field overhead costs, including personnel costs; labor burdens on personnel costs; insurance premiums), general conditions costs and profit associated with the Change shall not exceed the percentage set forth in the Special Conditions, regardless of the number of Subcontractors performing any portion of any Change. If a Change reduces the Contract Price, no profit, general conditions or overhead costs shall be paid by the District to the Contractor for the reduced or deleted Work; the Contract Price shall be reduced by the actual cost for the reduced or deleted Work multiplied by the percentage set forth in the Special Conditions for mark-ups on the cost of a Change adding to the scope of the Work.
- 9.4.5. Contractor Maintenance of Records. If the Contractor is directed to perform any Change pursuant to Article 9.1 or 9.2, the Contractor shall maintain detailed separate records on a daily basis for each separate Change. Such records shall include without limitation hourly records for labor and Construction Equipment and itemized records of materials and equipment used that day in connection with any Change to the Work. Subcontractors shall maintain records in accordance with this Article. Each daily record maintained hereunder shall be signed by Contractor's Superintendent/Subcontractor's Superintendent and shall incorporate a statement that all information contained therein is true, accurate, complete and relates only to the Change referenced therein. All records maintained hereunder shall be subject to inspection, review and/or reproduction by the District, Architect, Construction Manager or Project Inspector upon request. If the Contractor fails or refuses, for any reason, to maintain or make available for inspection, review and/or reproduction such records and the adjustment to the Contract Price on account of any Change to the Work is determined by the District, the District's reasonable good faith determination of the adjustment to the Contract Price on account of such Change shall be final, conclusive and binding upon the Contractor. The Contractor's obligation to maintain records hereunder is in addition to, and not in lieu of, other Contractor obligations relating to Changes to the Work.
- 9.5. Adjustment to Contract Time. If any Change(s) are authorized by the District, the Contract Time shall be extended or reduced by Change Order for a period of time commensurate with the time reasonably necessary to perform such Change
- 9.6. Addition or Deletion of Alternate Bid Item(s). If the Bid for the Work includes proposal(s) for Alternate Bid Item(s), during performance of the Work, the District may elect, to add any such Alternate Bid Item(s) if the same did not form a basis for award of the Contract or delete any such Alternate Bid Item(s) if they formed a basis for award of

the Contract. If the District elects to add or delete any such Alternate Bid Item(s) pursuant to the foregoing, the cost or credit for such Alternate Bid Item(s) shall be as set forth in the Contractor's Bid. If any Alternate Bid Item is added or deleted pursuant to the foregoing, the Contract Time shall be adjusted by the number of days allocated for the added or deleted Alternate Bid Item in the Contract Documents; if days are not allocated for any Alternate Bid Item added or deleted pursuant to the foregoing, the Contract Time shall be equitably adjusted.

- 9.7. Change Orders. If the District approves of a Change, a written Change Order prepared by the Architect on behalf of the District shall be forwarded to the Contractor describing the Change and setting forth the adjustment to the Contract Time and the Contract Price, if any, on account of such Change. All Change Orders shall: (i) be deemed full payment and final settlement of all claims 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; (ii) incorporate adjustments to the Contract Time; and (iii) constitute the Contractor's waiver of rights of rights under Civil Code §1542. Any claim or item 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; once 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; attempted or purported modifications or amendments are not binding upon the District and are null, void and unenforceable. Change Orders shall be binding upon the District only upon action of the District's Board of Trustees approving and ratifying such Change Order.
- 9.8. Unilateral Change Order. A Unilateral Change Order is a written Change Order issued by or on behalf of the District before the Contractor and District have agreed on the extent of adjustment of the Contract Time or the Contract Price relating to the Change reflected in a Unilateral Change Order. A Unilateral Change Order shall describe the scope and nature of the Change and set forth the adjustment to the Contract Time and Contract Price, if any. The District shall forward to the Contractor a copy of the Unilateral Change Order (for information only) at least five (5) days prior to the Board of Trustees' review and consideration of the Unilateral Change Order. Any Unilateral Change Order issued hereunder shall be binding upon the District and Contractor upon action of the District's Board of Trustees to ratify or approve such Unilateral Change Order. The objections, if any, of the Contractor to the extent of adjustment of the Contract Time or the Contract Price on account of the Change(s) incorporated into a Unilateral Change Order shall be submitted in writing by the Contractor to the District, Construction Manager and Architect not more than fifteen (15) days after the date of the District's Board of Trustees action to approve or ratify a Unilateral Change Order. The absence of the Contractor's written objections to a Unilateral Change Order within the time set forth above shall be deemed the Contractor's acceptance of the Contract Time and/or Contract Price adjustment set forth in a Unilateral Change Order for the Changes described therein and the Contractor shall be deemed to have knowingly waived any right to seek additional adjustments of the Contract Time or the Contract Price on account of Change(s) incorporated into such a Unilateral Change Order.
- 9.9. Construction Change Directive. A Construction Change Directive is a written instrument issued by or on behalf of the District directing a Change to the Work prior to the Contractor and District reaching full agreement on an adjustment of the Contract Time and/or Contract Price on account of such Change. The Contractor shall promptly commence and diligently complete any Change to the Work subject to a Construction Change Directive issued hereunder. The issuance of a Change Order in connection with any Construction Change Directive is not a condition precedent to Contractor's obligation to promptly commence and diligently complete a Construction Change Directive. Upon completion of a Construction Change Directive, if the Contractor and District have not agreed on the adjustment of Contract Time and/or Contract Price, the District shall issue a Unilateral Change Order for such Construction Change Directive.
- 9.10. Contractor Notice of Changes. If the Contractor claims that any instruction, request, the Drawings, the Specifications, action, condition, omission, default, or other situation obligates the District to increase the Contract Price or to extend the Contract Time ("Potential Changes"), the Contractor shall notify the Project Inspector, Construction Manager and Architect, in writing, of such claim within ten (10) days from the date of its actual or constructive notice of the factual basis supporting the Potential Changes. The District shall consider any such claim of the Contractor only if sufficient supporting documentation is submitted with the Contractor's notice to the Construction Manager, Project Inspector and Architect. Time is of the essence in Contractor's written notice pursuant to the preceding so that the District can promptly investigate and consider alternative measures to the address such Potential Changes. Accordingly, Contractor acknowledges that its failure, for any reason, to give written notice (with sufficient supporting documentation to permit the District's review and evaluation) within ten (10) days of its actual or constructive knowledge of any Potential Changes shall be deemed Contractor's waiver, release, discharge and relinquishment of any right to assert or claim any entitlement to an adjustment of the Contract Time or the Contract Price on account of any such Potential Changes.
- 9.11. Disputed Changes. If any dispute or disagreement between the Contractor and the District or the Architect regarding the characterization of any item as a Change or as to the appropriate adjustment of the Contract Price or the Contract Time on account thereof, the Contractor shall promptly proceed with the performance, subject to a subsequent resolution of such dispute or disagreement in accordance with the terms of the Contract Documents.

- 9.12. Minor Changes in the Work. The Architect may order minor Changes in the Work not involving an adjustment in the Contract Price or the Contract Time and not inconsistent with the intent of the Contract Documents. Such Changes shall be effected by written order and shall be binding on the District and the Contractor.
- 9.13. Unauthorized Changes. Any Work beyond the lines and grades shown on the Contract Documents, or any extra Work performed or provided by the Contractor without notice in strict conformity with the Contract Documents shall be considered unauthorized and at the sole expense of the Contractor. Work so done will not be measured or paid for, no extension to the Contract Time will be granted on account thereof and any such Work may be ordered removed at the Contractor's sole cost and expense.

10. Separate Contractors

- 10.1. District's Right to Award Separate Contracts. The District reserves the right to perform construction or operations related to the Work with the District's own forces or to award separate contracts in connection with other portions of the Project or other construction or operations at or about the Site. If the Contractor claims that delay or additional cost is involved because of such action by the District, the Contractor shall seek an adjustment to the Contract Price or the Contract Time as provided for in the Contract Documents. Failure of the Contractor to request such an adjustment in strict conformity with the Contract Documents shall be deemed a waiver of the same.
- 10.2. District's Coordination of Separate Contractors. The District shall coordinate the activities of the District's own forces and separate contractor(s) with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the District in reviewing their respective Construction Schedules when directed to do so. The Contractor shall make any revisions to the Accepted Construction Schedule deemed necessary after a joint review and mutual agreement. The Construction Schedules shall then constitute the Construction Schedules to be used by the Contractor, separate contractors and the District until subsequently revised.
- 10.3. Mutual Responsibility. The Contractor shall afford the District and separate contractors of the District with a reasonable opportunity for storage of their materials and equipment and performance of their activities at the Site.
- 10.4. Discrepancies or Defects. If any part of the Work depends for proper execution or results upon construction or operations by the District or a separate contractor to the District, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect, Construction Manager and Project Inspector any discrepancies or defects in such other construction that renders it unsuitable for such proper execution and results.

11. Tests; Inspections; Observations

- 11.1. Contractor's Notice. If the Contract Documents, Laws or any public authority with jurisdiction over the Work require the Work, or any portion thereof, to be specially tested, inspected or approved, the Contractor shall give the Architect, Construction Manager and Project Inspector written notice of the readiness of such Work for observation, testing or inspection at least two (2) working days prior to the time for the conducting of such test, inspection or observation. If any portion of the Work subject to tests, inspection or approval is covered up by Contractor prior to completion and satisfaction of the requirements of such tests, inspection or approval, Contractor shall be responsible for the uncovering of such portion of the Work as is necessary for performing such tests, inspection or approval without adjustment of the Contract Price or the Contract Time.
- 11.2. Cost of Tests and Inspections. The District will pay for fees, costs and expenses for the initial tests/inspections of materials/equipment which are conducted at the Site or locations within a one hundred (100) mile radius of the Site. All fees, costs or expenses for subsequent tests/inspections or for tests/inspections conducted at a location more than a one hundred (100) mile radius from the Site (including without limitation, travel and travel-related expenses) shall be borne solely and exclusively by the Contractor.
- 11.3. Testing/Inspection Laboratory. The District shall select duly qualified person(s) or testing laboratory(ies) to conduct the tests and inspections to be paid for by the District and required by the Contract Documents or the Laws. Tests and inspections required of the Work shall be as set forth in the Contract Documents and as required by the Laws, including without limitation, Title 24 of the California Code of Regulations. Test/inspection standards shall be as set forth in the Contract Documents or established by the Laws. Where inspection or testing is to be conducted by an independent laboratory or testing agency, materials or samples thereof shall be selected by the laboratory, testing agency, the Project Inspector, Construction Manager or Architect and not by the Contractor.
- 11.4. Additional Tests, Inspections and Approvals. If the Architect, Construction Manager, Project Inspector or public authorities having jurisdiction over any portion of the Work require additional testing, inspection or approval, the Architect, Project Inspector or Construction Manager will instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the District, and the Contractor shall give timely notice to the Architect, Construction Manager and Project Inspector of when and where tests and inspections are to be made so the Construction Manager, Project Inspector and Architect may observe such procedures. The District shall bear the costs of such additional tests, inspections or approvals, except to the extent that such additional tests, inspections or approvals reveal any failure of the Work to comply with the requirements of the Contract Documents, in which case the Contractor shall bear all costs made necessary by such failures, including

without limitation, the costs of corrections, repeat tests, inspections or approvals and the costs of the services, the Architect or its consultants, the Construction Manager and Project Inspector in connection therewith.

- 11.5. Delivery of Certificates. Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect, Project Inspector and Construction Manager.
- 11.6. Timeliness of Tests, Inspections and Approvals. Tests or inspections required and conducted pursuant to the Contract Documents shall be made or arranged by Contractor to avoid delay in the progress of the Work. The Contractor shall be liable for delays to completion of the Work if the Contractor fails coordinate and timely schedule required tests, inspections or observations of the Work.

12. Uncovering and Correction of Work

- 12.1. Uncovering of Work. If any portion of the Work is covered contrary to the request of the Architect, Construction Manager, Project Inspector or the requirements of the Contract Documents, it must, if required by the Architect, Construction Manager or Project Inspector, be uncovered for observation by the Architect, Project Inspector and/or the Construction Manager and be replaced at the Contractor's expense without adjustment of the Contract Time or the Contract Price.
- 12.2. Rejection of Work. Defective or Non-Conforming Work may be rejected by the District, Construction Manager, Architect or Project Inspector. The Contractor shall correct such rejected Work without adjustment to the Contract Price or the Contract Time, even if the Work, materials or equipment have been previously inspected by the Architect or the Project Inspector or even if they failed to observe the Defective or Non-conforming Work.
- 12.3. Correction of Work. The Contractor shall promptly correct any portion of the Work rejected by the District, Construction Manager, Architect or Project Inspector as Defective or Non-Conforming Work, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including additional testing and inspections and compensation for the Architect's services and expenses made necessary thereby. The Contractor shall bear all costs of correcting destroyed or damaged Work, whether completed or partially completed.
- 12.4. Removal of Non-Conforming or Defective Work. The Contractor shall, at its sole cost and expense, remove from the Site all portions of the Work which are defective or are not in accordance with the requirements of the Contract Documents which are neither corrected by the Contractor nor accepted by the District.
- 12.5. Failure of Contractor to Correct Work. If the Contractor fails to commence to correct Defective or Non-Conforming Work within three (3) days of notice of such condition and promptly thereafter complete the same within a reasonable time, the District may correct it in accordance with the Contract Documents and at the expense of the Contractor.
- 12.6. Acceptance of Defective or Non-Conforming Work. The District may, in its sole and exclusive discretion, elect to accept Defective or Non-Conforming Work instead of requiring its removal and correction, in which case the Contract Price shall be equitably reduced.

13. Warranties

- 13.1. Workmanship and Materials. The Contractor warrants to the District that: (i) all materials and equipment furnished under the Contract Documents are new, of good quality and of the most suitable grade and quality for the purpose intended, unless otherwise specified in the Contract Documents; and (ii) all Work and workmanship is of good quality, free from faults and defects and in conformity with the requirements of the Contract Documents. If required by the Architect or the District, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment incorporated into the Work. Any Work, or portion thereof not conforming to these requirements, including substitutions or alternatives not properly approved in accordance with the Contract Documents may be deemed Defective or Non-Conforming Work and subject to repair, replacement or other remedial action by the Contractor to render such work in accordance the Contract Documents. The Contractor expressly warrants the merchantability, the fitness for use, and quality of all Work; such warranty of the Contractor in addition, and not in lieu of, any warranty given by the manufacturer or supplier of such item.
- 13.2. Warranty Work. If, within one (1) year after the date of Final Acceptance, or such other time frame set forth elsewhere in the Contract Documents, any Work is Defective, Non-Conforming, not in accordance with the requirements of the Contract Documents, or otherwise contrary to the warranties contained in the Contract Documents, the Contractor shall commence all necessary corrective action within seven (7) days after receipt of a written notice from the District to do so, and to thereafter diligently complete the same. If the Contractor fails or refuses to commence correction of any such item within said seven (7) day period or to diligently prosecute such corrective actions to completion, the District may, without further notice to Contractor, the District may, in the sole discretion of the District: (i) cause such corrective Work to be performed and completed; or (ii) upon notice and demand to the Performance Bond Surety, require the Surety to complete corrective work. If the District elects to complete corrective work under (i) above, the Contractor and the Performance Bond Surety shall be responsible

for all costs in connection with such corrective Work, including without limitation, general administrative overhead costs of the District in securing and overseeing such corrective Work. The obligations of the Contractor hereunder are in addition to, and not in lieu of, any other obligations imposed by any special guarantee or warranty required by the Contract Documents, guarantees or warranties provided by any manufacturer of any item incorporated into the Work, or otherwise recognized, prescribed or imposed by the Laws. Neither the District's Final Acceptance, the making of Final Payment, nor the use or occupancy of the Work, in whole or in part, by District shall 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.

- 13.3. Guarantee. Upon completion of the Work, Contractor shall execute and deliver to the District the form of Guarantee included within the Contract Documents. The Contractor's execution and delivery of the form of Guarantee is an express condition precedent to any obligation of the District to disburse the Final Payment to the Contractor.
- 13.4. Survival of Warranties. The Contractor's warranty and guaranty obligations hereunder shall survive the Contractor's completion of Work under the Contract Documents, the District's Final Acceptance or the termination of the Contract.

14. Suspension of Work

- 14.1. District's Right to Suspend Work. The District may, without cause, and without invalidating or terminating the Contract, order the Contractor, in writing, to suspend, delay or interrupt the Work in whole or in part for such period of time as the District may determine. The Contractor shall resume and complete the Work suspended by the District in accordance with the District's directive, whether issued at the time of the directive suspending the Work or subsequent thereto.
- 14.2. Adjustments to Contract Price and Contract Time. If the District directs suspension of the Work, an adjustment shall be made to the Contract Price for increases in the direct cost of performance of the Work of the Contract Documents, actually caused by suspension, delay or interruption ordered by the District; provided however that no adjustment of the Contract Price shall be made to the extent: (i) that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or (ii) that an equitable adjustment is made or denied under another provision of the Contract Documents. The foregoing notwithstanding, any such adjustment of the Contract Price shall not include any adjustment to increase the Contractor's overhead, general administrative costs or profit, all of which will remain as reflected in the Cost Breakdown submitted by the Contractor pursuant to the Contract Documents. If the District directs suspension of the Work, the Contract Time shall be equitably adjusted to reflect the duration of the District's suspension of the Work.

15. Termination

- 15.1. Termination for Cause.
- 15.1.1. District's Right to Terminate. The District may terminate the Contract upon the occurrence of any one or more of the following events of the Contractor's default: (i) the Contractor refuses or fails to prosecute the Work with diligence to achieve Substantial Completion of the Work within the Contract Time; (ii) the Contractor fails to achieve Substantial Completion of the Work within the Contract Time; (iii) the Contractor becomes bankrupt or insolvent, or makes a general assignment for the benefit of creditors, or if the Contractor or a third party files a petition to reorganize or for protection under any bankruptcy or similar laws; (iv) the Contractor repeatedly fails to supply sufficient skilled workmen or sufficient quantities of suitable materials or equipment; (v) the Contractor repeatedly fails to make payments to any Subcontractor, Material Suppliers or others for labor, materials or equipment furnished in connection with the Work; (vi) the Contractor disregards the Laws or other requirements of any public entity having jurisdiction over the Work; (vii) the Contractor disregards proper directives of the Architect, Construction Manager, Project Inspector or District; (viii) the Contractor performs Work which deviates from requirements of the Contract Documents and fails or refuses to correct such Work; or (ix) the Contractor otherwise violates in any material way any provisions or requirements of the Contract Documents. Once the District determines that sufficient cause exists to justify the action, the District may terminate the Contract without prejudice to any other right or remedy the District may have, after giving the Contractor and the Surety at least seven (7) days advance written notice of the effective date of termination. The District shall have the sole discretion to permit the Contractor to remedy the cause for the termination without waiving the District's right to terminate the Contract, or otherwise waiving, restricting or limiting any other right or remedy of the District under the Contract Documents or the Laws.
- 15.1.2. District's Rights Upon Termination. If the Contract is terminated pursuant to this Article 15.1, the District may take over the Work and prosecute it to completion, by contract or otherwise, and may exclude the Contractor from the Site. The District may take possession of the Work and of all of the Contractor's tools, appliances, Construction Equipment, machinery, materials, and other items at or about the Site, and use the same to the full extent they could be used by the Contractor without liability to the Contractor. The District shall have the sole discretion as to the manner, methods, and reasonableness of the costs of completing the Work; the District shall not be required to obtain the lowest price for completion of the Work. If the District takes bids for completion of the Work, the Contractor is not eligible for award of such contract(s).

- 15.1.3. Completion by the Surety. If the Contract is terminated pursuant to this Article 15.1, the District may demand that the Surety take over and complete the Work, in which case the rights and obligations of the District and the Surety shall be as set forth in the Performance Bond. Upon the failure or refusal of the Surety to take over and begin completion of the Work within twenty (20) days after demand therefor, the District may take over the Work and prosecute it to completion as provided for above, provided that such action of the District shall not operate to modify, diminish or otherwise affect the liability of the Surety or Contractor to the District under the Contract Documents, Performance Bond or the Laws.
- 15.1.4. Assignment and Assumption of Subcontracts. Upon termination pursuant to the foregoing, the District shall, in its sole and exclusive discretion, have the option of requiring any Subcontractor or Material Supplier to perform in accordance with its Subcontract or Purchase Order with the Contractor and/or assign the Subcontract or Purchase Order to the District or such other person or entity designated by the District.
- 15.1.5. Costs of Completion. In the event of termination under this Article 15.1, the Contractor shall not receive any further payment of the Contract Price until the Work is completed. If the unpaid balance of the Contract Price as of the date of termination exceeds the District's direct and indirect costs and expenses for completing the Work, including without limitation, attorneys' fees and compensation for additional professional and consultant services, such excess shall be used to pay the Contractor for the cost of the Work performed prior to the effective date of termination with a reasonable allowance for overhead and profit. If the District's costs and expenses to complete the Work exceed the unpaid Contract Price, the Contractor and the Surety shall be jointly and severally liable for payment of the difference to the District.
- 15.1.6. Conversion to Termination for Convenience. If the Contract is terminated under this Article 15.1, and it is determined, for any reason, that the Contractor was not in default under the provisions hereof, the termination shall be deemed a Termination for Convenience of the District and thereupon, the rights and obligations of the District and the Contractor shall be determined in accordance with Article 15.2 hereof.
- 15.1.7. District's Rights Cumulative. If the Contract is terminated pursuant to this Article 15.1, the termination shall not affect or limit any rights or remedies of the District against the Contractor or the Surety. The rights and remedies of the District under this Article 15.1 are in addition to, and not in lieu of, any other rights and remedies provided by the Laws or under the Contract Documents.
- 15.2. Termination for Convenience of the District. The District may at any time, in its sole and exclusive discretion, by written notice to the Contractor, terminate the Contract in whole or in part when it is in the interest of, or for the convenience of, the District. In such case, the Contractor shall be entitled to payment for: (i) Work actually performed and in place as of the effective date of such termination for convenience of the District, with a reasonable allowance for profit and overhead on such Work, and (ii) reasonable termination expenses for reasonable protection of Work in place and suitable storage and protection of materials and equipment delivered to the Site but not yet incorporated into the Work, provided that such payments exclusive of termination expenses shall not exceed the total Contract Price as reduced by payments previously made to the Contractor and as further reduced by the value of the Work as not yet completed. The Contractor shall not be entitled to profit and overhead on Work which was not performed as of the effective date of the termination for convenience of the District. The District may, in its sole discretion, elect to have subcontracts assigned pursuant to Article 15.1.4 above after exercising the right hereunder to terminate for the District's convenience.

16. Miscellaneous

- 16.1. Governing Law; Interpretation. This Contract shall be governed by and interpreted pursuant to the laws of the State of California. The titles used in the Contract Documents are for convenience of reference only shall have no effect upon the interpretation of the Contract Documents. The Contract Documents shall be construed as a whole in accordance with their fair meaning and not strictly for or against the District or the Contractor. The neuter gender shall include the feminine and masculine, the masculine gender shall include the feminine and neuter, the singular number shall include the plural and the plural number shall include the singular. Except as otherwise expressly provided, capitalized terms used in the Contract Documents shall have the meaning and definition for such term as set forth in the Contract Documents.
- 16.2. Successors and Assigns. Unless otherwise expressly provided in the Contract Documents, all terms, conditions and covenants of the Contract Documents shall be binding upon, and shall inure to the benefit of the District and the Contractor and their respective heirs, representatives, successors-in-interest and assigns.
- 16.3. Cumulative Rights and Remedies; No Waiver. Duties and obligations imposed by the Contract Documents and rights or remedies available thereunder shall be in addition to and not in lieu of or otherwise a limitation or restriction of duties, obligations, rights and remedies otherwise imposed or available by the Laws. No action or failure to act by the District shall constitute a waiver of a right or remedy afforded it under the Contract Documents or the Laws nor shall such an action or failure to act constitute approval of or acquiescence in a breach hereunder.
- 16.4. Severability. If any provision of the Contract Documents is deemed illegal, invalid, unenforceable and/or void, by a court or any other governmental agency of competent jurisdiction, such provision shall be deemed to be severed

and deleted from the Contract Documents, but all remaining provisions hereof, shall in all other respects, continue in full force and effect.

- 16.5. No Assignment by Contractor. The Contractor shall not assign the Contract or any obligation of the Contractor thereunder, in whole or in part, without the express prior written consent and approval of the District, which may be granted, conditioned or withheld in the sole and exclusive discretion of the District.
- 16.6. Time of Essence. Time is of the essence in the Contractor's performance of its obligations under the Contract Documents.
- 16.7. Independent Contractor Status. The Contractor is an independent contractor to the District and not an agent or employee of the District.
- 16.8. Notices. Except as otherwise expressly provided for in the Contract Documents, all notices which the District or the Contractor may be required, or may desire, to serve on the other, shall be effective only if delivered by: (i) personal delivery; or by (ii) postage prepaid, First Class Certified Return Receipt Requested United States Mail, addressed to the District or the Contractor at their respective address set forth in the Contract Documents, or such other address(es) as either the District or the Contractor may designate from time to time by written notice to the other in conformity with the provisions hereof. For personal delivery, such notices shall be deemed effective upon delivery, provided that such personal delivery requires a signed receipt by the recipient acknowledging delivery of the same. For mailed notices, such notice shall be deemed effective on the third (3rd) working day after deposit in the mail.
- 16.9. Disputes; Continuation of Work. Notwithstanding any claim, dispute or other disagreement between the District and the Contractor regarding performance under the Contract Documents, the scope of Work thereunder, or any other matter arising out of or related to, in any manner, the Contract Documents or the Work, the Contractor shall proceed diligently with performance of the Work in accordance with the District's written direction, pending any final determination or decision regarding any such claim, dispute or disagreement.
- 16.10. Claims Resolution.
 - 16.10.1. Public Contract Code §9204 Claims Resolution Procedures. Claims of the Contractor are subject to the non-binding dispute resolution procedures set forth in Public Contract Code §9204 ("Section 9204") provided, however, that the Section 9204 procedures are expressly subject to the Contractor's prior full and timely compliance with requirements and procedures of the Contract Documents relating to procedures for resolution of claims, change orders, disputes and other matters in controversy under the Contract Documents.
 - 16.10.1.1. Claim Submittal and Documentation. Claims shall be submitted in strict compliance with Section 9204 submittal requirements and supported by documentation of: (i) contractual and legal basis establishing Claim entitlement or merit; (ii) factual basis for District liability for the Claim; (iii) detailed breakdown of labor, materials, equipment and other costs included in the Claim; and (iv) detailed basis, including Construction Schedule analysis and fragnets supporting any Contract Time adjustment or Liquidated Damages relief included in the scope of a Claim.
 - 16.10.1.2. District Claim Review Statement. Within the time permitted by Section 9204 or such other time mutually agreed to by the District and the Contractor the District will review the Claim and provide the Contractor with a written statement ("Claim Review Statement") identifying the disputed and undisputed portions of the Claim ("Undisputed Claims" or "Disputed Claims"). If the District fails to provide the Claim Review Statement within the time permitted under Section 9204 or other time mutually agreed to by the District and the Contractor, the Claim is deemed rejected in its entirety and thereupon, the Contractor may initiate the Meet and Confer process described below.
 - 16.10.1.3. Meet and Confer.
 - 16.10.1.3.1. Meet and Confer Demand. Within the time permitted under Section 9204, the Contractor may demand an informal conference to meet and confer with the District for settlement of Disputed Claims identified in the Claim Review Statement ("Meet and Confer"). The Contractor's Meet and Confer request must be submitted to the District: (i) in writing; (ii) by registered mail or certified mail, return receipt requested; and (iii) within ten (10) days after the Claim Review Statement is submitted to the Contractor or within ten (10) days after the date the Claim is deemed rejected, as applicable. Failure of the Contractor to strictly comply with the foregoing is a waiver of the Contractor's right to request the Meet and Confer and the Non-Binding Mediation procedures under Section 9204. If the Contractor strictly complies with the foregoing, the District will schedule the Meet and Confer conference within thirty (30) days of the Contractor's Meet and Confer request.
 - 16.10.1.3.2. Meet and Confer Statement. Within ten (10) business days after conclusion of the Meet and Confer conference, if any Disputed Claim remains, the District shall provide the Contractor a written statement identifying the Undisputed Claims and the Disputed Claims ("Meet and Confer

Statement”).

16.10.2. Non-Binding Mediation.

16.10.2.1. Contractor Initiation. The Contractor may request non-binding mediation (“Mediation”) of Disputed Claims identified in the Meet and Confer Statement. The Contractor’s Mediation demand must be submitted to the District: (i) in writing; (ii) by registered mail or certified mail, return receipt requested; (iii) within ten (10) days after the Meet and Confer Statement is submitted to the Contractor; and (iv) with specific identification of the Disputed Claims subject to Mediation. Failure of the Contractor to strictly comply with the foregoing is deemed a waiver of the Contractor’s right to demand Mediation procedures under Section 9204.

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

16.10.2.3. Mediation Procedures. Mediation includes any non-binding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the District and Contractor in dispute resolution through negotiation or by issuance of an evaluation.

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

16.10.2.5. Post-Mediation Disputed Claims. Any Disputed Claims remaining after Mediation shall be resolved in accordance with the applicable provisions of the Contract Documents.

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

16.10.3. Payments of Undisputed Claims. If a payment due from the District for Undisputed Claims is not made within the time established under Section 9204, the overdue portion of such payment shall bear interest at the rate of seven percent (7%) per annum from the date due. The District’s credit application of any amount due for an Undisputed Claim against amounts due to the District from the Contractor under the Contract Documents is deemed payment of the Undisputed Claim.

16.10.4. Subcontractor Claims.

16.10.4.1. Subcontractor Claim Submittal. If a Subcontractor lacks legal standing to assert a Claim against the District because privity of contract does not exist, the Contractor may present the District a Claim on behalf of the Subcontractor (“Subcontractor Claim”). Each Subcontractor requesting submittal of a Subcontractor Claim to the District shall furnish reasonable documentation to support the Subcontractor Claim. Procedures, requirements and time limits for submittal of Subcontractor Claims and processing of Subcontractor Claims shall be as set forth above for Contractor Claims, as augmented herein. Within forty-five (45) days of receipt of a Subcontractor’s written request to submit a Subcontractor Claim, the Contractor shall notify the Subcontractor in writing as to whether the Contractor presented the Subcontractor Claim to the District. If the Contractor did not present the Subcontractor Claim, the Contractor shall provide the Subcontractor with a statement of the reasons for not having done so.

16.10.4.2. Contractor Certification of Subcontractor Claim. The District’s review of Subcontractor Claims is expressly subject to the Contractor’s submittal of a duly completed and executed form of Contractor Certification of Subcontractor Claim establishing that the Contractor has thoroughly reviewed the Subcontractor Claim and based on the Contractor’s review, certify that: (i) the Subcontractor Claim is made by the Subcontractor in good faith; (ii) the Subcontractor Claim is supported by reasonable documentation establishing entitlement to the relief requested and District liability therefor; and (iii) the Subcontractor Claim does not incorporate any request constituting a False Claim under applicable law, including the California False Claim Act (Government Code §12650 et seq). The form of Contractor Certification of Subcontractor Claim is included in the Contract Documents. The District may summarily reject any Subcontractor Claim submitted without an accompanying duly completed and executed form of Contractor Certification of Subcontractor Claim.

16.10.4.3. District Review of Subcontractor Claim. Requests for District conduct of the Meet and Confer and/or non-binding mediation procedures must be submitted jointly by the Contractor and the Subcontractor submitting the Subcontractor Claim. If Mediation proceedings are initiated in connection

with a Subcontractor Claim, mediator and mediation administration fees and costs shall be borne equally by the District, Contractor and Subcontractor.

- 16.10.4.4. Disputed Subcontractor Claims. Subcontractor Claims which are not fully resolved by the Section 9204 non-binding dispute resolution procedures shall be resolved by Section 20104.4 Dispute Resolution Procedures or binding arbitration, as applicable. Commencement of Section 20104.4 Dispute Resolution Procedures or binding arbitration proceedings in connection with any Subcontractor Claim is subject to compliance with Government Code Claims requirements.
- 16.10.5. Government Code Claim Requirements. Pursuant to Government Code §930.6, any claim, demand, dispute, disagreement or other matter in controversy asserted by the Contractor, whether on behalf of itself or a Subcontractor, against the District for money or damages, including without limitation Disputed Claims remaining after completion of the Section 9204 non-binding dispute resolution procedures described above are deemed a "suit for money or damages" and shall be subject to the provisions of Government Code §§945.4, 945.6 and 946 ("Government Code Claims Process"). An express condition precedent to the Contractor's initiation of Section 20104.4 Dispute Resolution Procedures or binding arbitration proceedings is the Contractor's compliance with and exhaustion of the Government Code Claims Process, including without limitation, presentation of the claim, demand, dispute, disagreement or other matter in controversy between the Contractor and the District seeking money or damages to the District and acted upon or deemed rejected by the District in accordance with Government Code §900, et seq.
- 16.10.6. Section 20104.4 Dispute Resolution Procedures; Claims Less Than \$375,000. Disputed Claims remaining after completion of the Section 9204 non-binding dispute resolution procedures and the Government Code Claims Process which are equal to or less \$375,000 shall be resolved in accordance with the civil action procedures established in Public Contract Code §20104.4. Unless otherwise agreed to by the District and the Contractor in writing, the Mediation conducted pursuant to Section 9204 procedures shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.
- 16.10.7. Binding Arbitration of Claims Exceeding \$375,000.
- 16.10.7.1. JAMS Arbitration. Any Disputed Claims after completion of the Section 9204 procedures and the Government Code Claims Process which exceed \$375,000 and any other claims, disputes, disagreements or other matters in controversy between the District and the Contractor arising out of, or related, in any manner, to the Contract Documents, or the interpretation, clarification or enforcement thereof shall be resolved by binding arbitration conducted before a retired judge in accordance with the Construction Arbitration Rules and Procedures of Judicial Arbitration Mediation Services ("JAMS") in effect as of the date that a Demand for Arbitration is filed, except as expressly modified herein. The locale for any arbitration commenced hereunder shall be the regional office of the JAMS closest to the Site.
- 16.10.7.2. Demand for Arbitration. A Demand for Arbitration shall be filed and served within a reasonable time after the occurrence of the claim, dispute or other disagreement giving rise to the Demand for Arbitration, but in no event shall a Demand for Arbitration be filed or served after the date when the institution of legal or equitable proceedings based upon such claim, dispute or other disagreement would be barred by the applicable statute of limitations. If more than one Demand for Arbitration is filed by either the District or the Contractor relating to the Work or the Contract Documents, all Demands for Arbitration shall be consolidated into a single arbitration proceeding, unless otherwise agreed to by the District and the Contractor. The Contractor's Surety, a Subcontractor or Material Supplier to the Contractor and other third parties may be permitted to join in and be bound by an arbitration commenced hereunder if required by the terms of their respective agreements with the Contractor, except to the extent that such joinder would unduly delay or complicate the expeditious resolution of the claim, dispute or other disagreement between the District and the Contractor, in which case an appropriate severance order shall be issued by the Arbitrator(s).
- 16.10.7.3. Discovery. In connection with any arbitration proceeding commenced hereunder, the discovery rights and procedures provided for in California Code of Civil Procedure §1283.05 shall be applicable, and the same shall be deemed incorporated herein by this reference.
- 16.10.7.4. Arbitration Award. The award rendered by the Arbitrator(s) ("Arbitration Award") shall be final and binding upon the District and the Contractor only if the Arbitration Award is: (i) supported by substantial evidence; (ii) based on applicable legal standards in effect that the time the Arbitration Award is issued; and (iii) supported by written findings of fact and conclusions of law in conformity with California Code of Civil Procedure §1296. Any Arbitration Award that does not conform to the foregoing is invalid and unenforceable. The District and Contractor hereby expressly agree that the Court shall, subject to California Code of Civil Procedure §§1286.4 and 1296, vacate the Arbitration Award if, after review, the Court determines either that the Arbitration Award does not fully conform to the foregoing. The confirmation, enforcement, vacation or correction of an arbitration award rendered hereunder shall be

made by the Superior Court of the State of California for the county in which the Site is situated. The substantive and procedural rules for such post-award proceedings shall be as set forth in California Code of Civil Procedure §1285 et seq.

- 16.10.7.5. Arbitration Fees and Expenses. The expenses and fees of the Arbitrator(s) shall be divided equally among all of the parties to the arbitration. Each party to any arbitration commenced hereunder shall be responsible for and shall bear its own attorneys' fees, witness fees and other costs or expenses incurred in connection with such arbitration. The foregoing notwithstanding, the Arbitrator(s) may award arbitration costs, including Arbitrators' fees but excluding attorneys' fees, to the prevailing party.
- 16.10.7.6. Limitation on Arbitrator. The Superior Court for the State of California for the County in which the Project Site is situated has the sole and exclusive jurisdiction, and an arbitrator has no authority, to hear and/or determine a challenge to the commencement or maintenance of an arbitration proceeding on the grounds that: (i) the subject matter of the arbitration proceeding is barred by the applicable statute of limitations; (ii) the subject matter of the arbitration proceeding is barred by a provision of the California Government Claims Act; (iii) the subject matter of the arbitration proceeding is outside the scope of the arbitration clause; (iv) the Contractor has failed to satisfy all conditions precedent to commencement or maintenance of an arbitration proceeding; (v) waiver of the right to compel arbitration; (vi) grounds exist for the revocation of the arbitration agreement; and/or, (vii) there is the prospect that a ruling in arbitration would conflict or potentially with a ruling in a pending proceeding regarding the Project on a common issue of law or fact.
- 16.10.8. Inapplicability to Bid Bond. The arbitration proceedings described above are not be applicable to disputes, disagreements or enforcement of rights or obligations under the Bid Bond. All claims, disputes and actions to enforce rights or obligations under the Bid Bond shall be adjudicated only by judicial proceedings commenced in a court of competent jurisdiction.
- 16.11. Attorneys' Fees. Except as expressly provided for in the Contract Documents, or authorized by the Laws, neither the District nor the Contractor shall recover from the other any attorneys' fees or other costs associated with or arising out of any legal, administrative or other proceedings filed or instituted in connection with or arising out of the Contract Documents or the performance of either the District or the Contractor thereunder.
- 16.12. Provisions Required by the Laws Deemed Inserted. Each and every provision of the Laws and clause required by the Laws to be inserted in the Contract Documents is deemed to be inserted herein and the Contract Documents shall be read and enforced as though such provision or clause are included herein, and if through mistake, or otherwise, any such provision or clause is not inserted or if not correctly inserted, then upon application of either party, the Contract Documents shall forthwith be physically amended to make such insertion or correction.
- 16.13. Days. Unless otherwise expressly stated, references to "days" in the Contract Documents are calendar days.
- 16.14. Entire Agreement. The Contract Documents contain the entire agreement and understanding between the District and the Contractor concerning the subject matter hereof, and supersedes and replaces all prior negotiations, proposed agreements or amendments, whether written or oral. No amendment or modification to any provision of the Contract Documents shall be effective or enforceable except by an agreement in writing executed by the District and the Contractor.

[END OF SECTION]

SPECIAL CONDITIONS

1. Application of Special Conditions. These Special Conditions form a part of the Contract Documents for the Work generally described as: **Boiler Replacement Campus Wide**. Unless otherwise expressly provided otherwise, all of the Special Conditions apply to all Bid Packages.
2. Contract Time for Completion of Interim Milestones and Substantial Completion of Bid Packages. The District intends to construct the Project using a "Multiple Prime Contractor" approach; with each Contractor awarded a Contract for a Bid Package being obligated to complete the Work of the Bid Package in accordance with the requirements of the Bid Package, as scheduled and coordinated by the Construction Manager. The Work of each Bid Package is described elsewhere in the Contract Documents. The Contractor awarded a Bid Package must complete work of the Bid Package necessary to achieve completion of the Interim Milestones indicated below and to achieve Project Substantial Completion within the Contract Time.

Notice to Proceed Issue Date	Monday, April 16, 2018
Project Contract Time Commencement	Monday, April 16, 2018
Project Substantial Completion	Wednesday, July 11, 2018 (86) calendar days after commencement of Project Contract Time

3. Project Interim Milestones. The Project Interim Milestones are described below. Completion of each Project Interim Milestone is shown in the Bid Schedule, and may be revised upon issuance of the Baseline Construction Schedule issued by the Construction Manager. During construction of the Project, the District may revise the Project Interim Milestones and/or completion date of any of Project Interim Milestone without adjustment of the Contract Price or Contract Time.

Milestone No.	Milestone Description
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	

4. Liquidated Damages. Each Contractor for a Bid Package is subject to assessment of Liquidated Damages as follows:
 - 4.1. Liquidated Damages for Delayed Project Interim Milestones. If any Project Milestone identified above is within the scope of the Contractor's Bid Package and the Contractor fails or refuses, for any reason, to complete the Project Interim Milestone within the time established in the Baseline Construction Schedule or adjustments thereto in accordance with the Contract Documents, the Contractor will be assessed Liquidated Damages in the amount of **N/A Dollars (\$N/A)** per day until the Project Milestone is completed.
 - 4.2. Liquidated Damages for Delayed Project Substantial Completion. If a Contractor fails or refuses, for any reason, to prosecute the Work of its Bid Package in accordance with the Baseline Construction Schedule, as adjusted in accordance with the Contract Documents, and such failure or refusal causes or contributes to delayed Project Substantial Completion, the Contractor will be assessed Liquidated Damages in the amount of **Five Hundred Dollars (\$500.00)** per day for each day of delayed Project Substantial Completion caused by or contributed to by the Contractor.
 - 4.3. Liquidated Damages for Delayed Completion of Punchlist Items. If the Contractor does not complete Punchlist Items noted upon Substantial Completion within the time established pursuant to the Contract Documents, the Contractor shall be assessed Liquidated Damages in the amount of **Five Hundred Dollars (\$500.00)** per day from the date established for completion of all Punchlist Items until all Punchlist Items are actually completed.
 - 4.4. District Withhold of Liquidated Damages; Performance Bond Surety. If a Contractor is subject to assessment of Liquidated Damages pursuant to the foregoing, the District may withhold such assessments from the Contractor

Price then or thereafter due the Contractor. If the assessment of Liquidated Damages exceeds the then remaining balance of the Contract Price due the Contractor, the Contractor and the Surety issuing the Performance Bond shall be jointly and severally liable to the District for Liquidated Damages liability of the Contractor which exceeds the remaining Contract Price balance.

5. Construction Manager. The Construction Manager is Ledesma & Meyer Construction Co., Inc.
6. Hours and Days of Work at the Site.
 - 6.1. Work Hours/Days. Subject to limitations set forth elsewhere in the Contract Documents and the CWA, the hours/days of Work at the Site are: 7am – 5pm Mondays through Fridays, except for holiday days.
 - 6.2. Limitations on Work Hours/Days. Work activities at the Site will be limited or prohibited on days: (i) devoted to student testing or when testing of students may be adversely affected by Work activities at the Site; or (ii) when other special events or functions are scheduled. The Contractor shall familiarize itself with District activities at the Site to avoid Work activity interferences or disturbances to such District activities. The Contractor's Construction Schedule shall take into account the District activities which limit or preclude Work activities at the Site.
7. Contractor Personnel Parking. Personnel of the Contractor, Subcontractors and others performing Work at the Site will be allowed to park, with a valid District parking permit, in the parking spaces at a location designated by the District. Parking permit charges, if any, shall be borne and paid by the Contractor without adjustment of the Contract Price. The foregoing notwithstanding, the extent or location of parking for such personnel may be limited, restricted, eliminated or modified by the District as reasonably necessary to facilitate and accommodate necessary parking for the District's students, staff and visitors engaged in activities and functions in and about the Site. Neither the Contract Price nor the Contract Time shall be adjusted as a result of any such District modifications to the extent or location of parking.
8. District Provided Temporary Utilities. Pursuant to Article 4.3.4 of the General Conditions, during the Contractor's performance of the Work, the District will provide utility services and a point of connection for no utility services. If the District provides any utility services: (i) the District may discontinue, limit or condition use of such services by a Contractor if the District reasonably determines that the Contractor has wasted such utilities, and (ii) the District shall not be liable to the Contractor, nor shall the Contract Time or the Contract Price be increased if any District provided temporary utility service is discontinued or disrupted for any reason other than the District's non-payment of undisputed utility charges. Notwithstanding any provision of the Contract Documents to the contrary, the Contractor shall not use District provided water supply in connection with any earthwork or grading operations; water supply for earthwork or grading operations shall be obtained by the Contractor, without adjustment of the Contract Time or the Contract Price, from an offsite source or mobile water delivery service. Further, notwithstanding the District providing a point of connection for the Contractor's telephone/data service at the Site, the Contractor is solely responsible for the payment of utility service charges therefor. Temporary distributions of District provided utility services at the Site will be by the Contractor designated with such responsibilities in the scope of its Bid Package. Except for the District provided utility services and extent of temporary distributions thereof, each Contractor is responsible, without adjustment of the Contract Price or Contract Time for securing all utilities and utility services necessary for completion of its Bid Package Work.
9. Mark-Ups on Changes to the Work. In the event of Changes to the Work, pursuant to Article 9 of the General Conditions, the mark-up for all overhead (including home and field office overhead), general conditions costs and profit, shall not exceed the percentage of allowable direct actual costs for performance of the Change as set forth below.
 - 9.1. Subcontractor Performed Changes. For the portion of any Change performed by Subcontractors of any tier, the percentage mark-up on allowable actual direct labor and materials costs incurred by all Subcontractors of any tier shall be Ten Percent (10%). In addition, for the portion of any Change performed by a Subcontractor of any tier, the Contractor may add an amount equal to Five Percent (5%) of the allowable actual direct labor and materials costs of Subcontractors performing the Change; the foregoing mark-up shall not be applied to the Subcontractor mark-up.
 - 9.2. Contractor Performed Changes. For the portion of any Change performed by the Contractor's own forces, the mark-up on the allowable actual direct labor and materials costs of such portion of a Change shall be Ten Percent (10%).
 - 9.3. Bond Premium Costs. In addition to the foregoing mark-ups on the direct costs of labor and materials, a bond premium expense in an amount equal to the lesser of the Contractor's actual bond premium rate of One and One Half Percent (1.5%) of the total actual direct costs of labor and materials (before Subcontractor and Contractor mark-ups) will be allowed.
 - 9.4. Exclusions From Mark-Up of Actual Costs. Mark-ups on the actual cost of materials/equipment incorporated into a Change or for purchase/rental of Construction Equipment shall not be applied to any portion of such costs which are for sales, use or other taxes arising out of the purchase of materials/equipment and/or for purchase/rental of Construction Equipment.
10. Deferred Approval Items. The following Deferred Approval Items are incorporated into and made a part of the Work:
N/A. Each Contractor with a Deferred Approval Item in its Bid Package Work is responsible for timely preparing all

materials necessary for DSA review and approval of Deferred Approval Items without adjustment of the Contract Time or the Contract Price.

11. Minimum Insurance Coverage Limits

11.1. Contractor Insurance. Pursuant to Article 6 of the General Conditions, the Contractor shall obtain and maintain the following insurance coverages with minimum coverage limits as set forth below:

Policy of Insurance	Minimum Coverage Limits
Commercial General Liability Insurance	Per Occurrence: One Million Dollars (\$1,000,000)
	Aggregate: Two Million Dollars (\$2,000,000)
Workers Compensation	In accordance with the Laws
Employers Liability	One Million Dollars (\$1,000,000)
Automobile Liability	One Million Dollars (\$1,000,000) combined single limit
Contractor's Pollution Liability – Applicable to Abatement Contractors	Per Occurrence: One Million Dollars (\$1,000,000)
	Aggregate: Two Million Dollars (\$2,000,000)

11.2. Subcontractor Insurance. Pursuant to Article 6 of the General Conditions, each Subcontractor shall obtain and maintain the following insurance coverages with minimum coverage limits as set forth below:

Policy of Insurance	Minimum Coverage Limits
Commercial General Liability Insurance	Per Occurrence: One Million Dollars (\$1,000,000)
	Aggregate: Two Million Dollars (\$2,000,000)
Workers Compensation	In accordance with the Laws
Employers Liability	One Million Dollars (\$1,000,000)
Automobile Liability	One Million Dollars (\$1,000,000) combined single limit
Contractor's Pollution Liability - Applicable to Abatement Contractors	Per Occurrence: One Million Dollars (\$1,000,000)
	Aggregate: Two Million Dollars (\$2,000,000)

[END OF SECTION]

[THIS PAGE INTENTIONALLY BLANK]

**SUMMARY LIST OF SUBCONTRACTORS AND SUB-SUBCONTRACTORS
Completion Instructions**

The Contractor shall complete and submit the form of Summary List of Subcontractors and Subcontractors ("Subcontractor Summary") to the District within five (5) days of the District's issuance of the Notice to Proceed for the Work. **The Contractor must identify: (i) all Subcontractors who are in direct privity of contract with the Contractor, including those not identified in the Contractor's Subcontractors List submitted with the Bid Proposal; and (ii) all sub-subcontractors in direct privity of contract with a Subcontractor.** Subcontractors and Sub-Subcontractors identified herein must execute and deliver to the District the form of CWA Letter of Assent incorporated into the Contract Documents as a condition for performance of any Work by such Subcontractor or Sub-Subcontractor. The Contractor shall from time-to-time submit this Subcontractor Summary form as necessary to identify different or additional Subcontractors or Sub-Subcontractors.

Subcontractor	Sub-Subcontractors

(Duplicate this Subcontractor and Sub-Subcontractor Summary Form as Necessary
To All Identify Subcontractor and Sub-Subcontractors)

Contractor Name

By _____
(Signature of Contractor's Authorized Employee)

Title _____

Date _____

[THIS PAGE INTENTIONALLY BLANK]

CONDITIONAL WAIVER AND RELEASE ON PROGRESS PAYMENT

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

Identifying Information

Name of Claimant: _____
Name of Customer: _____
Job Location: _____
Owner: _____
Through Date: _____

Conditional Waiver and Release

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

Maker of Check: _____
Amount of Check: \$ _____
Check Payable to: _____

Exceptions

This document does not affect any of the following:
(1) Retentions.
(2) Extras for which the claimant has not received payment.
(3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment: _____
Date(s) of waiver and release: _____
Amount(s) of unpaid progress payment(s): \$ _____
(4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

Signature

Claimant’s Signature: _____
Claimant’s Title: _____
Date of Signature: _____

UNCONDITIONAL WAIVER AND RELEASE ON PROGRESS PAYMENT

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

Identifying Information

Name of Claimant: _____
Name of Customer: _____
Job Location: _____
Owner: _____
Through Date: _____

Unconditional Waiver and Release

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

Exceptions

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

Signature

Claimant's Signature: _____
Claimant's Title: _____
Date of Signature: _____

CONDITIONAL WAIVER AND RELEASE ON FINAL PAYMENT

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

Identifying Information

Name of Claimant: _____
Name of Customer: _____
Job Location: _____
Owner: _____

Conditional Waiver and Release

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

Maker of Check: _____
Amount of Check: \$ _____
Check Payable to: _____

Exceptions

This document does not affect any of the following:
Disputed claims for extras in the amount of: \$ _____

Signature

Claimant’s Signature: _____
Claimant’s Title: _____
Date of Signature: _____

UNCONDITIONAL WAIVER AND RELEASE ON FINAL PAYMENT

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

Identifying Information

Name of Claimant: _____
Name of Customer: _____
Job Location: _____
Owner: _____

Unconditional Waiver and Release

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

Exceptions

This document does not affect the following:
Disputed claims for extras in the amount of: \$ _____

Signature

Claimant's Signature: _____
Claimant's
Title: _____
Date of Signature: _____

COMMUNITY WORKFORCE AGREEMENT
BY AND BETWEEN
ANTELOPE VALLEY COLLEGE
AND
LOS ANGELES AND ORANGE COUNTIES
BUILDING AND CONSTRUCTION TRADES COUNCIL
AND
THE SIGNATORY CRAFT COUNCILS AND UNIONS
FOR
CONSTRUCTION PROJECTS AND MAJOR REHABILITATION

TABLE OF CONTENTS		Page
ARTICLE 1	INTENT AND PURPOSE	4
ARTICLE 2	SCOPE OF AGREEMENT	6
ARTICLE 3	UNION RECOGNITION AND EMPLOYMENT	10
ARTICLE 4	UNION ACCESS AND STEWARDS	15
ARTICLE 5	WAGES AND BENEFITS	16
ARTICLE 6	HOURS OF WORK, OVERTIME, SHIFTS AND HOLIDAYS	17
ARTICLE 7	WORK STOPPAGES AND LOCKOUTS	19
ARTICLE 8	WORK ASSIGNMENTS AND JURISDICTIONAL DISPUTES	23
ARTICLE 9	MANAGEMENT RIGHTS	23
ARTICLE 10	SETTLEMENT OF GRIEVANCES AND DISPUTES	25
ARTICLE 11	REGULATORY COMPLIANCE	27
ARTICLE 12	SAFETY AND PROTECTION OF PERSON AND PROPERTY	28
ARTICLE 13	TRAVEL AND SUBSISTENCE	29
ARTICLE 14	APPRENTICES	29
ARTICLE 15	WORK OPPORTUNITIES PROGRAM	30
ARTICLE 16	WORKING CONDITIONS	31
ARTICLE 17	PRE-JOB CONFERENCES	32
ARTICLE 18	LABOR/MANAGEMENT COOPERATION	32
ARTICLE 19	SAVINGS AND SEPARABILITY	33
ARTICLE 20	WAIVER	33
ARTICLE 21	AMENDMENTS	33
ARTICLE 22	DURATION OF THE AGREEMENT	33
ATTACHMENT A	– LETTER OF ASSENT	36
ATTACHMENT B	– LOCAL RESIDENT ZIP CODES	37
ATTACHMENT C	– CRAFT EMPLOYEE REQUEST FORM	40
ATTACHMENT D	– DRUG AND ALCOHOL TESTING POLICY	42

**ANTELOPE VALLEY COLLEGE
COMMUNITY WORKFORCE AGREEMENT
FOR NEW CONSTRUCTION AND MODERNIZATION**

This Community Workforce Agreement (hereinafter, “Agreement”) is entered into by and among the Board of Trustees of the Antelope Valley College (the “College”), the Los Angeles/Orange Counties Building and Construction Trades Council (the “Council”), and the signatory Craft Councils and Unions signing this Agreement (hereinafter together with the Council, collectively, the “Union” or “Unions”). This Agreement establishes the labor relations guidelines and procedures for the College and for the Contractors and craft employees represented by the Unions and engaged in Project Work. The College, Council and Unions are hereinafter referred to herein, as the context may require, as “Party” or “Parties.”

The Parties to this Agreement understand that if this Agreement is acceptable to the College, the policy of the College will be for the Project Work to be contracted exclusively to Contractors who agree to execute and be bound by the terms of this Agreement, directly or through the Letter of Assent (a form of which is attached as “**Attachment A**”), and to require each of its subcontractors, of whatever tier, to become bound. The College shall include, directly or by incorporation by reference, the requirements of this Agreement in the advertisement of and/or specifications for each and every contract for Project Work to be awarded by the College.

The College shall actively administer and enforce the obligations of this Agreement to ensure that the benefits envisioned from it flow to all signatory Parties, the Contractors and crafts persons working under it, and the residents and students of the College. The College shall therefore designate a “Community Workforce Coordinator,” either from its own staff or an independent contractor acting on behalf of the College, to monitor compliance with this Agreement; assist, as the authorized representative of the College, in developing and implementing the programs referenced herein, all of which are critical to fulfilling the intent and purposes of the Parties and this Agreement; and to otherwise implement and administer this Agreement. For such purposes, each Contractor recognizes the Community Workforce Coordinator, its successors or assigns, as its agent; and together with College and the Unions, the Community Workforce Coordinator shall be considered a “negotiating party” of this Agreement.

The term “Apprentice” as used in this Agreement shall mean those employees registered and participating in Joint Labor/Management Apprenticeship Programs approved by the Division of Apprenticeship Standards, Department of Industrial Relations of the State of California.

The term “Contractor” as used in this Agreement includes any individual, firm, partnership, or corporation, or combination thereof, including joint ventures, which as an Independent Contractor has entered into a contract with the College with respect to the Project Work, or with another Contractor as a subcontractor of whatever tier utilized by such Contractors for Project Work.

The term “Joint Labor/Management Apprenticeship Program” as used in this Agreement means a joint Union and Contractor administered apprenticeship program certified by the Division of Apprenticeship Standards, Department of Industrial Relations of the State of California.

The term “Letter of Assent” as used in this Agreement means the document that each Contractor (of any tier) must sign and submit to the Community Workforce Coordinator and the Council, before beginning any Project Work, which formally binds them to adhere to all the forms, requirements and conditions of this Agreement, in the letter attached hereto as Attachment A.

The term “Project” or “Project Work” as used in this Agreement means the College’s repair, renovation, rehabilitation, upgrade and improvement work and new construction projects which exceed the thresholds set forth in Section 2.2 of this Agreement and are contracted out by the College.

The term “Schedule A Agreements,” as used in this Agreement, means the local collective bargaining agreements of the signatory Unions having jurisdiction over the Project Work and which have signed this Agreement.

The term “Subscription Agreement” means the contract between a Contractor and a Union’s Labor/Management Trust Fund(s) that allows the Contractor to make the appropriate fringe benefit contributions in accordance with the terms of Schedule A.

The Union and all Contractors agree to abide by the terms and conditions of this Agreement and agree that this Agreement represents the complete understanding of the Parties. No Contractor is or will be required to sign or otherwise become a party to any other collective bargaining agreement with a signatory Union as a condition of performing work within the scope of this Agreement.

The Parties agree that this Agreement will be made available to, and will fully apply to, any successful bidder for Project Work, without regard to whether that successful bidder performs work at other sites on either a union or non-union basis. This Agreement shall not apply to any work of any Contractor other than that on Project Work specifically covered by this Agreement.

The use of masculine or feminine gender or titles in this Agreement should be construed as including both genders and not as gender limitations unless the Agreement clearly requires a different construction. Further, the use of Article titles and/or Section headings are for information only, and carry no legal significance.

ARTICLE 1 INTENT AND PURPOSE

Section 1.1 Background: The College's new construction and major rehabilitation projects will affect the school buildings and offices that are owned, leased or controlled by the College. The goal of this Project is to provide new construction and major rehabilitation of the College's facilities so as to provide sufficient facilities and technologies to educate properly the children within the College's boundaries. The College, therefore, wishing to utilize the most modern, efficient and effective procedures for construction, including assurances of a sufficient supply of skilled craftsperson's, and the elimination of disruptions or interference with Project Work,

adopts this Agreement in the best interests of the students, parents, College staff, and the taxpayers of the College to meet the College's goal that Project Work be completed on time and within budget.

Section 1.2 Identification and Retention of Skilled Labor and Employment of College

Residents: The vast amount of new school construction, substantial rehabilitation, and capital improvement work scheduled to be performed by the College will require large numbers of craft personnel and other supporting workers. The parties understand and intend to use the opportunities provided by the extensive amount of work to be covered by this Agreement to identify and promote, through cooperative efforts, programs and procedures (which may include, for example, programs to prepare persons for entrance into formal apprenticeship programs, or outreach programs to the community describing opportunities available as a result of the Project), the interest and involvement of College residents in the construction industry; assist them in entering the construction trades, and through utilization of the joint labor/management sponsored apprenticeship programs, provide training opportunities for those College residents and other individuals wishing to pursue a career in construction. Further, with assistance of the Community Workforce Coordinator, the College, the contractors, the Unions and their affiliated regional and national organizations, will work jointly to develop and implement procedures promptly for the identification of craft needs, the scheduling of work to facilitate the utilization of available craft workers, and to secure the services of craft workers in sufficient numbers to meet the high demands of the Project Work to be undertaken.

Section 1.3 Encouragement of Local and Small Business: The Project will provide many opportunities for local and small business enterprises to participate as contractors or suppliers, and the parties therefore agree that they will cooperate with all efforts of the College, the Community Workforce Coordinator, and other organizations retained by the College for the purpose of encouraging and assisting the participation of local and small businesses in Project Work. Specifically, all parties understand that the College has established and quantified goals which place a strong emphasis on the utilization of local and small businesses on the Project. Each party agrees that it shall employ demonstrable efforts to encourage utilization in an effort to achieve such goals. This may include, for example, participation in outreach programs, education and assistance to businesses not familiar with working on a project of this scope, and the encouragement of local residents to participate in Project Work through programs and procedures jointly developed to prepare and encourage such local residents for apprenticeship programs and formal employment on the Project through the referral programs sponsored and/or supported by the parties to this Agreement. Further, the parties shall ensure that the provisions of this Agreement do not inadvertently establish impediments to the participation of local and small businesses, and residents of the College.

Section 1.4 Project Cooperation: The parties recognize that the construction to take place under this Agreement involves unique and special circumstances which dictate the need for the parties to develop specific procedures to promote high quality, rapid and uninterrupted construction methods and practices. The smooth operation and successful and timely completion of the work is vitally important to the parents and the students of the College. The parties therefore agree that maximum cooperation among all parties involved is required; and that with construction work of this magnitude, with multiple contractors and crafts performing work on

multiple sites of over an extended period of time, all parties agree to work in a spirit of harmony and cooperation, and with an overriding commitment to maintain the continuity of Project Work. Further, the parties recognize that an Act of God or on Act of War could require the College to partially or fully suspend Project Work. The parties shall fully cooperate with any request by the College to redirect their equipment, skills and expertise to support the College's efforts necessitated by such events.

Section 1.5 Workers' Compensation Carve-out: Further, the parties recognize the potential which the Project may provide for the implementation of a cost effective workers' compensation system as permitted by California Labor Code, Section 3201.5, as revised. Should the College request, the Union parties agree to meet and negotiate in good faith with representatives of the College for the development, and subsequent implementation, of an effective program involving improved and revised dispute resolution and medical care procedures for the delivery of workers' compensation benefits and medical coverage as permitted by the Code.

Section 1.6 Peaceful Resolution of All Disputes: In recognition of the special needs of the Project and to maintain a spirit of harmony, labor-management peace and stability during the term of this Community Workforce Agreement, the parties agree to establish effective and binding methods for the settlement of all misunderstandings, disputes and grievances; and in recognition of such methods and procedures, the unions agree not to engage in any strike, slowdowns or interruptions or disruption of Project Work, and the contractors agree not to engage in any lockout, or any other action impairing or impeding the Project Work.

Section 1.7 Binding Agreement on Parties and Inclusion of College Residents and Businesses: By executing this Agreement, the College, Council, Unions and Contractors agree to be bound by each and all of the provisions of this Agreement, and pledge that they will work together to adopt, develop and implement processes and procedures which are inclusive of the residents and businesses of the College.

ARTICLE 2 SCOPE OF AGREEMENT

Section 2.1 General: This Agreement shall only apply to work which is contracted out by the College. This Agreement shall apply and is limited to all of the College's Project Work, as specified in Section 2.2 of this Article, performed by those Contractor(s) of whatever tier that have contracts awarded for such work, for the development of the College's facilities which, jointly, constitute the Project, and have been designated by the College for construction or rehabilitation.

Section 2.2 Specific: The Project is defined and limited to:

(a) All construction and major rehabilitation work pursuant to prime multi-trade construction contracts that exceed one hundred seventy-five thousand dollars (\$175,000.00) and all subcontracts flowing from these prime multi-trade contracts; and

(b) All prime specialty contracts that exceed twenty-five thousand (\$25,000), and all subcontracts flowing from these specialty contracts; and

(c) The Parties understand that the College may at any time, and at its sole discretion, determine to build segments of the Project under this Agreement which were not currently proposed, or to modify or not to build any one or more particular segments proposed to be covered. It is understood by the Parties that the College may at any time, and at its sole discretion, add additional projects under this Agreement not otherwise covered by this Agreement.

Section 2.3 Bundling of Contracts: The Parties understand that, to the maximum extent feasible, and consistent with goals of the College to (i) utilize this Agreement as the Labor Relations Policy for its construction and rehabilitation program, and (ii) fully utilize the services of small and local business enterprises for such construction and rehabilitation work:

(a) The College, in its sole discretion, with the advice of the Community Workforce Coordinator, will seek to group (or “bundle”) for bidding, contracts not meeting the thresholds of Section 2.2 (a) or (b) above. (Small contracts for like types of work, scheduled to be undertaken at the same school, in the same College or on the same project site, and within the same timeframe, will be considered for such bundling, consistent with economies of scale, and the purposes of this Agreement); and

(b) Project Work will not be split, divided or otherwise separated for contract award purposes to avoid application of this Agreement.

Section 2.4 Exclusions: Items specifically excluded from the Scope of this Agreement include the following:

(a) Work of non-manual employees, including but not limited to: superintendents; administrators; teachers; supervisors; time keepers, mail carriers, clerks, office workers, messengers; guards, safety personnel, emergency medical and first aid technicians; and other professional, engineering, administrative, supervisory and management employees;

(b) Equipment and machinery owned or controlled and operated by the College;

(c) All off-site manufacture and handling of materials, equipment or machinery; provided, however, that lay down or storage areas for equipment or material and manufacturing (prefabrication) sites, dedicated solely to the Project or Project Work, and the movement of materials or goods between locations on a Project site are within the scope of this Agreement;

(d) All employees of the College, Community Workforce Coordinator, design teams (including, but not limited to architects engineers and master planners), or any other consultants for the College (including, but not limited to, project managers and construction managers and their employees not engaged in Project Work) and their sub-consultants, and other employees of professional service organizations, not performing manual labor within the scope of this Agreement; provided, however, that it is understood and agreed that Building/Construction

Inspector and Field Soils and Materials Testers (Inspectors) are a covered craft under the CWA. This inclusion applies to the scope of work defined in the State of California Wage Determination for said Craft. This shall also specifically include such work where it is referred to by utilization of such terms as "quality control" or "quality assurance." Every Inspector performing under the Wage classification of Building/Construction Inspector and Field Soils and Material Testers under a professional services agreement of a construction contract shall be bound to all applicable requirements of the CWA. Project Work as defined by this Agreement shall be performed pursuant to the terms and conditions of this Agreement regardless of the manner in which the work was awarded;

(e) Any work performed on or near or leading to or into a site of work covered by this Agreement and undertaken by state, county, city or other governmental bodies, or their Contractors; or by public utilities, or their Contractors; and/or by the College or its Contractors (for work for which is not within the scope of this Agreement);

(f) Off-site maintenance of leased equipment and on-site supervision of such work;

(g) It is recognized that certain materials, equipment and systems of a highly technical and specialized nature will have to be installed at the Project. The nature of the materials, equipment and systems, together with requirements of manufacturer's or vendor's warranty, may dictate that it be prefabricated, pre-piped, and/or pre-wired and that it be installed under the supervision and direction of Owner's and/or manufacturer's personnel. The Unions agree to install such material, equipment and systems without incident;

(h) Non-construction support services contracted by the College, Community Workforce Coordinator, or Contractor in connection with this Project;

(i) Laboratory work for testing.

Section 2.5 Awarding of Contracts:

(a) The College and/or the Contractors, as appropriate, have the absolute right to award contracts or subcontracts on this Project to any Contractor notwithstanding the existence or non-existence of any agreements between such Contractor and any Union parties, provided only that such Contractor is ready, willing and able to execute and comply with this Community Workforce Agreement should such Contractor be awarded work covered by this Agreement.

(b) It is agreed that all Contractors and subcontractors of whatever tier, who have been awarded contracts for work covered by this Agreement, shall be required to accept and be bound to the terms and conditions of this Community Workforce Agreement, and shall evidence their acceptance by the execution of the Letter of Assent set forth in **Attachment "A"** hereto, prior to the commencement of work. At the time that any Contractor enters into a subcontract with any subcontractor of any tier providing for the performance on the construction contract, the Contractor shall provide a copy of this Agreement to said subcontractor and shall require the subcontractor, as a part of accepting the award of a construction subcontract, to agree in writing in the form of a Letter of Assent to be bound by each and every provision of this Agreement

prior to the commencement of work on the Project. No Contractor or subcontractor shall commence Project Work without having first provided a copy of the Letter of Assent as executed by it to the Community Workforce Coordinator and to the Council forty-eight (48) hours before the commencement of Project Work, or within forty-eight (48) hours after the award of Project Work to that Contractor (or subcontractor), whichever occurs later.

Section 2.6 Coverage Exception: This Agreement shall not apply if the College receives funding or assistance from any Federal, State, local or other public entity for the Construction Contract if a requirement, condition or other term of receiving that funding or assistance, at the time of the awarding of the contract, is that the College not require, bidders, contractors, subcontractors or other persons or entities to enter into an agreement with one or more labor organizations or enter into an agreement that contains any of the terms set forth herein. The College agrees that it will make every effort to establish the enforcement of this Agreement with any governmental agency or granting authority.

Section 2.7 Schedule A's:

(a) The provisions of this Agreement, including the Schedule A's (which are the local collective bargaining agreements of the signatory Unions having jurisdiction over the work on the Project, as such may be changed from time-to-time and which are incorporated herein by reference) shall apply to the work covered by this Agreement, notwithstanding the provisions of any other local, area and/or national agreement which may conflict with or differ from the terms of this Agreement. However, such does not apply to work performed under the National Cooling Tower Agreement, the National Stack Agreement, the National Transit Division Agreement (NTD), or within the jurisdiction of the International Union of Elevator Constructors and all instrument calibration and loop checking work performed under the terms of the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians except that Articles dealing with Work Stoppages and Lock-Outs, Work Assignments and Jurisdictional Disputes, and Settlement of Grievances and Disputes shall apply to such work. It is specifically agreed that no later agreement shall be deemed to have precedence over this Agreement unless signed by all Parties signatory hereto who are then currently employed or represented at the Project. Where a subject covered by the provisions of this Agreement is also covered by a Schedule A, the provisions of this Agreement shall apply. Where a subject is covered by a provision of a Schedule A and not covered by this Agreement, the provisions of the Schedule A shall prevail. Any dispute as to the applicable source between this Agreement and any Schedule A for determining the wages, hours of working conditions of employees on this Project shall be resolved under the procedures established in Article 10.

(b) It is understood that this Agreement, together with the referenced Schedule A's, constitutes a self-contained, stand-alone agreement and by virtue of having become bound to this Community Workforce Agreement, the Contractor will not be obligated to sign any other local, area or national collective bargaining agreement as a condition of performing work within the scope of this Agreement (provided, however, that the Contractor may be required to sign an uniformly applied, non-discriminatory "Subscription Agreement" or "Participation Agreement" at the request of the trustees or administrator of a trust fund established pursuant to Section 302 of the Labor Management Relations Act, and to which such Contractor is bound to make

contributions under this Agreement, provided that such Participation Agreement does not purport to bind the Contractor beyond the terms and conditions of this Agreement and/or expand its obligation to make contributions pursuant thereto). It shall be the responsibility of the prime Contractor to have each of its subcontractors sign such Agreement with the appropriate Craft Union prior to the subcontractor beginning Project Work.

Section 2.8 Binding Signatories Only: This Agreement shall only be binding on the signatory Parties hereto, and shall not apply to the parents, affiliates, subsidiaries, or other ventures of any such Party.

Section 2.9 Other College Work: This Agreement shall be limited to the construction work within the Scope of this Agreement including, specifically, site preparation and related demolition work, and new construction and major rehabilitation work for new or existing facilities referenced in Section 2.2 above. Nothing contained herein shall be interpreted to prohibit, restrict, or interfere with the performance of any other operation, work or function not covered by this Agreement, which may be performed by College employees or contracted for by the College for its own account, on its property or in and around a Project site.

Section 2.10 Separate Liability: It is understood that the liability of the Contractor(s) and the liability of the separate Unions under this Agreement shall be several and not joint. The Unions agree that this Agreement does not have the effect of creating any joint employment status between or among the College or Community Workforce Coordinator and/or any Contractor.

Section 2.11 Completed Project Work: As areas of Project Work are accepted by the College, this Agreement shall have no further force or effect on such items or areas except where the Contractor is directed by the College or its representatives to engage in repairs, modification, check-out and/or warranties functions required by its contract(s) with the College.

ARTICLE 3 UNION RECOGNITION AND EMPLOYMENT

Section 3.1 Recognition: The Contractor recognizes the Council and the Unions as the exclusive bargaining representative for the employees engaged in Project Work.

Section 3.2 Contractor Selection of Employees: The Contractor shall have the right to determine the competency of all employees, the number of employees required, the duties of such employees within their craft jurisdiction, and shall have the sole responsibility for selecting employees to be laid off, consistent with Section 3.3 and Section 4.3, below. The Contractor shall also have the right to reject any applicant referred by a Union for any reason, subject to any reporting pay required by Section 6.6; provided, however, that such right is exercised in good faith and not for the purpose of avoiding the Contractor's commitment to employ qualified workers through the procedures endorsed in this Agreement.

Section 3.3 Referral Procedures:

(a) For signatory Unions now having a job referral system contained in a Schedule A, the Contractor agrees to comply with such system and it shall be used exclusively by such Contractor, except as modified by this Agreement. Such job referral system will be operated in a nondiscriminatory manner and in full compliance with federal, state, and local laws and regulations which require equal employment opportunities and non-discrimination. All of the foregoing hiring procedures, including related practices affecting apprenticeship, shall be operated so as to consider the goals of the College to encourage employment of College residents and utilization of small local businesses on the Project, and to facilitate the ability of all Contractors to meet their employment needs.

The Unions will exert their best efforts to recruit and refer sufficient numbers of skilled craft workers to fulfill the labor requirements of the Contractor, including specific employment obligations to which the Contractor may be legally and/or contractually obligated; and to refer apprentices as requested to develop a larger, skilled workforce. The Unions will work with their affiliated regional and national unions, and jointly with the Community Workforce Coordinator and others designated by the College, to identify and refer competent craft persons as needed for Project Work, and to identify and hire individuals, particularly residents of the College, for entrance into joint labor/management apprenticeship programs, or to participation in other identified programs and procedures to assist individuals in qualifying and becoming eligible for such apprenticeship programs, all maintained to increase the available supply of skilled craft personnel for Project Work and future construction of maintenance work to be undertaken by the College.

(b) The Union shall not knowingly refer an employee currently employed by a Contractor on Project Work to any other Contractor.

(c) The Parties are aware of the College's policy that Contractors and other employers shall not employ, on Project Work when minors may be present on or around the site of such Project Work during working hours, a person who would not be eligible for employment by the College under California Educational Code, Section 45123. The Parties shall endeavor to employ persons under this Article in compliance with this policy, and the Contractors agree to remove such an individual in their employ from the particular Project site at the request of the College or the Community Workforce Coordinator.

Section 3.4 Non-Discrimination in Referral, Employment, and Contracting: The Unions and Contractors agree that they will not discriminate against any employee or applicant for employment in hiring and dispatching on the basis of race, color, religion, sex, gender, national origin, age, membership in a labor organization, sexual orientation, political affiliation, marital status or disability. Further, it is recognized that the College has certain policies, programs, and goals for the utilization of local small business enterprises. The Parties shall jointly endeavor to assure that these commitments are fully met, and that any provisions of this Agreement which may appear to interfere within a local and small business enterprises successfully bidding for work within the scope of this Agreement shall be carefully reviewed, and adjustments made as may be appropriate and agreed upon among the Parties, to ensure full compliance with the spirit

and letter of the College's policies and commitment to its goals for the significant utilization of local and small businesses as direct Contractors or suppliers for Project Work.

Section 3.5 Employment of College Area Residents:

(a) The Unions and Employers agree that, to the maximum extent allowed by law, and as long as they possess the requisite skills and qualifications, the Unions will exert their best efforts to refer and/or recruit sufficient numbers of skilled craft "Local Residents" as defined herein, to fulfill the requirements of the Employers. In recognition of the fact that the College and the communities surrounding Project Work will be impacted by the construction of the Project, the parties agree to support the hiring of workers from the residents of these surrounding areas ("Area Residents"), as well as Veterans and students of the College which have received an AA/AS degree or who have completed and received a completion certificate from an apprenticeship preparation program utilizing the multi-craft core curriculum from the College or the Antelope Valley YouthBuild ("Student Graduates"). Towards that end, the Unions agree that they will exert their best efforts to encourage and provide referrals and utilization of qualified workers:

(i) First, Area Residents residing in those first tier zip codes which cover the College service area, as reflected on the attached list of zip codes, as well as Veterans and Student Graduates, regardless of where they reside;

(ii) If the Unions cannot provide the Employers in the attainment of a sufficient number of qualified workers from paragraph (i), above, the Unions will exert their best efforts to then recruit and identify for referral qualified workers residing within the greater Antelope Valley area, as reflected on the attached list of zip codes.

(iii) If the Unions still have not provided the Employers in the attainment of a sufficient number of qualified workers from paragraphs (i) and (ii), above, the Unions will then exert their best efforts to recruit and identify for referral qualified workers residing within the County of Los Angeles.

Qualified workers residing within any of these three (3) areas described above, as well as Veterans and Student Graduates, regardless of where they reside, shall be referred to as Local Residents.

(b) A goal of 40% of all of the labor and craft positions shall be from Local Residents described in (a) above. To facilitate the dispatch of Local Residents, all Contractors will be required to utilize the Craft Employee Request Form whenever they are requesting the referral of any employee from a Union referral list for any Project Work, a sample of which is attached as **Attachment "C."**

(c) The Community Workforce Coordinator shall work with the Unions and Contractors in the administration of this Local Resident preference; and the Contractors and Unions shall cooperate by maintaining adequate records to demonstrate to the Community Workforce Coordinator that such preferences have been pursued. As part of this process, and in

order to facilitate the contract administration procedures, as well as appropriate benefit fund coverage, all Contractors shall require their “core work force” and any other persons employed other than through the referral process, to register with the appropriate hiring hall, if any.

Section 3.6 Helmets to Hardhats: The Employers and the Unions recognize a desire to facilitate the entry into the building and construction trades of veterans who are interested in careers in the building and construction industry. The employers and Unions agree to utilize the services of the Center for Military Recruitment, Assessment and Veterans Employment (hereinafter “Center”) and the Center’s “Helmets to Hardhats” program to serve as a resource for preliminary orientation, assessment of construction aptitude, referral to apprenticeship programs or hiring halls, counseling and mentoring, support network, employment opportunities and other needs as identified by the Parties. For purposes of this Agreement, the term “Eligible Veteran” shall have the same meaning as the term “veteran” as defined under Title 5, Section 2108(1) of the United States Code as the same may be amended or re-codified from time to time. It shall be the responsibility of each qualified College resident to provide the Unions with proof of his/her status as an Eligible Veteran.

The Unions and Employers agree to coordinate with the Center to create and maintain an integrated database of veterans interested in working on this Project and of apprenticeship and employment opportunities for this Project. To the extent permitted by law, the Unions will give credit to such veterans for bona fide, provable past experience.

Section 3.7 Core Employees:

(a) Except as otherwise provided in separate collective bargaining agreement(s) to which the Contractor is signatory, Contractors may employ, as needed, first, a member of his core workforce, then an employee through a referral from the appropriate Union hiring hall, then a second core employee, then a second employee through the referral system, and so on until a maximum of five (5) core employees are employed, thereafter, all additional employees in the affected trade or craft shall be requisitioned from the craft hiring hall in accordance with Section 3.3. In the laying off of employees, the number of core employees shall not exceed one-half plus one of the workforce for an employer with ten (10) or fewer employees, assuming the remaining employees are qualified to undertake the work available. This provision applies only to Contractors who are not directly signatory to a current Schedule A Agreement for the craft worker in its employ and is not intended to limit the transfer provisions of the Schedule A Agreement of any trade. As part of this process, and in order to facilitate the contract administration procedures, as well as appropriate fringe benefit fund coverage, all Contractors shall require their core employees and any other persons employed other than through the referral process, to register with the appropriate Union hiring hall, if any, prior to their first day of employment at a project site.

(b) The core work force is comprised of those employees whose names appeared on the Contractor’s active payroll for sixty (60) of the one hundred (100) working days immediately before award of Project Work to the Contractor; who possess any license required by state or federal law for the Project Work to be performed; who have the ability to safely perform the basic functions of the applicable trade; and who have been residing within the zip codes within

the geographic area serviced by the College for the one hundred (100) working days immediately prior to the award of Project Work to the Contractor.

(c) Prior to each Contractor performing any work on the Project, each Contractor shall provide a list of his core employees to the Community Workforce Coordinator and the Council. Failure to do so will prohibit the Contractor from using any core employees. Upon request by any Party to this Agreement, the Contractor hiring any core employee shall provide satisfactory proof (i.e., payroll records, quarterly tax records, driver's license, voter registration, postal address and such other documentation) evidencing the core employee's qualification as a core employee to the Community Workforce Coordinator and the Council.

Section 3.8 Time for Referral: If any Union's registration and referral system does not fulfill the requirements for specific classifications requested by any Contractor within forty-eight (48) hours (excluding Saturdays, Sundays and holidays), that Contractor may use employment sources other than the Union registration and referral services, and may employ applicants meeting such standards from any other available source. The Contractors shall inform the Union of any applicants hired from other sources within forty-eight (48) hours of such applicant being hired, and such applicants shall register with the appropriate hiring hall, if any.

Section 3.9 Lack of Referral Procedure: If a signatory Union does not have a job referral system as set forth in Section 3.3 above, the Contractors shall give the Union equal opportunity to refer applicants. The Contractors shall notify the Union of employees so hired, as set forth in Section 3.5.

Section 3.10 Union Membership: No employee covered by this Agreement shall be required to join any Union as a condition of being employed, or remaining employed, for the completion of Project Work; provided, however, that any employee who is a member of the referring Union at the time of referral shall maintain that membership in good standing while employed under this Agreement. All employees shall, however, be required to comply with the union security provisions of the applicable Schedule A for the period during which they are performing on-site Project Work to the extent, as permitted by law, of rendering payment of an amount equal to the applicable monthly window and working dues uniformly required for membership in the Union.

Section 3.11 Individual Seniority: Except as provided in Section 4.3, individual seniority shall not be recognized or applied to employees working on the Project; provided, however, that group and/or classification seniority in a Union's Schedule A as of the effective date of this Agreement shall be recognized for purposes of layoffs.

Section 3.12 Foremen: The selection and number of craft foreman and/or general foreman shall be the responsibility of the Contractor. All foremen shall take orders exclusively from the designated Contractor representatives. Craft foreman shall be designated as working foreman at the request of the Contractors.

Section 3.13 College Security Requirements: The Parties are aware of the College's policy that Contractors and other employers shall not employ a person who would not be eligible for employment by the College under California Education Code, Section 45123. All persons

working on Project Work, including all employees hired by a Contractor (or referred by a Signatory Union) to work on Project Work, shall be required to comply with all criminal background check certification requirements and policies of College for those persons who may come in contact with, or work in close proximity to, minors in the course of performing work on a Project. Contractors may refuse to employ any person who declines to comply with College's background check requirements or who is otherwise determined to be disqualified from participating in Project Work because of a disqualifying conviction. Similarly, College may ban or order the immediate removal of any person disqualified from working in the presence of, or in close proximity to, minors.

ARTICLE 4 UNION ACCESS AND STEWARDS

Section 4.1 Access to Project Sites: Authorized representatives of the Union shall have access to Project Work, provided that they do not interfere with the work of employees and further provided that such representatives fully comply with posted visitor, security and safety rules.

Section 4.2 Stewards:

(a) Each signatory Union shall have the right to dispatch a working journeyperson as a steward for each shift, and shall notify the Contractor in writing of the identity of the designated steward or stewards prior to the assumption of such person's duties as steward. Such designated steward or stewards shall not exercise any supervisory functions. There will be no non-working stewards. Stewards will receive the regular rate of pay for their respective crafts.

(b) In addition to his/her work as an employee, the steward should have the right to receive, but not to solicit, complaints or grievances and to discuss and assist in the adjustment of the same with the employee's appropriate supervisor. Each steward should be concerned only with the employees of the steward's Contractor and, if applicable, subcontractor(s), and not with the employees of any other Contractor. A Contractor will not discriminate against the steward in the proper performance of his/her Union duties.

(c) When a Contractor has multiple, non-contiguous work locations at one site, the Contractor may request and the Union shall appoint such additional working stewards as the Contractor requests to provide independent coverage of one or more such locations. In such cases, a steward may not service more than one work location without the approval of the Contractor.

(d) The stewards shall not have the right to determine when overtime shall be worked or who shall work overtime.

Section 4.3 Steward Layoff/Discharge: The relevant Contractor agrees to notify the appropriate Union twenty-four (24) hours before the layoff of a steward, except in the case of disciplinary discharge for just cause. If the steward is protected against such layoff by the provisions of the applicable Schedule A, such provisions shall be recognized when the steward

possesses the necessary qualifications to perform the remaining work. In any case in which the steward is discharged or disciplined for just cause, the appropriate Union will be notified immediately by the Contractor, and such discharge or discipline shall not become final (subject to any later filed grievance) until twenty-four (24) hours after such notice has been given.

Section 4.4 Employees on Non-Project Work: On work where the personnel of the College may be working in close proximity to the construction activities covered by this Agreement, the Union agrees that the Union representatives, stewards, and individual workers will not interfere with the College personnel, or with personnel employed by the any other employer not a Party to this Agreement.

ARTICLE 5 WAGES AND BENEFITS

Section 5.1 Wages: All employees covered by this Agreement shall be classified in accordance with work performed and paid by the Contractors the hourly wage rates for those classifications in compliance with the applicable prevailing wage rate determination established pursuant to applicable law. If a prevailing rate increases under law, the Contractor shall pay that rate as of its effective date under the law. Notwithstanding any other provision of this Agreement, this Agreement does not relieve Contractors directly signatory to one or more of the Schedule A Agreements from paying all wages set forth in such Agreements.

Section 5.2 Benefits:

(a) Contractors shall pay contributions to the established employee benefit funds in the amounts designated in the appropriate Schedule A and make all employee authorized deductions in the amounts designated in the appropriate Schedule A; provided, however, that such contributions shall not exceed the contribution amounts set forth in the applicable prevailing wage determination. Notwithstanding any other provision of this Agreement, Contractors directly signatory to one or more of the Schedule A Agreements are required to make all contributions set forth in those Schedule A Agreements without reference to the forgoing. Bona fide benefit plans with joint trustees or authorized employee deduction programs established or negotiated under the applicable Schedule A or by the Parties to this Agreement during the life of this Agreement may be added.

(b) The Contractor adopts and agrees to be bound by the written terms of the applicable, legally established, trust agreement(s) specifying the detailed basis on which payments are to be made into, and benefits paid out of, such trust funds for its employees. The Contractor authorizes the Parties to such trust funds to appoint trustees and successor trustees to administer the trust funds and hereby ratifies and accepts the trustees so appointed as if made by the Contractor.

(c) Each Contractor and subcontractor is required to certify to the Community Workforce Coordinator that it has paid all benefit contributions due and owing to the appropriate Trust(s) prior to the receipt of its final payment and/or retention. Further, upon timely notification by a Union to the Community Workforce Coordinator, the Community Workforce

Coordinator shall work with any prime Contractor or subcontractor who is delinquent in payments to assure that proper benefit contributions are made, to the extent of requesting the College or the prime Contractor to withhold payments otherwise due such Contractor, until such contributions have been made or otherwise guaranteed.

Section 5.3 Wage Premiums: Wage premiums, including but not limited to pay based on height of work, hazard pay, scaffold pay and special skills shall not be applicable to work under this Agreement, except to the extent provided for in any applicable prevailing wage determination.

Section 5.4 Compliance with Prevailing Wage Laws: The Parties agree that the Community Workforce Coordinator shall monitor the compliance by all Contractors and subcontractors with all applicable federal and state prevailing wage laws and regulations, and that such monitoring shall include Contractors engaged in what would otherwise be Project Work but for the exceptions to Agreement coverage in Section 2.2. All complaints regarding possible prevailing wage violations shall be referred to the Community Workforce Coordinator for processing, investigation and resolution, and if not resolved within thirty (30) calendar days, may be referred by any party to the state labor commissioner.

ARTICLE 6 HOURS OF WORK, OVERTIME, SHIFTS AND HOLIDAYS

Section 6.1 Hours of Work: Eight (8) hours per day between the hours of 6:00 a.m. and 5:30 p.m., plus one-half (½) hour unpaid lunch approximately mid-way through the shift, shall constitute the standard work day. Forty (40) hours per week shall constitute a regular week's work. The work week will start on Sunday and conclude on Saturday. The foregoing provisions of this Article are applicable unless otherwise provided in the applicable prevailing wage determination, or unless changes are permitted by law and such are agreed upon by the Parties. Nothing herein shall be construed as guaranteeing any employee eight (8) hours per day or forty (40) hours per week, or a Monday through Friday work standard work schedule.

Section 6.2 Place of Work: Employees shall be at their place of work (as designated by the Contractor) at the starting time and shall remain at their place of work, performing their assigned functions, until quitting time. The place of work is defined as the gang or tool box or equipment at the employee's assigned work location or the place where the foreman gives instructions. The Parties reaffirm their policy of a fair day's work for a fair day's wage. There shall be no pay for time not worked unless the employee is otherwise engaged at the direction of the Contractor.

Section 6.3 Overtime: Overtime shall be paid in accordance with the requirements of the applicable prevailing wage determination. There shall be no restriction on the Contractor's scheduling of overtime or the nondiscriminatory designation of employees who will work overtime. There shall be no pyramiding of overtime (payment of more than one form of overtime compensation for the same hour) under any circumstances.

Section 6.4 Shifts and Alternate Work Schedules:

(a) Alternate starting and quitting time and/or shift work may be performed at the option of the Contractor upon three (3) days' prior notice to the affected Union(s), unless a shorter notice period is provided for in the applicable Schedule A, and shall continue for a period of not less than five (5) working days. Saturdays and Sundays, if worked, may be used for establishing the five (5) day minimum work shift. If two shifts are worked, each shall consist of eight (8) hours of continuous work exclusive of a one-half (½) hour non-paid lunch period, for eight (8) hours pay. The last shift shall start on or before 6:00 p.m. The first shift starting at or after 6:00 a.m. is designated as the first shift, with the second shift following.

(b) Contractors, the Council and the Union recognize the economic impact upon the College and College residents of the massive Project being undertaken by the College and agree that all Parties to this Agreement desire and intend Project Work to be undertaken in a cost efficient and effective manner to the highest standard of quality and craftsmanship. Recognizing the economic conditions, the Parties agree that, except to the extent permitted by law, employees performing Project Work shall not be entitled to any differentials or additional pay based upon the shift or work schedule of the employees. Instead, all employees working on Project Work shall be paid at the same base rate regardless of shift or work schedule worked.

(c) Because of operational necessities, the second shift may, at the College's direction, be scheduled without the preceding shift having been worked. It is recognized that the College's operations and/or mitigation obligations may require restructuring of normal work schedules. Except in an emergency or when specified in the College's bid specification, the Contractor shall give affected Union(s) at least three (3) days' notice of such schedule changes.

Section 6.5 Holidays: Recognized holidays on this Project shall be those set forth and governed by the prevailing wage determination(s) applicable to this Project, unless or until such may be, and are, revised by mutual agreement of the Parties to this Agreement.

Section 6.6 Show-up Pay:

(a) Except as otherwise required by State law, Employees reporting for work and for whom no work is provided, except when given prior notification not to report to work, shall receive two (2) hours pay at the regular straight time hourly rate. Employees who are directed to start work shall receive four (4) hours of pay at the regular straight time hourly rate. Employees who work beyond four (4) hours shall be paid for actual hours worked. Whenever reporting pay is provided for employees, they will be required to remain at the Project Site and available for work for such time as they receive pay, unless released earlier by the principal supervisor of the Contractor(s) or his/her designated representative. Each employee shall furnish his/her Contractor with his/her current address and telephone number, and shall promptly report any changes to the Contractor.

(b) An employee called out to work outside of his/her shift shall receive a minimum of two (2) hours pay at the appropriate rate. This does not apply to time worked as an extension of (before or after) the employee's normal shift.

(c) When an employee leaves the job or work location of his/her own volition, or is discharged for cause or is not working as a result of the Contractor's invocation of Article XII, Section 12.3, the employee shall only be paid for actual time worked.

Section 6.7 Meal Periods: The Contractor will schedule a meal period of no more than one-half hour duration at the work location at approximately mid-point of the schedule shift; provided, however, that the Contractor may, for efficiency of the operation, establish a schedule which coordinates the meal periods of two or more crafts. An employee may be required to work through his meal period because of an emergency or a threat to life or property, or for such other reasons as are in the applicable Schedule A, and if he is so required, he shall be compensated in the manner established in the applicable Schedule A.

Section 6.8 Make-up Days: To the extent permitted by the applicable general wage determination, when an employee has been prevented from working for reasons beyond the control of the employer, including, but not limited to inclement weather or other natural causes, during the regularly scheduled work week, a make-up day may be worked on a non-regularly scheduled work day for which an employee shall receive eight (8) hours pay at the straight time rate of pay or any premium rate required for such hours under the prevailing wage law.

ARTICLE 7 WORK STOPPAGES AND LOCK-OUTS

Section 7.1 No Work Stoppages or Disruptive Activity: The Council and the Unions agree that neither they, and each of them, nor their respective officers or agents or representatives, shall incite or encourage, condone or participate in any strike, walk-out, slow-down, picketing, observing picket lines or other activity of any nature or kind whatsoever, for any cause or dispute whatsoever with respect to or in any way related to Project Work, or which interferes with or otherwise disrupts Project Work, or with respect to or related to the College or Contractors or subcontractors, including, but not limited to economic strikes, unfair labor practice strikes, safety strikes, sympathy strikes and jurisdictional strikes whether or not the underlying dispute is subject to arbitration. Any such actions by the Council, or Unions, or their members, agents, representatives or the employees they represent shall constitute a violation of this Agreement. The Council and the Union shall take all steps necessary to obtain compliance with this Article and neither should be held liable for conduct for which it is not responsible.

Section 7.2 Employee Violations: The Contractor may discharge any employee violating Section 7.1 above and any such employee will not be eligible for rehire under this Agreement.

Section 7.3 Standing to Enforce: The College, the Community Workforce Coordinator, or any Contractor affected by an alleged violation of Section 7.1 shall have standing and the right to enforce the obligations established therein.

Section 7.4 Expiration of Schedule A's: If the Schedule A Agreement, or any local, regional, and other applicable collective bargaining agreements expire during the term of the Project, the Union(s) agree that there shall be no work disruption of any kind as described in Section 7.1 above as a result of the expiration of any such agreement(s) having application on this Project

and/or failure of the involved Parties to that agreement to reach a new contract. Terms and conditions of employment established and set at the time of bid shall remain established and set. Otherwise to the extent that such agreement does expire and the Parties to that agreement have failed to reach concurrence on a new contract, work will continue on the Project on one of the following two (2) options, both of which will be offered by the Unions involved to the Contractors affected:

(a) Each of the Unions with a contract expiring must offer to continue working on the Project under interim agreements that retain all the terms of the expiring contract, except that the Unions involved in such expiring contract may each propose wage rates and employer contribution rates to employee benefit funds under the prior contract different from what those wage rates and employer contributions rates were under the expiring contracts. The terms of the Union's interim agreement offered to Contractors will be no less favorable than the terms offered by the Union to any other employer or group of employers covering the same type of construction work in Los Angeles County.

(b) Each of the Unions with a contract expiring must offer to continue working on the Project under all the terms of the expiring contract, including the wage rates and employer contribution rates to the employee benefit funds, if the Contractor affected by that expiring contract agrees to the following retroactive provisions: if a new Schedule A Agreement, local, regional or other applicable labor agreement for the industry having application at the Project is ratified and signed during the term of this Agreement and if such new labor agreement provides for retroactive wage increases, then each affected Contractor shall pay to its employees who performed work covered by this Agreement at the Project during the hiatus between the effective dates of such expired and new labor agreements, an amount equal to any such retroactive wage increase established by such new labor agreement, retroactive to whatever date is provided by the new labor agreement for such increase to go into effect, for each employee's hours worked on the Project during the retroactive period. All Parties agree that such affected Contractors shall be solely responsible for any retroactive payment to its employees.

(c) Some Contractors may elect to continue to work on the Project under the terms of the interim agreement option offered under paragraph (a) above and other Contractors may elect to continue to work on the Project under the retroactivity option offered under paragraph (b) above. To decide between the two options, Contractors will be given one week after the particular labor agreement has expired or one week after the Union has personally delivered to the Contractors in writing its specific offer of terms of the interim agreement pursuant to paragraph (a) above, whichever is the later date. If the Contractor fails to timely select one of the two options, the Contractor shall be deemed to have selected option (b).

Section 7.5 No Lockouts: Contractors shall not cause, incite, encourage, condone or participate in any lock-out of employees with respect to Project Work during the term of this Agreement. The term "lock-out" refers only to a Contractor's exclusion of employees in order to secure collective bargaining advantage, and does not refer to the discharge, termination or layoff of employees by the Contractor for any reason in the exercise of rights pursuant to any provision of this Agreement, or any other agreement, nor does "lock-out" include the College's decision to stop, suspend or discontinue any Project Work or any portion thereof for any reason.

Section 7.6 Best Efforts to End Violations:

(a) If a Contractor contends that there is any violation of this Article or Section 8.3, it shall notify, in writing, the Executive Secretary of the Council, the Senior Executive of the involved Union(s) and the Community Workforce Coordinator. The Executive Secretary and the leadership of the involved Union(s) will immediately instruct, order and use their best efforts to cause the cessation of any violation of the relevant Article.

(b) If the Union contends that any Contractor has violated this Article, it will notify the Contractor and the Community Workforce Coordinator, setting forth the facts which the Union contends violate the Agreement, at least twenty-four (24) hours prior to invoking the procedures of Section 7.8. The Community Workforce Coordinator shall promptly order the involved Contractor(s) to cease any violation of the Article.

Section 7.7 Withholding of services for failure to pay wages and fringe benefits:

Notwithstanding any provision of this Agreement to the contrary, it shall not be a violation of this Agreement for any Union to withhold the services of its members (but not the right to picket) from a particular Contractor who:

(a) fails to timely pay its weekly payroll; or

(b) fails to make timely payments to the Union's Joint Labor/Management Trust Funds in accordance with the provisions of the applicable Schedule A Agreements. Prior to withholding its members' services for the Contractor's failure to make timely payments to the Union's Joint Labor/Management Trust Funds, the Union shall give at least ten (10) days (unless a lesser period of time is provided in the Union's Schedule A Agreement, but in no event less than forty-eight (48) hours) written notice of such failure to pay by registered or certified mail, return receipt requested, and by facsimile transmission to the involved Contractor and the College. Union will meet within the ten (10) day period to attempt to resolve the dispute.

(c) Upon the payment of the delinquent Contractor of all monies due and then owing for wages and/or fringe benefit contributions, the Union shall direct its members to return to work and the Contractor shall return all such members back to work.

Section 7.8 Expedited Enforcement Procedure: Any party, including the College, which is an intended beneficiary of this Article, or the Community Workforce Coordinator, may institute the following procedures, in lieu of or in addition to any other action at law or equity, when a breach of Section 7.1, 7.5 or Section 8.3 is alleged.

(a) The party invoking this procedure shall notify Lou Zigman, who has been selected by the negotiating Parties, and whom the Parties agree shall be the permanent arbitrator under this procedure. If the permanent arbitrator is unavailable at any time, the party invoking this procedure shall notify one of the alternates selected by the Parties, in that order on an alternating basis. Notice to the arbitrator shall be by the most expeditious means available, with notices to the Parties alleged to be in violation, and to the Council if it is a Union alleged to be in

violation. For purposes of this Article, written notice may be given by telegram, facsimile, hand-delivery or overnight mail and will be deemed effective upon receipt.

(b) Upon receipt of said notice, the arbitrator named above or his/her alternate shall sit and hold a hearing within twenty-four (24) hours if it is contended that the violation still exists, but not sooner than twenty-four (24) hours after notice has been dispatched to the Council of the involved Union(s) and/or Contractor as required by Section 8.6, above.

(c) The arbitrator shall notify the Parties of the place and time chosen for this hearing. Said hearing shall be completed in one session, which, with appropriate recesses at the arbitrator's discretion, shall not exceed twenty-four (24) hours unless otherwise agreed upon by all Parties. A failure of any Party or Parties to attend said hearings shall not delay the hearing of evidence or the issuance of any award by the arbitrator.

(d) The sole issue at the hearing shall be whether or not a violation of Sections 7.1, 7.5 or Section 8.3 has in fact occurred. The arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation or to award damages. The Award shall be issued in writing within three (3) hours after the close of the hearing, and may be issued without an opinion. If any party desires a written opinion, one shall be issued within fifteen (15) days, but its issuance shall not delay compliance with, or enforcement of, the Award. The arbitrator may order cessation of the violation of the Article and other appropriate relief, and such Award, upon issuance, shall be served on all Parties by hand or registered mail.

(e) Such Award shall be final and binding on all Parties and may be enforced by any court of competent jurisdiction upon the filing of this Agreement and all other relevant documents referred to herein above in the following manner. Written notice of the filing of such enforcement proceedings shall be given to the other party. In any judicial proceeding to obtain a temporary order enforcing the arbitrator's Award as issued under Section 7.8(d) of this Article, all Parties waive the right to a hearing and agree that such proceedings may be ex parte. Such agreement does not waive any Party's right to participate in a hearing for a final order of enforcement. The court's order or orders enforcing the arbitrator's award shall be served on all Parties by hand or by delivery to their address as shown on this Agreement (for a Union), as shown in their business contract for work under this Agreement (for a Contractor) and to the representing Union (for an employee), by certified mail by the Party or Parties first alleging the violation.

(f) Any rights created by statute or law governing arbitration proceedings inconsistent with the above procedure or which interfere with compliance hereto are hereby waived by the Parties to whom they accrue.

(g) The fees and expenses of the arbitrator shall be equally divided between the party or Parties initiating this procedure and the respondent Party or Parties.

ARTICLE 8 WORK ASSIGNMENTS AND JURISDICTIONAL DISPUTES

Section 8.1 Assignment of Work: The assignment of Project Work will be solely the responsibility of the Employer performing the work involved; and such work assignments will be in accordance with the Plan for the Settlement of Jurisdictional Disputes in the Construction Industry (the “Plan”) or any successor Plan.

Section 8.2 The Plan: All jurisdictional disputes on this Project between or among the building and construction trades Unions and the Employers parties to this Agreement, shall be settled and adjusted according to the present Plan established by the Building and Construction Trades Department or any other plan or method of procedure that may be adopted in the future by the Building and Construction Trades Department. Decisions rendered shall be final, binding and conclusive on the Employers and Unions parties to this Agreement.

(a) If a dispute arising under this Article involves the Southwest Regional Council of Carpenters or any of its subordinate bodies, an Arbitrator shall be chosen by the procedures specified in Article V, Section 5, of the Plan from a list composed of John Kagel, Thomas Angelo, Robert Hirsch, and Thomas Pagan, and the Arbitrator’s hearing on the dispute shall be held at the offices of the applicable Building and Construction Trades Council within fourteen (14) days of the selection of the Arbitrator. All other procedures shall be as specified in the Plan.

Section 8.3 No Work Disruption Over Jurisdiction: All jurisdictional disputes shall be resolved without the occurrence of any strike, work stoppage, or slow-down of any nature, and the Employer’s assignment shall be adhered to until the dispute is resolved. Individuals violating this section shall be subject to immediate discharge.

Section 8.4 Pre-Job Conferences: As provided in Article 16, each Employer will conduct a pre-job conference with the Council prior to commencing work. The Primary Employer and the Owner will be advised in advance of all such conferences and may participate if they wish. Pre-job conferences for different Employers may be held together.

Section 8.5 Resolution of Jurisdictional Disputes: If any actual or threatened strike, sympathy strike, work stoppage, slow down, picketing, hand-billing or otherwise advising the public that a labor dispute exists, or interference with the progress of Project Work by reason of a jurisdictional dispute or disputes occurs, the Parties shall exhaust the expedited procedures set forth in the Plan, if such procedures are in the plan then currently in effect, or otherwise as in Article 7 above.

ARTICLE 9 MANAGEMENT RIGHTS

Section 9.1 Contractor and College Rights: The Contractors and the College have the sole and exclusive right and authority to oversee and manage construction operations on Project Work without any limitations unless expressly limited by a specific provision of this Agreement. In addition to the following and other rights of the Contractors enumerated in this Agreement,

the Contractors expressly reserve their management rights and all the rights conferred upon them by law. The Contractor's rights include, but are not limited to, the right to:

- (a) Plan, direct and control operations of all work;
- (b) Hire, promote, transfer and layoff their own employees, respectively, as deemed appropriate to satisfy work and/or skill requirements;
- (c) Promulgate and require all employees to observe reasonable job rules and security and safety regulations;
- (d) Discharge, suspend or discipline their own employees for just cause;
- (e) Utilize, in accordance with College approval, any work methods, procedures or techniques, and select, use and install any types or kinds of materials, apparatus or equipment, regardless of source of manufacture or construction; assign and schedule work at their discretion; and
- (f) Assign overtime, determine when it will be worked and the number and identity of employees engaged in such work, subject to such provisions in the applicable Schedule A(s) requiring such assignments be equalized or otherwise made in a nondiscriminatory manner.

Section 9.2 Specific College Rights: In addition to the following and other rights of the College enumerated in this Agreement, the College expressly reserves its management rights and all the rights conferred on it by law. The College's rights (and those of the Contractor Administrator on its behalf) include but are not limited to the right to:

- (a) Inspect any construction site or facility to ensure that the Contractor follows the applicable safety and other work requirements;
- (b) Require Contractors to establish a different work week or shift schedule for particular employees as required to meet the operational needs of the Project Work at particular locations;
- (c) At its sole option, terminate, delay and/or suspend any and all portions of the Project Work at any time; prohibit some or all work on certain days or during certain hours of the day to accommodate the ongoing operations of the College's educational facilities and/or to mitigate the effect of ongoing Project Work on businesses and residents in the neighborhood of the Project site; and/or require such other operational or schedule changes it deems necessary, in its sole judgment, to effectively maintain its primary mission and remain a good neighbor to those in the area of its facilities. (In order to permit the Contractors and Unions to make appropriate scheduling plans, the College will provide the Community Workforce Coordinator, and the affected Contractor(s) and Union(s) with reasonable notice of any changes it requires pursuant to this section; provided, however, that if notice is not provided in time to advise employees not to report for work, show-up pay shall be due pursuant to the provision of Article 6, Section 6.6);

(d) Approve any work methods, procedures and techniques used by Contractors whether or not these methods, procedures or techniques are part of industry practices or customs; and

(e) Investigate and process complaints, through its Community Workforce Coordinator, in the matter set forth in Articles 7 and 10.

Section 9.3 Use of Materials: There should be no limitations or restriction by Union upon a Contractor's choice of materials or design, nor, regardless of source or location, upon the full use and utilization, of equipment, machinery, packaging, precast, prefabricated, prefinished, or preassembled materials, tools or other labor saving devices, subject to the application of the State Public Contracts and Labor Codes as required by law in reference to offsite construction. Generally, the onsite installation or application of such items shall be performed by the craft having jurisdiction over such work. The College and its Community Workforce Coordinator shall advise all Contractors of, and enforce as appropriate, the off-site application of the prevailing wage law as it affects Project Work.

Section 9.4 Special Equipment, Warranties and Guaranties:

(a) It is recognized that certain equipment of a highly technical and specialized nature may be installed at Project Work sites. The nature of the equipment, together with the requirements for manufacturer's warranties, may dictate that it be prefabricated, pre-piped and/or pre-wired and that it be installed under the supervision and direction of the College's and/or manufacturer's personnel. The Unions agree to install such equipment without incident.

(b) The Parties recognize that the Contractor will initiate from time to time the use of new technology, equipment, machinery, tools, and other labor-savings devices and methods of performing Project Work. The Union agrees that they will not restrict the implementation of such devices or work methods. The Unions will accept and will not refuse to handle, install or work with any standardized and/or catalogue: parts, assemblies, accessories, prefabricated items, preassembled items, partially assembled items, or materials whatever their source of manufacture or construction.

(c) If any disagreement between the Contractor and the Unions concerning the methods of implementation or installation of any equipment, or device or item, or method of work, arises, or whether a particular part or pre-assembled item is a standardized or catalog part or item, the work will precede as directed by the Contractor and the Parties shall immediately consult over the matter. If the disagreement is not resolved, the affected Union(s) shall have the right to proceed through the procedures set forth in Article 10.

ARTICLE 10 SETTLEMENT OF GRIEVANCES AND DISPUTES

Section 10.1 Cooperation and Harmony on Site:

(a) This Agreement is intended to establish and foster continued close cooperation between management and labor. The Council shall assign a representative to this Project for the purpose of assisting the Unions, and working with the Community Workforce Coordinator, together with the Contractors, to complete the construction of the Project economically, efficiency, continuously and without any interruption, delays or work stoppages.

(b) The Community Workforce Coordinator, the Contractors, Unions, and employees collectively and individually, realize the importance to all Parties of maintaining continuous and uninterrupted performance Project Work, and agree to resolve disputes in accordance with the grievance provisions set forth in this Article or, as appropriate, those of Article 7 or 8.

(c) The Community Workforce Coordinator shall oversee the processing of grievances under this Article and Articles 7 and 8, including the scheduling and arrangements of facilities for meetings, selection of the arbitrator from the agreed-upon panel to hear the case, and any other administrative matters necessary to facilitate the timely resolution of any dispute; provided, however, it is the responsibility of the principal parties to any pending grievance to insure the time limits and deadlines are met.

Section 10.2 Processing Grievances: Any questions arising out of and during the term of this Agreement involving its interpretation and application, which includes applicable provisions of the Schedule A's, but not jurisdictional disputes or alleged violations of Section 7.1 and 7.5 and similar provisions, shall be considered a grievance and subject to resolution under the following procedures.

Step 1. Employee Grievances: When any employee subject to the provisions of this Agreement feels aggrieved by an alleged violation of this Agreement, the employee shall, through his Union business representative or, job steward, within ten (10) working days after the occurrence of the violation, give notice to the work site representative of the involved Contractor stating the provision(s) alleged to have been violated. A business representative of the Union or the job steward and the work site representative of the involved Contractor shall meet and endeavor to adjust the matter within ten (10) working days after timely notice has been given. If they fail to resolve the matter within the prescribed period, the grieving party may, within ten (10) working days thereafter, pursue Step 2 of this grievance procedure provided the grievance is reduced to writing, setting forth the relevant information, including a short description thereof, the date on which the alleged violation occurred, and the provision(s) of the Agreement alleged to have been violated. Grievances and disputes settled at Step 1 shall be non-precedential except as to the parties directly involved.

Union or Contractor Grievances: Should the Union(s) or any Contractor have a dispute with the other Party(ies) and, if after conferring within ten (10) working days after the disputing Party knew or should have known of the facts or occurrence giving rise to the dispute, a settlement is not reached within five (5) working days, the dispute shall be reduced to writing and processed to Step 2 in the same manner as outlined in 1(a) above for the adjustment of an employee complaint.

Step 2. The business manager of the involved Union or his designee, together with the site representative of the involved Contractor, and the labor relations representative of the Community Workforce Coordinator, shall meet within seven (7) working days of the referral of the dispute to this second step to arrive at a satisfactory settlement thereof. If the Parties fail to reach an agreement, the dispute may be appealed in writing in accordance with the provisions of Step 3 within seven (7) calendar days after the initial meeting at Step 2.

Step 3. (a) If the grievance shall have been submitted but not resolved under Step 2, either the Union or Contractor Party may request in writing to the Community Workforce Coordinator (with copy (ies) to the other Party (ies)) within seven (7) calendar days after the initial Step 2 meeting, that the grievance be submitted to an arbitrator selected from the agreed upon list below, on a rotational basis in the order listed. Those arbitrators are: (1) Louis Zigman; (2) Sara Adler; (3) Fredric Horowitz; (4) Edna Francis; (5) William Rule; (6) Walt Daugherty; and (7) Michael Rappaport. The decision of the arbitrator shall be final and binding on all Parties and the fee and expenses of such arbitrations shall be borne equally by the involved Contractor(s) and the involved Union(s).

(b) Failure of the grieving Party to adhere to the time limits established herein shall render the grievance null and void. The time limits established herein may be extended only by written consent of the Parties involved at the particular step where the extension is agreed upon. The arbitrator shall have the authority to make decisions only on issues presented and shall not have the authority to change, amend, add to or detract from any of the provisions of this Agreement.

(c) The fees and expenses incurred by the arbitrator, as well as those jointly utilized by the Parties (i.e., conference room, court reporter, etc.) in arbitration, shall be divided equally by the Parties to the arbitration, including Union(s) and Contractor(s) involved.

Section 10.3 Limit on Use of Procedures: Procedures contained in this Article shall not be applicable to any alleged violation of Articles 7 or 8, with a single exception that any employee discharged for violation of Section 7.2, or Section 8.3, may resort to the procedures of this Article to determine only if he/she was, in fact, engaged in that violation.

Section 10.4 Notice: The Community Workforce Coordinator (and the College, in the case of any grievance regarding the Scope of this Agreement) shall be notified by the involved Contractor of all actions at Steps 2 and 3, and further, the Community Workforce Coordinator shall, upon its own request, be permitted to participate fully as a party in all proceedings at such steps.

ARTICLE 11 REGULATORY COMPLIANCE

Section 11.1 Compliance with All Laws: The Council and all Unions, Contractors, subcontractors and their employed shall comply with all applicable federal and state laws, ordinances and regulations including, but not limited to, those relating to safety and health, employment and applications for employment. All employees shall comply with the safety

regulations established by the College, the Community Workforce Coordinator or the Contractor. Employees must promptly report any injuries or accidents to a supervisor.

Section 11.2 Monitoring Compliance: The Parties agree that the College shall require, and that the Community Workforce Coordinator and Council shall monitor, compliance by all Contractors and subcontractors with all federal and state laws regulation that, from time to time may apply to Project Work. It shall be the responsibility of both the Council and the Community Workforce Coordinator (on behalf of the College) to investigate or monitor compliance with these various laws and regulations. The Council may recommend to the Community Workforce Coordinator and/or the College procedures to encourage and enforce compliance with these laws and regulations.

Section 11.3 Prevailing Wage Compliance: The Council or Union shall refer all complaints regarding any potential prevailing wage violation to the Community Workforce Coordinator, who on its own, or with the assistance of the College's labor compliance program, shall process, investigate and resolve such complaints, consistent with Article 5, Section 5.4. The Council or Union, as appropriate, shall be advised in a timely manner with regard to the facts and resolution, if any, of any complaint. It is understood that this Section does not restrict any individual rights as established under the State Labor Code, including the rights of an individual to file a complaint with the State Labor Commissioner or to file a grievance for such violation under the grievance procedure set forth in this Agreement.

Section 11.4 Violations of Law: Based upon a finding of violation by the College of a federal and state law, and upon notice to the Contractor that it or its subcontractors are in such violation, the College, in the absence of the Contractor or subcontractor remedying such violation, shall take such action as it is permitted by law or contract to encourage that Contractor to come into compliance, including, but not limited to, assessing fines and penalties, and/or removing the offending Contractor from Project Work. Additionally, in accordance with the Agreement between the College and the Contractor, the College may cause the Contractor to remove from Project Work any subcontractor who is in violation of state or federal law.

ARTICLE 12 SAFETY AND PROTECTION OF PERSON AND PROPERTY

Section 12.1 Safety:

(a) It shall be the responsibility of each Contractor to ensure safe working conditions and employee compliance with any safety rules contained herein or established by the College, the Community Workforce Coordinator or the Contractor. It is understood that employees have an individual obligation to use diligent care to perform their work in a safe manner and to protect themselves and the property of the Contractor and the College.

(b) Employees shall be bound by the safety, security and visitor rules established by the Contractor, the Community Workforce Coordinator and/or the College. These rules will be published and posted. An employee's failure to satisfy his/her obligations under this section will subject him/her to discipline, up to and including discharge.

(c) The Parties to this Agreement adopt the Los Angeles/Orange Counties Building and Construction Trades Council Approved Drug and Alcohol Testing Policy, a copy of which is attached hereto as **Attachment “D,”** and which shall be the policy and procedure utilized under this Agreement.

Section 12.2 Suspension of Work for Safety: A Contractor may suspend all or a portion of the job to protect the life and safety of employees. In such cases, employees will be compensated only for the actual time worked; provided, however, that where the Contractor requests employees to remain at the site and be available for work, the employees will be compensated for stand-by time at their basic hourly rate of pay.

Section 12.3 Water and Sanitary Facilities: The Contractor shall provide adequate supplies of drinking water and sanitary facilities for all employees as required by state law or regulation.

ARTICLE 13 TRAVEL AND SUBSISTENCE

Travel expenses, travel time, subsistence allowances, zone rates and parking reimbursements shall be paid in accordance with the applicable Schedule A Agreement unless superseded by the applicable prevailing wage determination.

ARTICLE 14 APPRENTICES

Section 14.1 Importance of Training: The Parties recognize the need to maintain continuing support of the programs designed to develop adequate numbers of competent workers in the construction industry, the obligation to capitalize on the availability of the local work force in the area served by the College, and the opportunities to provide continuing work under the construction program. To these ends, the Parties will facilitate, encourage, and assist local residents to commence and progress in Labor/Management Apprenticeship and/or training Programs in the construction industry leading to participation in such apprenticeship programs. The College, the Community Workforce Coordinator, other College consultants, and the Council, will work cooperatively to identify, or establish and maintain, effective programs and procedures for persons interested in entering the construction industry and which will help prepare them for the formal joint labor/management apprenticeship programs maintained by the signatory Unions.

Section 14.2 Use of Apprentices:

(a) Apprentices used on Projects under this Agreement shall be registered in Joint Labor Management Apprenticeship Programs approved by the State of California. Apprentices may comprise up to thirty percent (30%) of each craft’s work force at any time, unless the standards of the applicable joint apprenticeship committee confirmed by the Division of Apprenticeship Standards (“DAS”), establish a lower or higher maximum percentage, and where such is the case, the applicable Union should use its best efforts with the Joint Labor

Management apprenticeship committee and, if necessary, the DAS to permit up to thirty percent (30%) apprentices on the Project.

(b) The Unions agree to cooperate with the Contractor in furnishing apprentices as requested up to the maximum percentage. The apprentice ratio for each craft shall be in compliance, at a minimum, with the applicable provisions of the Labor Code relating to utilization of apprentices. The College shall encourage such utilization, and, both as to apprentices and the overall supply of experienced workers, the Community Workforce Coordinator will work with the Council to assure appropriate and maximum utilization of apprentices and the continuing availability of both apprentices and journey persons.

(c) The Parties agree that apprentices will not be dispatched to Contractors working under this Agreement unless there is a journeyman working on the project where the apprentice is to be employed who is qualified to assist and oversee the apprentice's progress through the program in which he is participating.

(d) All apprentices shall work under the direct supervision of a journeyman from the trade in which the apprentice is indentured. A journeyman shall be defined as set forth in the California Code of Regulations, Title 8 [apprenticeship], Section 205, which defines a journeyman as a person who has either completed an accredited apprenticeship in his or her craft, or has completed the equivalent of an apprenticeship in length and content of work experience and all other requirements in the craft which has workers classified as journeyman in the apprenticeship occupation. Should a question arise as to a journeyman's qualification under this subsection, the Contractor shall provide adequate proof evidencing the worker's qualification as a journeyman to the Construction Manager and the Council.

ARTICLE 15

WORK OPPORTUNITIES PROGRAM

Section 15.1 The Parties to this Agreement support the development of increased numbers of skilled construction workers from among Area Residents to meet the labor needs of the Project, specifically, and the requirements of the local construction industry generally. Towards that end the Parties agree to cooperate respecting the establishment of a work opportunities program for Area Residents, the primary goals of which shall be to maximize construction work opportunities for traditionally underrepresented members of the community. In furtherance of the foregoing, the Unions specifically agree to:

a) Encourage the referral and utilization, to the extent permitted by law and hiring hall practices, of qualified Area Residents as journeymen, and apprentices on the Project and entrance into such qualified apprenticeship and training programs as may be operated by signatory Unions; and

b) Work cooperatively with the College and other College consultants to identify, or establish and maintain, effective programs, events and procedures for persons interested in entering the construction industry; and

- c) Participate in College based job fairs, career days and outreach events; and
- d) Provide speakers to speak at College programs and Academies as requested; and
- e) Assist Area Residents in contacting pre-apprenticeship programs that utilize the Building Trades multi-craft core curriculum (MC3) and the Apprenticeship Training Committees for the crafts and trades they are interested in. The Unions shall assist Area Residents who are seeking Union jobs on the Project and Union membership in assessing their work experience and giving them credit for provable past experience in their relevant craft or trade, including experience gained working for non-union Contractors. The Unions shall put on their rolls qualified bona fide Area Residents for work on this Project; and
- f) Allow tours of their JACs as requested; and
- g) Provide a contact information list for all Union representatives and Joint Apprenticeship Committee representatives; and
- h) Support local events and programs designed to recruit and develop adequate numbers of competent workers in the construction industry.

ARTICLE 16 WORKING CONDITIONS

Section 16.1 Meal and Rest Periods: There will be no non-working times established during working hours except as may be required by applicable state law or regulations. Meal periods and Rest periods shall be as provided for in Wage Order 16. Individual coffee containers will be permitted at the employees' work location; however, there will be no organized coffee breaks.

Section 16.2 Work Rules: The College, the Community Workforce Coordinator, and/or relevant Contractor shall establish such reasonable work rules as they deem appropriate and not inconsistent with this Agreement. These rules will be posted at the work sites by the Contractor and may be amended thereafter as necessary. Failure to observe these rules and regulations by employees may be grounds for discipline up to and including discharge.

Section 16.3 Emergency Use of Tools and Equipment: There should be no restrictions on the emergency use of any tools by any qualified employee or supervisor, or on the use of any tools or equipment for the performance of work within the jurisdiction, provided the employee can safely use the tools and/or equipment involved and is in compliance with applicable governmental rules and regulations.

Section 16.4 Access Restrictions for Cars: Recognizing the nature of the work being conducted on the site, employee access by a private automobile may be limited to certain roads and/or parking areas.

ARTICLE 17 PRE-JOB CONFERENCES

Each Contractor will conduct a pre-job conference with the appropriate affected Union(s) prior to commencing work. The Council and the Construction Manager shall be advised in advance of all such conferences and may participate if they wish. All work assignments shall be disclosed by the Contractor at a pre-job conference held in accordance with industry practice. Should there be any formal jurisdictional dispute raised under Article VIII, the Construction Manager shall be promptly notified.

ARTICLE 18 LABOR/MANAGEMENT COOPERATION

Section 18.1 Joint Committee: The Parties to this Agreement shall establish a six (6) person Joint Administrative Committee (JAC). This JAC shall be comprised of three (3) representatives selected by the College and three (3) representatives selected by the Council to monitor compliance with the terms and conditions of this Agreement. Each representative shall designate an alternate who shall serve in his or her absence for any purpose contemplated by this Agreement.

Section 18.2 Functions of Joint Committee: The Committee shall meet on a schedule to be determined by the Committee or at the call of the joint chairs, to discuss the administration of the Agreement, the progress of the Project, general labor management problems that may arise, and any other matters consistent with this Agreement. Substantive grievances or disputes arising under Articles 7, 8 or 10 shall not be reviewed or discussed by this Committee, but shall be processed pursuant to the provisions of the appropriate Article. The Community Workforce Coordinator shall be responsible for the scheduling of the meetings, the preparation of the agenda topics for the meetings, with input from the Unions the Contractors and the College. Notice of the date, time and place of meetings, shall be given to the Committee members at least three (3) days prior to the meeting. The College should be notified of the meetings and invited to send a representative(s) to participate. The Community Workforce Coordinator shall prepare quarterly reports on apprentice utilization and the training and employment of College residents, and a schedule of Project Work and estimated number of craft workers needed. The Committee or an appropriate subcommittee, may review such reports and make any recommendations for improvement, if necessary, including increasing the availability of skilled trades, and the employment of local residents or other individuals who should be assisted with appropriate training to qualify for apprenticeship programs.

Section 18.3 Subcommittees: The Committee may form subcommittees to consider and advise the full Committee with regard to safety and health issues affecting the Project and other similar issues affecting the overall Project, including any workers' compensation program initiated under this Agreement.

**ARTICLE 19
SAVINGS AND SEPARABILITY**

Section 19.1 Savings Clause: It is not the intention of the College, the Community Workforce Coordinator, Contractor or the Union parties to violate any laws governing the subject matter of this Agreement. The Parties hereto agree that in the event any provision of this Agreement is finally held or determined to be illegal or void as being in contravention of any applicable law or regulation, the remainder of the Agreement shall remain in full force and effect unless the part or parts so found to be void are wholly inseparable from the remaining portions of this Agreement. Further, the Parties agree that if and when any provision(s) of this Agreement is finally held or determined to be illegal or void by a court of competent jurisdiction, the Parties will promptly enter into negotiations concerning the substantive effect of such decision for the purposes of achieving conformity with the requirements of any applicable laws and the intent of the Parties hereto. If the legality of this Agreement is challenged and any form of injunctive relief is granted by any court, suspending temporarily or permanently the implementation of this Agreement, then the Parties agree that all Project Work that would otherwise be covered by this Agreement should be continued to be bid and constructed without application of this Agreement so that there is no delay or interference with the ongoing planning, bidding and construction of any Project Work.

Section 19.2 Effect of Injunctions or Other Court Orders: The Parties recognize the right of the College to withdraw, at its absolute discretion, the utilization of the Agreement as part of any bid specification should a Court of competent jurisdiction issue any order, or any applicable statute which could result, temporarily or permanently in delay of the bidding, awarding and/or construction on the Project. Notwithstanding such an action by the College, or such court order or statutory provision, the Parties agree that the Agreement shall remain in full force and the fact on covered Project Work to the maximum extent legally possible.

**ARTICLE 20
WAIVER**

A waiver of or a failure to assert any provisions of this Agreement by any or all of the Parties hereto shall not constitute a waiver of such provision for the future. Any such waiver shall not constitute a modification of the Agreement or change in the terms and conditions of the Agreement and shall not relieve, excuse or release any of the Parties from any of their rights, duties or obligations hereunder.

**ARTICLE 21
AMENDMENTS**

The provisions of this Agreement can be renegotiated, supplemented, rescinded or otherwise altered only by mutual agreement in writing, hereafter signed by the negotiating Parties hereto.

**ARTICLE 22
DURATION OF THE AGREEMENT**

Section 22.1 Duration:

(a) This Agreement shall be effective from the date signed by all Parties and shall remain in effect for a period of five (5) years and shall continue in effect from year to year thereafter unless either Party provides written notice of its intent to terminate, sent no earlier than ninety (90) days or later than sixty (60) days prior to the termination date or successor termination date. Any covered Project awarded during the term of this Agreement shall continue to be covered hereunder, until completion of the Project, notwithstanding the expiration date of this Agreement.

(b) This Agreement may be extended by mutual consent of the College and the Unions for such further periods as the Parties shall agree to.

Section 22.2 Turnover and Final Acceptance of Completed Work:

(a) Construction of any phase, portion, section, or segment of Project Work shall be deemed complete when such phase, portion, section or segment has been turned over to the College by the Contractor and the College has accepted such phase, portion, section, or segment. As areas and systems of the Project are inspected and construction-tested and/or approved and accepted by the College or third parties with the approval of the College, the Agreement shall have no further force or effect on such items or areas, except when the Contractor is directed by the College to engage and repairs or modifications required by its contract(s) with the College.

(b) Notice of each final acceptance received by the Contractor will be provided to the Council with the description of what portion, segment, etc. has been accepted. Final acceptance may be subject to a "punch" list, and in such case, the Agreement will continue to apply to each such item on the list until it is completed to the satisfaction of the College and Notice of Acceptance is given by the College or its representative to the Contractor. At the request of the Union, complete information describing any "punch" list work, as well as any additional work required of a Contractor at the direction of the College pursuant to (a) above, involving otherwise turned-over and completed facilities which have been accepted by the College, will be available from the Community Workforce Coordinator.

IN WITNESS whereof the Parties have caused this Continuity of Work Agreement to be executed as of the date and year above stated.

ANTELOPE VALLEY COLLEGE

LOS ANGELES/ORANGE COUNTIES
BUILDING & CONSTRUCTION
TRADES COUNCIL

By: _____

By: _____
Ron Miller, Executive Secretary

Dated: _____

Dated: _____

LOS ANGELES/ORANGE COUNTIES BUILDING AND CONSTRUCTION
TRADES COUNCIL CRAFT UNIONS AND DISTRICT COUNCILS

- Asbestos Heat & Frost Insulators (Local 5) _____
- Boilermakers (Local 92) _____
- Bricklayers & Allied Craftworkers (Local 4) _____
- Cement Masons (Local 600) _____
- Electricians (Local 11) _____
- Elevator Constructors (Local 18) _____
- Gunite Workers (Local 345) _____
- Iron Workers (Reinforced – Local 416) _____
- Iron Workers (Structural – Local 433) _____
- District Council of Laborers _____
- Laborers (Local 300) _____
- Operating Engineers (Local 12) _____
- Operating Engineers (Local 12) _____
- Operating Engineers (Local 12) _____
- Painters & Allied Trades DC 36 _____
- Pipe Trades (Local 250) _____
- Pipe Trades (Local 345) _____
- Pipe Trades (Plumbers Local 761) _____
- Pipe Trades (Sprinkler Fitters Local 709) _____
- Plasterers (Local 200) _____
- Plaster Tenders (Local 1414) _____
- Roofers & Waterproofers (Local 36) _____
- Sheet Metal Workers (Local 105) _____
- Teamsters (Local 986) _____
- Southwest Regional Council of Carpenters _____

ATTACHMENT A
LETTER OF ASSENT

To be signed by all contractors awarded work covered by the
Community Workforce Agreement prior to commencing work.

[Contractor's Letterhead]
Community Workforce Coordinator
C/O Antelope Valley College
3041 West Ave K
Lancaster, CA 93536

Attn: _____

Re: Community Workforce Agreement - Letter of Assent

Dear Sir:

This is to confirm that [name of company] agrees to be party to and bound by the Antelope Valley College Community Workforce Agreement effective _____, 2017, as such Agreement may, from time to time, be amended by the negotiating parties or interpreted pursuant to its terms. Such obligation to be a party and bound by this Agreement shall extend to all work covered by the Agreement undertaken by this Company on the project and this Company shall require all of its contractors and subcontractors of whatever tier to be similarly bound for all work within the scope of the Agreement by signing and furnishing to you an identical Letter of Assent prior to their commencement of work.

Sincerely,

[Name of Construction Company]

By: _____

Name: _____

Title: _____

Contractor State License No. _____

[Copies of this letter must be submitted to the Community Workforce Coordinator and to the Council per Section 2.5(b).]

ATTACHMENT B
Local Resident Zip Codes

COLLEGE SERVICE AREA ZIP CODES

(Tier 1)
[to be inserted]

GREATER ANTELOPE VALLEY AREA ZIP CODES

(Tier 2)

91390	93534	93554
93501	93535	93560
93510	93536	93591
93523	93543	
93532	93553	

THE REMAINING AREA ZIP CODES IN LOS ANGELES COUNTY

(Tier 3)

ATTACHMENT C

**ANTELOPE VALLEY COLLEGE
CRAFT REQUEST FORM**

TO THE CONTRACTOR: Please complete and fax this form to the applicable union to request craft workers that fulfill the hiring requirements for this project. After faxing your request, please call the Union to verify receipt and substantiate their capacity to furnish workers as specified below. Please print your Fax Transmission Verification Reports and keep copies for your records.

The Antelope Valley College Community Workforce Agreement establishes a goal that 40% of all of the labor and craft positions shall be from qualified workers residing, as well as “Veterans” and “Student Graduates,” regardless of where they reside: first, “Area Residents” which reside in those first tier zip codes which cover the College service area, as attached hereto, second, within the Greater Antelope Valley area, as reflected on the attached list of zip codes, third, in the remainder of the County of Los Angeles. For Dispatch purposes, employees residing within any of these three (3) areas, as well as Veterans and Student Graduates, regardless of where they reside, shall be referred to as Local Residents.

TO THE UNION: Please complete the “Union Use Only” section on the next page and fax this form back to the requesting Contractor. Be sure to retain a copy of this form for your records.

CONTRACTOR USE ONLY

To: Union Local # _____ **Fax#** () _____ **Date:** _____
Cc: Community Workforce Coordinator
From: Company: _____ Issued By: _____
 Contact Phone: () _____ Contact Fax: () _____

PLEASE PROVIDE ME WITH THE FOLLOWING UNION CRAFT WORKERS.

Craft Classification (i.e., plumber, painter, etc.)	Journeyman or Apprentice	Local Resident or General Dispatch	Number of workers needed	Report Date	Report Time
TOTAL WORKERS REQUESTED = _____					

Please have worker(s) report to the following work address indicated below:

Project Name: _____ Site: _____ Address: _____
 Report to: _____ On-site Tel: _____ On-site Fax: _____
 Comment or Special Instructions: _____

UNION USE ONLY

Date dispatch request received:
Dispatch received by:
Classification of worker requested:
Classification of worker dispatched:

WORKER REFERRED

Name:		
Date worker was dispatched:		
Is the worker referred a: (check all that apply)		
JOURNEYMAN	Yes _____	No _____
APPRENTICE	Yes _____	No _____
AREA RESIDENT	Yes _____	No _____
VETERAN	Yes _____	No _____
STUDENT GRADUATE	Yes _____	No _____
GENERAL DISPATCH FROM OUT OF WORK LIST	Yes _____	No _____

[This form is not intended to replace a Union's Dispatch or Referral Form normally given to the employee when being dispatched to the jobsite.]

ATTACHMENT D

LOS ANGELES/ORANGE COUNTIES BUILDING AND CONSTRUCTION TRADES COUNCIL APPROVED DRUG AND ALCOHOL TESTING POLICY

The Parties recognize the problems which drug and alcohol abuse have created in the construction industry and the need to develop drug and alcohol abuse prevention programs. Accordingly, the Parties agree that in order to enhance the safety of the work place and to maintain a drug and alcohol free work environment, individual Employers may require applicants or employees to undergo drug and alcohol testing.

1. It is understood that the use, possession, transfer or sale of illegal drugs, narcotics, or other unlawful substances, as well as being under the influence of alcohol and the possession or consuming alcohol is absolutely prohibited while employees are on the Employer's job premises or while working on any jobsite in connection with work performed under the Community Workforce Agreement ("CWA").

2. No Employer may implement a drug testing program which does not conform in all respects to the provisions of this Policy.

3. No Employer may implement drug testing at any jobsite unless written notice is given to the Union setting forth the location of the jobsite, a description of the project under construction, and the name and telephone number of the Project Supervisor. Said notice shall be addressed to the office of each Union signing the CWA. Said notice shall be delivered in person or by registered mail before the implementation of drug testing. Failure to give such notice shall make any drug testing engaged in by the Employer a violation of the CWA, and the Employer may not implement any form of drug testing at such jobsite for the following six months.

4. An employer who elects to implement drug testing pursuant to this Agreement shall require all employees on the Project to be tested. With respect to individuals who become employed on the Project subsequent to the proper implementation of this drug testing program, such test shall be administered upon the commencement of employment on the project, whether by referral from a Union Dispatch Office, transfer from another project, or another method. Individuals who were employed on the project prior to the proper implementation of this drug testing program may only be subjected to testing for the reasons set forth in Paragraph 5(f) (1) through 5(f) (3) of this Policy. Refusal to undergo such testing shall be considered sufficient grounds to deny employment on the project.

5. The following procedure shall apply to all drug testing:

a. The Employer may request urine samples only. The applicant or employee shall not be observed when the urine specimen is given. An applicant or employee, at his or her sole option, shall, upon request, receive a blood test in lieu of a urine test. No employee of the Employer shall draw blood from a bargaining unit employee, touch or handle urine specimens, or

in any way become involved in the chain of custody of urine or blood specimens. A Union Representative, subject to the approval of the individual applicant or employee, shall be permitted to accompany the applicant or employee to the collection facility to observe the collection, bottling, and sealing of the specimen.

b. The testing shall be done by a laboratory approved by the National Institute on Drug Abuse (NIDA), which is chosen by the Employer and the Union.

c. An initial test shall be performed using the Enzyme Multiplied Immunoassay Technique (EMZT). In the event a question or positive result arises from the initial test, a confirmation test must be utilized before action can be taken against the applicant or employee. The confirmation test will be by Gas Chromatography Mass Spectrometry (GC/MS). Cutoff levels for both the initial test and confirmation test will be those established by the National Institute on Drug Abuse. Confirmed positive samples will be retained by the testing laboratory in secured long-term frozen storage for a minimum of one year. Handling and transportation of each sample must be documented through strict chain of custody procedures.

d. In the event of a confirmed positive test result the applicant or employee may request, within forty-eight (48) hours, a sample of his/her specimen from the testing laboratory for purposes of a second test to be performed at a second laboratory, designated by the Union and approved by NDA. The retest must be performed within ten (10) days of the request. Chain of custody for this sample shall be maintained by the Employer between the original testing laboratory and the Union's designated laboratory. Retesting shall be performed at the applicant's or employee's expense. In the event of conflicting test results the Employer may require a third test.

e. If, as a result of the above testing procedure, it is determined that an applicant or employee has tested positive, this shall be considered sufficient grounds to deny the applicant or employee his/her employment on the Project.

f. No individual who tests negative for drugs or alcohol pursuant to the above procedure and becomes employed on the Project shall again be subjected to drug testing with the following exceptions:

1. Employees who are involved in industrial accidents resulting in damage to plant, property or equipment or injury to him/herself or others may be tested pursuant to the procedures stated hereinabove.

2. The Employer may test employees following thirty (30) days advance written notice to the employee(s) to be tested and to the applicable Union. Notice to the applicable Union shall be as set forth in Paragraph 3 above and such testing shall be pursuant to the procedures stated hereinabove.

3. The Employer may test an employee where the Employer has reasonable cause to believe that the employee is impaired from performing his/her job. Reasonable cause shall be defined as exhibiting aberrant or unusual behavior, the type of which

is a recognized and accepted symptom of impairment (i.e., slurred speech, unusual lack of muscular coordination, etc.). Such behavior must be actually observed by at least two persons, one of whom shall be a Supervisor who has been trained to recognize the symptoms of drug abuse or impairment and the other of whom shall be the job steward. If the job steward is unavailable or there is no job steward on the project the other person shall be a member of the applicable Union's bargaining unit. Testing shall be pursuant to the procedures stated hereinabove. Employees who are tested pursuant to the exceptions set forth in this paragraph and who test positive will be removed from the Employer's payroll.

g. Applicants or employees who do not test positive shall be paid for all time lost while undergoing drug testing. Payment shall be at the applicable wage and benefit rates set forth in the applicable Union's Master Labor Agreement. Applicants who have been dispatched from the Union and who are not put to work pending the results of a test will be paid waiting time until such time as they are put to work. It is understood that an applicant must pass the test as a condition of employment. Applicants who are put to work pending the results of a test will be considered probationary employees.

6. The employers will be allowed to conduct periodic job site drug testing on the Project under the following conditions:

a. The entire jobsite must be tested, including any employee or subcontractor's employee who worked on that project three (3) working days before or after the date of the test;

b. Jobsite testing cannot commence sooner than thirty (30) days after start of the work on the Project;

c. Prior to start of periodic testing, a business representative will be allowed to conduct an educational period on company time to explain periodic jobsite testing program to affected employees;

d. Testing shall be conducted by a N.I.D.A. certified laboratory, pursuant to the provisions set forth in Paragraph 5 hereinabove.

e. Only two periodic tests may be performed in a twelve month period.

7. It is understood that the unsafe use of prescribed medication, or where the use of prescribed medication impairs the employee's ability to perform work, is a basis for the Employer to remove the employee from the jobsite.

8. Any grievance or dispute which may arise out of the application of this Agreement shall be subject to the grievance and arbitration procedures set forth in the CWA.

9. The establishment or operation of this Policy shall not curtail any right of any employee found in any law, rule or regulation. Should any part of this Agreement be found unlawful by a court of competent jurisdiction or a public agency having jurisdiction over the

parties, the remaining portions of the Agreement shall be unaffected and the parties shall enter negotiations to replace the affected provision.

10. Present employees, if tested positive, shall have the prerogative for rehabilitation program at the employee's expense. When such program has been successfully completed the Employer shall not discriminate in any way against the employee. If work for which the employee is qualified exists he/she shall be reinstated.

11. The Employer agrees that results of urine and blood tests performed hereunder will be considered medical records held confidential to the extent permitted or required by law. Such records shall not be released to any persons or entities other than designated Employer representatives and the applicable Union. Such release to the applicable Union shall only be allowed upon the signing of a written release and the information contained therein shall not be used to discourage the employment of the individual applicant or employee on any subsequent occasion.

12. The Employer shall indemnify and hold the Union harmless against any and all claims, demands, suits, or liabilities that may arise out of the application of this Agreement and/or any program permitted hereunder.

13. Employees who seek voluntary assistance for substance abuse may not be disciplined for seeking such assistance. Requests from employees for such assistance shall remain confidential and shall not be revealed to other employees or management personnel without the employee's consent. Employees enrolled in substance abuse programs shall be subject to all Employer rules, regulations and job performance standards with the understanding that an employee enrolled in such a program is receiving treatment for an illness.

14. This Memorandum, of Understanding shall constitute the only Agreement in effect between the parties concerning drug and alcohol abuse, prevention and testing. Any modifications thereto must be accomplished pursuant to collective bargaining negotiations between the parties.

SIDE LETTER OF AGREEMENT
TESTING POLICY FOR DRUG ABUSE

It is hereby agreed between the parties hereto that an Employer who has otherwise properly implemented drug testing, as set forth in the Testing Policy for Drug Abuse, shall have the right to offer an applicant or employee a "quick" drug screening test. This "quick" screen test shall consist either of the "ICUP" urine screen or similar test or an oral screen test. The applicant or employee shall have the absolute right to select either of the two "quick" screen tests, or to reject both and request a full drug test.

An applicant or employee who selects one of the quick screen tests, and who passes the test, shall be put to work immediately. An applicant or employee who fails the "quick" screen test, or who rejects the quick screen tests, shall be tested pursuant to the procedures set forth in the Testing Policy for Drug Abuse. The sample used for the "quick" screen test shall be discarded immediately upon conclusion of the test. An applicant or employee shall not be deprived of any rights granted to them by the Testing Policy for Drug Abuse as a result of any occurrence related to the "quick" screen test.

SUMMARY OF WORK

1. PART 1 GENERAL
 - A. SECTION INCLUDES
 - 1 Work included.
 - 2 Contractor use of site.
 - 3 Work Sequence
 - B. WORK INCLUDED
 1. BE Building – Demolish and replace the existing boiler with a new boiler. Disconnect and reconnect all of the mechanical, plumbing and electrical connections that are required as a result of replacing the boiler. Properly dispose of removed boiler.
 2. Administration Building – Demolish and replace the existing boiler along with the hot water pumps and the associated piping, expansion tanks, air separators, valves, flue etc. and provide and install new items so as to provide a complete and operable system. Disconnect and reconnect all of the mechanical, electrical and plumbing items that are required as a result of replacing the boiler and aforementioned items. Properly dispose of all demoed items.
 3. Construct the work of each contract under a single lump sum contract. Multiple contracts will be awarded by the District as outlined in the Notice Calling for Bids (Section 00 11 13) and in accordance with the Construction Manager's "Work Scope Special Conditions" (Section 01011) for each work scope category. Each Category Contract will include ALL work in all of the specification sections noted under said Category in the Notice Inviting Bids. Division "0" and "1" of the Project Manual will be a part of ALL bids and contracts in ALL Categories.
 - a. "Work Scope Special Conditions" (Section 01011) is a matrix which contains the special conditions of each Category Contract. Columns containing a "yes" indicate that the work under the "Description" is to be a part of the Category Contract noted at the top of the list. Columns containing a "no" indicate that the work under the "Description" is to be excluded by the Category Contractor noted at the top of the list.
 - b. The work included in each specification section includes, but is not limited to, the furnishing of all labor, materials, appliances, tools, equipment, facilities, transportation, applicable taxes and services necessary for, and incidental to, performing all operations in connection with the specification section complete as shown on the drawings and / or specified therein.
 - c. ALL of the work in each specification section MUST be included in the work scope "Category" for which it has been assigned unless it has been SPECIFICALLY noted within the "Work Scope Special Conditions" (Section 01011) to be excluded. CONTRACTOR MUST EXAMINE ALL SPECIFICATION SECTIONS AND DRAWINGS for related work that may be specified or shown on the drawings and required to be included under their specific Category or referenced specification section.
 - d. In the unlikely event that the same work called out in this Contractor's

category is also called out in the category of another contractor or contractors, BOTH this Contractor and the other contractor/s will be expected to have included the work in their bids. It is not the District's intention for this double coverage to happen, however if it does, the District will seek a credit quotation from all affected contractors and the contractor offering the smallest credit or least favorable terms to the District shall be the contractor directed to perform the work. The other affected contractor/s shall have their contract work scope/s and price/s reduced by their proposed credit amounts.

C. WORK BY OWNER

1. Items noted "NIC" (Not In Contract) will be furnished and installed by the Owner.

D. OWNER FURNISHED PRODUCTS

1. Items noted "OFCI" (Owner Furnished -Contractor Installed) will be furnished by the Owner and installed by the Contractor
2. Items noted "OFOI" (Owner Furnished -Owner Installed) will be furnished by the Owner and installed by the Owner
3. Owner's responsibilities
 - a. Arrange for and deliver Owner reviewed shop drawings, product data, and samples to the Contractor
 - b. Arrange and pay for product delivery to site
 - c. On delivery, inspect products jointly with Contractor
 - d. Submit claims for transportation damage and replace damaged, defective, or deficient items
 - e. Arrange for manufacturer's warranties, inspections, and service
4. Contractor's responsibilities
 - a. Review Owner reviewed shop drawings, product data, and samples
 - b. Receive and unload products at site; inspect for completeness or damage jointly with Owner
 - c. Handle, store, install, assemble, and finish products
 - d. Repair or replace items damaged after receipt
5. Products
 - a. See equipment schedules
6. Items furnished by Owner for installation by Contractor (OFCI):
 - a. See equipment schedules

E. CONTRACTOR USE OF THE SITE

1. Contractor shall have use of the site throughout the construction period as regulated by the Construction Manager
2. Construction operations: Limited to area indicated on drawings

F. WORK SEQUENCE

1. Construct work in accordance with the Project Construction Schedule, Section 01310.

2. PART 2 PRODUCTS

Not Used

3. PART 3 EXECUTION

Not Used

END OF SECTION

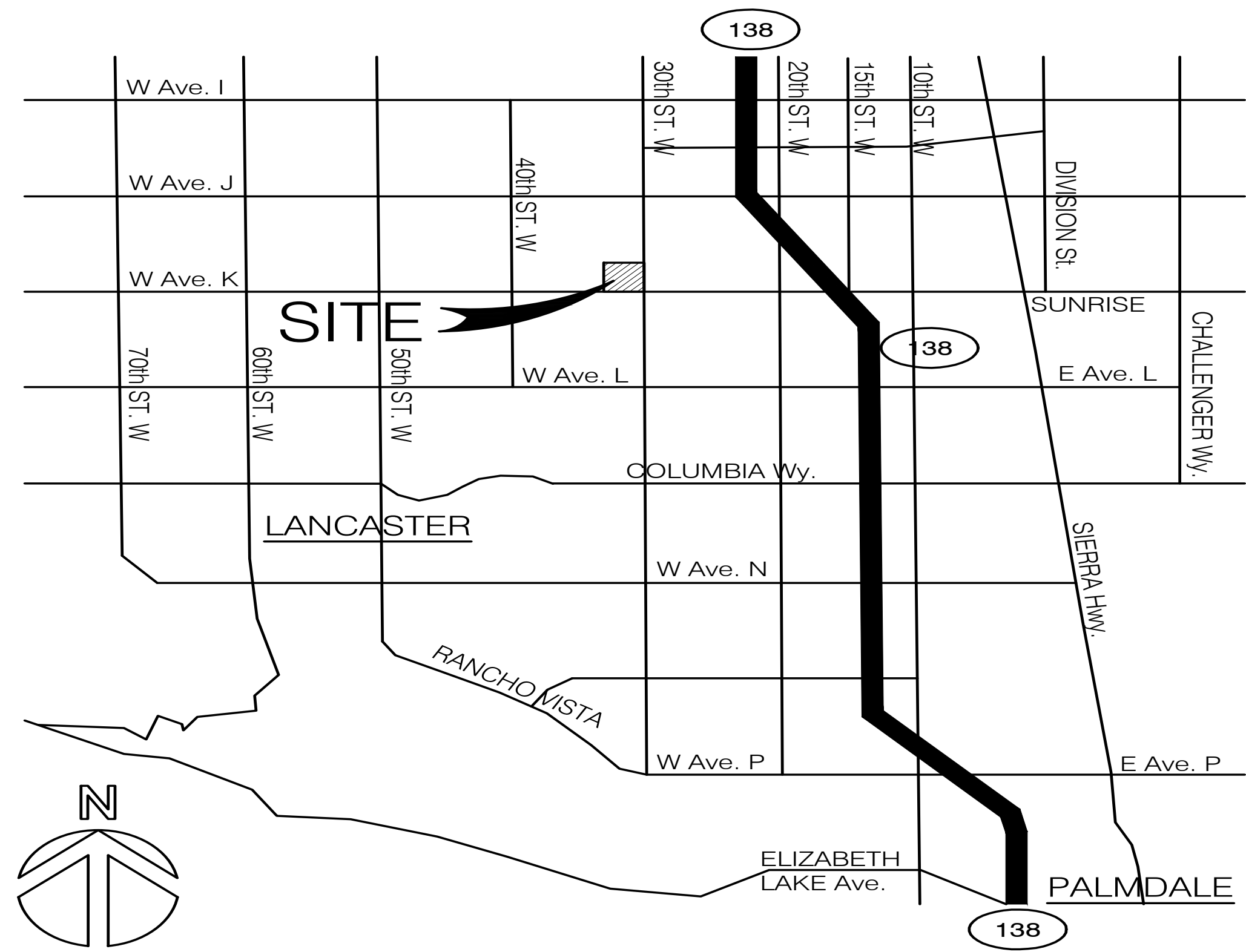
**ANTELOPE VALLEY COMMUNITY COLLEGE - BOILER REPLACEMENT CAMPUS WIDE
WORK SCOPE SPECIAL CONDITIONS**

ITEM:	DESCRIPTION:	Bid Package #21
1	Contractor shall not interfere with the normal, regular, or existing business operations or activities of the College at the project site. If required schedule work for after hours or weekends, all costs for working after hours or weekends shall be included within your base bid.	yes
2	Properly protect existing improvements scheduled to remain when performing work within this bid package.	yes
3	Provide all project submittals no later than fifteen (10) calendar days after receipt of Notice of Award regardless of what any other particular specification may otherwise indicate. Also, each Category Contractor will need to provide (1) electronic PDF copy of each submittal, shop drawing, and product data regardless of what any other particular specification may otherwise indicate. If required per Architects and/or Engineers requirements (1) hard copy of shop drawings must be provided upon request.	yes
4	Properly & completely coordinate all work through the Construction Manager to ensure that all work is properly and efficiently installed per the contract documents.	yes
5	All daily reports shall be turned into the Construction Manager on a daily basis.	yes
6	All deliveries and material or equipment moving between construction areas shall be coordinated and approved by the Construction Manager prior to commencement.	yes
7	Utilize suitable equipment for traversing the site, hauling or relocating of materials, and/or erection of items within this trade regardless of soils conditions, grades and existing finishes at no additional cost or delay to the schedule.	yes
8	Contractors within this category shall pay and maintain cell phone numbers for their project foreman throughout the duration of this project.	yes
9	Provide all job verification and field measuring as may be needed and/or required to ensure that the work is coordinated and fits properly.	yes
10	Repair any and all finishes damaged as a result of the execution of the work in this category.	yes
11	Provide cleanup on a daily basis to insure a clean and safe & accessible work environment.	yes
12	Contractor to provide trash containers and/or properly dispose of waste, trash, lunch trash and debris. This includes procurement of all hauling permits and/or dump fees which may be required. This applies equally to any/all subcontractors employed by the Prime Contractor.	yes
13	Be advised - the project site is located in an area of potential high winds. The protection against and prevention of wind damage to incomplete work or on-site stored materials is the responsibility of the contractor.	yes
14	Be advised - the project site is located in an area of potential high heat. The protection against and prevention of heat damage to incomplete work or on-site stored materials is the responsibility of the contractor	yes
15	The Construction Manager will set the construction working hours on site.	yes
16	Completely furnish all cutting and patching as required in all existing construction including finishes due to the installation of work of this category contractor.	yes
17	Coordinate with Facilities Services to sign out a parking pass and badge for each employee.	yes
18	Parking areas shall be designated by the Construction Manager.	yes
18	If Contractor needs a storage/laydown area, contractor shall provide temp fencing and storage containers for said area. Parking Lot 16 shall be established as the area for said storage area.	yes
19	Provide for all dust and noise mitigation during the entire contract duration.	yes
20	Provide all barricades, warning lights and signs & safety measures etc. required for the execution of the work within this category.	yes

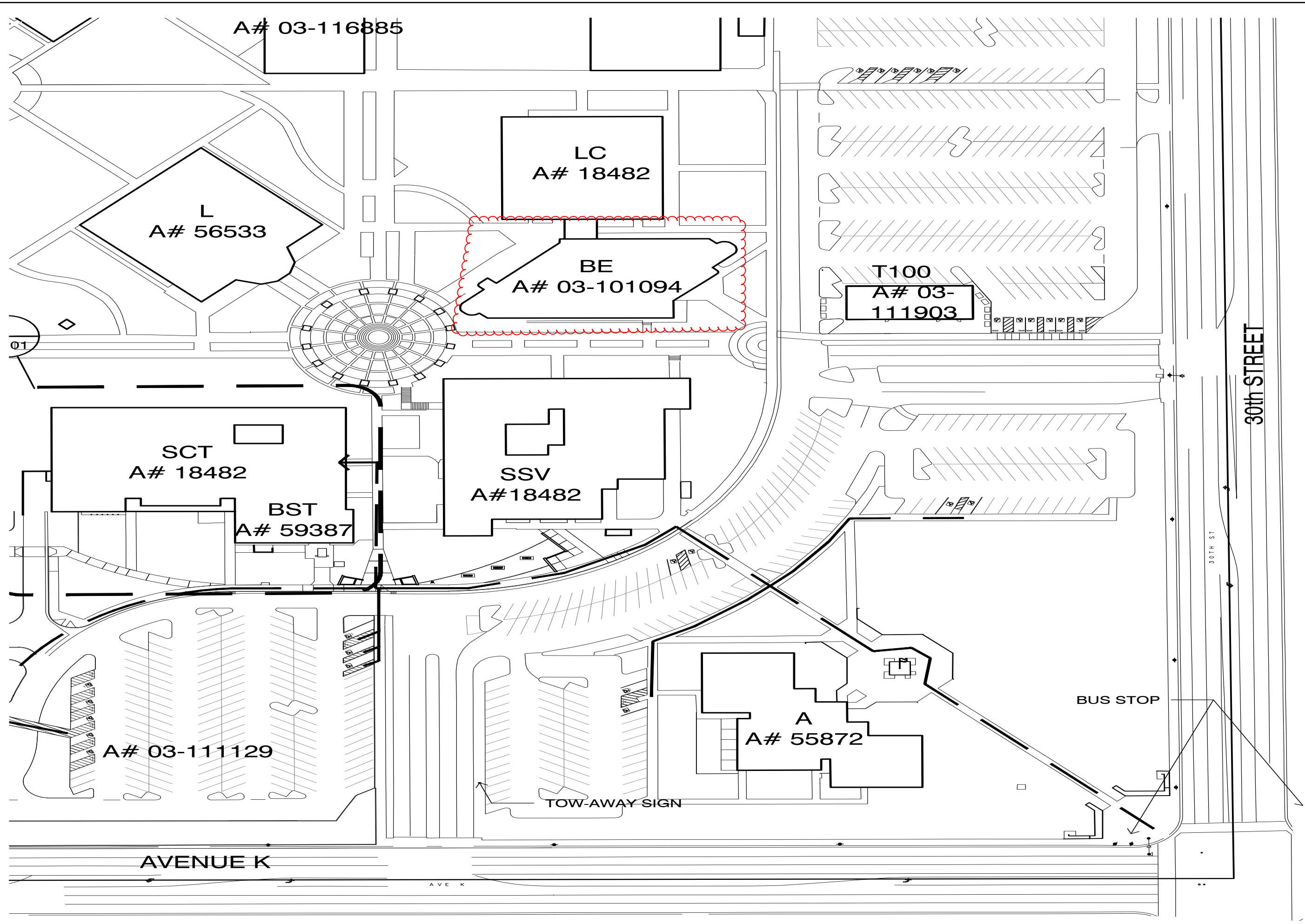
**ANTELOPE VALLEY COMMUNITY COLLEGE - BOILER REPLACEMENT CAMPUS WIDE
WORK SCOPE SPECIAL CONDITIONS**

ITEM:	DESCRIPTION:	Bid Package #21
21	Contractor shall verify and keep all existing systems fully operational as they execute the scope of work within this contract.	yes
22	Be advised that all Prime and Sub Contractors are bound to the "Community Work Force Agreement" that has been adopted by the Antelope Valley College Board of Trustees. Said Agreement establishes the labor relations guidelines and procedures for the Antelope Valley College and for the Contractors.	yes
23	This Bid Package Contractor shall include all allowances detailed in specification section 01210 for their respective category.	yes
24	Provide all demo and patching of finishes that may be required for the Mechanical, Electrical and Plumbing systems that is not particularly indicated but is required in order to provide complete and operable systems.	yes
25	Include all proper shut down activities, drainings of existing systems during non school operation hours so as not to disrupt regular schedule activities at the site. Advise the Construction Manager 48 hours ahead of scheduled shut downs.	yes
26	This Bid Package Contractor shall include all proper and safe disconnections of the Mechanical, Electrical, Controls and Plumbing systems for the boiler replacements.	yes
27	Administration Building - Properly demolish and properly dispose of all items indicated on Sheet MED201.	yes
28	Administration Building - Provide and install new concrete housekeeping pad extension as per Sheet S201 Details A&1.	yes
29	Administration Building - Provide and install the anchor bracket for the new boiler anchorage as per Sheet S201 Details 2 & 3.	yes
30	Administration Building - Provide and install all new mechanical, plumbing, HVAC piping, electrical and EMS as indicated on Sheets ME201, M501 and M601 so as to provide a complete and operable system.	yes
31	Administration Building - Provide and install all HVAC hot water piping insulation as indicated per the contract documents.	yes
32	Administration Building - Provide and install all plumbing, HVAC piping and equipment identification as required per the contract documents.	yes
33	Administration Building - Provide all Testing, Adjusting and Balancing as required of the new boiler and hot water system as indicated per the contract documents.	yes
34	Completely furnish & properly install all UNISTRUT not specifically shown on the contract documents but required by this bid package contractor in order to properly complete and/or support their respective work.	yes
35	BE Building - Properly disconnect, remove and properly dispose of existing boiler. Refer to CMSK Drawings 1 through 5. Be advised that the boiler is located on the 3rd Floor of the BE Building.	yes
36	BE Building - This Bid Package Contractor shall make all modifications necessary to the existing flue so as to reconnect to the new boiler. Refer to CMSK Drawings 1 through 5.	yes
37	BE Building - This Bid Package Contractor shall provide and properly install a Patterson Kelly N750VLX for the boiler replacement. Refer to CMSK Drawings 1 through 5.	yes

VICINITY MAP



CLIENT: ANTELOPE VALLEY COLLEGE	
PROJECT: Boiler Replacement Campus Wide Project	
BID NO: AVC2017/2018-3 CUPCAA	ADDRESS: 3041 WEST AVENUE K LANCASTER, CA 93436
DATE: 9-1-2017	
ADDENDUM:	
ADDENDUM:	
SHEET:	
CMSK 1	



CLIENT: ANTELOPE VALLEY COLLEGE

PROJECT: Boiler Replacement Campus Wide Project

BID NO: AVC2017/2018-3 CUPCCAA

ADDRESS: 3041 WEST AVENUE K
LANCASTER, CA 93436

DATE: 9-1-2017

ADDENDUM:

ADDENDUM:

SHEET:

CMSK 2



ANTELOPE VALLEY COLLEGE

Boiler Replacement Campus Wide Project

BID NO: AVC2017/2018-3 CUPCCA

ADDRESS: 3041 WEST AVENUE K
LANCASTER, CA 93436

CLIENT:

PROJECT:

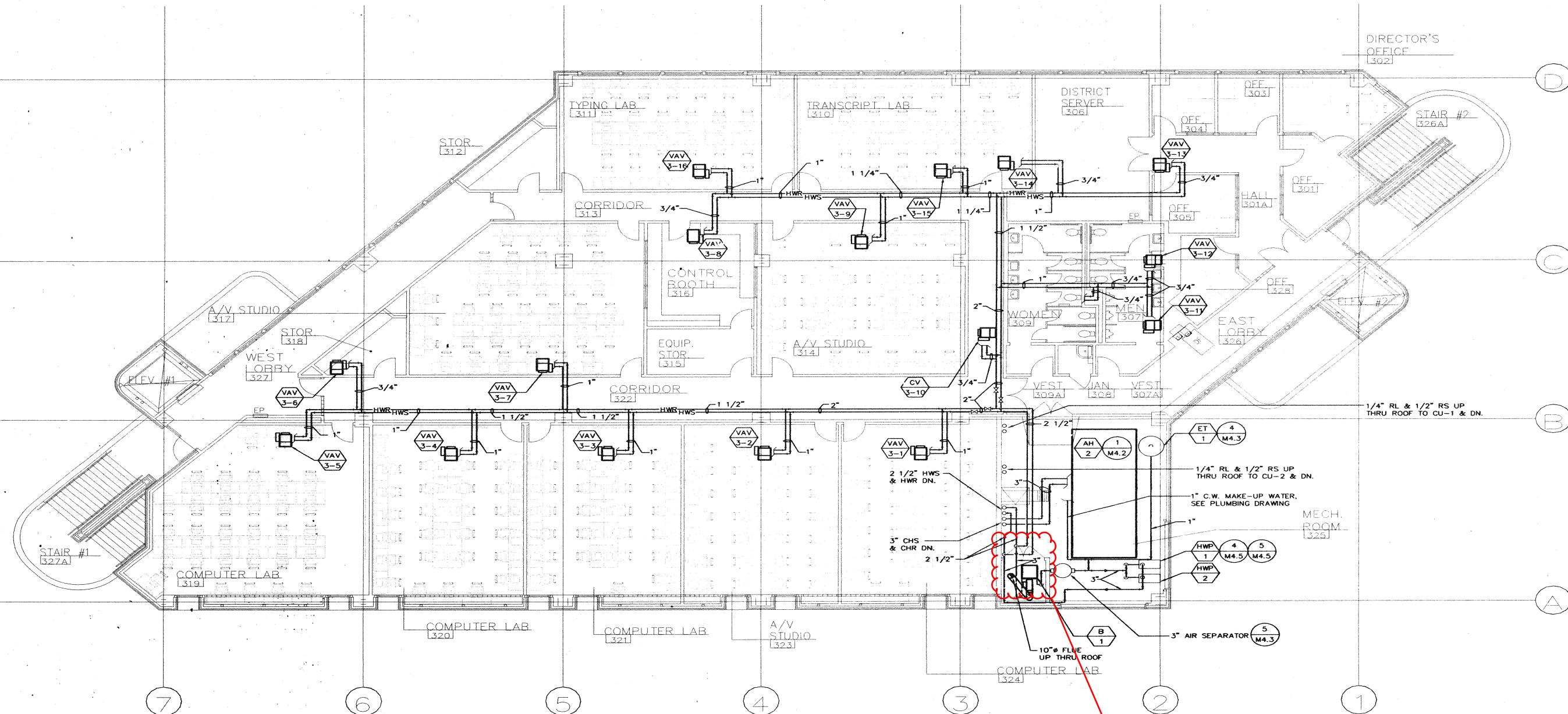
DATE: 9-1-2017

ADDENDUM:

ADDENDUM:

SHEET:

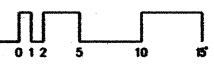
CMSK 3



Properly disconnect existing mechanical, electrical, plumbing, controls and flue systems and remove existing boiler. Replace boiler with new Patterson Kelley Boiler Model #N750VLX. Reconnect mechanical, electrical, plumbing, controls and flue system to new boiler. Provide for all modifications and/or additions to the existing mechanical, plumbing, electrical and flue system so as to reconnect these existing systems to the new boiler.


THIRD FLOOR PLAN

SCALE 1/8" = 1'-0"





Existing Boiler to be Replaced
BE Building

SHEET: CMSK 4	DATE: 9-1-2017 ADDENDUM: ADDENDUM:	CLIENT: ANTELOPE VALLEY COLLEGE PROJECT: Boiler Replacement Campus Wide Project	
	BID NO: AVC2017/2018-3 CUPCAA	ADDRESS: 3041 WEST AVENUE K LANCASTER, CA 93436	

Existing boiler to be replaced
BE Building



THERMIFIC®

DATE: 9-1-2017	CLIENT:	ANTELOPE VALLEY COLLEGE		
	PROJECT:	Boiler Replacement Campus Wide Project		
	BID NO:	AVC2017/2018-3 CUPCAA	ADDRESS:	
ADDENDUM:				
ADDENDUM:				
SHEET:	CMSK 5			

CHANGE ORDER PROCEDURE

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Submittals.
- B. Delivery, Storage, and Handling.
- C. Documentation of change in Contract Sum and Contract Time.
- D. Change procedures.
- E. Construction Change Authorization.
- F. Stipulated Sum change order.
- G. Unit Price Change Order.
- H. Time and Material Change Order.
- I. Execution of Change Orders.
- J. Correlation of Contractor submittals.

1.02 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 0 and Division 1 Specification Sections, apply to work of this Section.

1.03 SUBMITTALS

- A. Submit name of the individual authorized to receive change documents, and be responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Maintain a Register of proposal requests, supplemental instructions, and Change Orders at the job site, accurately reflecting current status of all pertinent data.
- B. Make the Register available to the Architect for review at his request.

1.05 DOCUMENTATION OF CHANGE IN CONTRACT SUM AND CONTRACT TIME

- A. Maintain detailed records of work done on a time, and material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Work.
- B. Document each quotation for a change in cost or time with sufficient data to allow evaluation of the quotation.

- C. On request, provide additional data to support computations:
 - 1. Equipment.
 - 2. Taxes, insurance and bonds.
 - 3. Overhead and profit.
 - 4. Justification for any change in Contract Time.
 - 5. Credit for deletions from Contract, similarly documented.
- D. Support each claim for additional costs, and for work done on a time and material basis, with additional information:
 - 1. Origin and date of claim.
 - 2. Dates and times work was performed, and by whom.
 - 3. Time records and wage rates paid.
 - 4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

1.06 CHANGE PROCEDURES

- A. If any bidder is in doubt as to the true meaning of any part of the Contract Documents, or finds discrepancies in or omissions from the drawings and specifications, a written request for information (RFI) or correction shall be submitted to the Architect. The Prime Contractor submitting the written request shall be responsible for its prompt delivery. Any interpretation or correction of the Contract Documents will be made only by addendum issued by the Architect, and a copy of any addendum will be hand-delivered, mailed, or faxed to each bidder known to have received a set of the Contract Documents. No person is authorized to make any oral interpretation of any provision in the Contract Documents, nor shall any oral interpretation be binding on the Owner.

If there are discrepancies on drawings, plans, or specifications, or conflicts between drawings, plans, specifications, terms, or conditions, the interpretation of the Architect shall prevail. Prime Contractor shall become familiar with the plans, specifications, and drawings.

- B. The Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the General Conditions Article 9: Changes and Ancillary Supplemental General Conditions by issuing an Instruction Bulletin (IB). A period of 3 working days will be provided to the Contractor to register his complaint in writing for the IB item. Failure to register a complaint within the 3 day period will result in acknowledgment by the Contractor that the minor change in the Work has no cost or time adjustment and that no claim will be submitted to the Owner.
- C. The Architect may issue a Proposed Change Order (PCO), as authorized by General Conditions Article 9: Changes and Ancillary Supplemental General Conditions which includes a detailed description of a proposed change with supplementary or revised Drawings and Specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid and an estimated amount of the change in construction cost. Contractor will prepare and submit an estimate within 7 days. Failure by the Prime Contractor to submit an estimate within the stipulated 7 day time will result in the Architect's estimated amount of the change to the Contract sum or time allowed to complete construction becoming the approved amounts, and acknowledgment by the Contractor that no claim will be submitted to the Owner.
- D. The Prime Contractor may propose a change for items other than previously addressed

supplemental instructions by submitting a Request for Information to the Construction Manager which will be returned to the Contractor within 15 days. If the Construction Manager's reply necessitates a change in the contract sum or time, the Contractor shall submit within 15 days a PCO to the Construction Manager. Failure by the Prime Contractor to submit a PCO within the stipulated 14 day period will void the item from being considered at any time during construction and acknowledgment by the Prime Contractor that no claim will be submitted to the Owner. The change request shall describe the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. No additional compensation or time will be considered for the submitted claims at any future date. Document any requested substitutions in accordance with Section 01631, "Products and Substitutions".

1.07 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Manager may issue a document in the field, signed by the Owner, instructing the Contractor to proceed with a change in the Work, to expedite work and avoid or minimize delays in the work.
- B. The document will describe changes in the Work, and will designate method of determining any change in Contract Sum or Contract Time.
- C. Promptly execute the change in Work. Submit final costs for Work involved and/or change in Contract Time for inclusion in a subsequent Change Order.

1.08 STIPULATED SUM CHANGE ORDER

Based on PCO and Prime Contractor's fixed price quotation for a Change Order, and in accordance with Article 9.4.1.1, as approved by Architect, Construction Manager and Owner.

1.09 UNIT PRICE CHANGE ORDER

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

1.10 TIME AND MATERIAL CHANGE ORDER

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

Allowable Costs: The term "Allowable Costs" means, and is limited to, the costs listed in this Paragraph 1.11 and that are not prohibited under Paragraph 1.12, below:

Labor: Straight-time wages and salaries, and overtime wages and salaries specifically authorized by District or College Project Manager in writing, for employees employed at the Site, or at fabrication sites off the Site, in the direct performance of the Extra Work or that would have been incurred in the direct performance of the Deleted Work, based on the actual cost for wages prevailing locally for each craft or type of the workers at the time the Extra Work is done or the Deleted Work is ordered eliminated. Labor costs for equipment operators and helpers involved in the performance of Extra Work shall be allowed only when such costs are not included in the invoice for equipment rental. The use of labor classification which would increase the Allowable Costs for Extra Work will not be permitted unless Contractor establishes the necessity for such additional costs. Overtime wages and salaries shall only constitute an Allowable Cost to the extent permitted by the Contract Documents and only as specifically authorized by College Project Manager in writing setting forth the amount of overtime anticipated, which amount shall be deemed the maximum amount of overtime reimbursable as an Allowable Cost.

Benefits: Net actual employer costs of payroll taxes (FICA, Medicare, SUTA, FUTA), insurance (as adjusted for experience modifiers, premium discounts, dividends, rebates, expense constants, assigned risk pool costs, net cost reductions due to policies with deductibles for self-insured losses, assigned risk rebates, or the like), health and welfare, pension, vacation, apprenticeship funds and benefits required by the Project Labor Agreement (if applicable), Labor Compliance Program (if applicable) or lawful collective bargaining agreements for employees on straight-time wages or salaries, and on overtime wages and salaries specifically authorized by College Project Manager in writing, for employees employed at the Site, or at fabrication sites off the Site. Contractor shall reduce its standard payroll tax percentages to properly reflect the effective cost reduction due to the estimated impact of the annual maximum wages subject to payroll taxes. An estimated percentage for labor burden may be used for the pricing of Compensable Changes; however, the percentage will be subject to verification by audit at Final Completion and the amount of any Change Order or Unilateral Change Order shall be subject to adjustment if it is determined that the actual labor burden percentage is less than the estimated percentage used. Contractor shall provide if requested by District as a condition of its right to payment, a breakdown of the calculation by Contractor and the Subcontractors of amounts charged for labor benefits and burden, which information may be used to establish billing rates for Compensable Changes.

Materials, Consumables: Costs of materials and consumable items furnished or incorporated into the Work. Except for costs that have been previously agreed to between District and a District Materials Vendor in a District Materials Contract that has been assigned to Contractor such costs for Extra Work shall be at the lowest price available to Contractor but in no event shall such costs exceed competitive costs obtainable from other subcontractors, suppliers, manufacturers and distributors in the general vicinity of the Site.

Taxes: Sales taxes on the costs of the materials and consumable items described in Subparagraph 1.11-C, above.

Tool, Equipment Rental: Rental charges for necessary machinery and equipment, whether owned or hired, as authorized in writing by District or College Project Manager, exclusive of hand tools. Regardless of ownership, such rental charges for Extra Work shall not exceed the lower of: (1) listed rates prevailing locally at equipment rental agencies or distributors at the time the Extra Work is performed; or (2) current U.S. Army Corp of Engineers scheduled charges for the area of the Project. Contractor shall attach a copy of the rate schedule to the daily reports and other documentation required by Paragraph 1.10, above. No charge shall be allowed or credit required for use of tools which have a replacement value of One Hundred Dollars (\$100) or less. The allowable rental rates shall include the cost of fuel, oil, lubrication, supplies, small

tools, necessary attachments, loading, transportation, repairs and maintenance of any kind, depreciation, storage, insurance and all incidentals. If equipment used for Extra Work is used intermittently and, when not in use, could be returned to its rental source at less expense to District than holding it at the Site, it shall be returned, unless Contractor elects to keep it at the Site at no expense to District. All equipment shall be acceptable to College Project Manager, in good working condition, and suitable for the purpose for which it is to be used. Manufacturers ratings and manufacturers approved modifications shall be used to classify equipment and it shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

Royalties, Permits: Additional or saved costs of royalties and permits.

Costs Not Allowed: Allowable Costs shall not include any of the following:

- A. Superintendent(s);
- B. Assistant superintendent(s);
- C. Project engineer(s);
- D. Project manager(s);
- E. Scheduler(s);
- F. Estimator(s);
- G. Drafting or detailing;
- H. Vehicles not dedicated solely to the performance of the Work;
- I. Small tools with a replacement value not exceeding One Hundred Dollars (\$100);
- J. Office expenses, including staff, materials and supplies;
- K. On-site and off-site trailer and storage rental and expenses;
- L. Site fencing not added solely due to the performance of Extra Work;
- M. Utilities, including gas, electric, sewer, water, telephone, fax and copier equipment;
- N. Computer and data-processing personnel, equipment and software;
- O. Federal, state or local business income and franchise taxes;
- P. Costs (other than the liquidated damages for Compensable Delay permitted by the Construction Contract) arising from or related to Delay or acceleration to overcome delay, whether incurred by Contractor or the Subcontractors, of any Tier;

Allowable Markups: Allowable Markups consist of the percentages set forth in this paragraph that, except as otherwise stated in the Contract Documents, are to be applied to the Allowable Costs for purposes of computing permitted adjustments to the Contract Sum Payable. Allowable Markups are deemed to cover, without limitation, the following:

(1) direct and indirect overhead, consumables, small tools, cleanup and profit of Contractor, Change Order preparation, vehicle costs, general clean-up costs, negotiations/research costs, additional guarantees/warranty costs; (2) direct and indirect overhead, consumables, small tools, cleanup and profit of the Subcontractors, of every Tier; and (3) all costs that are not reimbursable to Contractor under Paragraph 1.12, above. Allowable Markups shall be computed and applied as follows:

Review of Markups: It is Contractor's responsibility to review information submitted by Subcontractors to ensure that all markups by Subcontractors, of every Tier, comply with the requirements of the Contract Documents. Payment by District of markups that exceed Allowable Markups shall not be considered as a waiver by District of the right to repayment by Contractor of any markup charged that is in excess of Allowable Markups.

No Markup Allowed: Notwithstanding and without limitation to anything else stated in the Contract Documents, Contractor shall not be entitled to an Allowable Markup or any other amount or allowance as markup for overhead or profit on the following: (1) sums due to Contractor for Compensable Change that are based on agreed unit prices; (2) liquidated damages payable; to Contractor pursuant to Section 3.4 of the Construction Contract for Compensable Delay; or (3) other amounts with respect to which the Contract Documents

provide that no additional Allowable Markup shall be paid. Markup for overhead or profit on Compensable Changes that are performed by a District Materials Vendor pursuant to a District Materials Contract that has been assigned to Contractor pursuant to Section 2.5, above, shall be only permitted to be charged by the District Materials Vendor if, and if so only to the extent that, such markup is permitted under the terms of the District Materials Contract.

Net Allowable Costs: If any one Change or collection of Changes in the same or related portions of the Work or for Work covered by a single bulletin or instruction by District, College Project Manager or Design Consultant involves both additive adjustments and deductive adjustments, then the computation of amounts added or credited for Allowable Markups shall be based on the net difference between the additive items for which additional Allowable Markups is permitted and deductive items for which credits for Allowable Markups is required.

Unit Prices: Unless otherwise stated in the Contract Documents, unit prices stated in the contract Documents or subsequently agreed upon by District and Contractor shall be deemed to include and encompass all costs of performance, overhead and profit, including, without limitation, all Allowable Costs and Allowable Markups. If the unit price stated in the Contract Documents is based on an estimated quantity established by District in the Construction Contract and the actual quantity of such unit-priced item varies by more than 25% above or below the estimated quantity, an equitable adjustment in the Contract Sum Payable shall be made upon demand of either District or Contractor. Such equitable adjustment shall be based solely upon any increase or decrease in Allowable Costs (without any Allowable Markups), due solely to the variation above 125% or below 75% of the estimated quantity.

Discounts: For purposes of determining Allowable Costs of a Compensable Change, all trade discounts, rebates, refunds, and all returns from the sale of surplus materials and equipment shall accrue and be credited to District, and Contractor shall make provisions so that such discounts, rebates, refunds, and returns are secured.

Prompt Pricing: It is fundamental to the District's objective of controlling costs that performance of Compensable Changes on a time and materials basis of compensation and without a not-to-exceed price be limited to circumstances where it is impractical, without causing Delay to the Work, for Contractor to obtain competitive fixed or not-to-exceed prices pursuant to the regular pricing processes provided for by the Contract Documents. Contractor recognizes that prompt pricing by Contractor is critical to this objective. Accordingly, without limitation to any of District's other rights or remedies, it is agreed that if Contractor fails to timely submit a complete Change Order Request in accordance with Paragraph 1.06, above, with respect to any circumstance, event or occurrence constituting a Compensable Change that: (1) any resulting Delay to the performance of the Work (including, without limitation, the Compensable Change) shall be conclusively deemed to be an Unexcused Delay; (2) District shall have the option, exercised in its sole discretion, in lieu of exercising its rights under Paragraph 1.06, above, to unilaterally fix the amount of the adjustment to the Contract Sum Payable for such Compensable Change based on the "estimating guide" method set forth in Subparagraph 9.4.1.2 of the General Conditions, and (3) such unilateral adjustment by District shall be final and binding upon Contractor for purpose of determining the amount of the adjustment to the Contract Sum Payable on account of such Compensable Change, without any further right or recourse on the part of Contractor for any additional compensation or adjustment to the Contract Sum Payable.

Final Payment: No Claim by Contractor for adjustment to the Contract Sum Payable shall be allowed if asserted after Final Payment.

Full Resolution: Except as otherwise stated in Paragraph 1.20, below, the signing of a Change Order by Contractor and District shall be conclusively deemed to be a full resolution, settlement

and accord and satisfaction with respect to any and all Loss and Delay related to the subject matter of the Change Order including, without limitation, all rights to recovery of costs, expenses or damages for delay, disruption, hindrance, interference, extended or extraordinary (direct and indirect) overhead, unabsorbed home office overhead, multiplicity of changes, loss of productivity, labor, wage or material cost escalations, inefficiency, legal expenses, consultant costs, interest, lost profits or revenue, bond and insurance costs, changes in taxes and other similar and related Losses.

Reserved Rights: Change Orders shall be executed by Contractor without any express or implied reservation of rights by Contractor to reserve for the future the assertion of any right of recovery from District for Loss or Delay arising out of or relating to the subject matter of the Change Order. Unless specifically stated otherwise in the Change Order, execution by District of a Change Order shall not be interpreted as a waiver, release or settlement of any rights or claims that District may have for either: (1) Defective Work; (2) liquidated damages for Delay; or (3) recoupment by District (by way of withholding of funds, set off or recovery from Contractor) of amounts paid by District for costs or markups on costs that District determines, following payment of such amounts to Contractor, do not constitute reimbursable Allowable Costs or Allowable Markups under the terms of the Contract Documents.

No "Total Cost" Calculations. Contractor represents and warrants that it has the ability to generate and maintain complete and accurate cost accounting records that, if required, will reflect the actual Allowable Costs incurred or saved for multiple items of Compensable Change and, on an event-by-event basis, the effect of multiple Compensable Delays on the progress of the Work. Accordingly, Contractor agrees that all Change Order Requests and Claims shall be itemized in a manner that, with reasonable mathematical certainty and without reliance upon probabilities or inferences, segregates on a discrete, event-by-event basis the direct, actual Allowable Costs for which reimbursement is permitted and that are associated with each individual Compensable Change or Compensable Delay. Change Order Requests and Claims shall not be based, in whole or in part, upon any methodology (such as "total cost" or "modified total cost" methodologies) that purports to establish Contractor's entitlement to additional compensation inferentially based, solely or principally, on the difference between Contractor's total costs for the Work or a portion of the Work and its original Bid.

Multiple Changes: District reserves the absolute right to make whatever Changes, including, without limitation, Compensable Changes or Deleted Work, that it determines, in its sole discretion, are necessary and in its best interests. Under no circumstances shall the individual or cumulative number, value or scope of such Changes, or their individual and cumulative impact on the Work, become a basis for Contractor to assert any claim for breach of contract, rescission, termination, cardinal change or reformation of the Construction Contract, nor shall such circumstances be the basis for Contractor or any Subcontractors, of any Tier, to assert a right of recovery of any Loss if such right is not permitted by, or is in excess of that allowed under, the Contract Documents.

Continuous Performance: No dispute or disagreement with respect to any Changes or Delay, including, without limitation, disputes over Contractor's right to or the amount of any adjustment to the Contract Sum Payable or Contract Time, shall relieve or excuse Contractor from the obligation to proceed with and maintain continuous, expeditious and uninterrupted performance of the Work, including performance of any disputed Changes.

1.11 EXECUTION OF CHANGE ORDERS

A. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in this section. -

B. Change orders require approval by the Office of the State Architect per California Code of Regulations, Title 21, Section 38 prior to execution of change orders. District may provide a procedure for execution of change orders prior to OSA approval, to facilitate construction scheduling allowing Contractor to proceed.

ADDENDA AND CHANGE ORDERS

General: Work shall be executed in accordance with the approved plans addenda and change orders. Changes in the plans and specifications shall be made by addenda or change orders approved by the Office. [See Section 4-318(b)]

Addenda: Changes or alterations of the approved plans or specifications prior to letting a construction contract for the work involved shall be made by means of addenda which shall be submitted to and approved by the Office prior to distribution to contractors. Original copies of addenda shall be manually signed by the Architect or engineer in general responsible charge of preparation of the plans and specifications and by the Architect or registered engineer delegated responsibility for the portion affected by the addenda. [See Section 4-317(h)] One copy is required for the files of the Office.

Change Orders: Changes or alterations of the approved plans or specifications after a contract for the work has been let shall be made only by means of change orders submitted to and approved by the Office prior to commencement of the work shown thereon. Change orders shall state the reason for the change and the scope of work to be accomplished, and, where necessary, shall be accompanied by supplementary drawings referenced in the text of the change order. All change orders and supplementary drawings shall be manually signed by the Architect shall bear the approval of the school board and shall indicate the associated change in the project cost, if any. One copy of each change order is required for the files of the DSA Office.

Preliminary Change Orders: In order to expedite construction, preliminary change orders may be submitted to the Office. Preliminary change orders shall meet all the requirements necessary for a change order, with the exception of the approval of the school board and the associated change, if any, in costs. The preliminary change order does not require the stamp or seal, but does require the signature of the Architect or engineers. Work may proceed in accordance with the approved preliminary change order. An official change order shall be submitted to follow up on the preliminary change order as soon as possible.

1.12 CORRELATION OF CONTRACTOR SUBMITTALS

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

PROJECT COORDINATION

PART 1-GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General Conditions and other Division 1 Specification sections, apply to work of this section.

SUMMARY:

Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each Prime Contractor.

Minimum administrative and supervisory requirements necessary for coordination of work on the project to be fulfilled collectively by the Prime Contractors include but are not necessarily limited to the following:

- Coordination and meetings
- Administrative and supervisory personnel
- Changes in the work
- Limitations for use of site
- Tradesmen and workmanship standards
- Special reports
- Inspection, Tests and Reports
- General installation provisions
- Cutting and patching
- Cleaning and protection

These coordination requirements must be participated in by each Prime Contractor, where applicable, even though certain items for overall coordination purposes may be assigned to the Project Manager.

Refer to another Division 1 section for surveys and records reports.

Construction organization and start up:

Each Prime Contractor shall conform to the following:

Project Communications:

- a) Submittals
- b) Reports and Records
- c) Recommendations
- d) Coordination Drawing
- e) Schedules
- f) Resolutions of conflict

COORDINATION AND MEETINGS:

General: The Project Manager will prepare a written memorandum on required coordination activities, including such items as required notices, reports and attendance at meetings and distribute this memorandum to each entity performing work at the project site.

Each entity involved in the performance of work for entire project shall cooperate in the overall coordination of the work. Each entity, when requested, shall promptly furnish information for its portion of the work and shall respond promptly to the decisions and requests of personnel designated for coordination, supervisory, administrative, or similar functions.

Each trade installing concealed work, to which access must be available to the Owner after completion, shall furnish appropriate access doors and frames for installation by the Prime Contractor.

Similarly, the Prime Contractor shall furnish and install doors and frames giving access to elements of his work requiring the same. Locations must be suitable for access required, and acceptable to Architect. Access panels shall be compatible with construction in which they are installed, and installation shall be complete with required hardware, grounds, screeds, attachment devices and trim.

The Prime Contractor is responsible for coordination of structural, mechanical, and electrical elements prior to installation. Structural elements take precedence. All penetrations of structural elements must have approval of the Architect or Structural Engineer. Rerouting of ductwork, piping, or conduit around structural, mechanical or electrical elements is the responsibility of the mechanical or electrical subcontractors respectively and are not changes in the work and no claims for additional cost therefore will be valid.

Coordination Drawings: Prepare coordination drawings where work by separate entities requires fabrication off-site of products and materials, which must accurately interface. Coordination drawings shall indicate how work shown by separate shop drawings will interface and shall indicate installation sequence. Comply with all requirements of the "Submittals" section.

Where coordination drawings cover primarily the work of one prime contract, with only minor amounts of work by other Prime Contractors included, the Prime Contractor with the major amount of work shall prepare coordination drawings, as designated by the Project Manager.

Weekly Coordination Meetings: In addition to specific coordination meetings for each major element of work, and regular project meetings for other purposes (as indicated elsewhere in the contract documents), Project Manager will schedule and hold weekly general project coordination meetings at regularly scheduled times which are convenient for attendance by Prime Contractors and other entities then involved. Required attendance includes each Prime Contractor and every other entity identified by any Prime Contractor as being currently involved in coordination or planning for the work (of the entire project). Project Manager shall preside at each meeting, and shall record results of meetings and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting. At the option of the Project Manager, progress Applications for Payment may be withheld due to the non-attendance and participation in Weekly Progress Meetings until such time as the Prime Contractor is in compliance with the paragraph labeled "**Weekly Coordination Meetings**".

At the option of the Project Manager, monthly coordination meetings may be held integrally with monthly progress meetings as specified in section "Schedules/Payments, Separate Prime Contracts".

ADMINISTRATIVE/SUPERVISORY PERSONNEL:

General: Each Prime Contractor shall provide specific coordinating personnel as reasonably required for interfacing work with other work of total project.

Submittal of Staff Names, Duties: Within 15 days of contract date, each Prime Contractor shall submit a listing of Prime Contractor's principal staff assignments and consultants, naming persons and listing their addresses and telephone numbers.

LIMITATIONS ON USE OF THE SITE:

General: Limitations on site usage as well as specific requirements that impact utilization are indicated on the drawings and by other contract documents. In addition to these limitations and requirements, the Project Manager shall administer allocation of available space equitably among the separate Prime Contractors and other entities needing access and space, so as to produce the best overall efficiency in performance of the total work of the project. Each Prime Contractor shall schedule deliveries so as to minimize space and time requirements for storage of materials and equipment on site.

TRADESMEN AND WORKMANSHIP STANDARDS:

General: Each Prime Contractor shall instigate and maintain procedures to ensure that tradesmen performing work at site are skilled and knowledgeable in methods and craftsmanship needed to produce required quality levels for workmanship in completed work. Remove and replace work which does not comply with workmanship standards as specified and as recognized in the construction industry for applications indicated. Remove and replace other work damaged or deteriorated by faulty workmanship or its replacement.

Availability of Tradesmen: At each progress or coordination meeting, each Prime Contractor shall review the availability of tradesmen and projected needs to accomplish work as scheduled. Require each entity employing tradesmen to report on current and pending trade union actions and jurisdictional matters, which might affect progress of work. Where possible, dispute or delay as identified, consider alternatives and take actions to avoid disputes and delays.

SPECIAL REPORTS:

Reporting Accidents: Each Prime Contractor shall prepare and submit reports of significant accidents at site and anywhere else work is in progress. Record and document data and actions. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

INSPECTIONS, TESTS AND REPORTS:

General: Required inspection and testing services are intended to assist in determination of probable compliance's of the work with requirements, but do not relieve any Prime Contractor of responsibility for those compliance's, or for general fulfillment of requirements of contract documents. Specified inspections and tests are not intended to limit any Prime Contractor's quality control program. Afford reasonable access to agencies performing tests and inspections. Comply with all requirements of the "Quality Control" section.

Owner's Tests: Where tests or inspections are indicated as Owners responsibility, Owner will engage independent testing agency to perform required services. Notice of Readiness: In accordance with the General Conditions, each Prime Contractor will give timely notice to the Owner, the Architect, the Engineers, and the Project Manager of the readiness of any part of the work for required tests and inspections.

PART 2 -PRODUCTS (Not Applicable).

PART 3 -EXECUTION

GENERAL INSTALLATION PROVISIONS:

Pre-Installation Conferences: Well in advance of installation of every major unit of work which requires coordination and interfacing with other work, each Prime Contractor involved shall meet at project site with installers and representatives of manufacturers and fabricators who are involved in or affected by unit of work, and in its coordination or integration with other work which has preceded or will follow. The Project Manager will set the dates and times for such conferences in consultation with the involved parties. At each meeting, review progress of other work and preparations for particular work under consideration, including requirements of contract documents, options, related change orders, purchases, deliveries, shop drawings, product data, quality control samples, possible conflicts, compatibility problems, time schedules, weather limitations, temporary facilities, space and access limitations, structural limitations, governing regulations, safety, inspection and testing requirements, required performance results, recording requirements, and protection. Project Manager shall record significant discussions of each conference, and agreements and disagreements, along with final plan of action; and shall distribute record of meeting promptly to everyone concerned.

Installer's Inspection of Conditions: The Prime Contractor involved shall require the Installer of each major unit of work to inspect the substrate to receive the work and the conditions under which the work is to be performed. The Installer shall report all unsatisfactory conditions in writing to the Prime Contractor. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

Manufacturer's Instructions: Where installations include manufactured products, comply with the manufacturer's¹ applicable instructions and recommendations for installation, to the extent that these instructions and recommendations are more explicit or more stringent than requirements indicated in the contract documents.

Inspect each item of materials or equipment immediately prior to installation. Reject damaged and defective items.

Provide attachment and connection devices and methods for securing work properly. Secure work true to line and level, and within recognized tolerances. Allow expansion and building movement. Provide uniform joint width in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable visual-effect choices to the Architect for final decision.

Recheck measurements and dimensions of the work, as an integral step of starting each installation.

Install each unit of work during weather conditions and project status which will ensure the best possible results in coordination with the entire work. Isolate each unit of work from incompatible work

as necessary to prevent deterioration.

Coordinate enclosure of the work with required inspections and tests, so as to minimize the necessity of uncovering work for that purpose.

Mounting Heights: Where mounting heights are not indicated, mount individual units of work as directed by the Architect. Refer questionable mounting height choices to the Architect for final decision.

Access Provisions: Each trade installing concealed work, to which access must be available to the Owner after completion, shall furnish and install appropriate access doors and frames for installation by the Prime Contractor for Finish Carpentry. Locations must be suitable for the access required, and accepted by Project Manager and Architect. Access panels shall be compatible with the construction in which they are installed, and installation shall be complete with required hardware, grounds, screeds, attachment devices and trim.

Coordination Guidelines: Structural elements take precedence. All penetrations of structural members must have approval of the Structural Engineer. Routing of ductwork, piping, or conduit around structural, mechanical or electrical elements is the responsibility of the respective Prime Contractors or their subcontractors. This responsibility is a part of the work and no claims arising from failure to coordinate the work will be accepted.

CUTTING AND PATCHING:

General: Do not cut-and-patch structural work in a manner resulting in reduction of load carrying capacity or load/deflection ratio; submit proposed cutting and patching to Architect or Structural Engineer for structural approval before proceeding. Do not cut-and-patch operational elements and safety-related components in a manner resulting in reduction of capacities to perform in a manner intended or resulting in decreased operational life, increased maintenance, or decreased safety. Do not cut-and-patch work which is exposed on exterior or exposed in occupied spaces of building, in a manner resulting in reduction of visual qualities or resulting in substantial evidence of cut-and-patch work, both as judged solely by Architect. Remove and replace work judged by Architect to be cut-and-patched in a visually unsatisfactory manner.

Engage original Fabricator/Installer to perform cutting-and-patching of structural work, operational/safety-related components, and visually-exposed work; or, if not available, engage only recognized experts; employ only proven methods.

Materials: Except as otherwise indicated or accepted by Architect or Engineer, provide materials for cutting-and-patching which will result in equal-or-better work than work being cut-and-patched, in terms of performance characteristics and including visual effect where applicable. Use materials identical with original materials where feasible and where recognized that satisfactory results can be produced thereby.

Temporary Support and Protection: Provide adequate temporary support for work to be cut, to prevent failure. Do not endanger other work. Provide adequate protection of other work during cutting-and-patching, to prevent damage; and provide protection of the work from adverse weather exposure.

Cut work by methods least likely to damage work to be retained and work adjoining.

Where physical cutting action is required, cut work with sawing and grinding tools, not with hammering and chopping tools. Core drill openings completely through concrete work. Comply with the requirements of applicable sections of Division 2 where cutting-and patching requires excavating and backfilling.

Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.

Where feasible, inspect and test patched areas to demonstrate integrity of work.

Restore exposed finishes of patched areas; and, where necessary extend finish restoration onto retained work adjoining, in a manner which will eliminate evidence of patching.

Where patch occurs in a smooth unpainted surface, extend final paint coat over entire unbroken surface containing patch, after patched area has received prime and base coats.

CLEANING AND PROTECTION:

General: During handling and installation of work at the project site, each Prime Contractor shall clean and protect work in progress and adjoining work in the basis of continuous maintenance. Apply protective covering on installed work where it is required to ensure freedom from damage or deterioration at the time of substantial completion.

Clean and perform maintenance on installed work as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

Limiting Exposure of Work: To the extent possible through reasonable control and protection methods, each Prime Contractor shall supervise performance of the work in such a manner and by such means which will ensure that none of the work, whether completed or in progress, will be subjected to harmful, dangerous, damaging or otherwise deleterious exposure during the construction period. Such exposure includes, where applicable, but not by way of limitation the following:

Excessive static or dynamic loading; Excessive internal or external pressures; Excessively high or *low* temperatures; Thermal shock; Excessively high or low humidity; Air contamination or pollution; Water or ice; Solvents; Chemicals; Light; Radiation; Puncture; Abrasion; Heavy traffic; Soiling; Bacteria; Insect infestation; Combustion; Electrical current; High speed operation; improper lubrication; unusual wear or other misuse; Incompatible interface; Destructive testing; Misalignment; Excessive weathering; Unprotected storage; improper shipping or handling; Theft; and Vandalism.

END of SECTION

CUTTING AND PATCHING

PART 1 -GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General Conditions and other Division 1 Specification sections, apply to work of this section.

SUMMARY:

This Section specifies administrative and procedural requirements for cutting and patching.

Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each prime Contractor.

Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

Requirements of this Section apply to mechanical and electrical installations. Refer to Division-15 and Division-16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

SUBMITTALS:

Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:

Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.

Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.

List products to be used and firms or entities that will perform Work.

Indicate dates when cutting and patching is to be performed.

List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.

Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

QUALITY ASSURANCE:

Requirements for Structural Work: Do not cut and patch structural work in a manner that would result in a reduction of load-carrying capacity or of load-deflection ratio.

Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:

- Foundation construction.
- Structural concrete.
- Miscellaneous structural metals.
- Exterior curtain wall construction.
- Equipment supports.
- Piping, ductwork, vessels and equipment.
- Structural systems of special construction in Division-13.

Operational and Safety Limitations: Do not cut and patch operational elements or safety related components in a manner that would result in a reduction of their capacity to perform in the manner intended, or increased maintenance, or decreased operational life or safety.

Visual Requirements: Do not cut and patch construction exposed on the exterior or in its occupied spaces, in a manner that would, in the Architects' opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner. If possible retain the original installer or fabricator to cut and patch the exposed Work, or if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm.

PART 2 -PRODUCTS

MATERIALS:

Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 -EXECUTION

INSPECTION:

Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered. .

Before proceeding, meet at the site with parties involved in cutting and patching, including mechanical and electrical contractors. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding. .

PREPARATION:

Temporary Support: Provide temporary support of Work to be cut.

Protection: Protect existing construction during cutting and patching to prevent damage. Pro-vide

protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

Take precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but schedule to be removed or relocated until provisions have been made to bypass **them**.

PERFORMANCE:

General: Employ skilled workmen to perform cutting and patching work. Proceed with cutting and patching at the earliest feasible time and complete without delay.

Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with original installer's recommendations.

In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

Cut through concrete using a cutting machine such as a carborundum saw or diamond core drill.

Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.

By-pass utility services such as pipe and conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

Where removal of walls or partitions extends one finished area into another patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch, after the patched area has received primer and second coat.

CLEANING:

Thoroughly clean areas where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION

SECTION 01050
FIELD ENGINEERING

1. PART 1- GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including General Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 GENERAL

- A. Contractor shall provide and pay for field engineering services required for the project.

- 1. Survey work required in execution of the project
- 2. Civil, structural or other professional engineering services specified, or required to execute contractor's construction methods.

- B. Identify existing control points and property line corner stakes indicated on the drawings, as required

1.03 QUALIFICATIONS OF SURVEYOR ENGINEER

- A. Qualified professional engineer or registered land surveyor.. '

1.04 SURVEY REFERENCE POINT

- A. The Project Manager will establish two (2) base lines and two (2) reference benchmarks, which shall be protected and maintained by each Prime Contractor. Prime Contractor shall furnish line and grade from these established control points.

- 1. It shall be the responsibility of each Prime Contractor using this control to verify that the base lines and benchmarks are undisturbed and true prior to establishing its control.
- 2. Should the Prime Contractor, during the course of work, disturb, damage and/ or destroy the controls provided above, the Prime Contractor shall be responsible for replacing the controls at no additional cost to the Owner.
- 3. Should damage to the base control points occur, it shall be the responsibility of the Prime Contractor to notify the Project Manager immediately that damage has occurred.

- B. Survey Procedures: Before proceeding with the layout of actual work, each Prime Contractor shall verify the layout information shown on the drawings, -in relation to the property survey and existing bench marks. Each Prime Contractor shall record deviations, which are accepted, not corrected, on record drawings.

- 1. Locate and protect existing control points designated on drawings, prior to starting work; preserve all permanent reference points during construction.

- a. Do not change or relocate without prior written notice to the Architect or Construction Manager.
- b. Report to Construction Manager when any reference point is lost or destroyed, or requires relocation.
- c. Require surveyor to replace project control points which may be lost or

destroyed.

1.05 PROJECT SURVEY REQUIREMENTS

A. Establish lines and levels locate and layout, by instrumentation and similar appropriate means:

1. Stakes by grading and topsoil placement.
2. Utility slopes and invert elevations.
3. Batter boards lot structures
4. Building foundation, column locations and floor levels.
5. Controlling lines and levels required for the mechanical and electrical trades.

1.06 RECORDS

- A. Submit name and address of surveyor and professional engineer to the Architect and Construction Manager.
- B. On request of the Architect, submit documentation to verify accuracy of field engineering work.
- C. Submit certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance, or nonconformance with the contract documents.

END OF SECTION

DOCUMENT 01210

ALLOWANCES

PART 1 - GENERAL

.1 SUMMARY:

.1 Section Includes: Allowances which the Contractor shall provide for designated construction activities in the Work and in his bid.

.2 Related Documents: The Conditions of the Contract and other sections of Division apply to this section as fully as if repeated herein.

.2 DESCRIPTION OF REQUIREMENTS:

.1 Definitions and Explanations: Certain requirements of the construction related to each allowance are indicated and specified. The allowance has been established instead of additional requirements for that construction, and further requirements thereof will be issued by Change Order.

.2 Type of allowance scheduled herein for the Work include the following:

.1 Lump sum allowances

.3 Selection and Purchase: At earliest feasible date after award of Contract, advise the Architect of scheduled date when final selection and purchase of each product or system described by each allowance must be accomplished in order to avoid delays in performance of the Work.

.1 As requested by the Architect, obtain and submit proposals for construction activities involved in each allowance for use in making final selections; include recommendations for selections which are relevant to the proper performance of the work.

.2 Purchase products and systems as specifically selected by the Architect

.3 Submit proposals and recommendations, for purchase of products or systems of allowances, in form specified for Change Orders.

.4 Change Order Data: Where applicable, include in each change order proposal both the quantities of products being purchased and unit cost, along with total amount of purchases to be made. When requested, furnish data to substantiate quantities. Indicate applicable taxes and delivery charges.

.5 Unit Cost Allowances: Each change order amount for unit cost type allowance shall be based solely on the difference between the actual unit purchase amount and the unit allowance, multiplied by the final measure or count of construction in place with reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections and similar margins.

.1 Include installation costs in the purchase amount as part of the allowance.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CASH ALLOWANCES

3.1.1 The following Category Contractors shall include the following noted cash allowances in their base bid to be used solely by the Construction Manager;

3.1.1.1 Category #

3.1.2 Cash allowances shall be "net" amounts. Category contractors shall include all costs associated with the processing of items that may be charged against the designated allowance amount including estimating, project management, supervision, withholding of retention, overhead, profit, and bond costs in their base bid. The only allowable markup shall be a 10% overhead and profit fee by any subcontractor that may perform work (labor) submitted under the prime contractor. The Category Contractor shall receive no additional markups whatsoever. If any allowance amount (in whole or in part) is deleted by change order at any given point during the project, the Category Contractor shall credit back the full or unused portion of the allowance amount stipulated. The Category Contractor shall not be entitled to withhold any monies for overhead or profit or be obligated to return any overhead or profit included within their base bid. The use of any allowances is at the sole discretion of the Construction Manager.

END OF SECTION

SECTION 01300
SUBMITTALS

PART 1- GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General Conditions and other Division-1 Specification sections, apply to this section.

SUMMARY:

This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including:

- Shop Drawings
- Product Data
- Samples

Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each Prime Contractor.

SUBMITTAL PROCEDURES:

Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

Coordinate each submittal with purchasing, testing, delivery, other submittals and related activities that require sequential activity.

Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

Listing: Refer to the General Conditions, Article 4 for specified time listing requirements for all shop drawings, product data and samples and to materials and equipment elsewhere in Division for product list schedule.

Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.

Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Project Manager will promptly advise the Prime Contractor when a submittal being processed must be delayed for coordination.

If an intermediate submittal is necessary, process the same as the initial submittal.

Allow two weeks for reprocessing each submittal.

No extension of Contract Time will be authorized because of failure to transmit submittals to the Project Manager sufficiently in advance of the Work to permit processing.

Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

Include the following information on the label for processing and recording action taken.

- Project Name
- Date
- Name and address of Architect
- Name and address of Prime Contractor
- Name and address of subcontractor
- Name and address of supplier
- Name of manufacturer
- Number and title of appropriate Specification Section
- Drawing number and detail references, as appropriate

Provide 4" square spaces - for Architect's/Engineer's review stamp. Package each submittal appropriately for transmittal and handling. Submittals which are received from sources other than through Prime Contractor's office will be returned without being reviewed.

Prime Contractor's Review and Approval of Submittal: Each submittal upon which proper execution of the Work is dependent shall bear the Prime Contractor's review and approval stamp, dated and signed by the Prime Contractor in every case, certifying the Prime Contractor has (a) reviewed, checked, and approved the submittal and coordinated submittal contents with all requirements of the Work and the Contract Documents including related Work, (b) determined and verified measurements, quantities, field construction criteria, materials and equipment including catalog numbers and identifications, and similar data, or will do so, and (c) states that Work illustrated or described in the submittal is recommended by Prime Contractor and that the Prime Contractor's guarantee and warranty will fully apply thereto.

Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Prime Contractor to the Project Manager and to other destinations as indicated, by use of a transmittal form. Submittals received from sources other than the Prime Contractor will be returned to the sender "without action".

Transmittal Form: Prepare a draft of a transmittal form and submit it to the Architect/Engineer for acceptance. Provide on the form places for the following information:

- Project name
- Date
- To
- From
- Names of subcontractor, manufacturer and supplier
- References
- Category and type of submittal
- Submittal purpose and description
- Submittal and transmittal distribution record
- Signature of transmitter

Prime Contractor's certification stating that the information submitted complies with the requirements of the Contract Documents, with a place for the Prime Contractor's signature.

Record relevant information and requests for data on the transmittal form. On the transmittal form, or on a separate sheet attached to the form, record deviations from the requirements of the Contract Documents, if any, including minor variations and limitations.

SHOP DRAWINGS:

Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. 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 considered Shop Drawings.

Shop Drawings include fabrication and installation drawings, setting diagrams, shop work manufacturing instructions, coordination drawings, contractors' engineering calculations, schedules, patterns, templates and similar drawings. Include the following information:

- Dimensions
- Identification of products and materials included
- Compliance with specified standards
- Notation of coordination requirements
- Notation of dimensions established by field measurement

Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but not larger than 36" x 48".

Submittals: Submit 1 Electronic copy via email for the Project Manager's and Architect's (or Engineer's) review

Resubmittals: If required by the Architect's review, resubmit revised drawings in the same form and quantity as indicated at Paragraph above.

PRODUCT DATA:

Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

Mark the electronic copy to show applicable choices and options. . Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

- Manufacturer's printed recommendations
- Compliance with recognized trade association standards
- Compliance with recognized testing agency standards
- Application of testing agency labels and seals
- Notation of dimensions verified by field measurement
- Notation of coordination requirements

Do not submit Product Data until compliance with requirements of the Contract

Documents has been confirmed.

Submittals: Submit one (1) electronic copy of each required submittal. The Project Manager, Architect and Engineer will review and return marked with action taken and corrections, and modifications required. Resubmit when so indicated by Architect's review.

SAMPLES:

Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.

Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to match the Architect's Sample. Include the following:

- Generic description of the Sample
- Sample source
- Product name or name of manufacturer
- Compliance with recognized standards
- Availability and delivery time

Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed:

Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.

Preliminary Submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and other action.

Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.

Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

Sample sets may be used to obtain final acceptance of the construction associated with each set.

Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.

Field Samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish

materials and to establish the standard by which the Work will be judged.

Comply with submittal requirements to the fullest extent possible.
Process transmittal forms to provide a record of activity.

ARCHITECT'S ACTION:

Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return promptly.

Compliance with specified characteristics is the Prime Contractor's responsibility.

Conditions of Review:

Architect's review is for general conformance with the design concept and contract documents. Markings or comments shall not be construed as relieving the Prime Contractor from compliance with the project plans and specifications, nor departures there from. The Prime Contractor remains responsible for details and accuracy, for conforming and correlating all quantities and dimensions, for selecting fabrication processes for techniques of assembly, and for performing his work in a safe manner.

The Prime Contractor is responsible for coordinating his work with and between that of all Prime Contractors/Subcontractors and trades.

Absolutely no deviation from the Contract Documents will be permitted without written acknowledgment from the Prime Contractor to the Architect accompanying this submittal of all deviations contained in this submittal.

The Architect's review is not the final stage of acceptance for any part of the project, nor does it relieve the Prime Contractor of his Contract responsibilities.

Action Stamp: The Architect and Engineer will stamp each submittal to be returned with a review stamp with indications of the following conditions:

No Exceptions Taken: If this box is marked, the work covered by the submittal may proceed provided it complies with the requirements of the contract documents; acceptance of the work will depend upon that compliance.

Mark Corrections Noted: If this box is marked, the work covered by the submittal may proceed provided it complies with both the Architect's or Engineer's notations or corrections to the submittal and with the requirements of the contract documents; acceptance of the work will depend on that compliance.

Revise and Resubmit: If this box is marked, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise the submittal in accordance with the Architect's/Engineer's notations and resubmit without delay. Repeat if necessary.

Rejected and Resubmit: If this box is marked, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise the submittal or prepare a new submittal in accordance with the Architect's/Engineer's notations and resubmit without delay.

Remarks Attached: If this box is marked, the review has occasioned comments that have been attached to the submittal. Process these comments as if they had been written on the submittal itself.

Closeout Submittals: Refer to "Project Closeout" sections for specific general requirements on submittal of closeout information, materials, tools, and similar items.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01310

PROJECT CONSTRUCTION SCHEDULE

1. PART 1 GENERAL

A. SUMMARY

1. The work includes the preparation and submission of the sub-schedules and reports specified herein, including the up-to-date maintenance thereof as required by the CONSTRUCTION MANAGER. The Conditions of the Contract and the other sections of Division 1 apply to this section as fully as if repeated herein.

B. CONSTRUCTION SCHEDULE

1. The enclosed "PROJECT CONSTRUCTION SCHEDULE" is composed of tentative starting dates and fixed durations for each major activity of work on the project.

- a. Within 1 week of Contractor's receipt of District's Notice Of Award Letter, each Prime Contractor will be required to provide the following details to the CONSTRUCTION MANAGER:
- b. Proposed manpower loading of each scheduled field activity in order to properly complete same within the PROJECT CONSTRUCTION SCHEDULE'S fixed durations.
- c. Establish submittal lead times which will allow for the proper review time by the Architect without delaying the timely scheduled procurement of products, materials, and/or assemblies.
- d. Establish fabrication and/or procurement lead times which will maintain that no operation will be delayed from its scheduled starting date.

2. The Superintendent for each contractor shall submit, to the CONSTRUCTION MANAGER'S Project Superintendent, a brief written report by 12:00 noon on EACH AND EVERY WORKING DAY in which contractor is performing work on the project site which identifies each of the following:

- a. Schedule activity or activities currently under construction that day and the number of mechanics assigned to work the full or majority of the day on same.
- b. Total number of mechanics on the project that day which will work the full day.
- c. Estimated 100% completion date of each activity or activities currently under construction that day.
- d. Specific problems, if any, with the actions and/or inactions of other contractors, the DISTRICT, CONSTRUCTION MANAGER, ARCHITECT, consulting engineers, or the contract documents which are preventing CONTRACTOR'S work from being properly completed per the schedule.

3. CONTRACTOR must coordinate all work with all other contractors on the project through the CONSTRUCTION MANAGER'S Project Superintendent in order to complete each activity of their work within the fixed durations assigned to same as shown on the "PROJECT CONSTRUCTION SCHEDULE".

4. Schedule start dates as shown on the PROJECT CONSTRUCTION SCHEDULE are referred to as "tentative" only to the affect that said dates will be continually adjusted either forward or backward by the CONSTRUCTION MANAGER as the project progresses. Upon receipt of 48 hours advanced

notice by the CONSTRUCTION MANAGER to begin work on an activity, CONTRACTOR must properly man and perform the work of said activity and complete same within the noted number of consecutive working days or less assigned to said activity in the PROJECT CONSTRUCTION SCHEDULE.

5. CONTRACTOR is expected to continually monitor all phases of the project field construction progress in order to insure that CONTRACTOR'S work is properly implemented into the overall project improvements.
6. CONTRACTOR is expected to provide properly trained and skilled mechanics in adequate numbers and equipment needed and/or required in order to properly and efficiently complete all work activities per the schedule. Should CONSTRUCTION MANAGER have reason to believe at any time that CONTRACTOR is not providing an adequate workforce armed with the proper materials and/or equipment, CONSTRUCTION MANAGER shall give CONTRACTOR written notice of same. Activity Manpower loading submitted in item 1.B.1.b above shall in no way limit the responsibility of the CONTRACTOR to perform to the fixed duration requirements of the PROJECT CONSTRUCTION SCHEDULE.

END OF SECTION

SCHEDULES/PAYMENTS

PART 1-GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of each prime Contract, including General Conditions and other Division-1 Specification sections, apply to work of this section.

SUMMARY:

Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each Prime Contractor.

This section specifies schedules and payments integral for the Project, including but not necessarily limited to the following:

- Progress Schedules
- Color Schedules
- Submittal Schedules
- Progress Meetings Reporting
- Schedule of Values
- Payment Requests

COORDINATION, GENERAL:

Each Prime Contractor shall provide close administrative and procedural coordination of scheduling with other Prime Contractors. Each Prime Contractor shall also be responsive to the overall coordination responsibilities assigned to the Project Manager. Each Prime Contractor shall coordinate both the provisions of this and other sections, so as to provide consistency and logical coordination between the reports. Maintain coordination and correlation between separate reports by updating at monthly or shorter time intervals. Each Prime Contractor shall make appropriate distribution of each report and updated report to all other Prime Contractors involved in the work, Project Manager and Owner. In particular, provide close coordination of progress schedule, schedule of submittals & progress reports.

PRELIMINARY CONSTRUCTION SCHEDULES:

Incorporated into the Construction Documents, the Project Manager has provided a baseline construction schedule. Within five (5) days following execution of the Agreement, the Prime Contractors shall prepare and submit to Project Manager, individual preliminary construction schedules (General Conditions 7.3.1). Matching the Baseline Construction Schedule in bar-chart form showing its work, properly sequenced and coordinated with work of the Prime Contractors. Each schedule shall show completion of its work sufficiently in advance of date established for substantial completion of the entire work of the prime contracts. If schedule adjustments are necessary for proper sequencing and coordinating of the work, the Project Manager shall schedule a meeting with all Prime Contractors at the earliest possible date; at this meeting, each Prime Contractor shall negotiate reasonable adjustments to the schedule.

Based on preliminary construction schedules, any updating and feedback occurring during the project start-up, the Project Manager shall create the approved Construction Schedule for the entire work of the prime contracts. Within ten (10) days of receipt of multiple prime preliminary construction schedules, submit a multi-sheet, comprehensive, integrated, bar-chart type progress schedule indicating, by phase, a

time bar for each major category or unit of work to be performed at site; include minor elements of the work which are, nevertheless, involved in overall sequencing of the work. Show the work of each prime contract on a separate sheet, and prepare a simplified summary sheet of the combined work of the prime contracts. Arrange the schedules to show graphically the major sequences of work necessary for the completion of related elements of work. Arrange the schedules to show how substantial completion is scheduled to allow for the Architects procedures for certification of substantial completion. Prepare and maintain the schedule on either a sheet of sufficient width (or else a series of sheets) to show the required data clearly for the entire Construction Time. Prepare schedule on sheets of stable transparency (or other reproducible material) to permit reproduction for the required distribution.

Arrange schedule with notations to show how the sequence of work is affected by requirements for phased completion, work by separate non-Prime Contractors, work by the Owner, repurchased materials, coordination with existing work, limitations of continued occupancies, non-interruptible services, partial occupancy prior to substantial completion, site restrictions, provisions for future work, seasonal variations, environmental control, and similar provisions of total project. refer to other sections of Division 1 and other contract documents for requirements.

Following the initial submittal to and response by the Architect, the Project Manager shall print and distribute progress schedules to the Owner, separate Prime Contractors, the principal subcontractors and suppliers and others with a need-to-know schedule compliance requirement. Post copies in the temporary field office. When revisions are made, distribute updated issues to the same entities and post updated issues in the same locations. Delete entities from distribution when they have completed assigned work and are no longer involved in performance of scheduled work.

SUBMITTAL SCHEDULE:

Within five (5) days of the Agreement, the Prime Contractors shall prepare & submit to Project Manager complete schedule of work-related submittals. Correlate submittal schedule as required by the General Conditions, and with the listing of products or the procurement schedule as specified in the Products and Substitutions sections and elsewhere in the contract documents.

PROGRESS MEETINGS, REPORTING:

General: In addition to specific coordination and pre-installation meetings for each element of work, and other regular project meetings held for other purposes, Project Manager shall schedule and hold a general progress meeting each month, with time coordinated with preparation of payment requests. Require each Prime Contractor and each entities involved in planning, coordination or performance of work to be properly represented at each meeting. Review each entities present and future needs including interface requirements, time, sequences, deliveries, access, site utilization, temporary facilities and services, hours of work, hazards and risks, housekeeping, change orders, and documentation of information for payment requests.

Discuss whether each element of current work is ahead of schedule, on time, or behind schedule in relation with integrated and updated approved construction schedule. Determine how behind-schedule work will be expedited, and secure commitments from each Prime Contractor and other major entities involved in doing so. Discuss whether schedule revisions are required to ensure that current work and subsequent work will be completed within Contract Time of each prime contract. Review everything of significance that could affect progress of the work.

Initial Progress Meeting: Schedule the initial progress meeting, recognized as the "Preconstruction Meeting", for a date not more than 15 days after commencement of the work. Conduct this meeting as an organizational meeting, and review responsibilities and personnel assignments.

Reporting: Within 3 days after each progress meeting date, Project Manager shall distribute copies of minutes-of-the-meeting to each entity present and to others who should have been present. Include a brief summary (in narrative form) of progress of the work since previous meeting and report.

Daily Reports: The Project Manager and Inspector (as owner's representative) shall each prepare a daily report, recording the following information concerning events at the site. Duplicate copies of the Inspectors Daily Reports shall be available for the Architect's (or engineer) review when requested.

- List of Prime Contractors at the site.
- List of subcontractors at the site.
- Approximate total count of personnel at the site.
- High/low temperatures, general weather conditions.
- Accidents (refer to accident reports).
- Meetings and significant decisions.
- Unusual events (refer to special reports).
- Stoppages, delays, shortages, losses.
- Emergency procedures, field orders.
- Orders/requests by governing authorities.
- Change orders received, implemented.
- Services connected, disconnected.
- Equipment or system tests and start-ups.
- Partial completions.
- Substantial completions authorized.

Notice of Labor Disputes: Whenever an actual or potential labor-dispute is delaying or threatens to delay the performance of the work, the Prime Contractor shall immediately notify the Architect, orally, and confirm in writing. Such notice shall include all relevant information concerning the dispute and its background.

SCHEDULE OF VALUES:

General: Each Prime Contractor shall prepare a schedule of values/cost breakdown, as required by the General Conditions. Provide breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of payment requests and progress reports. Breakdown principal subcontract amounts into several line items. Round off to the nearest whole dollar, but with the total equal to the Contract Sum.

Sub-Schedules: Where work is separated into phases which require separately phased payments to Prime Contractor, provide sub-schedules showing values correlated with each phase of payment.

Material/Fabrication Values: For each unit of work where payment requests will be made on account of materials or equipment purchased, fabricated OR delivered but not yet installed, show "initial value" for payment request and "value added" for subsequent stage or stages of completion on that unit of work.

Time Coordination: In coordination of initial submittals and other administrative "startup" activities, submit the schedule of values to the Project Manager at the earliest feasible date, but in no case later than 7 days before the initial payment period for the project.

Listing: Arrange the schedule with columns to indicate the generic name of item, related specification sections, the subcontractor, the supplier/manufacturer/fabricator, change orders (numbers) which have affected the value, the dollar value of the item, and the percentage of the Contract Sum to nearest one-hundredth percent and adjusted to total 100 percent.

Margins of Cost: Show line items of indirect costs, and margins on actual costs, only to the extent such items will be individually listed in payment requests. In general, each item in the schedule of values and in payment requests shall be established to be complete with its total expenses and proportionate share of general overhead and profit margin. Except as otherwise indicated, those major cost items that are not directly the cost of actual work-in-place, such as distinct temporary facilities, may be either shown as line items in schedule of values or may be distributed as general overhead expense, at each Prime Contractor's option.

Schedule Updating: Update and resubmit the schedule of values when change orders affect listing and when the actual performance of the work involves necessary changes of substance to values previously listed.

PAYMENT REQUESTS:

General: Except as otherwise indicated, the progress payment cycle for each Prime Contractor is to be regular. Each application must be consistent with previous applications and payments. Certain applications for payment, such as the initial application, the application at substantial completion, and the final payment application involve additional requirements.

Waivers of Lien: For each payment application, each Prime Contractor shall submit waivers of lien for every entity (including Prime Contractor) who could lawfully and possibly file a lien in excess of \$100 arising out of the Contract and related to work covered by the payment. Submit partial waivers for the amount requested, prior to deduction of retainage, on each item. When application shows completion of an item, submit final or full waivers. The Owner reserves the right to designate which entities involved in the work must submit waivers.

Waiver Delays: Each progress payment must be submitted with Prime Contractor's waiver from the period of construction covered by the application. At the Prime Contractor's option, each progress payment may be submitted from waivers from the subcontractors or subcontractors and suppliers for the previous period of construction covered by the previous application. The final payment application must be submitted together with or preceded by final or complete waivers from every entity involved with performance of the work covered by the payment request.

Waiver Forms: Submit waivers on forms, and executed in a manner, acceptable to Project Manager.

Payment Application Times: The "date for each progress payment" for each Prime Contractor is as indicated in Owner-Prime Contractor Agreement and in the Supplementary Conditions to the General Conditions, Article 9.

Payment Application Forms: Certificate for Payment form available from Architect's office.

Application Preparation: Except as otherwise indicated, complete every entry provided for on the form, including notarization and execution by authorized persons. Incomplete applications will be returned by Project Manager without action. Entries must match current data of schedule of values, progress schedule and reports. Listing must include amounts of change orders issued prior to last day of the "period of construction" covered by application.

Initial Payment Application: The principal administrative actions and submittals which must precede or coincide with submittal of each Prime Contractor's first payment application can be summarized as follows, but not necessarily by way of limitation:

Listing of subcontractors and principal suppliers and fabricators.

Schedule of values.

Progress schedule (preliminary if not final).
Schedule of principal products.
Schedule of submittals (preliminary if not final).
Listing of Prime Contractor's staff assignments and principal consultants.
Performance and/or payment bonds.
Evidence satisfactory to Owner that Prime Contractor's insurance coverage's have been secured.
Data needed by Owner to secure related insurance coverage's.

Application at Time of Substantial Completion: Following issuance of Architect's final "certificate of substantial completion" on each Prime Contractor's work, and also in part as applicable to prior certificates on portions of completed work as designated, a "special" payment application may be prepared and submitted by Prime Contractor. The principal administrative actions and submittals which must proceed or coincide with such special applications can be summarized, as follows, but not necessarily by way of limitation:

Approvals or Certifications by governing authorities assuring Owner's full access and use of completed work.

Warranties (guarantees), maintenance agreements and similar provisions of contract documents.

Final cleaning of the work.

Listing of Prime Contractor's incomplete work, recognized as exceptions to Architect's (or Engineers) certificate of substantial completion.

Test/adjust/balance records, maintenance instructions, meter readings, start-up performance reports, and similar changeover information germane to Owner's occupancy, use, operation, and maintenance of completed work.

Application for reduction (if any) of retainage, and consent of surety

Advice to Owner on coordination of shifting insurance coverage's, including proof of extended coverage as required.

Architects Certificate of Substantial Completion.

Final Payment Application: The administrative actions and submittals which must precede or coincide with submittal of each Prime Contractor's final payment application can be summarized as follows, but not necessarily by way of limitation:

Completion of project close-out requirements.

Completion of items specified for completion beyond time of substantial completion (regardless of whether special payment application was previously made).

Assurance, satisfactory to Owner, that unsettled claims will be settled and that work not actually completed and accepted will be completed without undue delay.

Transmittal of required project construction records to Owner.

Proof, satisfactory to Owner, that taxes, fees and similar obligations of Prime Contractor have been paid.

Removal of temporary facilities, services, surplus materials, rubbish and similar elements.

Changeover of door locks and other provisions for Prime Contractor's access to Owner's

property.

Consent of surety for final payment.

After the completion of the work contemplated by this Contract, the Prime Contractor shall file with the Owner *his* affidavit, sworn to before a Notary Public, stating that all workmen and persons employed, all firms supplying the materials and all subcontractors upon the project have been paid in full and that there are not bills outstanding against the project for either labor or materials, except certain items in connection with the Notices to Withhold have been filed under the provisions of the Statutes of the State of California. The filing of such affidavit by the Prime Contractor shall be a prerequisite to making, by the Owner, of the final payment on the contract.

Application Transmittal: Each Prime Contractor shall submit 4 executed copies of each payment application, one copy of which shall be complete with waivers of lien and similar attachments. Transmit each copy with a transmittal form listing those attachments, and recording appropriate information related to application in a manner acceptable to Project Manager. Transmit to Project Manager by means ensuring receipt within 24 hours.

PART 2-PRODUCTS (Not Applicable)

PART 3-EXECUTION (Not Applicable)

END OF SECTION

SECTION 01323
CONSTRUCTION PHOTOGRAPHS

PART 1-GENERAL

1.1 SUMMARY

- A. Section includes requirements for photographs to be taken before and during the construction of the Project.

1.2 SUBMITTALS

- A. E-mail photos to the District and Construction Manager within 3 days after capturing photographs.

PART 2 -PRODUCTS (NOT USED)

PART 3 -EXAMINATION

3.1 GENERAL

- A. Provide time-dated construction photographs taken on first day of each month and at following stages of construction, when they do not coincide with the first day of the month.
 - 1. Prior to beginning any work at the site.
 - 2. Promptly after damage that may result in loss or liability occurs.
 - 3. At completion of all construction work and when at project completion.
- B. At each specified time during construction, take photographs from different views. Take 12 exterior views and 24 interior views. Views will be determined, or must be approved in advance by the Architect.
- C. Take color photographs with a digital camera at a resolution of not less than 4 mega pixels.
- D. E-mail photographs as specified above.

END OF SECTION

SECTION 01450
CONTRACTOR QUALITY CONTROL

PART 1- GENERAL

1.1 SUMMARY

- A. Section includes general requirements for quality control of the Work, including test and inspection procedures.
- B. Related work:
 - 1. Divisions 2 through 16 for specific test procedures to be performed in compliance with this Section.

1.2 ADMINISTRATIVE STAFF

- A. Provide a competent and adequate staff for the administration, coordination, supervision, and superintendence of the Work.
- B. Do not change key members of this staff without the consent of the District, unless such staff members prove to be unsatisfactory to the Contractor and cease to be in his employ. If the Contractor intends to change a key staff member, he shall give the District written notice at least 15 days prior to the intended change.
- C. Key staff members shall be full time employees, stationed at the site.
- D. Project staff shall include, but shall not be limited to, the following:
 - 1. Project Manager: The person who has responsibility for the prosecution of the work and who has the authority to act in matters for the coordination, direction, and technical administration of the work. Prior to commencement of the work, provide the District with the name of the project manager.
 - 2. Superintendent: The person who shall be in attendance at the Project site during the performance of the work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.
 - 3. Additional staff: In addition to the general project superintendent required above, provide the services of coordinating engineer for HVAC, Plumbing, Fire Protection, and Electrical Work: The full time person who has the responsibility for the coordination of the mechanical and electrical work with the work of other trades, for the review of mechanical and electrical shop drawings, for the resolution of conflicts and interferences between trades, for directing adjustments in the work that shall be required to comply with the Contract Documents, and for commissioning the mechanical and electrical systems. This individual shall have previous experience in coordinating these areas of work on projects of similar scale and complexity.

1.3 CONTRACTOR QUALITY CONTROL SYSTEM

- A. Establish a quality control system to perform sufficient inspections and tests of all items of Work, including that of all subcontractors, to ensure conformance with the Contract Documents for materials, workmanship, construction, finish, functional performance and identification.
- B. Quality control system shall ensure that the Work complies with the requirements of the Contract Documents. Controls shall be adequate to cover all construction operations.

- C. Apply, install, connect, erect, use, clean, adjust, and condition articles, materials and equipment in compliance with their manufacturer latest published instructions, unless more restrictive or stringent requirements are specified in the Specifications.
 - 1. When specified or requested, furnish the Architect 2 copies of such printed instructions prior to introduction of such items.
 - 2. If product manufacturer instructions are in conflict with the Contract Documents, notify the Architect for clarification before proceeding.
 - 3. Keep a clean, legible copy of the various product manufacturers instructions applicable to the Work at the Project site.
- D. Certificates:
 - 1. When specified, deliver to the Architect 2 signed certificates from suppliers of materials, equipment and manufactured items stating that such materials and manufactured items meet or exceed the standards specified.
 - 2. In lieu of such certification, the Contractor may submit reports of current tests made and attested by a reputable and recognized testing laboratory.

1.4 CONTRACTOR ASSISTANCE

- A. Cooperate with individual or firm performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the individual or firm sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:
 - 1. Providing access to the work to be tested or inspected and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
 - 2. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
 - 3. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.
 - 4. Providing the individual or firm with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
 - 5. Providing security and protection of samples and test equipment at the Project site.

1.5 VERIFICATION OF CONDITIONS

- A. Prior to installation of any product, inspect existing supports and assemblies to receive materials to be installed and arrange for correction of defects in the existing workmanship, material or conditions that may adversely affect work to be installed.
- B. Installation of materials will constitute acceptance of existing conditions as being in proper condition to receive the materials to be applied and waiver of claim that existing conditions are defective as pertains to warranty requirements.
- C. Where the Specifications require a product to be installed under the supervision or inspection of the material manufacturer or its representative, manufacturer or its representative shall also inspect the work in place and issue a letter to Architect verifying that this procedure was followed without exception.

1.6 INSTALLER QUALIFICATIONS

- A. Where the Specifications dictate a certain level of experience or expertise from the subcontractor/installer by requiring a minimum number of years of experience in the successful installation of a product or a minimum number of successful installations

for the product specified, it shall be the Contractor responsibility to verify the installer's competence and track record before signing a subcontract to perform the affected work.

1.7 MANUFACTURER FIELD SERVICES

- A. An experienced, competent, and authorized representative of the manufacturer of each item of equipment for which field services are required in the Specifications shall visit the site of the Work and inspect, check, adjust if necessary, and approve the equipment installation.
- B. In each case, the representative shall revisit the job-site as often as necessary until all problems are corrected and the equipment installation and operation are satisfactory, in the opinion of the Architect.
- C. Each manufacturer representative shall furnish to the Architect a written report certifying that the equipment has been properly installed, and lubricated; is in accurate alignment; is free from any undue stress imposed by connecting piping or anchor bolts; and has been operated under full load conditions and that it operated satisfactorily.
- D. All costs for these services shall be included in the Contract.

END OF SECTION

SECTION 01500
TEMPORARY CONSTRUCTION FACILITIES

PART 1- GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General Conditions and other Division-1 Specification sections, apply to work of this section.

SUMMARY:

Definitions: Specific administrative and procedural minimum actions are specified in this section, as extensions of provisions in General Conditions and other Contract Documents. These requirements have been included for special purposes as indicated. Nothing in this section is intended to limit types and amounts of temporary work required, and no omission from this section will be recognized by Architect, Engineer, Engineer or Project Manager that such temporary activity is not required for successful completion of the work and compliance with requirements of Contract Documents. Provisions of this section are applicable to, but not by way of limitation as follows:

- Utility services
- Construction facilities
- Support facilities
- Security / protection provisions

Multiple Prime Contracts: Provisions of this Section apply to construction activities of each Prime Contractor.

QUALITY ASSURANCE:

General: In addition to compliance with governing regulations and rules/recommendations of franchised utility companies, comply with specific requirements indicated and with applicable local industry standards for construction work (published recommendations by local "building councils").

ANSI Standards: Comply with applicable provisions of ANSI A10-Series standards on construction safety, including A10.3, A10.4, A10.S, A10.6, A10.7, A10.8, A10.9, A10.10, A10.11, A10.12, A10.13, A10.14, A10.1S, A10.17, A10.18, A10.20, and A10.22.

Conservation: In compliance with Owner's policy on energy/materials conservation, install and operate temporary facilities and perform construction activities in manner which reasonably will be conservative and avoid waste of energy and materials including water.

JOB CONDITIONS:

General: Establish and initiate use of each temporary facility at time first reasonably required for proper performance of the work. Terminate use and remove facilities at earliest reasonable time, when no longer needed or when permanent facilities have, with authorized use, replaced the need.

Conditions of Use: Install, operate, maintain and protect temporary facilities in a manner and at locations which will be safe, non-hazardous, sanitary, and protective of persons and property, and free of deleterious effects.

PARTS 2 AND 3 - PRODUCTS AND EXECUTION

TEMPORARY UTILITY SERVICES:

Water Service:

General: Owner will provide construction water service. Prime Contractors will be responsible for providing appurtenances for directing water to desired locations.

Electrical Power Service:

General: Prime Contractor shall be responsible to provide any and all temporary power required to complete the work of this contact.

Telephone Service:

General: Prime Contractor is required to provide telephone service is needed.

TEMPORARY CONSTRUCTION FACILITIES:

The types of temporary construction facilities required include, but not by way of limitation as follows:

- Water distribution
- Drainage and watering equipment
- Enclosure of work
- Heat
- Ventilation
- Electrical power distribution
- Lighting
- Hoisting facilities
- Stairs
- Ladders
- Roads

Provide facilities reasonably required to perform construction operations properly and adequately. Each Prime Contractor shall be responsible for providing all temporary facilities for the work of their contract (excluding those facilities specifically indicated above as being furnished by others.)

Heating: Heat with self-contained heaters, bearing UL, FM or other approval labels appropriate for application. Vent fuel-burning heaters, and equip units with individual thermostatic controls. Use electric-resistance space heaters only where no other, more energy-efficient, type of heater is available and allowable.

Supply power for electric welding by engine-driven power-generator sets.

Lighting: Prime Contractor to provide temporary lighting if needed.

TEMPORARY SUPPORT FACILITIES:

Each Prime Contractor will provide the first aid facilities, materials, and equipment required by governing authorities, laws, ordinances, regulations, standards, orders and underwriters for the work of his contract.

SECURITY/PROTECTION PROVISIONS:

Prime Contractor shall be responsible to provide any and all security and/or protective measures as deemed necessary to complete the work of this contract.

Temporary Fire Protection:

Construction Sheds, Etc: Shall be placed outside of the building structure, limited to no more than 300 square feet area and located at least ten feet away from the buildings or from combustible materials storage piles. Stoves shall be set on properly protected floor with ample lateral clearance and particular attention shall be given to stack clearance and arrangement.

Gasoline, Oils, Paint and Other Volatile Liquids: Shall be kept outside, to be brought into the building in quantities only as needed. Such storage shall be in a well ventilated location, well removed from all open heating or lighting devices. Particular care shall be given to the housekeeping in the storage room to eliminate spillage and accumulation of oil wastes: provide approved waste and safety cans.

Fire Extinguishers: Each Prime Contractor shall provide types, sizes, numbers and locations as would be reasonably effective in extinguishing fires during early stages, by personnel at Project Site. Prime Contractor will instruct all his personnel at Project Site, at time of their first arrival, on proper use of extinguishers.

Barricades, Guardrails, Warning Signs and Lights:

Each Prime Contractor shall comply with recognized standards and code requirements for erection of substantial and structurally adequate barricades where needed to prevent accidents and losses. Paint with appropriate colors, graphics and warning signs to inform personnel at site, and the general public where exposure exists, of hazard being protected. Provide lighting where appropriate and needed for recognition of facility, including flashing red lights where appropriate.

Each Prime Contractor shall construct and maintain fences, guardrails, barricades, lights, flashers, shoring and warning signs as required by local authorities and State safety ordinances and as required to protect the Owner's property from injury or loss and as necessary for the protection of the public place for carrying on the work covered in this contract. Leave all protection in place and maintain until removal is authorized.

All temporary work shall conform to all the requirements of State and local authorities and underwriters which pertain to operation, safety, and fire hazard. The Prime Contractor shall furnish and install all items necessary for conformity with such requirements, whether or not called for under the separate divisions of these specifications. All fencing and barricades shall be removed upon completion of the project.

Each Prime Contractor shall protect all streets and sidewalks and shall repair all damage caused by his work at his own expense.

Noise Control: Noise from job equipment and construction operations shall be kept to a minimum by adequate mufflers and other means as approved by the Project Manager.

Dust Control: Throughout the entire contract period, the Prime Contractor shall palliate dust conditions in the working area, involved portions of the site and all roads used in the operations. 1ms shall consist of intermittent watering and sprinkling of such frequency as will satisfactorily allay the dust during the hours that work is to be performed, as required.

Drainage Control: (Water) Prime Contractor shall at all times protect related or adjacent to his work, excavations, banks, trenches and/ or the building from rain water, spring water, ground water, backing up on drains or sewers, and all other water admitted to any work by his operation. He shall provide all pumps and other equipment and enclosures to provide this protection.

Prime Contractor shall construct and maintain all necessary temporary drainage and do all pumping necessary to keep aforementioned excavations, etc., free of water.

Each Prime Contractor shall furnish and maintain pumping apparatus as needed to prevent any water damage to the work in progress.

Pollution Control: All fires are strictly forbidden. Refer to Fire Regulations.

Weather Protection: Prime Contractor shall at all times provide protection to the work against weather, rain, wind storms, frost or heat so as to maintain all work, materials, apparatus and fixtures free from injury or damage.

LOCATION AND USE OF TEMPORARY FACILITIES:

Project Manager will direct location of construction trailers, sheds, and other facilities which individual Prime Contractors bring to the Project Site.

Prime Contractors will be responsible for damage to existing improvements caused by the installation, presence, use, and removal of temporary facilities. Temporary Facilities shall be removed as soon as their use is not needed and immediately repair all damage to previously existing or new work.

END OF SECTION

SECTION 01600
MATERIALS AND EQUIPMENT

PART 1- GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General Conditions and other Division-1 Specification sections, apply to work of this section.

SUMMARY:

This Section specifies administrative and procedural requirements governing the Prime Contractor's selection of products for use in the Project.

Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each Prime Contractor.

The Prime Contractor's Construction Schedule and the Schedule of Submittals are included under Sections "Submittals" and "Schedule/Payments".

Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.

Administrative procedures for handling requests for substitutions made after award of the Contract are included under Section "Product Substitutions".

DEFINITIONS:

Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well recognized meanings in the construction industry.

"Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

"Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturers published product literature that is current as of the date of the Contract Documents.

"Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

"Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

SUBMITTALS:

Product List Schedule: Prepare a schedule showing products specified in a tabular form acceptable to the Project Manager. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed. Indicate whether the product listed is one of those specified, a product conforming with performance specifications, or a product which must be reviewed under the provisions of Section 01631, Product Substitutions.

Coordinate the product list schedule with the Prime Contractor's Construction Schedule and the Schedule of Submittals.

Form: Prepare the product listing schedule with information on each item tabulated

under the following column headings:

- Related Specification Section number
- Generic name used in Contract Documents
- Proprietary name, model number and similar designations
- Manufacturer's name and address
- Supplier's name and address
- Installer's name and address
- Projected delivery date, or time span of delivery period

Initial Submittal: Within 30 days after date of commencement of the Work, submit 3 copies of an initial product list schedule. Provide a written explanation for omissions of data, and for known variations from Contract requirements.

Completed Schedule: Within 60 days after date of commencement of the Work, submit 3 copies of the completed product list schedule. Provide a written explanation for omissions of data, and for known variations from Contract requirements.

Architect's Action: The Architect will respond in writing to the Prime Contractor within 2 weeks of receipt of the completed product list schedule. No response within this time period constitutes no objection to listed manufacturers or products, but does not constitute a waiver of the requirement that products comply with Contract Documents. The Architect's response will include the following:

- A list of unacceptable product selections, containing a brief explanation of reasons **for this action**.

QUALITY ASSURANCE:

Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.

Compatibility of Options: When the Prime Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

- Each Prime Contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate Prime Contractors.

- If a dispute arises between Prime Contractors over concurrently selectable, but incompatible products, the Architect will determine which products shall be retained and which are incompatible and must be replaced.

PRODUCT DELIVERY, STORAGE, AND HANDLING:

Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.

Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.

Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.

Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.

Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation.

Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

PRODUCT SELECTION:

General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.

Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other products.

Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:

Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.

Semi-proprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.

Where products or manufacturers are specified by name, accompanied by the term "or equal, or "or approved equal" comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

Non-Proprietary Specifications: When the Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Prime Contractor to use of these products only, the Prime Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.

Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.

Compliance with Standards, Codes and Regulations: Where the specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.

Visual Matching: Where Specifications require matching an established Sample, the Architect's

decision will be final on whether a proposed product matches satisfactorily.

Where no product available within the specified category matches satisfactorily and also complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category, or for noncompliance with specified requirements.

Visual Selection: Where specified product requirements include the phrase " ... as selected from manufacturer's standard colors, patterns, textures ... " or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern and texture from the product line selected.

PART 3 - EXECUTION

INSTALLATION OF PRODUCTS:

Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.

Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION

SECTION 01631
PRODUCTS AND SUBSTITUTIONS

PART 1- GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General Conditions and other Division-1 Specification sections, apply to work of this section.

SUMMARY:

This Section specifies administrative and procedural requirements for handling requests for substitutions made after award of the Contract.

Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each Prime Contractor.

The Prime Contractor's Construction Schedule and the Schedule of Submittals are included under Sections "Submittals" and "Schedule/Payments".

Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.

Procedural requirements governing the Prime Contractor's selection of products and product options are included under Section "Materials and Equipment".

DEFINITIONS:

Definitions: Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.

Substitutions: Requests for changes in products, materials, equipment and methods of construction required by Contract Documents proposed by Prime Contractors after award of the Contract are considered requests for "substitutions". The following are not considered substitutions:

Substitutions requested by Bidders during the bidding period, and accepted prior to award of Contract, are considered as included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.

Revisions to Contract Documents requested by the Owner or Architect.

Specified options on products and construction methods included in the Contract Documents.

The Prime Contractor's determination of, and compliance with, governing regulations and orders.

Substitution Request Submittal: Requests for substitution will be considered if received within 35 days after commencement of the Work. Requests received more than 35 days after commencement of the Work may be considered or rejected at the discretion of the Architect.

Submit 3 copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures required for Change Order proposals.

Identify the product or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

Product Data, including Drawings and descriptions of products, and Installation procedures.

A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as

size, weight, durability and performance.

Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors that will become necessary to accommodate the proposed substitution.

A statement indicating the substitution's effect on the Prime Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.

Cost information, including a proposal of the net change, if any in the Contract Sum.

Certification by the Prime Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Prime Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.

Substitution Warranty: All submittals of Request for Substitutions under the General and Supplementary Conditions of this Section shall be accompanied by a completely executed (filled out) and signed Substitution Warranty in the form entitled "Substitution Warranty", bound herein. Substitutions will not be accepted without the Substitution Warranty.

In addition to other requirements, Prime Contractor shall warrant in writing on his own letterhead that substituted materials shall perform as specified, and assume complete responsibility for same, including responsibility and costs required for modifications to building or other materials or equipment, and any additional coordination with work of other trades.

Testing, if required shall be paid by Prime Contractor.

Architect's Action: Within one week of receipt of the request for substitution, the Architect will request additional information or documentation necessary for evaluation of the request. Within 2 weeks of receipt of the request, or one week of receipt of the additional information or documentation, whichever is later, the Project Manager will notify the Prime Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance will be in the form of a written instrument.

PART 2 - PRODUCTS

SUBSTITUTIONS:

Conditions: The Prime Contractor's substitution request will be received and considered by the Project Manager/Architect when one or more of the following conditions are satisfied, as

determined by the Architect; otherwise requests will be returned without action except to record noncompliance with these requirements.

Extensive revisions to Contract Documents are not required.

Proposed changes are in keeping with the general intent of Contract Documents.

The request is timely, fully documented and properly submitted.

THE REQUEST IS DIRECTLY RELATED TO AN "OR EQUAL" CLAUSE OR SIMILAR LANGUAGE IN THE CONTRACT DOCUMENTS.

The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as

a result of failure to pursue the Work promptly or coordinate activities properly.

The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.

The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Prime Contractor certifies that the substitution will overcome the incompatibility.

The specified product or method of construction cannot be coordinated with other materials, and where the Prime Contractor certifies that the proposed substitution can be coordinated.

The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Prime Contractor certifies that the proposed substitution provide the required warranty.

Where a proposed substitution involves more than one Prime Contractor, each Prime Contractor shall cooperate with the other Prime Contractors involved to coordinate the Work, provide uniformity and consistency, and to assure compatibility of products.

Refer elsewhere in Division 1 for definition of proprietary, semi-proprietary and nonproprietary specifications.

The Prime Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION - 01631

SECTION 01655
PRODUCT HANDLING

PART 1- GENERAL

1.1 SUMMARY

- A. Section establishes general requirements for product handling and storage, whether on or off the site, and supplements similar provisions found elsewhere in the Contract Documents.
- B. Related work
 - 1. Division one for handling provisions for OFCI items.

1.2 QUALITY ASSURANCE

- A. In the Contractor's quality control program include procedures required to insure protection of work and materials.

1.3 HANDLING

- A. General:
 - 1. Transport, deliver, handle, and store all materials and equipment used on the Project to prevent the intrusions of foreign matter, moisture, and to prevent damage. In all cases comply with the following.
 - 2. Material and equipment manufacturer's instructions regarding temperature limitations.
 - 3. Other environmental conditions required to maintain the original quality of the materials and equipment.
- B. Packaging:
 - 1. Provide packaged materials in their manufacturer's original containers with seals unbroken and labels intact until incorporating into the Work.
 - a. Where this information is not provided by the manufacturer on the container, it shall be provided by the supplier, fabricator or subcontractor of these materials.
 - 2. Wrapped or bundled materials shall clearly bear the manufacturer's name and trade mark.
- C. Damaged materials: Remove damaged or otherwise unsuitable material and equipment promptly from the site. Do not install damaged materials.

1.4 STORAGE

- A. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
- B. Store products at the site to facilitate inspection and measurement of quantity or counting of units.
- C. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

1. Do not subject slabs-on-grade to excessive loading by shoring, storage of materials, or operation of construction equipment unless adequately protected by heavy planking. Maintenance of slabs in good condition is the responsibility of the Contractor who shall remove damaged areas of such slabs and replace them with new work, to the Architect's satisfaction, at no cost to the District.
 2. Do not subject suspended slabs to construction loads exceeding their design loads, unless adequately shored with shoring designed for the Contractor by a California-licensed civil or structural engineer, who shall certify prior to imposing construction loads on slabs, that the shoring to be installed conforms with the shoring as designed.
- D. Store products subject to damage by the elements above ground, under cover in weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.
 - E. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
 - F. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
 - G. Locate storage piles, stacks or bins to avoid being disturbed, and protect from damage of any sort.
 - H. Store materials and equipment in accord with their manufacturer's instructions, above grade, and properly protected from weather and construction activities.
 - I. Payment may be withheld for improperly packaged and stored materials.

1.5 PROTECTION

- A. Protect finished surfaces, including floors, jambs and soffits of all openings used as passageways or through which materials and equipment must travel.
- B. Carts, hand trucks, wheelbarrows and similar wheeled conveyances used on or in any portion of the structure shall be equipped with pneumatic tires, unless otherwise authorized by the Architect.
- C. Keep finished surfaces clean and unmarred until the date of acceptance.
- D. Refer to individual Specification Sections for additional specific product handling and protection requirements.

1.6 MAINTENANCE

- A. Maintain periodic system of inspection of stored products on a scheduled basis to assure that:
 - 1. State of storage facilities is adequate to provide conditions recommended by the product manufacturer.
 - 2. Required environmental conditions are maintained on a continuing basis.
 - 3. Surfaces of products exposed to the elements are not adversely affected.
- B. Mechanical and electrical equipment which require servicing and/ or connection of temporary power for heating and other climatic protection devices, during long term storage, shall have complete manufacturer's instructions accompanying each item, with notice of enclosed instructions shown on the exterior of the packaging.

END OF SECTION

SECTION 01700
PROJECT CLOSEOUT

PART 1- GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General Conditions and other Division-1 Specification sections, apply to work of this section. .

SUMMARY:

This Section specifies administrative and procedural requirements for project closeout, including but not limited to:

- Inspection procedures
 - Project record document submittal
 - Operating and maintenance manual submittal
 - Submittal of warranties
 - Final cleaning
- Closeout requirements for specific construction activities are included in the appropriate Sections in Division-2 through -16.

Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each Prime Contractor.

SUBSTANTIAL COMPLETION:

Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

Each Prime Contractor shall submit specific warranties, workmanship bonds, final certifications and similar documents.

The appropriate Prime Contractors shall obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, and similar releases.

Submit record drawings, and similar final record information.

Deliver tools, spare parts, extra stock, and similar items.

Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with constructions tools, mock-ups, and similar elements.

Complete final clean-up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

Inspection Procedures: On receipt of a request for review of completed work, the Project Manager will either proceed with observations or advise the Prime Contractor of unfilled requirements. The Project Manager will prepare the Certificate of Substantial Completion following review(s), or advise the Prime Contractor of construction that must be completed or

corrected before the certificate will be issued.

The Project Manager with the Architect will review completed work when reasonably requested and assured that the Work has been substantially completed. Completion of all work found to be acceptable under the conditions of the contract and according to the Contract Documents will form the basis of requirements for final acceptance.

FINAL ACCEPTANCE:

Preliminary Procedures: Before requesting final review of completed work for certification of final acceptance and final payment complete the following. List exceptions in the request. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

Submit an updated final statement accounting for final additional changes to the Contract Sum.

Submit a certified copy of the Architect's final observation checklist of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.

Submit consent of surety to final payment.

Submit a final liquidated damages settlement statement.

Subsequent Review of Completed Work: The Project Manager will observe the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Project Manager and Architect.

Upon completion of all work found to be acceptable under the Contract and according to the Contract Documents, the Architect will prepare a certificate of final acceptance, or advise the Prime Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

If necessary, subsequent observation(s) will be repeated.

RECORD DOCUMENT SUBMITTALS:

General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect's/Project Manager's reference during normal working hours.

Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies from the Work as originally shown. Mark whichever drawing is most capable

of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. **Give particular attention to concealed elements that would be difficult to measure and record at a later date.**

Indicate the location of all underground piping, conduits or infrastructure.

Indicate all revisions to construction documents that relate to location or routing.

Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.

Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.

Note related Instruction Bulletin or Change Order numbers where applicable.

Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

Indicate invert elevations of pipe below grade or floor line, plugged wyes, tees, caps, manholes; exact locations and sizes of piping, valves, conduit, junction or pull boxes; and all other pertinent data, and similar *items* required for maintenance and repair service.

All such work shall be indicated by measured dimension to building comers or other permanent monuments, indicating its exact location in the concrete slabs or underground. Such drawings shall be made to scale.

Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

Upon completion of the Work, submit record Specifications to the Project Manager for the Owner's records.

Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work, which cannot otherwise be readily discerned later by direct observation. Noted related Instruction Bulletins or Change Orders and mark-up of record drawings and Specifications.

Upon completion of mark-up, submit complete set of record Product Data to the Project Manager for the Owner's records.

Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Prime Contractors will meet at the site with the Project Manager and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes.

Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete

miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Project Manager for the Owner's records.

Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2-inch, 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:

- Table of Contents
- Description of System
- Detailed Operating & Maintenance instructions
- Index to manufacturers literature
- Copies of posted instructions
- Emergency instructions
- Spare parts list
- Copies of warranties
- Wiring diagrams
- Recommended "turn around" cycles
- Inspection procedures

Shop Drawings and Product Data
Fixture lamping schedule

The description of systems and general operating instructions for plumbing and electrical manuals may cover only complicated or unusual parts of these systems, such as sewage ejectors, transformers, high tension switchgear and signal and alarm systems. Manufacturer's literature and data shall be that of the actual equipment installed under contract for the particular facility. Further guidance is available in the ASHRAE guide and Data Book, 1970, Systems Volume, Chapter 39, Operation and Maintenance.

The preparation of operating and maintenance manuals posted instructions and instructions for training personnel in operating and maintaining equipment installed in the building shall be the responsibility of the Prime Contractor.

Final Submittal: Not less than 30 days prior to completion of the project or actual start of operation (and instruction period, whichever is earlier), the Architect will be furnished four (4) complete sets of manuals for distribution after acceptance as follows:

One set including the original and reproducible copy of posted operation instruction to the Architect.

One (1) set to the Prime Contractor to be used for instruction purposes and turned over to the operating engineer in charge after completion of instruction.

Two (2) sets to the Owner.

Scope: A separate manual or separate chapter will be prepared and submitted for each of the following classes of equipment or systems included in a project or as otherwise specified.

- Heating Plants
- Cooling Plants
- Air Conditioning Systems
- Heating Systems if separate from air conditioning
- Ventilating Systems
- Exhaust Systems
- Control Systems
- Plumbing Systems
- Fire Protection
- Electrical Systems

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

CLOSEOUT PROCEDURES

Posted Instructions: Operating instructions and diagrams shall be prepared for posting near the equipment. Instructions shall be framed and mounted by the Prime Contractor.

Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel at the job to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:

- Maintenance manuals
- Record documents
- Spare parts and materials
- Tools
- Lubricants
- Identification systems
- Control sequences
- Hazards
- Cleaning

Warranties and bonds
Maintenance agreements and similar continuing comments

As part of this instruction for operating equipment demonstrate the following procedures:

Start-up
Shut-down
Emergency operations
Noise and vibration adjustments
Safety procedures
Economy and efficiency adjustments.

FINAL CLEANING:

General: General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".

Cleaning: The Prime Contractor for final cleaning shall employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.

Remove labels that are not permanent labels.

Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision - obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances.

Restore reflective surfaces to their original reflective condition.

Leave concrete floors broom clean. Remove all oil or other miscellaneous stains from concrete floors.

Vacuum carpeted surfaces.

Wipe surfaces of mechanical and electrical equipment.

Remove excess lubrication and other substances.

Clean plumbing fixtures to a sanitary condition.

Clean light fixtures and lamps.

Thoroughly sweep, rake and clean all roof surfaces all roofing and sheet metal and other debris, all visible paper labels.

Entire site, to within 50 feet of any construction accomplished under this contract shall be handraked clean of all debris (i.e., chunks of plaster, paper, rock, etc.)

Remove all stains, marks, asphalt and paint from all curbs, walks, and redwood headers. If stains and marks cannot be removed by normal cleaning procedure, the Contract shall, at his expense, use water blast (2,000 psi) technique.

Removal of Protection: Each Prime Contractor shall remove temporary protection and facilities installed for the protection of the Work during construction.

Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage

systems. Remove waste materials from the site and dispose of in a lawful manner.

Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

CONTINUING INSPECTIONS:

General: Except as otherwise required by specific warranties, agreements to maintain, workmanship / maintenance bonds, and similar continuing commitments, comply with Owner's request to participate in inspections at end of each time period of such continuing commitments. Participate in general inspection of the work approximately one year beyond date(s) of completion.

END OF SECTION

CLEANING

1. PART 1 GENERAL
 - A. SECTION INCLUDES
 1. Cleanup during construction of the building before acceptance by the District. Each contractor will be responsible for cleanup of their work and legal disposal and haul away of their debris offsite.
 - B. RELATED DOCUMENTS
 1. The Conditions of the Contract and other sections of Division 1 apply to this section as fully as if repeated herein.
2. PRODUCTS
 - A. MATERIALS
 1. Use cleaning materials which will not create hazards to health or property and which will not damage materials. Use cleaning materials and methods recommended by the manufacturer of the surface material to be cleaned. Use cleaning material only on surfaces recommended by the cleaning material manufacturer.
3. EXECUTION
 - A. CLEANUP DURING CONSTRUCTION
 1. It is required that the entire project be kept in a neat and orderly condition, and the Construction Manager may, at any time during construction, order a general cleanup of the site as a part of the work.
 2. Dispose of waste, trash, and debris in a safe, acceptable manner, in accordance with applicable laws and ordinances and as prescribed by authorities having jurisdiction. Bury no such waste material and debris on the site. Burning of trash and debris on the site will not be permitted.
 3. Location of dump for trash and debris and length of haul is the Contractor's responsibility.
 4. If any contractor has not substantially commenced their clean-up operations as required by the Construction Manager within 24 hours after receiving a fax notice from the Construction Manager, the District may without further notice to Contractor, commence said clean-up at the Prime Contractor's cost. All costs incurred as a result of the District's clean-up on behalf of the Contract shall be deducted from the Contractor's contract price by unilateral change order. In the event the District's clean-up involves debris of more than one prime contractor of the District, the Construction Manager shall make a determination as to the percentage owed by each contractor and this determination shall be final & binding to all contractors involved. Although it is understood by all parties that the District has the right to clean-up the debris of any contractor after giving said contractor 24 hour fax notice, it is NOT the District's obligation to do so. The sole responsibility & liability of debris on the site remains that of the contractor generating same.

5. Five percent (5%) of each Contractor's bid will automatically be held in abeyance within their "contract schedule of values" for clean-up. If, in the Construction Manager Superintendent's opinion, the Contractor is maintaining a clean project, a pro-rata share of this clean-up budget will be paid monthly to the Contractor in accordance with their approximate aggregate percentage of completion of the project. If the Contractor fails to heed written directives to clean-up during the course of the project, the work will be done at the Contractor's expense and a unilateral deductive change order will be written against their contract with the District for all costs incurred by the District for the clean-up. THE ESTABLISHMENT OF THIS FIVE PERCENT (5%) BUDGET FOR CLEAN-UP IN NO WAY LIMITS THE COST TO THE CONTRACTOR FOR MAINTAINING A CLEAN PROJECT. In the event that the Contractor's failure to maintain a clean project causes or contributes to an accident or property damage, neither the District, Construction Manager, or any of their respective employees shall be held responsible or liable for damages because of their failure to clean-up the Contractor's debris, materials, tools, or equipment.

END OF SECTION

GENERAL MECHANICAL REQUIREMENTS

1. PART 1 GENERAL

A. SCOPE

1. Basic mechanical requirements specifically applicable to Division 23 Sections.
2. Work includes but is not necessarily limited to the following:
 - a. Labor, materials, services, equipment, and appliances required for completion of tasks as indicated on drawing or in specification or as inherently necessary to prepare spaces and systems for new installations as follows:
 - 1) Heating, ventilating, exhaust and air conditioning systems and equipment
 - 2) Testing, adjusting and balancing

B. DRAWINGS AND SPECIFICATIONS

1. Drawings accompanying these Specifications show intent of Work to be done. Specifications shall identify quality and grade of installation and where equipment and hardware is not particularly specified, Contractor shall provide submittals for all products and install them per manufacturers' recommendations, and in a first class manner.
2. Examine Drawings and Specifications for elements in connection with this Work; determine existing and new general construction conditions and be familiar with all limitations caused by such conditions.
3. Plans are intended to show general arrangement and extent of Work contemplated. Exact location and arrangement of parts shall be determined after the College's Representative has reviewed equipment, as Work progresses, to conform in best possible manner with surroundings, and as directed by the College's Representative.
4. Contract Documents are in part diagrammatic and intended to show the scope and general arrangement of the Work under this Contract. The Contractor shall follow these drawings in laying out the equipment, piping and ductwork. Drawings are not intended to be scaled for roughing in measurements or to serve as shop drawings. Where job conditions require minor changes or adjustments in the indicated locations or arrangement of the Work, such changes shall be made without change in the Contract amount.
5. Follow dimensions without regard to scale. Where no figures or notations are given, the Plans shall be followed.

C. UTILITIES

1. Location and sizes of electrical, mechanical and plumbing service facilities are shown in accordance with data secured from existing record drawings and site observations. Data shown are offered as an estimating guide without guarantee of accuracy. Check and verify all data given, and verify exact location of all utility services pertaining to Work prior to excavation or performing Work.

D. APPLICABLE REFERENCE STANDARDS, CODES AND REGULATIONS:

1. Meet requirements of all state codes having jurisdiction.
2. State of California Code of Regulations:
 - a. Title 8, Industrial Relations
 - b. Title 19, State Fire Marshal Regulations
 - c. 2016 California Building Code (CBC), Title 24, Part 2
 - d. 2016 California Electrical Code, Title 24, Part 3
 - e. 2016 California Mechanical Code, Title 24, Part 4
 - f. 2016 California Plumbing Code, Title 24, Part 5

- g. 2016 California Fire Code, Title 24, Part 9
 - h. 2016 California Standards Code, Title 24, Part 12
 - i. 2016 California Title 24, Energy Conservation Standards
3. Additional Referenced Standards:
- a. AABC Associated Air Balance Council
 - b. AMCA Air Moving and Conditioning Association
 - c. ARI Air-Conditioning and Refrigeration Institute
 - d. ASHRAE American Society of Heating, Refrigeration and Air Conditioning Engineers
 - e. ASME American Society of Mechanical Engineers
 - f. ASTM American Society for Testing and Materials
 - g. NEMA National Electrical Manufacturer's Association
 - h. NFPA National Fire Protection Association Standards
 - i. PDI Plumbing and Drainage Institute
 - j. UL Underwriters Laboratories
4. Codes and ordinances having jurisdiction over Work are minimum requirements; but, if Contract Documents indicate requirements, which are in excess of those minimum requirements, then requirements of the Contract Documents shall be followed. Should there be any conflicts between Contract Documents or codes or any ordinances having jurisdiction, report these to the College's Representative.
5. Obtain permits, and request inspections from authority having jurisdiction.

E. PROJECT and SITE CONDITIONS

1. The arrangement of and connection to equipment shown on the Drawings is based upon information available and is not intended to show exact dimensions peculiar to a specific manufacturer. The Drawings are, in part, diagrammatic and some features of the illustrated equipment installations may require revision to meet actual equipment installation requirements. Structural supports, housekeeping pads, piping connections and adjacent equipment may have to be altered to accommodate the equipment provided. No additional payment will be made for such revisions or alterations.
2. Examine all Drawings and Specifications to be fully cognizant of all work required under this Division.
3. Examine site related work and surfaces before starting work of any Section.
4. Install Work in locations shown on approved Drawings, unless prevented by Project conditions.
5. Prepare revised shop drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission from the College's Representative before proceeding.
6. Beginning work of any Section constitutes acceptance of conditions.

F. COOPERATION WITH WORK UNDER OTHER DIVISIONS

1. Cooperate with other trades to facilitate general progress of Work. Allow all other trades every reasonable opportunity for installation of their work.
2. Work under this Division shall follow general building construction closely. Set pipe sleeves and inserts and verify that openings for chases and pipes are provided.
3. Work with other trades in determining exact location of outlets, pipes, and pieces of equipment to avoid interference with lines required to maintain proper installation of Work.
4. Make such progress in the Work to not delay work of other trades.
5. Mechanical Work shall have precedence over the other in the following sequence:
 - a. Soil and waste piping
 - b. Hydronic piping
 - c. Ductwork
 - d. Fire sprinkler piping

e. Domestic water piping

G. DISCREPANCIES

1. The Contractor shall check all Drawings furnished him immediately upon their receipt and shall promptly notify the College's Representative of any discrepancies. Figures marked on Drawings shall in general be followed in preference to scale measurements. Piping and instrumentation diagrams shall in general govern floor plans and sections. Large-scale drawings shall in general govern small-scale drawings.
2. Where requirements between Drawings and Specifications conflict, the more restrictive provisions shall apply.
3. If any part of the Specifications or Drawings appears unclear or contradictory, apply to College's Representative for interpretation and decision as early as possible, including during bidding period. Do not proceed with such work without College's Representatives decision. Beginning work of any Section constitutes acceptance of conditions.

H. CHANGES

1. The Contractor shall be responsible to make and obtain approval from the College's Representative for all necessary adjustments in piping and equipment layouts as required to accommodate the relocations of equipment and/or devices, which are affected by any approved authorized changes or Product substitutions. All changes shall be clearly indicated on the "Record" drawings.

I. SUBMITTALS

1. Refer to Division 01 for additional requirements.
2. The manufacturer, contractor or supplier shall include a written statement that the submitted equipment, hardware or accessory complies with the requirement of that particular specification section.
 - a. The manufacturer shall resubmit the specification section showing compliance with each respective paragraphs and specified items and features in that particular specification section.
 - b. All exceptions shall be clearly identified by referencing respective paragraph and other requirements along with proposed alternative.
3. Note that prior to acceptance of shop drawings for review, a submittal schedule shall be submitted to the College's Representative.
4. Submit all Division 23 shop drawings and product data grouped and referenced by the specification technical section numbers in one complete submittal package.
5. Shop Drawings:
 - a. Drawings shall be a minimum of 8.5 inches by 11 inches in size with a minimum scale of 1/4-inch per foot, except as specified otherwise.
 - b. Include installation details of equipment indicating proposed location, layout and arrangement, accessories, piping, and other items that must be shown to assure a coordinated installation.
 - c. Indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices.
 - d. If equipment is disapproved, revise drawings to show acceptable equipment and resubmit.
6. Whenever more than one (1) manufacturer's product is specified, the first named product is the basis of design used in the Work and the use of alternate-named manufacturer's products or substitutes may require modifications in that design.
7. Proposed Products List: Include Products as required by the individual section in this Division.
8. The Contractor shall be responsible for all equipment ordered and/or installed prior to receipt of shop drawings returned from the College's Representative

bearing the College's Representative stamp of "Reviewed". All corrections or modifications to the equipment as noted on the shop drawings shall be performed and equipment removed from the job site at the request of the College's Representative without additional compensation.

9. **Manufacturer's Data:** For each manufactured item, provide current manufacturer's descriptive literature of cataloged products, certified equipment drawings, diagrams, performance and characteristic curves if applicable, and catalog cuts.
10. **Standard Compliance:** When materials or equipment provided by the Contractor must conform to the standards of organizations such as American National Standards Institute (ANSI) or American Water Works Association (AWWA), submit proof of such conformance to the College's Representative for approval. If an organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified. In lieu of the label or listing, submit a certificate from an independent testing organization, which is competent to perform acceptance testing and is approved by the College's Representative. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard.
11. **Certified Test Reports:** Before delivery of materials and equipment, certified copies of all test reports specified in individual sections shall be submitted for approval.
12. **Certificates of Compliance or Conformance:** Submit manufacturer's certifications as required on products, materials, finish, and equipment indicated in the technical sections. Certifications shall be documents prepared specifically for this Contract. Pre-printed certifications and copies of previously submitted documents will not be acceptable. The manufacturer's certifications shall name the appropriate products, equipment, or materials and the publication specified as controlling the quality of that item. Certification shall not contain statements to imply that the item does not meet requirements specified, such as "as good as"; or "achieve the same end use and results as materials formulated in accordance with the referenced publications"; or "equal or exceed the service and performance of the specified material." Certifications shall simply state that the item conforms to the requirements specified. Certificates shall be printed on the manufacturer's letterhead and shall be signed by the manufacturer's official authorized to sign certificates of compliance or conformance.

J. **PRODUCT ALTERNATIVES OR SUBSTITUTIONS**

1. Refer to General Conditions and Division 01 for additional requirements.

K. **POSTED OPERATING INSTRUCTIONS**

1. Furnish approved operating instructions for systems and equipment indicated in the technical sections for use by operation and maintenance personnel.
2. The operating instructions shall include control diagrams, and control sequence for each principal system and equipment. Print or engrave operating instructions and frame under glass or in approved laminated plastic. Post instructions as directed. Attach or post operating instructions adjacent to each principal system and equipment. Provide weather-resistant materials or weatherproof enclosures for operating instructions exposed to the weather. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

L. **MANUFACTURER'S RECOMMENDATIONS**

1. Where installation procedures or any part thereof are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not

proceed until recommendations are received. Failure to furnish recommendations shall be cause for rejection of the equipment or material.

M. DELIVERY AND STORAGE

1. Refer to Division 1 for additional requirements.
2. Handle, store, and protect equipment and materials in accordance with the manufacturer's recommendations and with the requirements of NFPA 70B P, Appendix I, titled "Equipment Storage and Maintenance During Construction." Replace damaged or defective items with new items.

N. EXTRA MATERIALS

1. Refer to Division 1 for additional requirements.
2. Unless otherwise specified, spare parts, wherever required by detailed specification sections, shall be stored in accordance with the provisions of this paragraph. Spare parts shall be tagged by project equipment number and identified as to part number, equipment manufacturer, and subassembly component (if appropriate). Spare parts subject to deterioration such as ferrous metal items and electrical components shall be properly protected by lubricants or desiccants and encapsulated in hermetically sealed plastic wrapping. Spare parts with individual weights less than 50 pounds and dimensions less than 2 feet wide, or 18 inches high, or 3 feet in length shall be stored in a wooden box with a hinged wooden cover and locking hasp. Hinges shall be strap type. The box shall be painted and identified with stenciled lettering stating the name of the equipment, equipment numbers, and the words "spare parts." A neatly type inventory of spare parts shall be taped to the underside of the cover.

2. PART 2 PRODUCTS (Not applicable)

3. PART 3 EXECUTION

A. GENERAL

1. Obtain and pay for all permits and inspections, including any independent testing required to verify standard compliance, and deliver certificates for same to the College's Representative.

B. WORK RESPONSIBILITIES

1. The drawings indicate diagrammatically the desired locations or arrangement of piping, equipment, etc., and are to be followed as closely as possible. Proper judgment must be exercised in executing the work to secure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference with structural conditions.
2. The Contractor is responsible for the correct placing of Work and the proper location and connection of Work in relation to the work of other trades. Advise appropriate trade as to locations of access panels.
3. In the event changes in the indicated locations or arrangements are necessary, due to developed conditions in the building construction or rearrangement of furnishings or equipment, such changes shall be made without extra cost, providing the change is ordered before the ductwork, piping, etc. and work directly connected to same is installed and no extra materials are required.
4. Where equipment is furnished by others, verify dimensions and the correct locations of this equipment before proceeding with the roughing-in of connections.
5. All scaled and figured dimensions are approximate of typical equipment of the class indicated. Before proceeding with any work, carefully check and verify all dimensions, sizes, etc. with the drawings to see that the equipment will fit into the spaces provided without violation of applicable codes.
6. Should any changes to the Work indicated on the Drawings or described in the

Specifications be necessary in order to comply with the above requirements, notify the College immediately and cease work on all parts of the contract, which are affected until approval for any required modifications to the construction has been obtained from the College.

7. Be responsible for any cooperative work, which must be altered due to lack of proper supervision or failure to make proper provisions in time. Such changes shall be under direction of the College and shall be made to his satisfaction. Perform all Work with competent and skilled personnel.
8. All work, including aesthetic as well as mechanical aspects of the Work, shall be of the highest quality consistent with the best practices of the trade.
9. Replace or repair, without additional compensation, any Work, which, in the opinion of the College, does not comply with these requirements.

C. PAINTING

1. Factory Applied:
 - a. Mechanical equipment shall have factory-applied painting systems which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test, except equipment specified to meet requirements of ANSI C37.20 shall have a finish as specified in ANSI C37.20.
 - b. Refer to individual sections of this Division for more stringent requirements.
2. Field Applied:
 - a. Paint all mechanical equipment as required to touch up, to match finish on other equipment in adjacent spaces or to meet safety criteria.

END OF SECTION

METERS AND GAGES FOR HVAC PIPING

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes:
 - a. Filled-system thermometers.
 - b. Liquid-in-glass thermometers.
 - c. Thermowells.
 - d. Dial-type pressure gages.
 - e. Gage attachments.
 - f. Test plugs.
 - g. Test-plug kits.

C. ACTION SUBMITTALS

1. Product Data: For each type of product.
2. Shop Drawings:
 - a. Include diagrams for power, signal, and control wiring.

D. INFORMATIONAL SUBMITTALS

1. Product Certificates: For each type of meter and gage.

E. CLOSEOUT SUBMITTALS

1. Operation and Maintenance Data: For meters and gages to include in operation and maintenance manuals.

2. PART 2 PRODUCTS

A. LIQUID-IN-GLASS THERMOMETERS

1. Metal-Case, Industrial-Style, Liquid-in-Glass Thermometers:
 - a. Standard: ASME B40.200.
 - b. Case: Cast aluminum; 9-inch nominal size unless otherwise indicated.
 - c. Case Form: Adjustable angle unless otherwise indicated.
 - d. Tube: Glass with magnifying lens and blue or red organic liquid.
 - e. Tube Background: Nonreflective aluminum with permanently etched scale markings graduated in deg F.
 - f. Window: Glass.
 - g. Stem: Aluminum and of length to suit installation.
 - 1) Design for Thermowell Installation: Bare stem.
 - h. Connector: 1-1/4 inches, with ASME B1.1 screw threads.
 - i. Accuracy: Plus or minus 1 percent of scale range or one scale division, to a maximum of 1.5 percent of scale range.

B. THERMOWELLS

1. Thermowells:
 - a. Standard: ASME B40.200.
 - b. Description: Pressure-tight, socket-type fitting made for insertion in piping tee fitting.
 - c. Material for Use with Copper Tubing: CNR or CUNI.

- d. Material for Use with Steel Piping: CRES CSA.
 - e. Type: Stepped shank unless straight or tapered shank is indicated.
 - f. External Threads: NPS 1/2, NPS 3/4, or NPS 1, ASME B1.20.1 pipe threads.
 - g. Internal Threads: 1/2, 3/4, and 1 inch, with ASME B1.1 screw threads.
 - h. Bore: Diameter required to match thermometer bulb or stem.
 - i. Insertion Length: Length required to match thermometer bulb or stem.
 - j. Lagging Extension: Include on thermowells for insulated piping and tubing.
 - k. Bushings: For converting size of thermowell's internal screw thread to size of thermometer connection.
2. Heat-Transfer Medium: Mixture of graphite and glycerin.

C. DIAL-TYPE PRESSURE GAGES

- 1. Direct-Mounted, Metal-Case, Dial-Type Pressure Gages:
 - a. Standard: ASME B40.100.
 - b. Case: Sealed type; drawn steel; 4-1/2-inch nominal diameter.
 - c. Pressure-Element Assembly: Bourdon tube unless otherwise indicated.
 - d. Pressure Connection: Brass, with NPS ¼ ASME B1.20.1 pipe threads and bottom-outlet type unless back-outlet type is indicated.
 - e. Movement: Mechanical, with link to pressure element and connection to pointer.
 - f. Dial: Nonreflective aluminum with permanently etched scale markings graduated in psi.
 - g. Pointer: Dark-colored metal.
 - h. Window: Glass.
 - i. Ring: Metal.
 - j. Accuracy: Grade B, plus or minus 2 percent of middle half of] scale range.

D. GAGE ATTACHMENTS

- 1. Snubbers: ASME B40.100, brass; with NPS 1/4, ASME B1.20.1 pipe threads and porous-metal-type surge-dampening device. Include extension for use on insulated piping.
- 2. Valves: Brass ball or stainless-steel needle, with NPS 1/4 , ASME B1.20.1 pipe threads.

E. TEST PLUGS

- 1. Description: Test-station fitting made for insertion in piping tee fitting.
- 2. Body: Brass or stainless steel with core inserts and gasketed and threaded cap. Include extended stem on units to be installed in insulated piping.
- 3. Thread Size: NPS 1/4, ASME B1.20.1 pipe thread.
- 4. Minimum Pressure and Temperature Rating: 500 psig at 200 deg F.
- 5. Core Inserts: EPDM self-sealing rubber.

F. TEST-PLUG KITS

- 1. Furnish one test-plug kit(s) containing two thermometers, one pressure gage and adapter, and carrying case. Thermometer sensing elements, pressure gage, and adapter probes shall be of diameter to fit test plugs and of length to project into piping.
- 2. Carrying Case: Metal or plastic, with formed instrument padding.

3. PART 3 EXECUTION

A. INSTALLATION

1. Install thermowells with socket extending a minimum of one-third of pipe diameter and in vertical position in piping tees.
2. Install thermowells of sizes required to match thermometer connectors. Include bushings if required to match sizes.
3. Install thermowells with extension on insulated piping.
4. Fill thermowells with heat-transfer medium.
5. Install direct-mounted thermometers in thermowells and adjust vertical and tilted positions.
6. Install direct-mounted pressure gages in piping tees with pressure gage located on pipe at the most readable position.
7. Install valve and snubber in piping for each pressure gage for fluids (except steam).
8. Install test plugs in piping tees.
9. Assemble and install connections, tubing, and accessories between flow-measuring elements and flowmeters according to manufacturer's written instructions.
10. Install thermometers in the following locations:
 - a. Inlet and outlet of each hydronic boiler.
11. Install pressure gages in the following locations:
 - a. Discharge of each pressure-reducing valve.
 - b. Suction and discharge of each pump.

B. CONNECTIONS

1. Install meters and gages adjacent to machines and equipment to allow space for service and maintenance of meters, gages, machines, and equipment.

C. ADJUSTING

1. After installation, calibrate meters according to manufacturer's written instructions.
2. Adjust faces of meters and gages to proper angle for best visibility.

D. THERMOMETER SCALE-RANGE SCHEDULE

1. Scale Range for Heating, Hot-Water Piping: 30 to 240 deg F

E. PRESSURE-GAGE SCALE-RANGE SCHEDULE

1. Scale Range for Heating, Hot-Water Piping: 0 to 160 psi.

END OF SECTION

BALL VALVES FOR HVAC PIPING

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes:
 - a. Bronze ball valves.

C. DEFINITIONS

1. CWP: Cold working pressure.

D. ACTION SUBMITTALS

1. Product Data: For each type of valve.

E. DELIVERY, STORAGE, AND HANDLING

1. Prepare valves for shipping as follows:
 - a. Protect internal parts against rust and corrosion.
 - b. Protect threads, flange faces, and weld ends.
 - c. Set ball valves open to minimize exposure of functional surfaces.
2. Use the following precautions during storage:
 - a. Maintain valve end protection.
 - b. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
3. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use operating handles or stems as lifting or rigging points.

2. PART 2 PRODUCTS

A. GENERAL REQUIREMENTS FOR VALVES

1. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
2. ASME Compliance:
 - a. ASME B1.20.1 for threads for threaded-end valves.
 - b. ASME B16.1 for flanges on iron valves.
 - c. ASME B16.5 for flanges on steel valves.
 - d. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - e. ASME B31.1 for power piping valves.
 - f. ASME B31.9 for building services piping valves.
3. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.
4. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
5. Valve Sizes: Same as upstream piping unless otherwise indicated.
6. Valve Actuator Types:
 - a. Hand-lever: For quarter-turn valves.
7. Valves in Insulated Piping:
 - a. Include 2-inch stem extensions.

- b. Extended operating handle of nonthermal-conductive material, and protective sleeves that allow operation of valves without breaking the vapor seals or disturbing insulation.
 - c. Memory stops that are fully adjustable after insulation is applied.
8. Valve Bypass and Drain Connections: MSS SP-45.

B. BRONZE BALL VALVES

- 1. Bronze Ball Valves, Two-Piece with Full Port and Stainless-Steel Trim:
 - a. Manufacturers:
 - 1) Nibco
 - 2) Apollo Valve
 - 3) Milwaukee Valve
 - b. Description:
 - 1) Standard: MSS SP-110.
 - 2) CWP Rating: 600 psig.
 - 3) Body Design: Two piece.
 - 4) Body Material: Bronze.
 - 5) Ends: Threaded.
 - 6) Seats: PTFE.
 - 7) Stem: Stainless steel.
 - 8) Ball: Stainless steel, vented.
 - 9) Port: Full.
- 2. Bronze Ball Valves, Three-Piece with Full Port Stainless-Steel Trim:
 - a. Manufacturers:
 - 1) Nibco
 - 2) Apollo Valve
 - 3) Milwaukee Valve
 - b. Description:
 - 1) Standard: MSS SP-110.
 - 2) CWP Rating: 600 psig.
 - 3) Body Design: Three piece.
 - 4) Body Material: Bronze.
 - 5) Ends: Threaded.
 - 6) Seats: PTFE.
 - 7) Stem: Stainless steel.
 - 8) Ball: Stainless steel, vented.
 - 9) Port: Full.

3. PART 3 EXECUTION

A. EXAMINATION

- 1. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- 2. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- 3. Examine threads on valve and mating pipe for form and cleanliness.
- 4. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- 5. Do not attempt to repair defective valves; replace with new valves.

B. VALVE INSTALLATION

- 1. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

2. Locate valves for easy access and provide separate support where necessary.
 3. Install valves in horizontal piping with stem at or above center of pipe.
 4. Install valves in position to allow full stem movement.
 5. Install valve tags. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for valve tags and schedules.
- C. GENERAL REQUIREMENTS FOR VALVE APPLICATIONS
1. If valves with specified CWP ratings are unavailable, the same types of valves with higher CWP ratings may be substituted.
 2. Select valves with the following end connections:
 - a. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
 - b. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - c. For Steel Piping, NPS 2 and Smaller: Threaded ends.
 - d. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
- D. HEATING-WATER VALVE SCHEDULE
1. Pipe NPS 2-1/2 and Smaller: bronze ball valves, two or three piece with stainless-steel trim, and full port.
 - a. Valves may be provided with solder-joint ends instead of threaded ends or flanged ends.

END OF SECTION

CHECK VALVES FOR HVAC PIPING

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes:
 - a. Bronze swing check valves.

C. DEFINITIONS

1. CWP: Cold working pressure.
2. EPDM: Ethylene propylene copolymer rubber.
3. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.

D. ACTION SUBMITTALS

1. Product Data: For each type of valve.

E. DELIVERY, STORAGE, AND HANDLING

1. Prepare valves for shipping as follows:
 - a. Protect internal parts against rust and corrosion.
 - b. Protect threads, flange faces, grooves, and weld ends.
 - c. Block check valves in either closed or open position.
2. Use the following precautions during storage:
 - a. Maintain valve end protection.
 - b. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
3. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

2. PART 2 PRODUCTS

A. GENERAL REQUIREMENTS FOR VALVES

1. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
2. ASME Compliance:
 - a. ASME B1.20.1 for threads for threaded-end valves.
 - b. ASME B16.1 for flanges on iron valves.
 - c. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - d. ASME B31.9 for building services piping valves.
3. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.
4. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
5. Valve Sizes: Same as upstream piping unless otherwise indicated.
6. Valve Bypass and Drain Connections: MSS SP-45.

B. BRONZE SWING CHECK VALVES

1. Bronze Swing Check Valves with Bronze Disc, Class 125:
2. Manufacturers:

- a. Nibco
 - b. Milwaukee Valve
 - c. Watts Regulator
3. Description:
- a. Standard: MSS SP-80, Type 3.
 - b. CWP Rating: 200 psig.
 - c. Body Design: Horizontal flow.
 - d. Body Material: ASTM B 62, bronze.
 - e. Ends: Threaded.
 - f. Disc: Bronze.

3. PART 3 EXECUTION

A. EXAMINATION

1. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
2. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
3. Examine threads on valve and mating pipe for form and cleanliness.
4. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
5. Do not attempt to repair defective valves; replace with new valves.

B. VALVE INSTALLATION

1. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
2. Locate valves for easy access and provide separate support where necessary.
3. Install valves in horizontal piping with stem at or above center of pipe.
4. Install valves in position to allow full stem movement.
5. Install check valves for proper direction of flow and as follows:

C. GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

1. If valves with specified SWP classes or CWP ratings are unavailable, the same types of valves with higher SWP classes or CWP ratings may be substituted.
2. Select valves, except wafer types, with the following end connections:
 - a. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules.
 - b. For Copper Tubing, NPS 2-1/2 to NPS 4 Flanged ends except where threaded valve-end option is indicated in valve schedules.
 - c. For Steel Piping, NPS 2-1/2 to NPS 4 Flanged ends except where threaded valve-end option is indicated in valve schedules.

END OF SECTION

HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes:
 - a. Metal pipe hangers and supports.
 - b. Trapeze pipe hangers.
 - c. Metal framing systems.
 - d. Thermal-hanger shield inserts.
 - e. Fastener systems.
 - f. Pipe stands.
 - g. Equipment supports.
2. Related Requirements:
 - a. 232113 "Hydronic Piping"

C. ACTION SUBMITTALS

1. Product Data: For each type of product.

D. INFORMATIONAL SUBMITTALS

1. Welding certificates.

E. QUALITY ASSURANCE

1. Structural-Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code, Section IX.

2. PART 2 PRODUCTS

A. PERFORMANCE REQUIREMENTS

1. Structural Performance: Hangers and supports for HVAC piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

B. METAL PIPE HANGERS AND SUPPORTS

1. Carbon-Steel Pipe Hangers and Supports:
 - a. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
 - b. Galvanized Metallic Coatings: Pre-galvanized, hot-dip galvanized, or electro-galvanized.
 - c. Nonmetallic Coatings: Plastic coated, or epoxy powder-coated.
 - d. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
 - e. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel
2. Copper Pipe and Tube Hangers:
 - a. Description: MSS SP-58, Types 1 through 58, copper-plated steel, factory-fabricated components.
 - b. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel

- C. TRAPEZE PIPE HANGERS
 - 1. Description: MSS SP-58, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

- D. METAL FRAMING SYSTEMS
 - 1. MFMA Manufacturer Metal Framing Systems:
 - a. Description: Shop- or field-fabricated, pipe-support assembly made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.
 - b. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
 - c. Channels: Continuous slotted carbon-steel channel with in-turned lips.
 - d. Channel Width: Selected for applicable load criteria.
 - e. Channel Nuts: Formed or stamped nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
 - f. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel
 - g. Metallic Coating: Hot-dip galvanized

- E. THERMAL-HANGER SHIELD INSERTS
 - 1. Insulation-Insert Material for Hot Piping: ASTM C 552, Type II cellular glass with 100-psi or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psi minimum compressive strength.
 - 2. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
 - 3. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
 - 4. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

- F. FASTENER SYSTEMS
 - 1. Mechanical-Expansion Anchors: Insert-wedge-type anchors for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
 - a. Hilti KB TZ
 - b. Indoor Applications, mechanical room: stainless-steel.
 - c. Outdoor Applications: Stainless steel.

- G. PIPE STANDS
 - 1. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.
 - 2. Compact Pipe Stand:
 - a. Description: Single base unit with integral-rod roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.
 - b. Base: Single, vulcanized rubber, molded polypropylene, or polycarbonate.
 - c. Hardware: Galvanized steel or polycarbonate.
 - d. Accessories: Protection pads.

- H. EQUIPMENT SUPPORTS
 - 1. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

- I. MATERIALS.

1. Carbon Steel: ASTM A 1011/A 1011M.
2. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; galvanized.
3. Stainless Steel: ASTM A 240/A 240M.
4. Threaded Rods: Continuously threaded. Zinc-plated or galvanized steel for indoor applications and stainless steel for outdoor applications. Mating nuts and washers of similar materials as rods.
5. Grout: ASTM C 1107/C 1107M, factory-mixed and -packaged, dry, hydraulic-cement, non-shrink and nonmetallic grout; suitable for interior and exterior applications.
 - a. Properties: Non-staining, noncorrosive, and nongaseous.
 - b. Design Mix: 5000-psi, 28-day compressive strength.

3. PART 3 EXECUTION

A. APPLICATION

1. 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.

B. HANGER AND SUPPORT INSTALLATION

1. Metal Pipe-Hanger Installation: Comply with MSS SP-58. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
2. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-58. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
 - a. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
 - b. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
3. Fastener System Installation:
 - a. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
4. Pipe Stand Installation:
 - a. Pipe Stand Types except Curb-Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
5. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
6. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
7. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
8. Install lateral bracing with pipe hangers and supports to prevent swaying.
9. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
10. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
11. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes

and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

12. Insulated Piping:
 - a. Attach clamps and spacers to piping.
 - 1) Piping Operating Above Ambient Air Temperature: Clamp may project through insulation.
 - 2) Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
 - b. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - c. Shield Dimensions for Pipe: Not less than the following:
 - 1) NPS 1/4 to NPS 3-1/2, 12 inches long and 0.048 inch thick.
 - d. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

C. EQUIPMENT SUPPORTS

1. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
2. Grouting: Place grout under supports for equipment and make bearing surface smooth.
3. Provide lateral bracing, to prevent swaying, for equipment supports.

D. METAL FABRICATIONS

1. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
2. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
3. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
 - a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - b. Obtain fusion without undercut or overlap.
 - c. Remove welding flux immediately.
 - d. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

E. ADJUSTING

1. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
2. Trim excess length of continuous-thread hanger and support rods to 1/2 inches.

F. HANGER AND SUPPORT SCHEDULE

1. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
2. Comply with MSS SP-58 for pipe-hanger selections and applications that are not specified in piping system Sections.
3. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
4. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
5. Use carbon-steel pipe hangers and supports and metal framing systems and attachments for general service applications.
6. Use thermal-hanger shield inserts for insulated piping and tubing.
7. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

- a. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of non-insulated or insulated, stationary pipes NPS 1/2 to NPS 30.
 - b. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 if little or no insulation is required.
8. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
- a. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
 - b. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
 - c. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 - d. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
9. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
- a. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 - b. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction, to attach to top flange of structural shape.
 - c. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 - d. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 - e. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
 - f. C-Clamps (MSS Type 23): For structural shapes.
 - g. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
 - h. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
 - i. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 - j. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 - k. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 - l. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - 1) Light (MSS Type 31): 750 lb (340 kg).
 - 2) Medium (MSS Type 32): 1500 lb (680 kg).
 - 3) Heavy (MSS Type 33): 3000 lb (1360 kg).
 - m. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 - n. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 - o. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
10. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
- a. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 - b. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 - c. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
11. Comply with MSS SP-58 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
12. Comply with MFMA-103 for metal framing system selections and applications

- that are not specified in piping system Sections.
13. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.

END OF SECTION

IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes:
 - a. Equipment labels.
 - b. Warning signs and labels.
 - c. Pipe labels.

C. ACTION SUBMITTALS

1. Product Data: For each type of product.

2. PART 2 PRODUCTS

A. EQUIPMENT LABELS

1. Plastic Labels for Equipment:
 - a. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8-inch-thick, and having predrilled holes for attachment hardware.
 - b. Letter Color: White
 - c. Background Color: Black
 - d. Maximum Temperature: Able to withstand temperatures up to 160 deg F (71 deg C).
 - e. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
 - f. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
 - g. Fasteners: Stainless-steel rivets or self-tapping screws.
 - h. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
2. Label Content: Include equipment's Drawing designation or unique equipment number, drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.

B. WARNING SIGNS AND LABELS

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8-inch-thick, and having predrilled holes for attachment hardware.
2. Letter Color: White
3. Background Color: Red.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.

7. Fasteners: Stainless-steel rivets or self-tapping screws.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
9. Label Content: Include caution and warning information plus emergency notification instructions.

C. PIPE LABELS

1. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction according to ASME A13.1.
2. Pre-tensioned Pipe Labels: Pre-coiled, semi-rigid plastic formed to cover fully circumference of pipe and to attach to pipe without fasteners or adhesive.
3. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings; also include pipe size and an arrow indicating flow direction.
4. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.
 - a. Lettering Size: Size letters according to ASME A13.1 for piping and At least 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances.

3. PART 3 EXECUTION

A. PREPARATION

1. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

B. GENERAL INSTALLATION REQUIREMENTS

1. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
2. Coordinate installation of identifying devices with locations of access panels and doors.
3. Install identifying devices before installing acoustical ceilings and similar concealment.

C. EQUIPMENT LABEL INSTALLATION

1. Install or permanently fasten labels on each major item of mechanical equipment.
2. Locate equipment labels where accessible and visible.

D. PIPE LABEL INSTALLATION

1. Pipe Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 - a. Near each valve and control device.
 - b. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
 - c. Near penetrations and on both sides of through walls, floors, ceilings, and inaccessible enclosures.
 - d. At access doors, manholes, and similar access points that permit view of concealed piping.
 - e. Near major equipment items and other points of origination and termination.
 - f. Spaced at maximum intervals of 20 feet

- g. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- 2. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes, including pipes where flow is allowed in both directions.
- 3. Pipe Label Color Schedule:
 - a. Heating Water Piping: Black letters on a yellow background.
 - b. Natural Gas: White letters, blue background.
 - c. Industrial Cold Water: White letters on a green background.

END OF SECTION

TESTING, ADJUSTING, AND BALANCING FOR HVAC

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes:
 - a. Balancing Hydronic Piping Systems:
 - 1) Variable-flow hydronic systems.
 - b. Control system verification.

C. DEFINITIONS

1. AABC: Associated Air Balance Council.
2. BAS: Building automation systems.
3. NEBB: National Environmental Balancing Bureau.
4. TAB: Testing, adjusting, and balancing.
5. TABB: Testing, Adjusting, and Balancing Bureau.
6. TAB Specialist: An independent entity meeting qualifications to perform TAB work.
7. TDH: Total dynamic head.

D. ACTION SUBMITTALS

1. Qualification Data: Within 60 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.
2. 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.
3. System Readiness Checklists: Within 90 days of Contractor's Notice to Proceed, submit system readiness checklists as specified in "Preparation" Article.
4. Examination Report: Submit a summary report of the examination review required in "Examination" Article.
5. Certified TAB reports.
6. Sample report forms.
7. Instrument calibration reports, to include the following:
 - a. Instrument type and make.
 - b. Serial number.
 - c. Application.
 - d. Dates of use.
 - e. Dates of calibration.

E. QUALITY ASSURANCE

1. TAB Specialists Qualifications: Certified by NEBB.
 - a. TAB Field Supervisor: Employee of the TAB specialist and certified by NEBB
 - b. TAB Technician: Employee of the TAB specialist and certified by NEBB as a TAB technician.
2. Instrumentation Type, Quantity, Accuracy, and Calibration: Comply with requirements in ASHRAE 111, Section 4, "Instrumentation."

F. FIELD CONDITIONS

1. Full Owner Occupancy: Owner will occupy the site and existing building during entire TAB period. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.
2. PART 2 PRODUCTS (Not Applicable)
3. PART 3 EXECUTION
 - A. EXAMINATION
 1. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems designs that may preclude proper TAB of systems and equipment.
 2. Examine installed systems for 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 applicable for intended purpose and are accessible.
 3. Examine the approved submittals for HVAC systems and equipment.
 4. 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.
 5. Examine equipment performance data including fan and pump curves.
 - a. 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.
 6. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.
 7. Examine test reports specified in individual system and equipment Sections.
 8. Examine strainers. Verify that startup screens have been replaced by permanent screens with indicated perforations.
 9. Examine control valves for proper installation for their intended function of throttling, diverting, or mixing fluid flows.
 10. Examine system pumps to ensure absence of entrained air in the suction piping.
 11. Examine operating safety interlocks and controls on HVAC equipment.
 12. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.
 - B. PREPARATION
 1. Prepare a TAB plan that includes the following:
 - a. Equipment and systems to be tested.
 - b. Strategies and step-by-step procedures for balancing the systems.
 - c. Instrumentation to be used.
 - d. Sample forms with specific identification for all equipment.
 2. Perform system-readiness checks of HVAC systems and equipment to verify system readiness for TAB work. Include, at a minimum, the following:
 - a. Hydronics:
 - 1) Verify leakage and pressure tests on water distribution systems have been satisfactorily completed.
 - 2) Piping is complete with terminals installed.
 - 3) Water treatment is complete.
 - 4) Systems are flushed, filled, and air purged.
 - 5) Strainers are pulled and cleaned.
 - 6) Control valves are functioning per the sequence of operation.
 - 7) Shutoff and balance valves have been verified to be 100 percent open.

- 8) Pumps are started and proper rotation is verified.
- 9) Pump gage connections are installed directly at pump inlet and outlet flanges or in discharge and suction pipe prior to valves or strainers.
- 10) Variable-frequency controllers' startup is complete and safeties are verified.
- 11) Suitable access to balancing devices and equipment is provided.

C. GENERAL PROCEDURES FOR TESTING AND BALANCING

1. Perform testing and balancing procedures on each system according to the procedures contained in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and in this Section.
2. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.
 - a. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
 - b. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Section 230719 "HVAC Piping Insulation."
3. 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.
4. Take and report testing and balancing measurements in inch-pound (IP) units.

D. GENERAL PROCEDURES FOR HYDRONIC SYSTEMS

1. Prepare test reports for pumps, coils, and heat exchangers. Obtain approved submittals and manufacturer-recommended testing procedures. Crosscheck the summation of required coil and heat exchanger flow rates with pump design flow rate.
2. Prepare schematic diagrams of systems' "as-built" piping layouts.
3. In addition to requirements in "Preparation" Article, prepare hydronic systems for testing and balancing as follows:
 - a. Check liquid level in expansion tank.
 - b. Check highest vent for adequate pressure.
 - c. Check flow-control valves for proper position.
 - d. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
 - e. Verify that motor starters are equipped with properly sized thermal protection.
 - f. Check that air has been purged from the system.

E. PROCEDURES FOR VARIABLE-FLOW HYDRONIC SYSTEMS

1. Balance systems with automatic two- and three-way control valves by setting systems at maximum flow through heat-exchange terminals, and proceed as specified above for hydronic systems.
2. Adjust the variable-flow hydronic system as follows:
 - a. Verify that the differential-pressure sensor is located as indicated.
 - b. Determine whether there is diversity in the system.
3. For systems with no diversity:
 - a. Adjust pumps to deliver total design gpm.
 - 1) Measure total water flow.
 - a) Position valves for full flow through coils.
 - b) Measure flow by main flow meter, if installed.
 - c) If main flow meter is not installed, determine flow by pump TDH or exchanger pressure drop.
 - 2) Measure pump TDH as follows:

- a) Measure discharge pressure directly at the pump outlet flange or in discharge pipe prior to any valves.
 - b) Measure inlet pressure directly at the pump inlet flange or in suction pipe prior to any valves or strainers.
 - c) Convert pressure to head and correct for differences in gage heights.
 - d) Verify pump impeller size by measuring the TDH with the discharge valve closed. Note the point on manufacturer's pump curve at zero flow and verify that the pump has the intended impeller size.
 - e) With valves open, read pump TDH. Adjust pump discharge valve until design water flow is achieved.
- 3) Monitor motor performance during procedures and do not operate motor in an overloaded condition.
- b. Mark final settings and verify that all memory stops have been set.
 - c. Verify final system conditions as follows:
 - 1) Re-measure and confirm that total water flow is within design.
 - 2) Re-measure final pumps' operating data, TDH, volts, amps, and static profile.
 - 3) Mark final settings.
 - d. Verify that memory stops have been set.

F. PROCEDURES FOR BOILERS

- 1. Hydronic Boilers:
 - a. Measure and record entering- and leaving-water temperatures.
 - b. Measure and record water flow.
 - c. Record relief valve pressure setting.

G. CONTROLS VERIFICATION

- 1. In conjunction with system balancing, perform the following:
 - a. Verify temperature control system is operating within the design limitations.
 - b. Confirm that the sequences of operation are in compliance with Contract Documents.
 - c. Verify that controllers are calibrated and function as intended.
 - d. Verify that controller set points are as indicated.
 - e. Verify the operation of lockout or interlock systems.
 - f. Verify the operation of valve and damper actuators.
 - g. Verify that controlled devices are properly installed and connected to correct controller.
 - h. Verify that controlled devices travel freely and are in position indicated by controller: open, closed, or modulating.
 - i. Verify location and installation of sensors to ensure that they sense only intended temperature, humidity, or pressure.
- 2. Reporting: Include a summary of verifications performed, remaining deficiencies, and variations from indicated conditions.

H. PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

I. TOLERANCES

- 1. Set HVAC system's airflow rates and water flow rates within the following tolerances:
 - a. Heating-Water Flow Rate: Plus or minus 10 percent.
- 2. Maintaining pressure relationships as designed shall have priority over the tolerances specified above.

J. PROGRESS REPORTING

1. 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.
- K. FINAL REPORT
1. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.
 - a. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
 - b. Include a list of instruments used for procedures, along with proof of calibration.
 - c. Certify validity and accuracy of field data.
 2. Final Report Contents: In addition to certified field-report data, include the following:
 - a. Pump curves.
 - b. Manufacturers' test data.
 - c. Field test reports prepared by system and equipment installers.
 - d. Other information relative to equipment performance; do not include Shop Drawings and Product Data.
 3. General Report Data: In addition to form titles and entries, include the following data:
 - a. Title page.
 - b. Name and address of the TAB specialist.
 - c. Project name.
 - d. Project location.
 - e. Engineer's name and address.
 - f. Contractor's name and address.
 - g. Report date.
 - h. Signature of TAB supervisor who certifies the report.
 - i. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
 - j. Summary of contents including the following:
 - 1) Indicated versus final performance.
 - 2) Notable characteristics of systems.
 - 3) Description of system operation sequence if it varies from the Contract Documents.
 - k. Nomenclature sheets for each item of equipment.
 - l. Notes to explain why certain final data in the body of reports vary from indicated values.
 4. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:
 - a. Water flow rates.
 - b. Pipe and valve sizes and locations.
 - c. Position of balancing devices.
 5. Gas-Fired Heat Apparatus Test Reports: In addition to manufacturer's factory startup equipment reports, include the following:
 - a. Unit Data:
 - 1) System identification.
 - 2) Location.
 - 3) Make and type.
 - 4) Model number and unit size.
 - 5) Manufacturer's serial number.
 - 6) Fuel type in input data.

- 7) Output capacity in Btu/h.
- 8) Ignition type.
- 9) Burner-control types.
- 10) Motor horsepower and rpm.
- 11) Motor volts, phase, and hertz.
- 12) Motor full-load amperage and service factor.
- b. Test Data (Indicated and Actual Values):
 - 1) Low-fire fuel input in Btu/h.
 - 2) High-fire fuel input in Btu/h.
 - 3) Manifold pressure in psig.
 - 4) High-temperature-limit setting in deg F.
 - 5) Operating set point in Btu/h.
 - 6) Motor voltage at each connection.
 - 7) Motor amperage for each phase.
 - 8) Heating value of fuel in Btu/h.
6. Pump Test Reports: Calculate impeller size by plotting the shutoff head on pump curves and include the following:
 - a. Unit Data:
 - 1) Unit identification.
 - 2) Location.
 - 3) Service.
 - 4) Make and size.
 - 5) Model number and serial number.
 - 6) Water flow rate in gpm.
 - 7) Water pressure differential in feet of head or psig.
 - 8) Required net positive suction head in feet of head or psig.
 - 9) Pump rpm.
 - 10) Impeller diameter in inches.
 - 11) Motor make and frame size.
 - 12) Motor horsepower and rpm.
 - 13) Voltage at each connection.
 - 14) Amperage for each phase.
 - 15) Full-load amperage and service factor.
 - 16) Seal type.
 - b. Test Data (Indicated and Actual Values):
 - 1) Static head in feet of head or psig
 - 2) Pump shutoff pressure in feet of head or psig.
 - 3) Actual impeller size in inches.
 - 4) Full-open flow rate in gpm.
 - 5) Full-open pressure in feet of head or psig.
 - 6) Final discharge pressure in feet of head or psig.
 - 7) Final suction pressure in feet of head or psig.
 - 8) Final total pressure in feet of head or psig.
 - 9) Final water flow rate in gpm.
 - 10) Voltage at each connection.
 - 11) Amperage for each phase.
7. Instrument Calibration Reports:
 - a. Report Data:
 - 1) Instrument type and make.
 - 2) Serial number.
 - 3) Application.
 - 4) Dates of use.
 - 5) Dates of calibration.

L. VERIFICATION OF TAB REPORT

1. The TAB specialist's test and balance engineer shall conduct the inspection in the presence of the College's Representative
2. If rechecks yield measurements that differ from the measurements

- documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."
3. 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.
 4. If TAB work fails, proceed as follows:
 - a. TAB specialists shall 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.
 - b. If the second final inspection also fails, Owner may contract the services of another TAB specialist to complete TAB work according to the Contract Documents and deduct the cost of the services from the original TAB specialist's final payment.
 5. Prepare test and inspection reports.

END OF SECTION

HVAC PIPING INSULATION

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section includes insulating the following HVAC piping systems:
 - a. Heating hot-water piping, indoors.

C. ACTION SUBMITTALS

1. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).

D. INFORMATIONAL SUBMITTALS

1. Qualification Data: For qualified Installer.
2. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.
3. Field quality-control reports.

E. QUALITY ASSURANCE

1. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
 - a. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - b. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

F. DELIVERY, STORAGE, AND HANDLING

1. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

G. COORDINATION

1. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
2. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.
3. Coordinate installation and testing of heat tracing.

H. SCHEDULING

1. Schedule insulation application after pressure testing systems and, where

required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

2. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

2. PART 2 PRODUCTS

A. INSULATION MATERIALS

1. Products shall not contain asbestos, lead, mercury, or mercury compounds.
2. 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.
3. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
4. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.
5. Mineral-Fiber, Preformed Pipe Insulation:
 - a. Manufacturers:
 - 1) Johns Manville
 - 2) Knauff
 - 3) Dow 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. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
 - c. 1-1/2" Wall thickness for pipe ¾" and larger, smaller pipe use 1" wall thickness.

B. INSULATING CEMENTS

1. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.

C. ADHESIVES

1. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.
2. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
3. ASJ Adhesive, and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

D. SEALANTS

1. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:
 - a. Materials shall be compatible with insulation materials, jackets, and substrates.
 - b. Fire- and water-resistant, flexible, elastomeric sealant.
 - c. Service Temperature Range: Minus 40 to plus 250 deg F.
 - d. Color: White.

E. FACTORY-APPLIED JACKETS

1. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
 - a. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.

F. FIELD-APPLIED JACKETS

1. FSK Jacket: Aluminum-foil-face, fiberglass-reinforced scrim with kraft-paper backing.

G. TAPES

1. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
 - a. Width: 3 inches.
 - b. Thickness: 11.5 mils.
 - c. Adhesion: 90 ounces force/inch in width.
 - d. Elongation: 2 percent.
 - e. Tensile Strength: 40 lbf/inch in width.
 - f. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.
2. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.
 - a. Width: 3 inches.
 - b. Thickness: 6.5 mils.
 - c. Adhesion: 90 ounces force/inch in width.
 - d. Elongation: 2 percent.
 - e. Tensile Strength: 40 lbf/inch in width.
 - f. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.
3. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
 - a. Width: 2 inches.
 - b. Thickness: 3.7 mils.
 - c. Adhesion: 100 ounces force/inch in width.
 - d. Elongation: 5 percent.
 - e. Tensile Strength: 34 lbf/inch in width.

3. PART 3 EXECUTION

A. EXAMINATION

1. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
 - a. Verify that systems to be insulated have been tested and are free of defects.
 - b. Verify that surfaces to be insulated are clean and dry.
 - c. Proceed with installation only after unsatisfactory conditions have been corrected.

B. PREPARATION

1. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
2. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

C. GENERAL INSTALLATION REQUIREMENTS

1. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
2. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.
3. 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.
4. Install insulation with longitudinal seams at top and bottom of horizontal runs.
5. Install multiple layers of insulation with longitudinal and end seams staggered.
6. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
7. Keep insulation materials dry during application and finishing.

8. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
9. Install insulation with least number of joints practical.
10. 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 pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
11. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
12. Install insulation with factory-applied jackets as follows:
 - a. Draw jacket tight and smooth.
 - b. Cover circumferential joints with 3-inch-wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
 - c. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap.
 - d. For below-ambient services, apply vapor-barrier mastic over staples.
 - e. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
 - f. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
13. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
14. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
15. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
16. For above-ambient services, do not install insulation to the following:
 - a. Vibration-control devices.
 - b. Testing agency labels and stamps.
 - c. Nameplates and data plates.
 - d. Manholes.
 - e. Handholes.
 - f. Cleanouts.

D. PENETRATIONS

1. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
 - a. Seal penetrations with flashing sealant.
 - b. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 - c. Extend jacket of outdoor insulation outside roof flashing at least 2

- inches below top of roof flashing.
- d. Seal jacket to roof flashing with flashing sealant.
- 2. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
 - a. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping and fire-resistive joint sealers.

E. GENERAL PIPE INSULATION INSTALLATION

- 1. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- 2. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
 - a. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
 - b. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
 - c. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
 - d. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
 - e. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
 - f. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
 - g. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
 - h. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
 - i. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.
- 3. Insulate instrument connections for thermometers, pressure gages, pressure

temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

4. Install removable insulation covers at locations indicated. Installation shall conform to the following:
 - a. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
 - b. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
 - c. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
 - d. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.
 - e. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

F. INSTALLATION OF MINERAL-FIBER INSULATION

1. Insulation Installation on Straight Pipes and Tubes:
 - a. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
 - b. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
 - c. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward-clinched staples at 6 inches o.c.
 - d. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.
2. Insulation Installation on Pipe Flanges:
 - a. Install preformed pipe insulation to outer diameter of pipe flange.
 - b. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
 - c. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
 - d. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.
3. Insulation Installation on Pipe Fittings and Elbows:
 - a. Install preformed sections of same material as straight segments of pipe insulation when available.
 - b. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.
4. Insulation Installation on Valves and Pipe Specialties:
 - a. Install preformed sections of same material as straight segments of pipe insulation when available.

- b. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
 - c. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
 - d. Install insulation to flanges as specified for flange insulation application.
- G. FIELD-APPLIED JACKET INSTALLATION
- 1. Where FSK jackets are indicated, install as follows:
 - a. Draw jacket material smooth and tight.
 - b. Install lap or joint strips with same material as jacket.
 - c. Secure jacket to insulation with manufacturer's recommended adhesive.
 - d. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch-wide joint strips at end joints.
 - e. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.
- H. FIELD QUALITY CONTROL
- 1. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
 - 2. Tests and Inspections:
 - a. Inspect pipe, fittings, strainers, and valves, randomly selected by the College's Representative, by removing field-applied jacket and insulation in layers in reverse order of their installation.
 - 3. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.
- I. PIPING INSULATION SCHEDULE, GENERAL
- 1. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
 - 2. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
 - a. Drainage piping located in crawl spaces.
 - b. Underground piping.
 - c. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

END OF SECTION

DIRECT DIGITAL CONTROLS FOR HVAC

1. PART 1 GENERAL

A. SUMMARY

1. This Section includes primary HVAC equipment controls for the HVAC Building Management System (BMS) including control components for terminal heating and cooling units.
2. This specification summarizes standard of quality expected for systems and components. HVAC DDC controls shall be as specified in Paragraph 2.1 below.
3. The BMS shall be an Ethernet based system incorporating operator's terminals, global controllers, system controllers, unit controllers and input/output instrumentation devices. The system shall be a distributed programmable controller network using the latest protocols, BACnet and local area network (LAN) standards as defined by ANSIASHRAE for Building Automation and Control Systems.

B. SCOPE OF WORK

1. Furnish and install a fully integrated Building Automation System, incorporating direct digital control (DDC) for environmental controls, energy management, equipment monitoring and control, and subsystems as herein specified. The installation of the control system shall be performed under the direct supervision of a manufacturer's certified controls technician with approved shop drawings, flow diagrams, bill of materials, point-to-point wiring diagrams and sequences of operation.
2. All materials and equipment shall be standard components, regularly manufactured for this and/or other systems and not custom designed specifically for this project. All systems components shall have been thoroughly tested and proven in actual use for at least two years in the U.S. commercial or industrial controls industry.
3. Provide all BMS and instrumentation wiring for a complete and operable system. All wiring shall be installed in accordance with all applicable code requirements.
4. Comply with all College standards for graphic development, graphic navigation, point naming convention, controller programming, and analog point change of state limits. The Contractor will be furnished the basic background graphic system displays on an as-needed basis to meet College operation requirements for integration into the existing campus Facility Automation System.
5. Provide all the necessary hardware, software and licenses for both wired and wireless communications.

C. WORK SPECIFIED IN OTHER SECTIONS

1. All wells, valves, pressure taps, control dampers, air flow stations, flow meters, etc. if specified in this section shall be installed as specified elsewhere in Division 23.
2. The following shall be provided as specified in Division 26:
 - a. 120V power junction boxes for all BMS and/or temperature control panels.
 - b. Wiring of all power feeds through all disconnects and starters to electrical motors.
 - c. Wiring of any remote start/stop switches and manual or automatic motor speed control devices.
 - d. All fire alarm interface wiring to HVAC equipment, fire/smoke dampers or other devices required for fire safety shutdown or smoke control.

D. RELATED WORK

1. Division 23 Mechanical.

2. Division 26 Electrical.

E. QUALITY ASSURANCE

1. The BMS system shall be designed and installed, commissioned and serviced by the manufacturer's local office representative. All personnel shall be factory trained with 5 years of commercial DDC controls experience to provide a professional installation. Manufacturer shall have an in-place support facility within 50 miles of the College with technical staff, spare parts inventory and necessary test and diagnostic equipment.
2. Materials and equipment shall be the catalogued products of manufacturers regularly engaged in production and installation of automatic temperature control systems and shall be the manufacturer's latest standard design that complies with these specification requirements.
3. BMS shall comply with UL 916 PAZX and 864 UDTZ standards as listed at the time of the bid.
4. All electronic equipment shall conform to the requirements of FCC Regulation, Part 15, Section 15, governing Radio Frequency Electromagnetic Interference and be so labeled.
5. Furnish, if asked for, the building automation system manufacturer's documentation supporting compliance with the latest version of ISO-9002 (Model for Quality Assurance in Production, Installation, and servicing).

F. SUBMITTALS

1. One electronic (PDF) complete set of documentation for designed system approval:
 - a. Valve schedules.
 - b. Equipment data specification cut sheets.
 - c. System schematics diagrams with instrumentation, point names, point addresses, sequence of operation, and a bill of material.
 - d. Panel layout drawings with controller terminations, field terminal strips, inter-panel wiring, power supplies, relays and local control devices.
 - e. System riser diagram with interface to the existing campus Facility Automation System.
 - f. Floor plans provided as part of the graphics as-builts.
2. Upon project completion, submit operation and maintenance manuals consisting of the following:
 - a. Index sheet, listing contents in alphabetical order.
 - b. Manufacturer's equipment parts list of all functional components of the system.
 - c. Controller programs with comment description of sequence of operations.
 - d. Operator's Manual.
 - e. List of connected data points, including panels to which they are connected and input/output devices (sensors, actuators, etc.)
 - f. Hardware points and virtual points commissioning document.
 - g. Floor plan communications routing diagrams.

G. WARRANTY

1. Provide all services, materials and equipment for the successful operation of the entire BMS system for a period of one year after the College's Representative's formal acceptance.
2. The adjustment, required testing, and repair of the system shall include all, transmission equipment, system operating sequences and all instrumentation sensors, controllers, actuator, etc.

2. PART 2 PRODUCTS

A. MANUFACTURERS

1. Building Automation System provider shall be Siemens Industry, Inc. – Apogee. System shall seamlessly interface with the existing Siemens System 600 Apogee server. Black box gateways, integrators, driver, etc. will not be acceptable as seamless integration. All functionality of the System 600 Apogee shall be provided at existing workstations including, but not limited to, trending, archiving, custom reporting, system profiler, programming and scheduling.
2. The BAS contractor shall be a Company owned branch office. Manufacturer's representatives and distributorships of the control systems do not qualify.

B. NETWORKING COMMUNICATIONS

1. The BAS shall network existing operator workstations and stand-alone DDC Controllers. The network architecture shall consist of three levels; a campus-wide Ethernet network based on TCPIIP protocol, a high performance 10/100 Mb peer-to-peer building level network and DDC Controller floor level local area networks. Operator access from any campus workstation shall be totally transparent to the user when retrieving data or developing control programs.
2. The design of BMS shall allow the co-existence of new DDC Controllers with existing DDC Controllers in the same network without the use of gateways or protocol converters.
3. Peer-to-Peer Building Level Network:
 - a. All operator devices either network resident or connected via dial-up modems shall have the ability to access all point status and application report data or execute control functions for any and all other devices with global access to the network data at any time.
 - b. The network shall support a minimum of 100 DDC Controllers and PC workstations.
 - c. Each PC workstation shall support a minimum of 4 peer to peer networks hardwired or dial up.
 - d. The system shall support integration of third party systems (fire alarm, security, lighting, PCL, chiller, boiler) via panel mounted open protocol processor. This processor shall exchange data between the two systems for interprocess control. All exchange points shall have full system functionality as specified herein for hardwired points.
4. DDC Controller Floor Level Network:
 - a. This level communication shall support a family of application specific controllers and shall communicate with the peer-to-peer network through DDC Controllers for transmission of global data.

C. DDC CONTROLLERS

1. DDC Controllers shall be 16-bit stand-alone, multi-tasking, multi-user, real-time digital control processors. The Controller shall consist of modular hardware with plug-in enclosed processors, communication controllers, power supplies and input/output point modules. Controller size shall be sufficient to fully meet the requirements of this specification and the attached point I/O schedule. Each controller shall support a minimum of two (2) Floor Level LAN Device Networks.
2. Each DDC Controller shall have sufficient memory to support its own operating system and databases, including:
 - a. Control processes.
 - b. Energy Management applications.
 - c. Alarm management applications including custom alarm messages for each level alarm for each point in the system.
 - d. Historical/trend data for points specified.
 - e. Maintenance support applications.
 - f. Custom processes.
 - g. Manual override monitoring.

3. Each DDC Controller shall support firmware upgrades without the need to replace hardware.
4. Provide all processors, power supplies and communication controllers so that the implementation of a point only requires the addition of the appropriate point input/output termination module and wiring.
5. DDC Controllers shall provide a minimum two RS-232C serial data communication ports for operation of devices such as industry standard printers, operator terminals, modems and portable laptop operator's terminals. DDC Controllers shall allow temporary use of portable devices without interrupting the normal operation of permanently connected modems, printers or terminals.
6. The operator shall have the ability to manually override automatic or centrally executed commands at the DDC Controller via local, point discrete, on-board hand/off/auto operator override switches for digital control type points and gradual switches for analog control type points.
 - a. Switches shall be mounted either within the DDC Controllers key-accessed enclosure, or externally mounted with each switch keyed to prevent unauthorized overrides.
 - b. DDC Controllers shall monitor the status of all overrides and inform the operator that automatic control has been inhibited. DDC Controllers shall also collect override activity information for reports.
7. DDC Controllers shall provide local LED status indication for each digital input and output for constant, up-to-date verification of all point conditions without the need for an operator I/O device. Graduated intensity LED'S or analog indication of value shall also be provided for each analog output. Status indication shall be visible without opening the panel door.
8. Each DDC Controller shall continuously perform self-diagnostics, communication diagnosis and diagnosis of all panel components. The DDC Controller shall provide both local and remote annunciation of any detected component failures, low battery conditions or repeated failure to establish communication
9. Isolation shall be provided at all peer-to-peer network terminations, as well as all field point terminations to suppress induced voltage transients consistent with IEEE Standards 587- 1980.
10. In the event of the loss of normal power, there shall be an orderly shutdown of all DDC Controllers to prevent the loss of database or operating system software. Non-volatile memory shall be incorporated for all critical controller configuration
 - a. Upon restoration of normal power, the DDC Controller shall automatically resume full operation without manual intervention.
 - b. Should DDC Controller memory be lost for any reason, the user shall have the capability of reloading the DDC Controller via the local RS-232C port, via telephone line dial-in or from a network workstation PC.

D. DDC CONTROLLER RESIDENT SOFTWARE FEATURES

1. The software programs specified in this Section shall be provided as an integral part of DDC Controllers and shall not be dependent upon any higher-level computer for execution.
2. The DDC Controllers shall have the ability to perform the following pre-tested control algorithms:
 - a. Two-position control.
 - b. Proportion control.
 - c. Proportional plus Integral control.
 - d. Proportional, Integral, plus Derivative control.
 - e. Automatic tuning of PID control loops.
 - f. In accordance with OSHA regulations.
3. DDC Controllers shall have the ability to perform any or all the following energy management routines:
 - a. Time-of-day scheduling.

- b. Calendar-based scheduling.
 - c. Holiday scheduling.
 - d. Temporary schedule overrides.
 - e. Start-Stop Time Optimization.
 - f. Automatic Daylight Savings Time Switchover.
 - g. Night Setback Control.
 - h. Enthalpy switchover (economizer).
 - i. Peak demand limiting.
 - j. Temperature-compensated duty cycle.
4. DDC controllers shall be able to execute custom, job-specific processes defined by the user, to automatically perform calculations and special control routines.
- a. A single process shall be able to incorporate measured or calculated data from any and all other DDC Controllers on the network. In addition, a single process shall be able to issue commands to points in any and all other DDC Controllers on the network. Database shall support 30-character English language point names, structured for searching and logs.
 - b. Processes shall be able to generate operator messages and advisories to operator terminals, printers, etc. A process shall be able to directly send a message to a specified device or cause the execution of a dial-up connection to a remote device such as a printer or pager.
 - c. DDC Controller shall provide a HELP function key to assist the user.
 - d. DDC Controller shall be capable of comment lines for sequence of operation explanation.
5. Alarm management shall be provided to monitor and direct alarm information to operator devices. Each DDC Controller shall perform distributed, independent alarm analysis and filtering to minimize operator interruptions due to non-critical alarms, minimize network traffic and prevent alarms from being lost. At no time shall the DDC Controllers ability to report alarms be affected by either operator or activity at a PC workstation, local I/O device or communications with other panels on its network.
- a. All alarm or point change reports shall include the point's English language description and the time and date of occurrence.
 - b. The user shall be able to define the specific system reaction for each point. Alarms shall be prioritized to minimize nuisance reporting and to speed operator response to critical alarms. A minimum of six priority levels shall be provided for each point. Point priority levels shall be combined with user definable destination categories (PC, printer, DDC Controller, etc.) to provide full flexibility in defining the handling of system alarms. Each DDC Controller shall automatically inhibit the reporting of selected alarms during system shutdown and start-up. Users shall have the ability to manually inhibit alarm reporting for each point.
 - c. Alarm reports and messages will be directed to a user-defined list of operator devices or PC's based on time (after hour's destinations) or based on priority.
 - d. In addition to the point's descriptor and the time and date, the user shall be able to print, display or store a 200-character alarm message to more fully describe the alarm condition or direct operator response.
6. A variety of historical data collection utilities shall be provided to manually or automatically sample, store and display system data.
- a. Any point, physical or calculated may be designated for trending. Any point, regardless of physical location in the network, may be collected and stored in each DDC Controllers point group. Two methods of collection shall be allowed: either by a pre-defined time interval or upon a pre-defined change of value. Sample intervals of 1 minute to 7 days shall be provided. Each DDC Controller shall have dedicated RAM-based buffer for trend data and shall be capable of storing a minimum of 2000 data sam-

- ples. All trend data shall be available for use in 3rd party personal computer applications (i.e. Microsoft Excel, Lotus 123).
- b. DDC Controllers shall also provide high resolution sampling capability for verification of control loop performance. Operator-initiated automatic and manual loop tuning algorithms shall be provided for operator-selected PID control loops.
 - c. PID loop tuning shall be capable of being initiated either locally at the DDC Controller, from a network workstation or remotely using dial-in modems. For all PID loop tuning functions, access shall be limited to authorized personnel through password protection.
7. DDC Controllers shall be capable of automatically accumulating and storing run-time hours for digital input and output points and automatically sample, calculate and store consumption totals for analog and digital pulse input type points
 8. The peer-to-peer network shall allow the DDC Controllers to access any data from or send control commands and alarm reports directly to any other DDC Controller or combination of controllers on the network without dependence upon a central or immediate processing device. DDC Controllers shall send alarm reports to multiple workstations without dependence upon a central or intermediate processing device. The peer to peer network shall also allow any DDC Controller to access, edit, modify, add, delete, back up, and restore all system point database and all programs.
 9. The peer-to-peer network shall allow the DDC controllers to assign a minimum of 50 passwords access and control priorities to each point individually. The logon password (at any PC workstation or portable operator terminal) shall enable the operator to monitor, adjust and control the points the operator is authorized for. All other points shall not be displayed on the PC workstation or portable terminal (e.g. all base building and all tenant points shall be accessible to any base building operators, but only tenant points shall be accessible to tenant building operators). Passwords and priorities for every point shall be fully programmable and adjustable.
- E. APPLICATION SPECIFIC CONTROLLERS (ASC)
1. Each DDC Controller shall be able to extend its performance and capacity through the use of remote application specific controllers (ASCs) through Floor Level LAN Device Networks.
 2. Each ASC shall operate as a stand-alone controller capable of performing its specified control responsibilities independently of other controllers in the network. Each ASC shall be a microprocessor-based, multi-tasking, real-time digital control processor. Provide the following types of ASCs as a minimum:
 - a. Central System Controllers.
 - b. Terminal Equipment Controllers.
 3. Each ASC shall be capable of control of the terminal device independent of the manufacturer of the terminal device.
 4. Central System Controllers:
 - a. Provide for control of central HVAC systems and equipment including, but not limited to, rooftop units; packaged air handling units; chilled and condenser water systems; and hot water systems.
 - b. Controllers shall include all input and output instrumentation necessary to perform the specified control sequences. Provide a hand/off/automatic switch for each digital output for manual override capability. Switches shall be mounted either with the controller's key-accessed enclosure, or externally mounted with each switch keyed to prevent unauthorized overrides. In addition, each switch position shall be supervised in order to inform the system that automatic control has been overridden.
 - c. Each controller shall support its own real-time operating system. Provide a time clock with battery backup for stand-alone operation in the event

- communication with its DDC Controller is lost and to insure protection during power outages.
- d. All programs shall be field-customized to meet the user's exact control strategy requirements. Central System controllers utilizing pre-packaged or canned programs will not be acceptable.
 - e. Programming of central system controllers shall utilize the same language and code as used by DDC Controllers to maximize system flexibility and ease of use. Should the system controller utilize a different control language, provide a DDC Controller to meet the specified functionality.
 - f. Each controller shall have connection provisions for a portable operator's terminal. This tool shall allow the user to display, generate or modify all point databases and operating programs.
 - g. Provide a door-mounted interface terminal to allow for direct-user access to the controller. The terminal shall provide the user with the following functionality as a minimum:
 - 1) View and set date and time.
 - 2) Modify and override time-of-day schedules.
 - 3) View points and alarms.
 - 4) Monitor points.
 - 5) Command and modify setpoints.
5. Terminal Equipment Controllers:
- a. Provide for control capability of each piece of equipment, including, but not limited to, the following:
 - 1) Air Handling Units.
 - 2) Heat Exchangers.
 - 3) Pumps.
 - 4) Constant Air Volume (CAV) boxes.
 - 5) Variable Air Volume (VAV) boxes.
 - 6) Fan Coils and Computer Room Units.
 - 7) Exhaust Fans.
 - b. Controllers shall include all input and output instrumentation necessary to perform the specified control sequences. Analog outputs shall be industry standard signals such as 24V floating control, 4-20 ma, 0-10 vdc or 3-15 psig pneumatic allowing for the interface to a variety of modulating actuators. Terminal controllers utilizing proprietary control signals and actuators will not be acceptable.

F. EXISTING WORKSTATION OPERATOR INTERFACE

1. Operator workstation interface software shall minimize operator training through the use of English language prompting, English language point identification and industry standard PC application software. The software shall provide, as a minimum, the following functionality:
 - a. Real-time graphical viewing and control of environment.
 - b. Scheduling and override of building operations.
 - c. Collection and analysis of historical data and dynamic data (trend plot).
 - d. Definition and construction of dynamic color graphic displays.
 - e. Editing, programming, storage and downloading of controller databases.
 - f. Alarm reporting, routing, messaging, and acknowledgement.
2. Provide a graphical user interface which shall minimize the use of a keyboard through the use of a mouse or similar pointing device with a 'point and click' approach to menu selection. There shall be a minimum of 8 pre-defined function keys to allow quick access to frequently used applications:
3. The software shall provide a multi-tasking type environment that allows the user to run several applications simultaneously. BMS software shall run within the Microsoft Windows 7 program manager. These Windows applications shall run simultaneously with the BMS software. The mouse or Alt-Tab keys shall be used to quickly select and switch between multiple applications. The operator

shall be able to work in Microsoft Word, Excel, and other Windows based software packages, while concurrently annunciating on-line BMS alarms and monitoring information.

- a. Provide functionality such that any of the following may be performed simultaneously on-line and in any combination, via user-sized windows:
 - 1) Dynamic color graphics and graphic control.
 - 2) Alarm management, routing to designated locations, and customized messages.
 - 3) Week at a Glance Time of Day scheduling.
 - 4) Trend data definition and presentation.
 - 5) Graphic definition and construction.
 - 6) Program and point database editing on-line.
- b. Report and alarm printing shall be accomplished via Windows program manager, allowing use of network printers.
4. Multiple-level password access protection shall be provided to allow the user/manager to limit workstation control, display and data base manipulation capabilities as deemed appropriate for each user, based upon an assigned password. A minimum of six levels of access and 50 passwords shall be supported.
5. Operator Activity Tracking audit trail report to track system changes, accounting for operator initiated actions, changes made by a particular person or changes made to a specific piece of equipment, designated time frame, shall be printable and archived for future use. The operator activity tracking shall be in a tamper-proof buffer file.
6. Reports shall be generated on demand or via pre-defined schedule and directed to either flat screen displays, printers or disk. As a minimum, the system shall allow the user to easily obtain the following types of reports:
 - a. A general listing of all or selected points in the network.
 - b. List of all points currently in alarm.
 - c. List of all points currently in override status.
 - d. List of all disabled points.
 - e. List of all points currently locked out.
 - f. List of user accounts and access levels.
 - g. List all weekly schedules.
 - h. List of holiday programming.
 - i. List of limits and deadbands.
 - j. Excel reports.
 - k. System diagnostic reports including, list of DDC panels on line and communicating, status of all DDC terminal unit device points.
 - l. List of programs.
7. Scheduling and Override -Provide a graphical spreadsheet-type format for simplification of time-of-day scheduling and overrides of building operations. Schedules shall reside in both the PC workstation and DDC Controller to ensure time equipment scheduling when PC is off- line. Provide override access through menu selection or function key. Provide the following spreadsheet graphic types as a minimum:
 - a. Weekly schedules.
 - b. Zone schedules, minimum of 200 unique zones.
 - c. Monthly calendars.
8. Collection and Analysis of Historical Data
 - a. Provide trending capabilities that allow the user to easily monitor and preserve records of system activity over an extended period of time. Any system point may be trended automatically at time-based intervals or change of value, both of which shall be user- definable. Trend data may be stored on hard disk for future diagnostics and reporting. Additionally, trend data may be archived to network drives or removable disk media for future retrieval.

- b. Trend data reports shall be provided to allow the user to view all trended point data. Reports may be customized to include individual points or predefined groups of at least six points. Provide additional functionality to allow predefined groups of up to 250 trended points to be easily transferred on-line to a Microsoft Excel spreadsheet file. DDC contractor shall provide custom designed spreadsheet reports for use by the College's Representative to track energy usage and cost, equipment run times, equipment efficiency, and/or building environmental conditions. DDC contractor shall also provide setup of custom reports including creation of data format templates for monthly or weekly reports.
 - c. Provide additional functionality that allows the user to view real-time trend data on a trend graph displays. A minimum of six points may be graphed, regardless of whether they have been redefined for trending. The dynamic graphs shall continuously update point values. At any time the user may redefine sampling times or range scales for any data stored on the workstation disk for future recall and analysis. Exact point values may be viewed and the graphs may be printed.
 - d. System Configuration and Definition
 - e. Network wide control strategies shall not be restricted to a single DDC Controller; but shall be able to include data from any and all other network controller panels to allow the development of global control strategies.
 - f. Provide automatic backup and restore of all DDC controller databases on the workstation hard disk. In addition, all database changes shall be performed while the workstation is on-line without disrupting other system operations. Changes made at the DDC Controllers shall be automatically uploaded to the workstation, ensuring system continuity.
 - g. System configuration, programming, editing, graphics generation shall be performed on-line. If programming and system back-up must be done with the PC workstation off-line, the BMS contractor shall provide at least 2 operator workstations.
9. Alarm Management
- a. Alarm Routing shall allow the user to send alarm notification to selected printers or PC location based on time of day, alarm severity or point type.
 - b. Alarm Notification shall be provided via two alarm icons, to distinguish between routine maintenance type alarms and critical alarms. These alarm icons shall be displayed when the user is working in other Windows programs. The BMS alarm display screen shall be displayed when the user clicks on the alarm icon.
 - c. Alarm Display shall list the alarms with highest priority at the top of the display. The alarm display shall provide selector buttons for display of the associated point graphic and message.
 - d. Alarm messages shall be customizable for each point to display detailed instructions to the user regarding actions to take in the event of an alarm.
 - e. The proposed alarms and their specific reporting destination shall be submitted for approval by the College's Representative prior to implementation.

G. DYNAMIC COLOR GRAPHIC

- 1. Create color graphic floor plan displays, from as-builts, and system schematics for each mechanical system including air handling units, chilled water systems and hot water heat exchanger systems. Provide graphics to support all points in the I/O summary of this specification to optimize system performance analysis, command changes to operating parameters and for speed of alarm recognition.
- 2. The operator interface shall allow users to access the various system schematics and floor plans via a campus standard graphical navigation scheme, menu

- selection or text-based commands. Graphics software shall permit the importing of AutoCAD or Bitmap drawings for use in the system.
3. Dynamic temperature values, humidity values, flow values and status indication shall be shown in their actual respective locations and shall automatically update to represent current conditions without operator intervention and without pre-defined screen refresh rates.
 - a. Analog bars in 3 sizes shall be available for monitor and control of analog values; high and low alarm limit settings shall be displayed on the analog scale. The user shall be able to "click and drag" the pointer to change the setpoint.
 - b. Provide the user the ability to display blocks of point data by defined point groups; alarm conditions shall be displayed by flashing point blocks.
 - c. Equipment state may be changed by clicking on the point block or graphic symbol and selecting the new state (on/off) or setpoint in a drop down window.
 4. Colors shall be used to indicate point status change. Active point information shall be shown as dark blue text that automatically changes to black text when the point fails to function. The status colors shall be user definable.
 5. The windowing environment of the PC operator workstation shall allow the user to simultaneously view several applications at a time to analyze total building operation or to allow the display of a graphic associated with an alarm to be viewed without interrupting work in progress.
 6. Off the shelf graphic software (Microgafx Designer, Corel Draw or equal software) shall be provided to allow the user to add, modify or delete system graphic displays.
 7. A clipart library of HVAC and automation symbols shall be provided including fans, valves, heat exchangers, chillers, AHU systems, standard ductwork diagrams and laboratory symbols. The user shall have the ability to add custom symbols to the clipart library.

H. INSTRUMENTATION

1. Instrumentation specified herein is approved College standards and represents the minimum performance requirements for this project.
2. Thermowells:
 - a. When thermowells are required, the sensor and well shall be supplied as a complete assembly including wellhead and Greenfield fitting.
 - b. Thermowells shall be pressure rated and constructed in accordance with the system working pressure.
 - c. Thermowells and sensors shall be mounted in threadolet or 1/2" NPT saddle and allow easy access to the sensor for repair and replacement.
3. Liquid Immersion Temperature Sensors:
 - a. Model: BAPI Model BA/10K or approved equal.
 - b. Operating Temperature: -40 to 240°F.
 - c. Sensing Element: NTC 10K (Type II) Thermistor
 - d. Accuracy at Calibration Temperature: $\pm 1 \pm F$
 - e. All sensors measuring temperatures in pipes larger than 2 inches in diameter or in pressure vessels shall be supplied with wells properly fabricated for the service. Wells shall be non-corrosive to the medium being measured and shall have sufficient physical strength to withstand pressures and velocities to which they are subjected. Wells shall be installed in the piping at elbows where piping is smaller than the length of the well to affect proper flow across the entire area of the well.
 - f. Stainless steel, Type 304, socket with minimum insertion length of 2-1/2".
4. Outside Air Temperature and Humidity Sensors:
 - a. Model: Vaisala HUMIDICAP Outdoor Humidity and Temperature Transmitter HMD6OY0 or approved equal.
 - b. Humidity Operating Range: 0 to 100% RH.

- c. Humidity Output Signal: 4 to 20 mA, 0 to 100% linear, proportional.
 - d. Humidity Accuracy: $\pm 2.0\%$ RH, 0-90% RH
 - e. Humidity Sensing Element: HUMICAP 180.
 - f. Temperature Range: -40-140°F.
 - g. Temperature Output Signal: 4 to 20 mA, 0 to 100% linear, proportional.
 - h. Temperature Accuracy: $\pm 0.36^\circ\text{F}$.
 - i. Temperature Sensing Element: 1K-ohm Platinum RTD 1/3 Class B IEC 751.
 - j. Outdoor installations shall be of weatherproof construction or in appropriate NEMA enclosures. These installations shall be protected from solar radiation and wind effects. They shall also be provided with a solar radiation shield.
5. Water Pressure Sensors:
- a. Water differential pressure sensors shall be Setra Model 231 transmitters or approved equal.
 - b. Pressure transmitters shall be constructed to withstand 100% pressure over-range without damage and to hold calibrated accuracy when subject to a momentary 40% over-range input.
 - c. Provide a minimum of a NEMA 1 housing for the transmitter. Locate transmitters in accessible local control panels wherever possible.
 - d. Provide brass 3-valve manifold assembly with shut-off and shunt valves.
 - e. Provide standard Viton/Silicone bleed screw seals.
 - f. The pressure transmitter shall be capable of transmitting a linear electronic signal proportional to the differential of the pressure input signals with the following minimum performance specifications.
 - g. Span: Refer to Points List.
 - h. Accuracy: $\pm 0.25\%$ of full scale.
 - i. Non-Repeatability: 0.05%.
 - j. Non-linearity: $\pm 0.20\%$
 - k. Response: 30 to 50 ms.
 - l. Temperature stability: Less than 0.02% FS/ $^\circ\text{F}$ change
 - m. Output: 0 to 10 VDC
6. Control Cable
- a. Control wiring as specified in Division 26 Section "Low Voltage Electrical Power Conductors and Cables" and "Raceways and Boxes for Electrical Systems."

3. PART 3 PROJECT MANAGEMENT

A. PROJECT MANAGEMENT

1. Provide a designated project manager who will be responsible for the following:
 - a. Construct and maintain project schedule.
 - b. On-site coordination with all associated trades and subcontractors.
 - c. Authorized to accept and execute orders or instructions from College's Representative.
 - d. Attend project meetings as necessary to avoid conflicts and delays.
 - e. Make necessary field decisions relating to this scope of work.
 - f. Advise College's Representative that system designs may not achieve expected results.
 - g. Coordination/single point of contact.

B. POINT OF SCHEDULE I/O SUMMARY

1. See Section 230993, Sequence of Operations for HVAC Controls and mechanical control drawings.
2. Use AVC point naming conventions and standards AVC graphics.

C. SEQUENCE OF OPERATION

1. See Section 230993, Sequence of Operation for HVAC Controls and mechanical control drawings.

D. START-UP AND COMMISSIONING

1. When installation of the system is complete, verify instrumentation and verify transmission media operation before placing the system on-line. Complete all testing, calibrating, adjusting and final field tests. Verify that all systems are operable from local controls upon panel controller failure or loss of power.
2. Furnish a commissioning document that identifies each hardware connected point is sensing or controlling within its specified accuracy range. Also furnish a list of virtual setpoints that demonstrate they provide the specified control in the sequence of operation.
3. Furnish any recommendation for system modification in writing to the College's Representative. Do not make any system modification, including operating parameters and control settings, without prior approval of College's Representative.

E. TRAINING

1. Furnish the services of factory trained instructors to give full instruction to College personnel in the operation of the system installed. Instructors shall be certified as an instructor by the manufacturer with all aspects of the matter they are to teach. Furnish all students with a student binder containing product specific training modules for the system installed. All training shall be held at the College facilities during normal working hours of 7:00am to 3:30pm weekdays.
2. Furnish 8 hours of training for College's operating personnel. Training shall be furnished in 2 sessions. The first session shall be 4 hours and shall include basic overview of system operation. The second session shall be 4 hours and scheduled at the end of the warranty period. Training shall include but not be limited to:
 - a. Explanation of drawings, operations and maintenance manuals.
 - b. Walk-through of the job site to locate control components.
 - c. Operator workstation and peripherals.
 - d. DDC Controller and ASC operation/function.
 - e. Operator control functions including field panel programming.
 - f. Operation of portable operator's terminal.
 - g. Explanation of adjustment, calibration and replacement procedures.
 - h. Student binder with training modules.
3. Since the College may require personnel to have a more comprehensive understanding of the hardware and software, additional advanced training must be made available from the contractor and/or manufacturer. If such training is required by the College, it will be contracted at a later date.

END OF SECTION

SEQUENCE OF OPERATIONS FOR HVAC DDC

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section includes control sequences for DDC for HVAC systems, subsystems, and equipment.
2. Related Requirements:
 - a. Section 230900 "Direct Digital Controls for HVAC" for control equipment.

C. DEFINITIONS

1. Analog Output: Proportional output signal (zero- to 10-V dc, 4 to 20 mA).
2. Binary Output: On/off output signal or contact closure.
3. DDC: Direct digital control.
4. Digital Output: Data output that must be interpreted digitally.

D. ACTION SUBMITTALS

1. Product Data:
 - a. An instrumentation list for each controlled system. Label each element of the controlled system in table format. Show, in the table element name, type of device, manufacturer, model number, and control device product data sheet number.
 - b. A complete description of the operation of the control system, including sequences of operation. Include and reference a schematic diagram of the controlled system.
2. Shop Drawings:
 - a. Riser diagrams showing control network layout, communication protocol, and wire types.
 - b. Schematic diagram of each controlled system. Include all control points labeled with point names shown or listed. Show the location of control elements in the system.
 - c. Wiring diagram for each controlled system. Show all control elements labels. Where a control element is the same as that shown on the control system schematic, label with the same name. Label all terminals.

E. HEATING CONTROL SEQUENCES

1. Equipment:
 - a. Boiler, B-1
 - b. Constant speed, heating hot water pumps, P-1 and P-2
 - c. Sensors:
 - 1) OSA temperature
 - 2) HHWS and HHWR temperature
 - 3) Pump status
 - 4) Boiler status
 - d. Output Device:
 - 1) Pump starter.
 - 2) Boiler starter
 - 3) Boiler temperature reset
 - e. Integrate HHW sequence into existing BAS equipment and into existing

sequence of operations.

2. Sequence:
 - a. All set points are adjustable.
 - b. The pumping arrangement is N+1, only one pump operates at any time.
 - c. Whenever the outdoor temperature is at or below 84-deg F and the building is 'on', enable a HHW pump.
 - d. Whenever the OSA is at or below 35-deg F, enable one HHW pump regardless if the building is 'on'.
 - e. Alternate starting P-1 and P-2 to maintain equal operating hours between the two pumps.
 - f. If one pump fails to operate, then start the other one and send an alarm to the BAS operator.
 - g. Once pump operation is verified, then enable the boiler.
 - 1) If the boiler fails to start or stops when needed, then alarm BAS operator
 - 2) If the boiler fails and the OSA is less than 35-deg F, then command the OSA dampers closed on the AHU and alarm the BAS operator.
 - h. Reset the HHW leaving temperature according to the following schedule:
 - 1) Minimum HHW leaving temperature set point is 130-deg F
 - 2) Maximum HHW leaving temperature set point is 200-deg F
 - 3) 84-deg F OSA, HHW leaving set point = 130-deg F
 - 4) 65-deg F OSA, HHW leaving set point = 200-deg F
 - 5) Increase HHW leaving set point linearly between OSA temperatures of 84-deg F and 65-deg F
 - 6) Below 65-deg F the HHW leaving set point shall be 200-deg F
 - i. VAV control valve polling:
 - 1) Whenever the boiler is on poll the space temperatures and VAV HHW valves positions once every 20-minutes.
 - 2) When 5 or more VAV HHW valves are 90% open or greater and space temperatures are below set points, increase leaving HHW temperature by 5-deg F.
 - 3) When no VAV control valves are 90% or more open and all space temperatures are satisfied, then decrease the leaving HHW temperature set point by 5-deg F.
 - 4) Repeat adjustment once every 20-minutes whenever the boiler is enabled.
 - j. When the OSA temperature is above 84-deg F:
 - 1) Turn off boiler
 - 2) Reset HHW temperature to base settings
 - 3) Turn off lead HW pump once the HHW temperature is at or below 130-deg F

2. PART 2 PRODUCTS (Not Applicable)

3. PART 3 EXECUTION

A. COORDINATION

1. DDC provider shall coordinate with boiler manufacturer for controlling the boiler, point mapping and interfacing between boiler controls and building automation system.

END OF SECTION

FACILITY NATURAL-GAS PIPING

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes:
 - a. Pipes, tubes, and fittings.
 - b. Piping specialties.
 - c. Piping and tubing joining materials.
 - d. Manual gas shutoff valves.
 - e. Pressure regulators.

C. DEFINITIONS

1. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
2. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
3. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. ACTION SUBMITTALS

1. Product Data: For each type of the following:
 - a. Piping specialties.
 - b. Corrugated, stainless-steel tubing with associated components.
 - c. Valves. Include pressure rating, capacity, settings, and electrical connection data of selected models.
 - d. Pressure regulators. Indicate pressure ratings and capacities.

E. INFORMATIONAL SUBMITTALS

1. Welding certificates.
2. Field quality-control reports.

F. CLOSEOUT SUBMITTALS

1. Operation and Maintenance Data: For pressure regulators to include in emergency, operation, and maintenance manuals.

G. QUALITY ASSURANCE

1. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

H. DELIVERY, STORAGE, AND HANDLING

1. Handling Flammable Liquids: Remove and dispose of liquids from existing natural-gas piping according to requirements of authorities having jurisdiction.
2. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

3. Store and handle pipes and tubes having factory-applied protective coatings to avoid damaging coating, and protect from direct sunlight.

I. PROJECT CONDITIONS

1. Interruption of Existing Natural-Gas Service: Do not interrupt natural-gas service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide purging and startup of natural-gas supply according to requirements indicated:
 - a. Notify the College's Representative no fewer than seven days in advance of proposed interruption of natural-gas service.
 - b. Do not proceed with interruption of natural-gas service without the College's Representative's permission.

2. PART 2 PRODUCTS

A. PERFORMANCE REQUIREMENTS

1. Minimum Operating-Pressure Ratings:
 - a. Piping and Valves: 100 psig minimum unless otherwise indicated.
 - b. Service Regulators: 65 psig minimum unless otherwise indicated.
 - c. Minimum Operating Pressure of Service Meter: 10 psig
2. Natural-Gas System Pressure within Buildings: 0.5 psig or less

B. PIPES, TUBES, AND FITTINGS

1. Steel Pipe: ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.
 - a. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
 - b. Wrought-Steel Welding Fittings: ASTM A 234/A 234M for butt welding and socket welding.
 - c. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.
 - d. Forged-Steel Flanges and Flanged Fittings: ASME B16.5, minimum Class 150, including bolts, nuts, and gaskets of the following material group, end connections, and facings:
 - 1) Material Group: 1.1.
 - 2) End Connections: Threaded or butt welding to match pipe.
 - 3) Lapped Face: Not permitted underground.
 - 4) Gasket Materials: ASME B16.20, metallic, flat, asbestos free, aluminum o-rings, and spiral-wound metal gaskets.
 - 5) Bolts and Nuts: ASME B18.2.1, carbon steel aboveground and stainless steel underground.
2. Corrugated, Stainless-Steel Tubing: Comply with ANSI/IAS LC 1.
 - a. Tubing: ASTM A 240/A 240M, corrugated, Series 300 stainless steel.
 - b. Coating: PE with flame retardant.
 - 1) Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a) Flame-Spread Index: 25 or less.
 - b) Smoke-Developed Index: 50 or less.
 - c. Fittings: Copper-alloy mechanical fittings with ends made to fit and listed for use with corrugated stainless-steel tubing and capable of metal-to-metal seal without gaskets. Include brazing socket or threaded ends complying with ASME B1.20.1.
 - d. Striker Plates: Steel, designed to protect tubing from penetrations.

- e. Manifolds: Malleable iron or steel with factory-applied protective coating. Threaded connections shall comply with ASME B1.20.1 for pipe inlet and corrugated tubing outlets.
 - f. Operating-Pressure Rating: 5 psig.
- C. PIPING SPECIALTIES
- 1. Appliance Flexible Connectors:
 - a. Indoor, Fixed-Appliance Flexible Connectors: Comply with ANSI Z21.24.
 - b. Corrugated stainless-steel tubing with polymer coating.
 - c. Operating-Pressure Rating: 0.5 psig.
 - d. End Fittings: Zinc-coated steel.
 - e. Threaded Ends: Comply with ASME B1.20.1.
 - f. Maximum Length: 72 inches
 - 2. Y-Pattern Strainers:
 - a. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
 - b. End Connections: Threaded ends for NPS 2 and smaller; flanged ends for NPS 2-1/2 and larger.
 - c. Strainer Screen: 60-mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.
 - d. CWP Rating: 125 psig.
 - 3. Weatherproof Vent Cap: Cast- or malleable-iron increaser fitting with corrosion-resistant wire screen, with free area at least equal to cross-sectional area of connecting pipe and threaded-end connection.
- D. JOINING MATERIALS
- 1. Joint Compound and Tape: Suitable for natural gas.
 - 2. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- E. MANUAL GAS SHUTOFF VALVES
- 1. General Requirements for Metallic Valves, NPS 2 (DN 50) and Smaller: Comply with ASME B16.33.
 - a. CWP Rating: 125 psig.
 - b. Threaded Ends: Comply with ASME B1.20.1.
 - c. Dry seal Threads on Flare Ends: Comply with ASME B1.20.3.
 - d. Tamperproof Feature: Locking feature for valves indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
 - e. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction for valves 1 inch and smaller.
 - f. Service Mark: Valves 1-1/4 inches to NPS 2 shall have initials "WOG" permanently marked on valve body.
 - 2. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim: MSS SP-110.
 - a. Body: Bronze, complying with ASTM B 584.
 - b. Ball: Chrome-plated bronze.
 - c. Stem: Bronze; blowout proof.
 - d. Seats: Reinforced TFE; blowout proof.
 - e. Packing: Threaded-body packnut design with adjustable-stem packing.
 - f. Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
 - g. CWP Rating: 600 psig.
 - h. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
 - i. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

3. Bronze Plug Valves: MSS SP-78.
 - a. Body: Bronze, complying with ASTM B 584.
 - b. Plug: Bronze.
 - c. Ends: Threaded, socket, or flanged as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
 - d. Operator: Square head or lug type with tamperproof feature where indicated.
 - e. Pressure Class: 125 psig.
 - f. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
 - g. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

F. PRESSURE REGULATORS

1. General Requirements:
 - a. Single stage and suitable for natural gas.
 - b. Steel jacket and corrosion-resistant components.
 - c. Elevation compensator.
 - d. End Connections: Threaded for regulators NPS 2 and smaller; flanged for regulators NPS 2-1/2 and larger.
2. Service Pressure Regulators: Comply with ANSI Z21.80.
 - a. Manufacturer: American Meter or equal
 - b. Body and Diaphragm Case: Cast iron or die-cast aluminum.
 - c. Springs: Zinc-plated steel; interchangeable.
 - d. Diaphragm Plate: Zinc-plated steel.
 - e. Seat Disc: Nitrile rubber resistant to gas impurities, abrasion, and deformation at the valve port.
 - f. Orifice: Aluminum; interchangeable.
 - g. Seal Plug: Ultraviolet-stabilized, mineral-filled nylon.
 - h. Single-port, self-contained regulator with orifice no larger than required at maximum pressure inlet, and no pressure sensing piping external to the regulator.
 - i. Pressure regulator shall maintain discharge pressure setting downstream, and not exceed 150 percent of design discharge pressure at shutoff.
 - j. Overpressure Protection Device: Factory mounted on pressure regulator.
 - k. Atmospheric Vent: Factory- or field-installed, stainless-steel screen in opening if not connected to vent piping.
 - l. Maximum Inlet Pressure: 100 psig.

3. PART 3 EXECUTION

A. EXAMINATION

1. Examine roughing-in for natural-gas piping system to verify actual locations of piping connections before equipment installation.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

B. PREPARATION

1. Close equipment shutoff valves before turning off natural gas to premises or piping section.
2. Inspect natural-gas piping according to NFPA 54 to determine that natural-gas utilization devices are turned off in piping section affected.
3. Comply with NFPA 54 requirements for prevention of accidental ignition.

C. OUTDOOR PIPING INSTALLATION

1. Comply with NFPA 54 for installation and purging of natural-gas piping.

2. Install fittings for changes in direction and branch connections.

D. INDOOR PIPING INSTALLATION

1. Comply with NFPA 54 for installation and purging of natural-gas piping.
2. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
3. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.
4. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
5. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
6. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
7. Locate valves for easy access.
8. Install natural-gas piping at uniform grade of 2 percent down toward drip and sediment traps.
9. Install piping free of sags and bends.
10. Install fittings for changes in direction and branch connections.
11. Verify final equipment locations for roughing-in.
12. Comply with requirements in Sections specifying gas-fired appliances and equipment for roughing-in requirements.
13. Drips and Sediment Traps: Install drips at points where condensate may collect, including service-meter outlets. Locate where accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.
 - a. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches (75 mm) long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.
14. Extend relief vent connections for service regulators, line regulators, and overpressure protection devices to outdoors and terminate with weatherproof vent cap.
15. Conceal pipe installations in walls, pipe spaces, utility spaces, above ceilings, below grade or floors, and in floor channels unless indicated to be exposed to view.
16. Concealed Location Installations: Except as specified below, install concealed natural-gas piping and piping installed under the building in containment conduit constructed of steel pipe with welded joints as described in Part 2. Install a vent pipe from containment conduit to outdoors and terminate with weatherproof vent cap.
 - a. Prohibited Locations:
 - 1) Do not install natural-gas piping in or through circulating air ducts, clothes or trash chutes, chimneys or gas vents (flues), ventilating ducts, or dumbwaiter or elevator shafts.
 - 2) Do not install natural-gas piping in solid walls or partitions.
17. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.
18. Connect branch piping from top or side of horizontal piping.
19. Install unions in pipes NPS 2 and smaller, adjacent to each valve, at final connection to each piece of equipment. Unions are not required at flanged connections.
20. Do not use natural-gas piping as grounding electrode.

21. Install strainer on inlet of each line-pressure regulator and automatic or electrically operated valve.
 22. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- E. VALVE INSTALLATION
1. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing, aluminum, or copper connector.
 2. Install underground valves with valve boxes.
 3. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.
 4. Install earthquake valves aboveground outside buildings according to listing.
 5. Install anode for metallic valves in underground PE piping.
- F. PIPING JOINT CONSTRUCTION
1. Ream ends of pipes and tubes and remove burrs.
 2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
 3. Threaded Joints:
 - a. Thread pipe with tapered pipe threads complying with ASME B1.20.1.
 - b. Cut threads full and clean using sharp dies.
 - c. Ream threaded pipe ends to remove burrs and restore full inside diameter of pipe.
 - d. Apply appropriate tape or thread compound to external pipe threads unless dry-seal threading is specified.
 - e. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
 4. Welded Joints:
 - a. Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators.
 - b. Bevel plain ends of steel pipe.
 - c. Patch factory-applied protective coating as recommended by manufacturer at field welds and where damage to coating occurs during construction.
 5. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter.
 6. Flanged Joints: Install gasket material, size, type, and thickness appropriate for natural-gas service. Install gasket concentrically positioned.
 7. Flared Joints: Cut tubing with roll cutting tool. Flare tube end with tool to result in flare dimensions complying with SAE J513. Tighten finger tight, then use wrench. Do not overtighten.
- G. HANGER AND SUPPORT INSTALLATION
1. Install seismic restraints on piping. Comply with requirements for seismic-restraint devices specified in Section 230548 "Vibration and Seismic Controls for HVAC."
 2. Comply with requirements for pipe hangers and supports specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- H. CONNECTIONS
1. Connect to utility's gas main according to utility's procedures and requirements.
 2. Install natural-gas piping electrically continuous, and bonded to gas appliance equipment grounding conductor of the circuit powering the appliance according to NFPA 70.
 3. Install piping adjacent to appliances to allow service and maintenance of appliances.

4. Connect piping to appliances using manual gas shutoff valves and unions. Install valve within 72 inches of each gas-fired appliance and equipment. Install union between valve and appliances or equipment.
 5. Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.
- I. LABELING AND IDENTIFYING
1. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for piping and valve identification.
- J. FIELD QUALITY CONTROL
1. Perform tests and inspections.
 2. Tests and Inspections:
 - a. Test, inspect, and purge natural gas according to NFPA 54 and authorities having jurisdiction.
 3. Natural-gas piping will be considered defective if it does not pass tests and inspections.
 4. Prepare test and inspection reports.
- K. OUTDOOR PIPING SCHEDULE
1. Aboveground natural-gas piping shall be one of the following:
 - a. Steel pipe with malleable-iron fittings and threaded joints.
 - b. Steel pipe with wrought-steel fittings and welded joints.
- L. INDOOR PIPING SCHEDULE FOR SYSTEM PRESSURES LESS THAN 0.5 PSIG
1. Aboveground piping NPS 2 and smaller shall be the following:
 - a. Steel pipe with malleable-iron fittings and threaded joints.

END OF SECTION

HYDRONIC PIPING

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section includes pipe and fitting materials and joining methods for the following:
 - a. Copper tube and fittings.
 - b. Steel pipe and fittings.
 - c. Joining materials.
 - d. Dielectric fittings.

C. ACTION SUBMITTALS

1. Product Data: For each type of the following:
 - a. Pipe.
 - b. Fittings.
 - c. Joining materials.

D. INFORMATIONAL SUBMITTALS

1. Qualification Data: For Installer.
2. Welding certificates.
3. Field quality-control reports.

E. QUALITY ASSURANCE

1. Steel Support Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. Pipe Welding: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code: Section IX.
 - a. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.
 - b. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

2. PART 2 PRODUCTS

A. PERFORMANCE REQUIREMENTS

1. Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature unless otherwise indicated:
 - a. Hot-Water Heating Piping: 100 psig at 200 deg F.
 - b. Air-Vent Piping: 180 deg F/200 deg F
 - c. Safety-Valve-Inlet and -Outlet Piping: Equal to the pressure of the piping system to which it is attached.

B. COPPER TUBE AND FITTINGS

1. Drawn-Temper Copper Tubing: ASTM B 88, Type L
2. Wrought-Copper Unions: ASME B16.22.

C. STEEL PIPE AND FITTINGS

1. Steel Pipe: ASTM A 53/A 53M, black steel with plain ends; welded and seamless, Grade B, and wall thickness as indicated in "Piping Applications" Article.
2. Cast-Iron Threaded Fittings: ASME B16.4; Classes 125 and 250 as indicated in "Piping Applications" Article.
3. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300 as indicated in "Piping Applications" Article.
4. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300 as indicated in "Piping Applications" Article.
5. Cast-Iron Pipe Flanges and Flanged Fittings: ASME B16.1, Classes 25, 125, and 250; raised ground face, and bolt holes spot faced as indicated in "Piping Applications" Article.
6. Wrought-Steel Fittings: ASTM A 234/A 234M, wall thickness to match adjoining pipe.
7. Wrought Cast- and Forged-Steel Flanges and Flanged Fittings: ASME B16.5, including bolts, nuts, and gaskets of the following material group, end connections, and facings:
 - a. Material Group: 1.1.
 - b. End Connections: Butt welding.
 - c. Facings: Raised face.
8. Steel Pipe Nipples: ASTM A 733, made of same materials and wall thicknesses as pipe in which they are installed.

D. JOINING MATERIALS

1. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
 - a. ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inch maximum thickness unless otherwise indicated.
 - 1) Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
 - 2) Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
2. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
3. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for joining copper with copper; or BA9-1, silver alloy for joining copper with bronze or steel.
4. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

E. DIELECTRIC FITTINGS

1. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
2. Dielectric Unions:
 - a. Description:
 - 1) Standard: ASSE 1079.
 - 2) Pressure Rating: 125 psig minimum at 200deg F.
 - 3) End Connections: Solder-joint copper alloy and threaded ferrous.
3. Dielectric Flanges:
 - a. Description:
 - 1) Standard: ASSE 1079.
 - 2) Factory-fabricated, bolted, companion-flange assembly.
 - 3) Pressure Rating: 125 psig minimum at 200deg F.
 - 4) End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
4. Dielectric-Flange Insulating Kits:
 - a. Description:

- 1) Nonconducting materials for field assembly of companion flanges.
 - 2) Pressure Rating: 150 psig.
 - 3) Gasket: Neoprene or phenolic.
 - 4) Bolt Sleeves: Phenolic or polyethylene.
 - 5) Washers: Phenolic with steel backing washers.
5. Dielectric Nipples:
- a. Description:
 - 1) Standard: IAPMO PS 66.
 - 2) Electroplated steel nipple, complying with ASTM F 1545.
 - 3) Pressure Rating: 300 psig at 225 deg F.
 - 4) End Connections: Male threaded or grooved.
 - 5) Lining: Inert and noncorrosive, propylene.

3. PART 3 EXECUTION

A. PIPING APPLICATIONS

1. Hot-water heating piping, aboveground, NPS 2 and smaller shall be the following:
 - a. Type L, drawn-temper copper tubing, wrought-copper fittings, and brazed joints.
2. Hot-water heating piping, aboveground, NPS 2-1/2 and larger, shall be the following:
 - a. Schedule 40 steel pipe, wrought-steel fittings and wrought-cast or forged-steel flanges and flange fittings, and welded and flanged joints.
3. Condensate-Drain Piping: Type M, drawn-temper copper tubing, wrought-copper fittings, and soldered joints or Schedule 40 PVC plastic pipe and fittings and solvent-welded joints.
4. Blowdown-Drain Piping: Same materials and joining methods as for piping specified for the service in which blowdown drain is installed.
5. Air-Vent Piping:
 - a. Inlet: Same as service where installed.
 - b. Outlet: Type K, annealed-temper copper tubing with soldered or flared joints.
6. Safety-Valve-Inlet and -Outlet Piping for Hot-Water Piping: Same materials and joining methods as for piping specified for the service in which safety valve is installed with metal-to-plastic transition fittings for plastic piping systems according to piping manufacturer's written instructions.

B. PIPING INSTALLATIONS

1. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
2. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
3. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
4. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
5. Install piping to permit valve servicing.
6. Install piping at indicated slopes.
7. Install piping free of sags and bends.
8. Install fittings for changes in direction and branch connections.
9. Install piping to allow application of insulation.
10. Select system components with pressure rating equal to or greater than system operating pressure.

11. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
12. Install drains, consisting of a tee fitting, NPS 3/4 ball valve, and short NPS 3/4 threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.
13. Install piping at a uniform grade of 0.2 percent upward in direction of flow.
14. Reduce pipe sizes using eccentric reducer fitting installed with level side up.
15. Install branch connections to mains using tee fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.
16. Install valves according to the following:
 - a. Section 230523.12 "Ball Valves for HVAC Piping."
17. Install unions in piping, NPS 2 and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.
18. Install flanges in piping, NPS 2-1/2 and larger, at final connections of equipment and elsewhere as indicated.
19. Install shutoff valve immediately upstream of each dielectric fitting.
20. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for identifying piping.

C. DIELECTRIC FITTING INSTALLATION

1. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

D. HANGERS AND SUPPORTS

1. Comply with requirements in Section 230529 "Hangers and Supports for HVAC Piping and Equipment" for hanger, support, and anchor devices. Comply with the following requirements for maximum spacing of supports.
2. Install the following pipe attachments:
 - a. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet long.
 - b. Provide copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
 - c. On plastic pipe, install pads or cushions on bearing surfaces to prevent hanger from scratching pipe.
3. Install hangers for steel piping with the following maximum spacing and minimum rod sizes:
 - a. NPS 3/4: Maximum span, 7 feet.
 - b. NPS 1: Maximum span, 7 feet.
 - c. NPS 1-1/2: Maximum span, 9 feet.
 - d. NPS 2: Maximum span, 10 feet.
 - e. NPS 2-1/2: Maximum span, 11 feet.
 - f. NPS 3 and Larger: Maximum span, 12 feet.
4. Install hangers for drawn-temper copper piping with the following maximum spacing and minimum rod sizes:
 - a. NPS 3/4: Maximum span, 5 feet; minimum rod size, 3/8 inch.
 - b. NPS 1: Maximum span, 6 feet; minimum rod size, 3/8 inch.
 - c. NPS 1-1/4: Maximum span, 7 feet; minimum rod size, 3/8 inch.
 - d. NPS 1-1/2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
 - e. NPS 2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
 - f. NPS 2-1/2: Maximum span, 9 feet; minimum rod size, 3/8 inch.
 - g. NPS 3 and Larger: Maximum span, 10 feet; minimum rod size, 3/8 inch.

E. PIPE JOINT CONSTRUCTION

1. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
3. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8/A5.8M.
4. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - a. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - b. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
5. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.
6. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
7. Plastic Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - a. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 - b. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
 - c. PVC Pressure Piping: Join ASTM D 1785 schedule number, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule number PVC pipe and socket fittings according to ASTM D 2855.
 - d. PVC Non-pressure Piping: Join according to ASTM D 2855.

F. FIELD QUALITY CONTROL

8. Prepare hydronic piping according to ASME B31.9 and as follows:
 - a. Leave joints, including welds, uninsulated and exposed for examination during test.
 - b. Provide temporary restraints for expansion joints that cannot sustain reactions due to test pressure. If temporary restraints are impractical, isolate expansion joints from testing.
 - c. Flush hydronic piping systems with clean water; then remove and clean or replace strainer screens.
 - d. Isolate equipment from piping. If a valve is used to isolate equipment, its closure shall be capable of sealing against test pressure without damage to valve. Install blinds in flanged joints to isolate equipment.
 - e. Install safety valve, set at a pressure no more than one-third higher than test pressure, to protect against damage by expanding liquid or other source of overpressure during test.
9. Perform the following tests on hydronic piping:
 - a. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
 - b. While filling system, use vents installed at high points of system to release air. Use drains installed at low points for complete draining of test liquid.
 - c. Isolate expansion tanks and determine that hydronic system is full of water.
 - d. Subject piping system to hydrostatic test pressure that is not less than 1.5 times the system's working pressure. Test pressure shall not exceed maximum pressure for any vessel, pump, valve, or other component in system

- under test. Verify that stress due to pressure at bottom of vertical runs does not exceed 90 percent of specified minimum yield strength or 1.7 times the "SE" value in Appendix A in ASME B31.9, "Building Services Piping."
- e. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
 - f. Prepare written report of testing.
10. Perform the following before operating the system:
- a. Open manual valves fully.
 - b. Inspect pumps for proper rotation.
 - c. Set makeup pressure-reducing valves for required system pressure.
 - d. Inspect air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
 - e. Set temperature controls so all coils are calling for full flow.
 - f. Inspect and set operating temperatures of hydronic equipment, such as boilers to specified values.
 - g. Verify lubrication of motors and bearings.

END OF SECTION

HYDRONIC PIPING SPECIALTIES

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes:
 - a. Hydronic specialty valves.
 - b. Air-control devices.
 - c. Strainers.
 - d. Connectors.
2. Related Requirements:
 - a. Section 230523.12 "Ball Valves for HVAC Piping" for specification and installation requirements for ball valves common to most piping systems.
 - b. Section 230523.14 "Check Valves for HVAC Piping" for specification and installation requirements for check valves common to most piping systems.

C. ACTION SUBMITTALS

1. Product Data: For each type of product:
 - a. Include construction details and material descriptions for hydronic piping specialties.
 - b. Include rated capacities, operating characteristics, and furnished specialties and accessories.
 - c. Include flow and pressure drop curves based on manufacturer's testing for calibrated-orifice balancing valves and automatic flow-control valves.

D. CLOSEOUT SUBMITTALS

1. Operation and Maintenance Data: For hydronic piping specialties to include in emergency, operation, and maintenance manuals.

E. MAINTENANCE MATERIAL SUBMITTALS

1. Differential Pressure Meter: For each type of balancing valve and automatic flow control valve, include flowmeter, probes, hoses, flow charts, and carrying case.

F. QUALITY ASSURANCE

1. Pipe Welding: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code: Section IX.
2. Safety Valves and Pressure Vessels: Shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

2. PART 2 PRODUCTS

A. HYDRONIC SPECIALTY VALVES

1. Diaphragm-Operated, Pressure-Reducing Valves: ASME labeled.
 - a. Body: Bronze or brass.
 - b. Disc: Glass and carbon-filled PTFE.
 - c. Seat: Brass.
 - d. Stem Seals: EPDM O-rings.

- e. Diaphragm: EPT.
- f. Low inlet-pressure check valve.
- g. Inlet Strainer: Stainless Steel removable without system shutdown.
- h. Valve Seat and Stem: Noncorrosive.
- i. Valve Size, Capacity, and Operating Pressure: Selected to suit system in which installed, with operating pressure and capacity factory set and field adjustable.

B. AIR-CONTROL DEVICES

1. Manual Air Vents:
 - a. Body: Bronze.
 - b. Internal Parts: Nonferrous.
 - c. Operator: Screwdriver or thumbscrew.
 - d. Inlet Connection: NPS 1/2.
 - e. Discharge Connection: NPS 1/8.
 - f. CWP Rating: 150 psig.
 - g. Maximum Operating Temperature: 225 deg F.
2. Automatic Air Vents:
 - a. Body: Bronze or cast iron.
 - b. Internal Parts: Nonferrous.
 - c. Operator: Noncorrosive metal float.
 - d. Inlet Connection: NPS 1/2.
 - e. Discharge Connection: NPS 1/4.
 - f. CWP Rating: 150 psig.
 - g. Maximum Operating Temperature: 240 deg F.
3. Bladder-Type Expansion Tanks:
 - a. Tank: Welded steel, rated for 125-psig working pressure and 375 deg F maximum operating temperature. Factory test after taps are fabricated and supports installed and are labeled according to ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
 - b. Bladder: Securely sealed into tank to separate air charge from system water to maintain required expansion capacity.
 - c. Air-Charge Fittings: Schrader valve, stainless steel with EPDM seats.
4. In-Line Air Separators:
 - a. Tank: One-piece cast iron with an integral weir constructed to decelerate system flow to maximize air separation.
 - b. Maximum Working Pressure: Up to 175 psig.
 - c. Maximum Operating Temperature: Up to 300 deg F.

C. STRAINERS

1. Y-Pattern Strainers:
 - a. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
 - b. End Connections: Threaded ends for NPS 2 and smaller; flanged ends for NPS 2-1/2 and larger.
 - c. Strainer Screen: Stainless-steel, 40-mesh strainer, or perforated stainless-steel basket.
 - d. CWP Rating: 125 psig.

D. CONNECTORS

1. Stainless-Steel Bellow, Flexible Connectors:
 - a. Body: Stainless-steel bellows with woven, flexible, bronze, wire-reinforcing protective jacket.
 - b. End Connections: Threaded or flanged to match equipment connected.
 - c. Performance: Capable of 3/4-inch (20-mm) misalignment.
 - d. CWP Rating: 150 psig (1035 kPa).
 - e. Maximum Operating Temperature: 250 deg F (121 deg C).

3. PART 3 EXECUTION

A. VALVE APPLICATIONS

1. Install shutoff-duty valves at each branch connection to supply mains and at supply connection to each piece of equipment.
2. Install check valves at each pump discharge and elsewhere as required to control flow direction.
3. Install safety valves at hot-water generators and elsewhere as required by ASME Boiler and Pressure Vessel Code. Install drip-pan elbow on safety-valve outlet and pipe without valves to the outdoors; pipe drain to nearest floor drain or as indicated on Drawings. Comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1, for installation requirements.
4. Install pressure-reducing valves at makeup-water connection to regulate system fill pressure.

B. HYDRONIC SPECIALTIES INSTALLATION

5. Install automatic air vents at high points of system piping in mechanical equipment rooms only. Install manual vents at heat-transfer coils and elsewhere as required for air venting.
6. Install piping from boiler air outlet, air separator, or air purger to expansion tank with a 2 percent upward slope toward tank.
7. Install in-line air separators in pump suction. Install drain valve on air separators NPS 2 and larger.
8. Install expansion tanks on the floor. Vent and purge air from hydronic system, and ensure that tank is properly charged with air to suit system Project requirements.

END OF SECTION

HYDRONIC PUMPS

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes:
 - a. Close-coupled, in-line centrifugal pumps.

C. DEFINITIONS

1. Buna-N: Nitrile rubber.
2. EPT: Ethylene propylene terpolymer.
3. HI: Hydraulic Institute

D. ACTION SUBMITTALS

1. Product Data: For each type of pump. Include certified performance curves and rated capacities, operating characteristics, furnished specialties, final impeller dimensions, and accessories for each type of product indicated. Indicate pump's operating point on curves.
2. Shop Drawings: For each pump.
 - a. Show pump layout and connections.
 - b. Include setting drawings with templates for installing foundation and anchor bolts and other anchorages.
 - c. Include diagrams for power, signal, and control wiring.

E. CLOSEOUT SUBMITTALS

1. Operation and Maintenance Data: For pumps to include in emergency, operation, and maintenance manuals.
2. Provide one replacement seal kit complete with all pump gaskets.

2. PART 2 PRODUCTS

A. CLOSE-COUPLED, IN-LINE CENTRIFUGAL PUMPS

1. Manufactures:
 - a. Basis of Design: Bell & Gossett
 - b. Equal
2. Description: Factory-assembled and -tested, centrifugal, overhung-impeller, close-coupled, in-line pump as defined in HI 1.1-1.2 and HI 1.3; designed for installation with pump and motor shafts mounted horizontally or vertically.
3. Pump Construction:
 - a. The pumps shall be close-coupled, inline for vertical or horizontal installation, in cast iron bronze fitted (or all bronze) construction specifically designed for quiet operation. Suitable standard operations at 250°F and 175 PSIG working pressure. The pump internals shall be capable of being serviced without disturbing piping connections.
 - b. EPR/Carbon/Silicon-Carbide seal (250°F maximum operating temperature).
 - c. The pumps shall have a solid stainless-steel shaft that is integral to the motor.
 - d. The motor bearings shall support the shaft via heavy-duty permanently lubricated ball bearings.

- e. Pump shall be equipped with an internally-flushed mechanical seal assembly installed in an enlarged tapered seal chamber. Seal assembly shall be the unitized type with stainless steel drive tabs, EPR bellows and seat gasket, stainless steel spring, and be of a carbon silicon-carbide design with the carbon face rotating against a stationary silicon-carbide face.
- f. Pump shaft shall connect to a brass impeller. Impeller shall be hydraulically and dynamically balanced, threaded onto the motor shaft.
- g. Pump should be designed to allow for true back pull-out access to the pump's working components for ease of maintenance.
- h. Pump volute shall be of a cast iron design for heating systems or cast brass for domestic water systems. The connection style on the cast iron and bronze pumps shall be flanged. Volute shall include gauge ports at nozzles.
- i. Motors shall meet scheduled horsepower, speed, voltage, and enclosure design. Motors shall have permanently lubricated ball bearings sized to offset the additional bearing loads associated with the closed-coupled pump design. Motors shall be non-overloading at any point on the pump curve and shall meet NEMA specifications.
- j. Pumps shall conform to ANSI/HI 9.6.3.1 standard for Preferred Operating Region (POR) unless otherwise approved by the engineer.
- k. Pump shall be of a maintainable design and for ease of maintenance should use machine fit parts and not press fit components.
- l. Pump manufacturer shall be ISO-9001 certified.
- m. Each pump shall be factory tested and name-plated before shipment.

B. PUMP SPECIALTY FITTINGS

- 1. Triple-Duty Valve:
 - a. Angle or straight pattern.
 - b. 175-psig pressure rating, cast-iron body, pump-discharge fitting.
 - c. Drain plug and bronze-fitted shutoff, balancing, and check valve features.
 - d. Brass gage ports with integral check valve and orifice for flow measurement.

3. PART 3 EXECUTION

A. EXAMINATION

- 1. Examine equipment foundations and anchor-bolt locations for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- 2. Proceed with installation only after unsatisfactory conditions have been corrected.

B. PUMP INSTALLATION

- 1. Comply with HI 1.4.
- 2. Install pumps to provide access for periodic maintenance including removing motors, impellers, couplings, and accessories.
- 3. Independently support pumps and piping so weight of piping is not supported by pumps and weight of pumps is not supported by piping.
- 4. Automatic Condensate Pump Units: Install units for collecting condensate and extend to open drain.
- 5. Equipment Mounting:
- 6. Equipment Mounting: Install in-line pumps with continuous-thread hanger rods and of size required to support weight of in-line pumps.
 - e. Comply with requirements for hangers and supports specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."

C. CONNECTIONS

1. Where installing piping adjacent to pump, allow space for service and maintenance.
2. Connect piping to pumps. Install valves that are same size as piping connected to pumps.
3. Install suction and discharge pipe sizes equal to or greater than diameter of pump nozzles.
4. Install triple-duty valve on discharge side of pumps.
5. Install Y-type strainer and shutoff valve on suction side of pumps.
6. Install pressure gages on pump suction and discharge or at integral pressure-gage tapping, or install single gage with multiple-input selector valve.
7. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
8. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

D. STARTUP SERVICE

1. Perform startup service.
 - a. Complete installation and startup checks according to manufacturer's written instructions.
 - b. Check piping connections for tightness.
 - c. Clean strainers on suction piping.
 - d. Perform the following startup checks for each pump before starting:
 - 1) Verify bearing lubrication.
 - 2) Verify that pump is free to rotate by hand and that pump for handling hot liquid is free to rotate with pump hot and cold. If pump is bound or drags, do not operate until cause of trouble is determined and corrected.
 - 3) Verify that pump is rotating in the correct direction.
 - e. Prime pump by opening suction valves and closing drains, and prepare pump for operation.
 - f. Start motor.
 - g. Open discharge valve slowly.

E. DEMONSTRATION

1. Train Owner's maintenance personnel to adjust, operate, and maintain hydronic pumps.

END OF SECTION

WATER TREATMENT FOR CLOSED-LOOP HYDRONIC SYSTEMS

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section includes the following water treatment for closed-loop hydronic systems:
 - a. Manual chemical-feed equipment.
 - b. Chemicals.
2. Related Requirements:

C. DEFINITIONS

1. TSS: Total suspended solids are solid materials, including organic and inorganic, that are suspended in the water. These solids may include silt, plankton, and industrial wastes.

D. ACTION SUBMITTALS

1. Product Data: Include rated capacities, operating characteristics, and furnished specialties and accessories for the following products:
 - a. Bypass feeders.
 - b. Chemical material safety data sheets.

E. INFORMATIONAL SUBMITTALS

1. Water Analysis Provider Qualifications: Verification of experience and capability of HVAC water-treatment service provider.
2. Field quality-control reports.

F. CLOSEOUT SUBMITTALS

1. Operation and Maintenance Data: For sensors, injection pumps, and controllers to include in emergency, operation, and maintenance manuals.

G. QUALITY ASSURANCE

1. HVAC Water-Treatment Service Provider Qualifications: An experienced HVAC water-treatment service provider capable of analyzing water qualities, installing water-treatment equipment, and applying water treatment as specified in this Section.

2. PART 2 PRODUCTS

A. PERFORMANCE REQUIREMENTS

1. Water quality for hydronic systems shall minimize corrosion, scale buildup, and biological growth for optimum efficiency of hydronic equipment without creating a hazard to operating personnel or the environment.
2. Base HVAC water treatment on quality of water available at Project site, hydronic system equipment material characteristics and functional performance characteristics, operating personnel capabilities, and requirements and guidelines of authorities having jurisdiction.
3. Closed hydronic systems, including hot-water heating shall have the following water qualities:
 - a. pH: Maintain a value within 9.0 to 10.5
 - b. "P" Alkalinity: Maintain a value within 100 to 500 ppm.

- c. Boron: Maintain a value within 100 to 200 ppm.
- d. Chemical Oxygen Demand: Maintain a maximum value of 100 ppm.
- e. Soluble Copper: Maintain a maximum value of 0.20 ppm.
- f. TSS: Maintain a maximum value of 10 ppm.
- g. Ammonia: Maintain a maximum value of 20 ppm.
- h. Free Caustic Alkalinity: Maintain a maximum value of 20 ppm.
- i. Microbiological Limits:
 - 1) Nitrate Reducers: Maintain a maximum value of 100 organisms/mL
 - 2) Sulfate Reducers: Maintain a maximum value of zero organisms/mL.
 - 3) Iron Bacteria: Maintain a maximum value of zero organisms/mL.

B. MANUAL CHEMICAL-FEED EQUIPMENT

- 1. Bypass Feeders: Steel, with corrosion-resistant exterior coating, minimum 3-1/2-inch fill opening in the top, and NPS 3/4 bottom inlet and top side outlet. Quarter turn or threaded fill cap with gasket seal and diaphragm to lock the top on the feeder when exposed to system pressure in the vessel.
 - a. Capacity: 2 gal.
 - b. Minimum Working Pressure: 125 psig.

C. CHEMICALS

- 1. Chemicals shall be as recommended by water-treatment system manufacturer that are compatible with piping system components and connected equipment and that can attain water quality specified in "Performance Requirements" Article.

3. PART 3 EXECUTION

A. WATER ANALYSIS

- 1. Perform an analysis of supply water to determine quality of water available at Project site.

B. INSTALLATION

- 1. Install chemical application equipment on concrete bases, level and plumb. Maintain manufacturer's recommended clearances. Arrange units so devices that require servicing are accessible. Anchor chemical tanks and floor-mounting accessories to substrate.
- 2. Bypass Feeders: Install in closed hydronic systems, including hot-water heating and equipped with the following:
 - a. Install bypass feeder in a bypass circuit around circulating pumps unless otherwise indicated on Drawings.
 - b. Install a full-port ball isolation valves on inlet, outlet, and drain below the feeder inlet.
 - c. Install a swing check on the inlet after the isolation valve.

C. CONNECTIONS

- 1. Where installing piping adjacent to equipment, allow space for service and maintenance.
- 2. Make piping connections between HVAC water-treatment equipment and dissimilar-metal piping with dielectric fittings. Comply with requirements in Section 232116 "Hydronic Piping Specialties."
- 3. Install shutoff valves on HVAC water-treatment equipment inlet and outlet. Section 230523.12 "Ball Valves for HVAC Piping."

D. FIELD QUALITY CONTROL

- 1. Perform the following tests and inspections:
 - a. Inspect field-assembled components and equipment installation, including piping.

- b. Inspect piping and equipment to determine that systems and equipment have been cleaned, flushed, and filled with water, and are fully operational before introducing chemicals for water-treatment system.
 - c. Do not enclose, cover, or put piping into operation until it is tested and satisfactory test results are achieved.
 - d. Test for leaks and defects. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 - e. Leave uncovered and unconcealed new, altered, extended, and replaced water piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
 - f. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow test pressure to stand for four hours. Leaks and loss in test pressure constitute defects.
 - g. Repair leaks and defects with new materials and retest piping until no leaks exist.
 2. Equipment will be considered defective if it does not pass tests and inspections.
 3. Comply with ASTM D 3370 and with the following standards:
 - a. Silica: ASTM D 859.
 - b. Acidity and Alkalinity: ASTM D 1067.
 - c. Iron: ASTM D 1068.
 - d. Water Hardness: ASTM D 1126.
- E. DEMONSTRATION
 1. Train Owner's maintenance personnel to adjust, operate, and maintain HVAC water-treatment systems and equipment.

END OF SECTION

GAS VENTS

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes:
 - a. Listed double-wall vents.

C. ACTION SUBMITTALS

1. Product Data: For each type of product.
 - a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for product.

D. INFORMATIONAL SUBMITTALS

1. Sample Warranty: For special warranty.

E. QUALITY ASSURANCE

1. Certified Sizing Calculations: Manufacturer shall certify venting system sizing calculations.

2. PART 2 PRODUCTS

A. POSITIVE PRESSURE, UL-1738 LISTED CATEGORY IV VENTS

1. Manufacturers:
 - a. M&G DuraVent
 - b. Heat Fab Saf-T Vent
 - c. Metal Fab Corr/Guard
2. The vent shall be of double-wall, factory built type, designed for use in conjunction with Category II, III or IV condensing or non-condensing gas fired appliances or as specified by the heating equipment manufacturer.
3. Maximum continuous flue gas temperature shall not exceed 480°F (249°C).
4. Vent shall be listed for a minimum positive pressure rating of 6" W.C. and shall have passed at 15" W.C.
5. The vent system shall be continuous from the appliance's flue outlet to the vent termination outside the building. All system components shall be UL / ULC listed and supplied from the same manufacturer.
6. The vent inner wall (flue) shall be constructed from AL29-4C® stainless steel, with a minimum wall thickness of .016" for 3" through 7" diameter vents, .019" for 8" through 12" and .024" for 14" through 16" diameter vents.
7. The vent outer wall (jacket) shall be stainless steel with a minimum wall thickness of 0.016" for 3" through 6", 0.024" for 7" through 16". There shall be a ½" air space between the flue and jacket.
8. All section joints shall have a triple lipped directional silicone gasket for sealing and a built in mechanical locking band.
9. All system components such as vent supports, roof or wall penetrations, terminations, appliance connectors and drain fittings require to install the vent system shall be UL / ULC listed and provided by the vent manufacturer.
10. Vent layout shall be designed and installed in compliance with manufacturer's installation instructions and all applicable local codes.

3. PART 3 EXECUTION

A. EXAMINATION

1. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of work.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

B. APPLICATION

1. Category IV Vent: Condensing gas appliances.

C. INSTALLATION OF LISTED VENTS

1. Comply with minimum clearances from combustibles and minimum termination heights according to product listing or NFPA 211, whichever is most stringent.
2. Seal between sections of positive-pressure vents according to manufacturer's written installation instructions, using sealants recommended by manufacturer.
3. Support vents at intervals recommended by manufacturer to support weight of vents and all accessories, without exceeding appliance loading.
4. Lap joints in direction of flow.

D. CLEANING

1. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris, and repair damaged finishes.

END OF SECTION

FIRE-TUBE CONDENSING BOILERS

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. This Section includes packaged, factory-fabricated and assembled, gas-fired, fire-tube condensing boilers, trim, and accessories for space heating hot water.

C. SUBMITTALS

1. Product Data: Include performance data, operating characteristics, furnished specialties, and accessories.
2. Shop Drawings: For boilers, boiler trim, and accessories.
 - a. Include plans, elevations, sections, details, and attachments to other work.
 - b. Wiring Diagrams: Power, signal, and control wiring.
3. Source quality-control test reports: Indicate and interpret test results for compliance with performance requirements before shipping.
4. Field quality-control test reports: Indicate and interpret test results for compliance with performance requirements.
5. Warranty: Standard warranty specified in this Section.

D. CLOSEOUT SUBMITTALS

1. Operation and Maintenance Data: For boilers to include in emergency, operation, and maintenance manuals.

E. QUALITY ASSURANCE

1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
2. ASME Compliance: Fabricate and label boilers to comply with ASME Boiler and Pressure Vessel Code.
3. ASHRAE/IESNA 90.1 Compliance: Boilers shall have minimum efficiency according to "Gas and Oil-Fired Boilers - Minimum Efficiency Requirements."
4. AHRI Compliance: Boilers shall be AHRI listed and must meet the minimum efficiency specified under AHRI BTS-2000 as defined by Department of Energy in 10 CFR Part 431.
5. ANSI Compliance: Boilers shall be compliant with ANSI Z21.13 test standards for US and Canada.
6. CSA Compliant: Boilers shall be compliant with CSA certification.

F. COORDINATION

1. Coordinate size and location of concrete bases. Concrete, reinforcement, and formwork requirements are specified on structural drawings.

G. WARRANTY

1. Standard Warranty: Boilers shall include manufacturer's standard form in which manufacturer agrees to repair or replace components of boilers that fail in materials or workmanship within specified warranty period.
 - a. Warranty Period for Fire-Tube Condensing Boilers:

- 1) Heat Exchanger, Pressure Vessel and Condensation Collection Basin shall carry a 10-year limited warranty against defects in materials or workmanship and failure due to thermal shock.
- 2) All other components shall carry a one-year warranty from date of boiler start up.

2. PART 2 PRODUCTS

A. MANUFACTURERS

1. Basis-of-Design Product: Lochinvar Knight FTXL Boiler as specified on Drawings. All others must be submitted by Voluntary alternate.

B. CONSTRUCTION

1. Description: Boiler shall be natural gas fired, fully condensing, and fire tube design. The boiler shall be factory-fabricated, factory-assembled, and factory-tested, fire-tube condensing boiler with heat exchanger sealed pressure tight, built on a steel base; including insulated jacket; flue-gas vent; combustion-air intake connections; water supply, return, and condensate drain connections; and controls.
2. Heat Exchanger: The heater exchanger shall bear the ASME "H" stamp for 160 psi working pressure and shall be National Board listed. The heat exchanger shall be constructed of a fully welded 316L stainless steel and of fire tube design. The heat exchanger shall be designed for a single-pass water flow to limit the water side pressure drop. Cast iron, aluminum, or condensing copper tube boilers will not be accepted.
3. Efficiency: Boilers shall have an AHRI certified minimum thermal efficiency of 97 percent.
4. Condensate Collection Basin: Fully welded 316L stainless steel and shall include a stainless-steel combustion analyzer test port.
5. Pressure Vessel: The pressure vessel shall be in accordance with ASME Section IV pressure vessel code. The pressure vessel shall be designed for a single-pass water flow to limit the water side pressure drop. The pressure vessel shall contain a volume of water no less than 17-gallons
6. Burner: Natural gas, forced draft single burner premix design. The burner shall be high temperature stainless steel with a woven Fecralloy outer covering to provide modulating firing rates. The burner shall be capable of the stated gas train turndown without loss of combustion efficiency.
7. Blower: Boiler shall be equipped with a pulse width modulating blower system to precisely control the fuel/air mixture to provide modulating boiler firing rates for maximum efficiency. The burner firing sequence of operation shall include pre-purge, firing, modulation, and post-purge operation.
 - a. Motors: Comply with requirements specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
8. Gas Train: The boiler shall be supplied with a negative pressure regulation gas train and shall be capable of 7:1 turndown, 103.5MBH minimum input and 725MBH maximum output
9. Ignition: Spark ignition with 100 percent main-valve shutoff with electronic flame supervision.
10. Casing:
 - a. Jacket: Heavy gauge primed and painted steel jacket with snap-in closures.
 - b. Control Compartment Enclosures: NEMA 250, Type 1A.
 - c. Insulation: Minimum ½ inch thick, mineral fiber insulation surrounding the heat exchanger.
 - d. Combustion-Air Connections: Inlet and vent duct collars.
11. Characteristics and Capacities:
 - a. Heating Medium: Hot water.

- b. Design Water Pressure Rating: 160 psi working pressure.
- c. Safety Relief Valve Setting: 100-psig
- d. Minimum Water Flow Rate: 18-gpm

C. TRIM

- 1. Safety Relief Valve:
 - a. Size and Capacity: 100 lb.
 - b. Description: Fully enclosed steel spring with adjustable pressure range and positive shutoff; factory set and sealed.
- 2. Pressure Gage: Minimum 3-1/2-inch diameter. Gage shall have normal operating pressure about 50 percent of full range.
- 3. Drain Valves: Minimum NPS 3/4 or nozzle size with hose-end connection.
- 4. Condensate Neutralization Kit: Factory supplied condensate trap with condensate trip sensor, high capacity condensate receiver prefilled with appropriate medium.

D. CONTROLS

- 1. Refer to Division 23 Section "Instrumentation and Control for HVAC."
- 2. Boiler controls shall feature a standard, factory installed multi-color graphic LCD screen display with navigation dial and includes the following standard features:
 - a. Con-X-U's capable: Boiler shall have the ability to communicate remotely using the optional Con-X-U's software via a wireless or Ethernet connection.
 - b. Four pump control: Boiler shall have the ability to control the boiler pump, a system pump, a domestic hot water pump, and a domestic hot water recirculation pump.
 - c. Ramp delay: Boiler may be programmed to limit the firing rate based on six limits steps and six time intervals.
 - d. Boost function: Boiler may be programmed to automatically increase the set point a fixed number of degrees (adjustable by installer) if the setpoint has been continuously active for a set period of time (time adjustable by installer). This process will continue until the space heating demand ends.
 - e. PC port connection: Boiler shall have a PC port allowing the connection of PC boiler software.
 - f. Time clock: Boiler shall have an internal time clock with the ability to time and date stamp lock-out codes and maintain records of runtime.
 - g. Maintenance reminder: Boiler shall have the ability to display a yellow colored, customizable maintenance notification screen. All notifications are adjustable by the installer based upon months of installation, hours of operation, and number of boiler cycles.
 - h. English Error codes: Boiler shall have a user interface that displays a red error screen with fault codes that are displayed in English and include a date and time stamp for ease of servicing.
 - i.
 - j. Anti-cycling control: Boiler shall have the ability to set a time delay after a heating demand is satisfied allowing the boiler to block a new call for heat. The boiler will display an anti-cycling blocking on the screen until the time has elapsed or the water temperature drops below the anti-cycling differential parameter. The anti-cycling control parameter is adjustable by the installer.
 - k.
 - l. Space Heating Night setback: Boiler may be programmed to reduce the space heating temperature set point during a certain time of the day.
 - m. Freeze protection: Boiler shall turn on the boiler and system pumps when the boiler water temperature falls below 45 degrees. When the boiler water temperature falls below 37 degrees the boiler will automatically turn on.

- Boiler and pumps will turn off when the boiler water temperature rises above 43 degrees.
- n. Isolation valve control: Boiler shall have the ability to control a 2-way motorized control valve. Boiler shall also be able to force a fixed number of valves to always be energized regardless of the number of boilers that are firing.
 - o. BMS integration with 0-10V DC input: The Control shall allow an option to Enable and control set point temperature or control firing rate by sending the boiler a 0-10V input signal.
 - p. Data logging: Boiler shall have non-volatile data logging memory including last 10 lockouts, space heat run hours, domestic hot water run hours and ignition attempts. All data should be visible on the boiler screen.
3. Boiler operating controls shall include the following devices and features:
- a. Set-Point Adjust: Set points shall be fully adjustable by the installer.
 - b. Retain two subparagraphs below for steam boilers.
 - c. Retain one of three subparagraphs below for operating control sequences. Retain one of first two subparagraphs for hot-water boilers; or third, for steam boilers.
 - d. Sequence of Operation: Factory installed controller to modulate burner firing rate to maintain system water temperature in response to call for heat.
 - e. Sequence of Operation: Boiler shall come standard with outdoor reset control which will control burner firing rate to reset supply-water temperature inversely with outside-air temperature. At 10 deg F outside-air temperature, set supply-water temperature at 180 deg F; at 60 deg F outside-air temperature, set supply-water temperature at 140 deg F.
4. Burner Operating Controls: To maintain safe operating conditions, burner safety controls limit burner operation and include:
- a. In subparagraph below, retain "temperature" option for hot-water boiler and "pressure" option for steam boiler.
 - b. High Temperature Limit: Automatic and manual reset stops burner if operating conditions rise above maximum boiler design temperature. Limit switch to be manually reset on the control interface.
 - c. In first subparagraph below, retain first option for hot-water boilers and second option for steam boilers.
 - d. Low-Water Cutoff Switch: Electronic probe shall prevent burner operation on low water. Cutoff switch shall be manually reset on the control interface.
 - e. Blocked Inlet Safety Switch: Manual-reset pressure switch field mounted on boiler combustion-air inlet.
 - f. High and Low Gas Pressure Switches: Pressure switches shall prevent burner operation on low or high gas pressure. Pressure switches to be manually reset on the control interface.
 - g. Blocked Drain Switch: Blocked drain switch shall prevent burner operation when tripped. Switch to be manually reset on the control interface.
 - h. Low air pressure switch: Pressure switches shall prevent burner operation on low air pressure. Switch to be manually reset on the control interface.
 - i. Optional Audible Alarm: Factory mounted on control panel with silence switch; shall sound alarm for any lockout conditions.
5. Building Automation System Interface:
- a. Boiler shall have the ability to receive a 0-10V system from a building management system and control by the following:
 - 1) 0-10V DC input to control Modulation or Setpoint
 - 2) 0-10V DC input from Variable-speed Boiler pump
 - 3) 0-10V DC output signal to a Variable-speed system pump
 - 4) 0-10V DC input Enable/Disable signal
 - b. Factory installed Modbus gateway interface to enable building automation system to monitor, control, and display boiler status and alarms.

E. ELECTRICAL POWER

1. Controllers, Electrical Devices, and Wiring: Electrical devices and connections are specified in Division 26 Sections.
2. Single-Point Field Power Connection: Factory-installed and factory-wired switches, motor controllers, transformers, and other electrical devices necessary shall provide a single-point field power connection to boiler.
3. Electrical Characteristics:
 - a. See Drawings
 - b. Voltage
 - 1) 120V / 1PH
 - c. Frequency: 60 Hz

F. VENTING

1. Exhaust flue must be Category IV approved stainless steel sealed vent material from one of the approved manufacturers listed in the Installation and Operation manual. Boilers exhaust vent length must be able to extend to 100 equivalent feet.
2. Intake piping must be of approved material as listed in the Installation and Operations manual. Boilers intake pipe length must be able to extend to 100 equivalent feet.
3. Boiler venting and intake piping configuration shall be installed per one of the approved venting methods shown in the Installation and Operation manual.
4. Boilers using common venting must only include like models and the optional common vent damper. Contact the factory for common vent sizing.
5. Boiler shall come standard with a flue sensor to monitor and display flue gas temperature on factory provided LCD display.
6. Refer to manufacturer's Installation and Operations manual for detailed venting instructions and approved manufacturers.

G. SOURCE QUALITY CONTROL

1. Burner and Hydrostatic Test: Factory adjust burner to eliminate excess oxygen, carbon dioxide, oxides of nitrogen emissions, and carbon monoxide in flue gas and to achieve combustion efficiency; perform hydrostatic test.
2. Test and inspect factory-assembled boilers, before shipping, according to ASME Boiler and Pressure Vessel Code.

3. PART 3 EXECUTION

A. EXAMINATION

1. Before boiler installation, examine roughing-in for concrete equipment bases, anchor-bolt sizes and locations, and piping and electrical connections to verify actual locations, sizes, and other conditions affecting boiler performance, maintenance, and operations.
 - a. Final boiler locations indicated on Drawings are approximate. Determine exact locations before roughing-in of piping and electrical connections.
2. Examine mechanical spaces for suitable conditions where boilers will be installed.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

B. BOILER INSTALLATION

1. Install equipment on 5"(min) concrete housekeeping pad.
2. Install gas-fired boilers according to NFPA 54.
3. Assemble and install boiler trim.
4. Install electrical devices furnished with boiler but not specified to be factory mounted.
5. Install control wiring to field-mounted electrical devices.

C. CONNECTIONS

1. Install boilers level on concrete bases. Concrete base is specified in Division 23 Section "Common Work Results for HVAC," and concrete materials and installation requirements are specified on structural drawings.
2. Install piping adjacent to boiler to allow service and maintenance.
3. Install piping from equipment drain connection to nearest floor drain. Piping shall be at least full size of connection. Provide an isolation valve if required.
4. Connect gas piping to boiler gas-train inlet with union. Piping shall be at least full size of equipment connection. Provide a reducer if required.
5. Connect hot-water piping to supply and return boiler tappings with shutoff valve and union or flange at each connection.
6. Install piping from safety relief valves to nearest floor drain.
7. Boiler Venting:
 - a. Install flue venting kit and combustion-air intake.
 - b. Connect full size to boiler connections. Comply with requirements in Division 23 Section "Breechings, Chimneys, and Stacks."
8. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
9. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

D. FIELD QUALITY CONTROL

1. Perform tests and inspections and prepare test reports.
 - a. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
2. Tests and Inspections:
 - a. Perform installation and startup checks according to manufacturer's written instructions. Complete startup form included with Boiler and return to Manufacturer as described in the instructions.
 - b. Leak Test: Hydrostatic test. Repair leaks and retest until no leaks exist.
 - c. Operational Test: Start units to confirm proper motor rotation and unit operation. Adjust air-fuel ratio and combustion.
 - d. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 1) Check and adjust initial operating set points and high- and low-limit safety set points of fuel supply, water level and water temperature.
 - 2) Set field-adjustable switches and circuit-breaker trip ranges as indicated.
3. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other than normal occupancy hours for this purpose.

E. DEMONSTRATION

1. Engage a factory representative or a factory-authorized service representative for boiler startup. Start-up sheet shall be completed and a copy shall be sent to the Engineer and the Manufacturer. A combustion analysis shall be completed and the gas valve adjusted per the Installation and Operations manual and note in start-up report.
2. Factory representative or a factory-authorized representative shall provide Owners training to instruct maintenance personnel to adjust, operate, and maintain boilers. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes:
 - a. Building wires and cables rated 600 V and less.
 - b. Connectors, splices, and terminations rated 600 V and less.
2. Related Requirements:
 - a. Section 260533 "Raceways and Boxes for Electrical Systems"
 - b. Section 260553 "Identification for Electrical Systems."

C. DEFINITIONS

1. ASTM: American Society of Testing Materials.
2. ICEA: Insulated Cable Engineers Association.
3. IEEE: Institute of Electrical & Electronics Engineers.
4. NEMA: National Electrical Manufacturers Association.
5. NETA ATS: International Electrical Testing Association - Acceptance Testing Specification.
6. VFC: Variable frequency controller.

D. ACTION SUBMITTALS

1. Product Data: Submit manufacturer's technical data for each type of product, indicating conductor/cable construction, insulation material, thickness of insulation, jacket, cable stranding, and voltage rating of each type of conductor/cable specified, splices and terminations. Indicate date and place of manufacture for each conductor/cable, cable, splice and termination.
2. Manufacturer's ISO certification.

E. INFORMATIONAL SUBMITTALS

1. Qualification Data: For Independent Testing Agency.
2. Field quality-control reports. Perform field testing of cables per para 3.8. Submit six (6) copies of field test reports to owner's representative within two (2) weeks of completion of test.

F. QUALITY ASSURANCE

1. General Requirements: The low voltage power conductors and cable shall be copper, minimum 600V rated unless otherwise indicated. Aluminum conductors and cables shall not be accepted unless otherwise indicated.
2. Materials and installation shall meet or exceed requirements in the following referenced standards and shall be listed and labelled by UL.
 - a. ICEA S-93-639/ NEMA WC 74.
 - b. AEIC CS8.
 - c. UL 1072.
 - d. IEEE.
 - e. ASTM.
 - f. NEMA.
3. Conductors and cables shall be of the same manufacturer, and shipped to the job site in original unbroken reels.

4. Conductors and cables shall be manufactured with in twelve (12) months of installation. Date of manufacture shall be clearly marked on conductors or conductor reels.
5. Manufacturer shall have minimum ten (10) years' experience in the manufacturer of conductors and cables similar to those specified on this project.
6. Manufacturer shall have ISO 9001 and ISO 9002 certification.
7. All conductors and cables shall be new and supplied by a local distributor.
8. American made conductors and cables have been acceptable. If non-domestic product is submitted, notice is hereby given that extensive testing shall be required to insure quality and conformance to the Specifications. All of the testing procedures and results shall be satisfactory to the Owner's representative. The Contractor shall bear all costs for testing and shall be responsible for all costs associated with travel, lodging, etc. for the Owner's Representative to witness the test at the manufacturer's testing facility. The Contractor shall reimburse the Owner at \$1,200 per man day or part thereof for the time required to witness the testing.
9. Testing: Provide the services of an independent qualified testing laboratory to perform the specified field tests. Notify the University's Representative fourteen (14) days in advance of performance of work requiring testing.
10. Conductors, cables, splices and terminations shall be manufactured within twelve (12) months of installation. Each item shall have a permanent marking on the product or the original manufacturers' package indicating the date of manufacture unless otherwise noted.
11. Testing Agency Qualifications:
 - a. Testing agency shall be an independent company; shall have been a member of NETA for a minimum of last ten (10) years and has permanent in-house testing engineers and technicians involved with testing of low voltage electrical power conductors and cables similar to those specified on this project.
 - b. Testing company shall be located with 50 miles radius of the project.
 - c. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.
 - d. Field Testing technician and supervisor shall have minimum ten (10) years' experience in field testing of low voltage power conductors and cables of the type and rating similar to the conductors and cables to be tested on this project.

2. PART 2 PRODUCTS

A. CONDUCTORS AND CABLES

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:
 - b. Southwire Incorporated
 - c. Alpha Wire.
 - d. Belden Inc.
 - e. Equal
2. Conductor Material: Electrical grade, soft drawn annealed copper, 98 percent conductivity, and fabricated in accordance with ASTM and IPCEA standards. Minimum size is number 12 for branch circuits, number 14 stranded for control wiring. Aluminum conductors are not permitted. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.
3. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN-2-THWN-2.
4. Multiconductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for metal-clad cable, Type MC, Type SO and with ground wire.
5. VFC Cable:
 - a. Comply with UL 1277, UL 1685, and NFPA 70 for Type TC-ER cable.

- b. Type TC-ER with oversized crosslinked polyethylene insulation, dual spirally wrapped copper tape shields and three bare symmetrically applied ground wires, and sunlight- and oil-resistant outer PVC jacket.
 - c. Comply with UL requirements for cables in direct burial applications.
6. Provide separate neutral with each branch circuit serving outlets. When dedicated neutrals are provided, use color spiral to match associated phase.

B. CONNECTORS AND SPLICES

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:
 - b. IlSCO; a branch of Bardes Corporation.
 - c. NSI Industries LLC.
 - d. O-Z/Gedney; a brand of the EGS Electrical Group.
 - e. 3M; Electrical Markets Division.
 - f. Equal
- 2. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
- 3. Copper conductors shall be terminated in copper or bronze mechanical connectors or lugs or tool applied compression connections made of copper for all connections except those on wiring devices.
- 4. Splices in wires No. 10 and smaller shall be made with twist-on splicing connector in accordance with UL486-C. Connections in wires No. 8 and larger shall be made with compression type connectors in accordance with UL486-A and wrapped with insulated tape in accordance with UL501. Insulating tape shall be applied in a minimum of two layers of half wrap or built to match the overall insulation of the wire.
- 5. Splices in underground pull boxes shall be made submersible type and made using "3M" Scotch-cast epoxy kits.
- 6. Pressure type connectors are not permitted.

C. SYSTEM DESCRIPTION

- 1. Electrical Components, Devices, and Accessories: UL Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- 2. Comply with NFPA 70.

3. PART3 EXECUTION

A. CONDUCTOR MATERIAL APPLICATIONS

- 1. Feeders: Copper, Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- 2. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which shall be extra flexible stranded.

B. CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- 1. Exposed Feeders: Type THHN-2-THWN-2, single conductors in raceway.
- 2. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-2-THWN-2, single conductors in raceway.
- 3. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-2-THWN-2, single conductors in raceway.
- 4. Exposed Branch Circuits, Including in Crawlspace: Type THHN-2-THWN-2, single conductors in raceway.
- 5. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-2-THWN-2, single conductors in raceway.

6. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Under-ground: Type THHN-2-THWN-2, single conductors in raceway.

C. INSTALLATION OF CONDUCTORS AND CABLES

1. All conductors and cables shall be installed in a raceway.
2. Before installing conductors and cables in existing conduits, verify the continuity of each conduit; each surface conduit is properly supported per code and clear of any debris.
3. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
4. 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.
5. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
6. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
7. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

D. CONNECTIONS

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
2. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than un-spliced conductors.
 - a. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
3. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

E. IDENTIFICATION

1. Each conductor shall be factory color coded by conductor manufacturer. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
2. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

F. SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

1. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

G. FIRESTOPPING

1. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

H. FIELD QUALITY CONTROL

1. Testing Agency: Engage an independent qualified testing agency to perform tests and inspections.
2. Test and Inspection Reports: Prepare a written report to record the following:
 - a. Procedures used.
 - b. Results that comply with requirements. Include color scan images.

- c. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- 3. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes: Grounding systems and equipment.
2. Section includes grounding systems and equipment, plus the following special applications:
 - a. Overhead-line grounding.
 - b. Underground distribution grounding.
 - c. Ground bonding common with lightning protection system.

C. Definitions:

1. NETA ATS: International Electrical Testing Association - Acceptance Testing Specification.
2. NETA MTS: International Electrical Testing Association - Maintenance Testing Specification.
3. NFPA: National Fire Protection Association.

D. ACTION SUBMITTALS

1. Product Data: Submit manufacturer's technical catalog cuts for each type of product indicated.
2. Shop Drawings: Site drawings to scale including details showing location and size of each field connection of grounding system.
 - a. Wiring Diagrams: Differentiate between manufacturer installed and field installed wiring.

E. INFORMATIONAL SUBMITTALS

1. Informational Submittals:
 - a. Ground rods.
 - b. Grounding conductors, connectors.
 - c. Grounding arrangements and connections for separately derived systems.
 - d. Grounding for sensitive electronic equipment.
2. Qualification Data: For qualified independent testing agency and testing agency's field supervisor.
3. Field quality-control reports. Submit written test reports including the following:
 - a. Test procedures used.
 - b. Test results that comply with requirements.
 - c. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

F. QUALITY ASSURANCE

1. Testing Agency Qualifications:
 - a. Testing agency shall be an independent company; shall have been a member of NETA for a minimum of last ten (10) years and has permanent in-house testing engineers and technicians involved with testing of grounding systems similar to those specified on this project.
 - b. Testing company shall be located within 50 miles radius of the project.

- c. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
 - d. Field Testing technician and supervisor shall have minimum ten (10) years' experience in field testing of grounding systems of the type and rating similar to the systems to be tested on this project.
2. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 3. Comply with UL 467 for grounding and bonding materials and equipment.

2. PART 2 - PRODUCTS

A. GROUNDING ELECTRODES, CONDUCTORS, CONNECTOR, BUS:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or equal:
 - a. Grounding Connectors, Bars and Rods:
 - 1) Erico Inc.; Electrical Product Group
 - 2) Framatome Connectors/Burndy Electrical.
 - 3) Ideal Industries, Inc.
 - 4) O-Z/Gedney Co.; a business of the EGS Electrical Group.
 - 5) Thomas & Betts, Electrical.
 - b. Grounding Conductors and cables:
 - 1) Southwire
 - 2) American Insulated Wire
 - 3) Okonite

B. CONDUCTORS

1. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
2. Bare Copper Conductors:
 - a. Solid Conductors: ASTM B 3.
 - b. Stranded Conductors: ASTM B 8.
 - c. Tinned Conductors: ASTM B 33.
 - d. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
 - e. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 - f. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
 - g. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
3. Bare Grounding Conductor and Conductor Protector for Wood Poles:
 - a. No. 4 AWG minimum, soft-drawn copper.
 - b. Conductor Protector: Half-round PVC or wood molding; if wood, use pressure-treated fir, cypress, or cedar.
4. Grounding Bus: Predrilled rectangular bars of annealed copper, [1/4 by 4 inches (6.3 by 100 mm)] in cross section, with 9/32-inch (7.14-mm) holes spaced 1-1/8 inches (28 mm) apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.

C. CONNECTORS

1. Listed and labeled by UL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

2. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, pressure type with at least two bolts.
 - a. Pipe Connectors: Clamp type, sized for pipe.
3. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
4. Bus-bar Connectors: Mechanical type, cast silicon bronze, solderless compression or exothermic-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

D. GROUNDING ELECTRODES

1. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet in diameter.
2. Chemical-Enhanced Grounding Electrodes: Copper tube, straight or L-shaped, charged with nonhazardous electrolytic chemical salts
 - a. Termination: Factory-attached No. 4/0 AWG bare conductor at least 48 inches (1200 mm) long.
 - b. Backfill Material: Electrode manufacturer's recommended material.

3. PART 3 EXECUTION

A. APPLICATIONS

1. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
2. Underground Grounding Conductors: Install bare [tinned-]copper conductor, No. 2/0 AWG minimum.
 - a. Bury at least 24 inches below grade.
 - b. Duct-Bank Grounding Conductor: Bury 12 inches above duct bank when indicated as part of duct-bank installation.
3. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.
4. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
 - a. Install bus on insulated spacers 2-inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
 - b. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down to specified height above floor; connect to horizontal bus.
5. Conductor Terminations and Connections:
 - a. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - b. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
 - c. Connections to Ground Rods at Test Wells: Bolted connectors.
 - d. Connections to Structural Steel: Welded connectors.

B. GROUNDING OVERHEAD LINES

1. Comply with IEEE C2 grounding requirements.
2. Install two parallel ground rods if resistance to ground by a single, ground-rod electrode exceeds 25 ohms.
3. Drive ground rods until tops are 12 inches below finished grade in undisturbed earth.
4. Ground-Rod Connections: Install bolted connectors for underground connections and connections to rods.
5. Lightning Arrester Grounding Conductors: Separate from other grounding conductors.

6. Secondary Neutral and Transformer Enclosure: Interconnect and connect to grounding conductor.
7. Protect grounding conductors running on surface of wood poles with molding extended from grade level up to and through communication service and transformer spaces.

C. GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

1. Comply with IEEE C2 grounding requirements.
2. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches (100 mm) will extend above finished floor. If necessary, install ground rod before manhole is placed and provide 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 insulating tape or heat-shrunk insulating sleeve from 2 inches (50 mm) above to 6 inches (150 mm) below concrete. Seal floor opening with waterproof, non-shrink grout.
3. Install #4/0 bare copper ground wire loop around the outside perimeter of the manhole, in soil, 12" above bottom of manhole. Cadweld ground wire loop to #4/0 bare copper ground wire connecting all exposed metal parts inside the manhole through a 1" opening at the top of manhole wall. Seal and waterproof opening after wire installation.
4. Grounding Connections to Manhole Components: Bond 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 bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields according to written instructions by manufacturer of splicing and termination kits.
5. Pad-Mounted Transformers and Medium Voltage Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 1/0 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

D. EQUIPMENT GROUNDING

1. Install insulated equipment grounding conductors with all feeders and branch circuits in the same conduit containing phase and neutral conductors. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.
2. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70. :
 - a. Feeders and branch circuits.
 - b. Lighting circuits.
 - c. Receptacle circuits.
 - d. Single-phase motor and appliance branch circuits.
 - e. Three-phase motor and appliance branch circuits.
 - f. Flexible raceway runs.
 - g. Armored and metal-clad cable runs.
 - h. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.

- i. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.
 - j. X-Ray Equipment Circuits: Install insulated equipment grounding conductor in circuits supplying x-ray equipment. Verify requirements with X-ray equipment supplier prior to rough-ins.
3. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
 4. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
 5. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.
 6. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.
 7. Signal and Communication Equipment: In addition to grounding and bonding required by NFPA 70, provide a separate grounding system complying with requirements in TIA/ATIS J-STD-607-A.
 - a. For telephone, alarm, voice and data, and other communication equipment, 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.
 - b. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-4-by-12-inch grounding bus.
 - c. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
 - d. All metallic conduits and cable tray shall be continuously bonded to maintain low resistance ground path and bonded back to the central equipment by the use of bonding jumpers where needed.

E. INSTALLATION

1. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
2. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.
3. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 - a. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.

- b. For grounding electrode system, install ground rods at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- 4. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Section 260543 "Underground Ducts and Raceways for Electrical Systems," and shall be at least 12 inches deep, with cover.
 - a. Test Wells: Install at least one test well for each service unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.
- 5. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - a. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - b. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - c. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- 6. Grounding and Bonding for Piping:
 - a. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
 - b. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
 - c. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
- 7. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.
- 8. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet (18 m) apart.
- 9. Ground Ring: Install a grounding conductor, electrically connected to each building structure ground rod and to each [steel column] [indicated item], extending around the perimeter of [building] [area or item indicated].
 - a. Install tinned-copper conductor not less than No. 2/0 AWG for ground ring and for taps to building steel.
 - b. Bury ground ring not less than 24 inches from building's foundation.

F. LABELING

- 1. Comply with requirements in Section 260553 "Identification for Electrical Systems" for instruction signs. The label or its text shall be green.
- 2. Install labels at the telecommunications bonding conductor and grounding equalizer.
 - a. Label Text: "If this connector or cable is loose or if it must be removed for any reason, notify the facility manager."

G. FIELD QUALITY CONTROL

1. Testing Agency: Engage an independent qualified testing agency to perform tests and inspections. Refer to section
2. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
3. Perform tests and inspections.
 - a. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
4. Tests and Inspections:
 - a. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 - b. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
 - c. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells. Make tests at ground rods before any conductors are connected.

Measure ground resistance no fewer than two full days after last trace of precipitation and without 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 fall-of-potential method according to IEEE 81.

- d. Prepare dimensioned Drawings locating each test well, ground rod and 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.
5. Grounding system will be considered defective if it does not pass tests and inspections.
6. Prepare test and inspection reports.
7. Report measured ground resistances that exceed the following values:
 - a. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
 - b. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
 - c. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
 - d. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm(s).
 - e. Substations and Pad-Mounted Equipment: 5 ohms.
8. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. This Section includes the following:
 - a. Hangers and supports for electrical equipment and systems.
 - b. Construction requirements for concrete bases.

C. DEFINITIONS

1. EMT: Electrical metallic tubing.
2. IMC: Intermediate metal conduit.
3. RMC: Rigid metal conduit.

D. PERFORMANCE REQUIREMENTS

1. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
2. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
3. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
4. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

E. ACTION SUBMITTALS

1. Product Data: For the following:
 - a. Steel slotted support systems.
 - b. Nonmetallic slotted support systems.

F. INFORMATIONAL SUBMITTALS

1. Welding certificates.

G. QUALITY ASSURANCE

1. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. Comply with NFPA 70.

H. COORDINATION

1. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified together with concrete Specifications.

2. PART 2 PRODUCTS

A. SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

1. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.

- a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2) Unistrut; Tyco International, Ltd.
 - 3) Equal
- b. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
- c. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
- d. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
- e. Channel Dimensions: Selected for applicable load criteria.
2. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
3. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
4. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored 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 malleable iron.
5. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
6. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - a. 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.
 - 1) Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a) Hilti Inc.
 - b) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - c) Equal
 - b. Mechanical-Expansion Anchors: Insert-wedge-type, [zinc-coated] [stainless] steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - 1) Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a) Hilti Inc.
 - b) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - c) Equal
 - c. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
 - d. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
 - e. Hanger Rods: Threaded steel.

B. FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

1. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

3. PART 3 EXECUTION

A. APPLICATION

1. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
2. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as scheduled in NECA 1, where its Table 1 lists maximum spacings less than stated in NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
3. 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.
 - a. Secure raceways and cables to these supports with two-bolt conduit clamps or single-bolt conduit clamps or single-bolt conduit clamps using spring friction action for retention in support channel.
4. 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.

B. SUPPORT INSTALLATION

1. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
2. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.
3. 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.
4. 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:
 - a. To Wood: Fasten with lag screws or through bolts.
 - b. To New Concrete: Bolt to concrete inserts.
 - c. To Existing Concrete: Expansion anchor fasteners.
 - d. 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.
 - e. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
 - f. To Light Steel: Sheet metal screws.
 - g. 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.
5. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

C. INSTALLATION OF FABRICATED METAL SUPPORTS

1. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
2. Field Welding: Comply with AWS D1.1/D1.1M.

D. PAINTING

1. 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.

- a. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
2. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes:
 - a. Metal conduits, tubing, and fittings.
 - b. Nonmetal conduits, tubing, and fittings.
 - c. Metal wireways and auxiliary gutters.
 - d. Nonmetal wireways and auxiliary gutters.
 - e. Surface raceways.
 - f. Boxes, enclosures, and cabinets.

C. DEFINITIONS

1. ARC: Aluminum rigid conduit.
2. EMT: Electrical metal tubing
3. ENT: Electrical non-metallic tubing
4. GRC: Galvanized rigid steel conduit.
5. HDPE: High density polyethylene pipe
6. IMC: Intermediate metal conduit.
7. LFMC: Liquid-tight flexible metal conduit
8. LFNC: Liquid-tight flexible non-metallic conduit.
9. RNC: Rigid non-metallic conduit
10. RTRC: Reinforced thermosetting resin conduit

D. QUALITY ASSURANCE:

1. Each conduit shall bear manufacturer's trademark and UL label.
2. Each type of conduit and fittings shall be of a single manufacturer. Multiple manufacturers of the same material are not acceptable.
3. Comply with California Electric Code (CEC)

E. ACTION SUBMITTALS

1. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
2. Source quality-control reports.

2. PART 2 PRODUCTS

A. METAL CONDUITS, TUBING, AND FITTINGS

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following
 - a. Allied Tube & Conduit; a Tyco International Ltd. Co.
 - b. Thomas & Betts Corporation.
 - c. Western Tube and Conduit Corporation.
 - d. Equal
2. Listing and Labeling: Metal conduits, tubing, and fittings shall be UL listed and labeled as defined in NFPA 70, and marked for intended location and application.
3. GRC: Comply with ANSI C80.1 and UL 6.
4. ARC: Comply with ANSI C80.5 and UL 6A.
5. IMC: Comply with ANSI C80.6 and UL 1242.

6. EMT: Comply with ANSI C80.3 and UL 797.
7. FMC: Comply with UL 1; zinc-coated steel..
8. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
9. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
 - a. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
 - b. Fittings for EMT:
 - c. Material: Steel.
 - d. Type: Setscrew or compression.
 - e. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
 - f. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.
10. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

B. NONMETALLIC CONDUITS, TUBING, AND FITTINGS

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following
 - a. RACO; a Hubbell company.
 - b. Thomas & Betts Corporation.
 - c. Equal
2. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. ENT: Comply with NEMA TC 13 and UL 1653.
4. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
5. LFNC: Comply with UL 1660.
6. Rigid HDPE: Comply with UL 651A.
7. Continuous HDPE: Comply with UL 651B.
8. Coilable HDPE: Preassembled with conductors or cables, and complying with ASTM D 3485.
9. RTRC: Comply with UL 1684A and NEMA TC 14.
10. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
11. Fittings for LFNC: Comply with UL 514B.
12. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
13. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. METAL WIREWAYS AND AUXILIARY GUTTERS

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following
 - a. Cooper B-Line, Inc.
 - b. Square D; a brand of Schneider Electric.
 - c. Equal
2. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 3R unless otherwise indicated, and sized according to NFPA 70.

- a. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
4. Wireway Covers: Screw-cover type or Flanged-and-gasketed type unless otherwise indicated.
5. Finish: Manufacturer's standard enamel finish.

D. NONMETALLIC WIREWAYS AND AUXILIARY GUTTERS

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 Moulded Products, Inc.
 - b. Hoffman; a Pentair company.
 - c. Lamson & Sessions; Carlon Electrical Products.
 - d. Equal
2. Listing and Labeling: Nonmetallic wireways and auxiliary gutters shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Description: Fiberglass polyester, extruded and fabricated to required size and shape, without holes or knockouts. Cover shall be gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections shall be flanged and have stainless-steel screws and oil-resistant gaskets.
4. Description: PVC, extruded and fabricated to required size and shape, and having snap-on cover, mechanically coupled connections, and plastic fasteners.
5. Fittings and Accessories: Couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings shall match and mate with wireways as required for complete system.
6. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
7. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

E. SURFACE RACEWAYS

1. Listing and Labeling: Surface raceways and tele-power poles shall be UL listed and labeled as defined in NFPA 70, and marked for intended location and application.
2. Surface Metal Raceways: Galvanized steel with snap-on covers complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Hubbell Wiring Systems
 - 2) Wiremold / Legrand.
 - 3) Mono-Systems, Inc.
 - 4) Panduit Corp.
 - 5) Equal
3. Surface Nonmetallic Raceways: Two- or three-piece construction, complying with UL 5A, and manufactured of rigid PVC with texture and color selected by Architect from manufacturer's standard colors. Product shall comply with UL 94 V-0 requirements for self-extinguishing characteristics.

- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Hubbell Incorporated; Wiring Device-Kellems Division.
 - 2) Wiremold / Legrand.
 - 3) Mono-Systems, Inc.
 - 4) Panduit Corp.
 - 5) Equal
- F. BOXES, ENCLOSURES, AND CABINETS
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cooper Technologies Company; Cooper Crouse-Hinds.
 - b. Thomas & Betts Corporation.
 - c. Wiremold / Legrand.
 - d. Equal
 2. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
 3. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
 4. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, aluminum, Type FD, with gasketed cover.
 5. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
 6. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
 7. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.
 8. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
 9. Gangable boxes are prohibited.
 10. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1, Type 3R, Type 4, Type 4X, Type 12 with continuous-hinge cover with flush latch unless otherwise indicated.
 - a. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 - b. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
 11. Cabinets:
 - a. NEMA 250, Type 1, Type 3R, Type 4X, Type 12 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 - b. Hinged door in front cover with flush latch and concealed hinge.
 - c. Key latch to match panelboards.
 - d. Metal barriers to separate wiring of different systems and voltage.
 - e. Accessory feet where required for freestanding equipment.
 - f. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

3. PART 3 EXECUTION

A. RACEWAY APPLICATION

1. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 - a. Exposed Conduit: GRC or IMC
 - b. Concealed Conduit, Aboveground: GRC, IMC, EMT, RNC.
 - c. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 - d. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R, or Type 4.

2. Indoors: Apply raceway products as specified below unless otherwise indicated:
 - a. Exposed, Not Subject to Physical Damage: EMT or RNC.
 - b. Exposed, Not Subject to Severe Physical Damage: EMT
 - c. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - d. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
3. Minimum Raceway Size: 3/4-inch trade size. 1/2-inch may be used for control wiring.
4. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - a. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 - b. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.
 - c. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
5. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
6. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.
7. Install surface raceways only where indicated on Drawings.
8. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F or on roofs.

B. INSTALLATION

1. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
2. 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.
3. Complete raceway installation before starting conductor installation.
4. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
5. Arrange stub-ups so curved portions of bends are not visible above finished slab.
6. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
7. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
8. Support conduit within 12 inches of enclosures to which attached.
9. Stub-ups to Above Recessed Ceilings:
 - a. Use EMT, IMC, or RMC for raceways.
 - b. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
10. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
11. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
12. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
13. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch

- trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
14. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
 15. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
 16. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
 17. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 250lbs (113 kgs) tensile strength. Leave at least 12 inches of slack at each end of pull wire. Provide acrylic identification tags (2"X4") at each end indicating the source. Cap underground raceways designated as spare above grade alongside raceways in use.
 18. Surface Raceways:
 - a. Install surface raceway with a minimum 2-inch radius control at bend points.
 - b. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
 19. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
 20. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - a. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - b. Where an underground service raceway enters a building or structure.
 - c. Where otherwise required by NFPA 70.
 21. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
 22. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semi-recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
 - a. Use LFMC in damp or wet locations
 23. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
 24. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
 25. Locate boxes so that cover or plate will not span different building finishes.
 26. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
 27. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
 28. Set metal floor boxes level and flush with finished floor surface.
 29. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

- C. FIRESTOPPING
 - 1. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

- D. PROTECTION
 - 1. Protect coatings, finishes, and cabinets from damage and deterioration.
 - a. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - b. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

IDENTIFICATION FOR ELECTRICAL SYSTEMS

1. PART 1 GENERAL

A. RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. SUMMARY

1. Section Includes:
 - a. Identification for raceways.
 - b. Identification of power and control cables.
 - c. Identification for conductors.
 - d. Warning labels and signs.
 - e. Instruction signs.
 - f. Equipment identification labels.
 - g. Miscellaneous identification products.

C. ACTION SUBMITTALS

1. Product Data: Submit manufacturer's catalog cut sheets for each electrical identification product indicated.
2. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.
3. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

D. QUALITY ASSURANCE

1. Comply with ANSI A13.1 and IEEE C2.
2. Comply with NFPA 70.
3. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
4. Comply with ANSI Z535.4 for safety signs and labels.
5. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969. Adhesive type labels shall be used for only applications indicated in this section.

E. COORDINATION

1. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
2. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
3. Coordinate installation of identifying devices with location of access panels and doors.
4. Install identifying devices before installing acoustical ceilings and similar concealment.

2. PART 2 PRODUCTS

A. POWER AND CONTROL RACEWAY IDENTIFICATION MATERIALS

1. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
2. Colors for Raceways Carrying Feeders and Circuits at 600 V or Less:
 - a. Black letters on an orange field

- b. Legend: Indicate voltage and system or service type.
 - 3. Colors for Raceways Carrying Feeders and Circuits at More Than 600 V:
 - a. Black letters on an orange field.
 - b. Legend: "DANGER CONCEALED HIGH VOLTAGE WIRING."
 - 4. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.
 - 5. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pre-tensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
 - 6. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pre-tensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
 - 7. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
- B. ARMORED AND METAL-CLAD CABLE IDENTIFICATION MATERIALS
 - 1. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.
 - 2. Colors for Cables Carrying Circuits at 600 V and Less:
 - a. Black letters on an orange field
 - b. Legend: Indicate voltage and system or service type.
 - 3. Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.
 - 4. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches wide; compounded for outdoor use.
 - 5. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tube with machine-printed identification label. Sized to suit diameter of and shrinks to fit firmly around cable it identifies. Full shrink recovery at a maximum of 200 deg F. Comply with UL 224.
- C. POWER AND CONTROL CABLE IDENTIFICATION MATERIALS
 - 1. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.
 - 2. Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.
 - 3. Self-Adhesive, Self-Laminating Polyester Labels: Preprinted, 3-mil- thick flexible label with acrylic pressure-sensitive adhesive that provides a clear, weather- and chemical-resistant, self-laminating, protective shield over the legend. Labels sized to fit the cable diameter such that the clear shield overlaps the entire printed legend.
 - 4. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tube with machine-printed identification label. Sized to suit diameter of and shrinks to fit firmly around cable it identifies. Full shrink recovery at a maximum of 200 deg F. Comply with UL 224.
 - 5. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
 - 6. Snap-Around Labels: Slit, pre-tensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of cable it identifies and to stay in place by gripping action.
 - 7. Snap-Around, Color-Coding Bands: Slit, pre-tensioned, flexible, solid-colored acrylic sleeve, 2 inches (50 mm) long, with diameter sized to suit diameter of cable it identifies and to stay in place by gripping action.

D. CONDUCTOR AND CABLES IDENTIFICATION MATERIALS

1. Color coding of conductors: Provide color coded insulation by conductor manufacturer. Coordinate with Division 26, Section "Low Voltage Electrical Power Conductors and Cables". If permitted by owner's representative, install color coding conductor tape for temporary installations only.
2. Provide tags on each pull rope of spare conduits showing starting point and end point of spare conduits.

E. WARNING LABELS AND SIGNS

1. Comply with NFPA 70 and 29 CFR 1910.145.
2. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
3. Baked-Enamel Warning Signs:
 - a. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
 - b. 1/4-inch grommets in corners for mounting.
 - c. Nominal size, 7 by 10 inches.
4. Metal-Backed, Butyrate Warning Signs:
 - a. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
 - b. 1/4-inch grommets in corners for mounting.
 - c. Nominal size, 10 by 14 inches.
5. Warning label and sign shall include, but are not limited to, the following legends:
 - a. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - b. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES for electrical service 600V or less."
 - c. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 60-INCHES for electrical service above 600V and up to 15000V."
 - d. Provide other warning labels and signs as required by applicable code and regulation.

F. EQUIPMENT IDENTIFICATION LABELS

1. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch.
2. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.
3. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.
4. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch except designation which will be in 1/2-inch letters unless otherwise indicated.
5. Labels shall include the following information. Color of nameplate shall be black for equipment connected to normal power, red for equipment connected to emergency power, and blue for equipment connected to Un-interruptible Power Supply. Color of letters shall be white.
 - a. Panel or equipment designation.
 - b. Rating: Volt, Amps, No. of phase and wires, horsepower, etc.
 - c. AIC Rating (RMS Symmetrical Amps).

- d. Fed from information.
 - e. Manufacturer Shop Order number.
 - f. Date of Installation.
 - g. Other information as requested by Owner.
6. For medium-voltage switchgear:
- a. Use 1 inch to identify equipment designation
 - b. Use 3/4 inch to identify voltage rating and source
 - c. Use 1/2 inch to identify individual feeder breakers and buckets
 - d. Use 1/4 inch to identify control switches, indicating lights, and other miscellaneous devices on the bucket door.
7. Adhesive labels and nameplates are not acceptable.

G. WIRING DEVICES LABELS

- 1. Identify wiring devices with heavy duty clear vinyl polyester tape "Weber" unless otherwise indicated. Provide labels on the device cover plate made of non-metallic materials. Color of letters shall be black for device connected to normal power, color of letters shall be red for device connected to emergency power. Labels shall be printed, flexible, self-adhesive type. In addition, write the circuit no. (e.g. 1PA-2) on the inside of the device cover plate of non-metallic material using a permanent marker.
- 2. For stainless steel cover plates, engrave information on the device cover plate.
- 3. Device (receptacles, switches etc.) label shall include panel designation and circuit number.

H. CABLE TIES

- 1. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
 - a. Minimum Width: 3/16 inch.
 - b. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
 - c. Temperature Range: Minus 40 to plus 185 deg F.
 - d. Color: Black except where used for color-coding.
- 2. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
 - a. Minimum Width: 3/16 inch.
 - b. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
 - c. Temperature Range: Minus 40 to plus 185 deg F.
 - d. Color: Black.
- 3. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, self-locking.
 - a. Minimum Width: 3/16 inch.
 - b. Tensile Strength at 73 deg F, According to ASTM D 638: 7000 psi.
 - c. UL 94 Flame Rating: 94V-0.
 - d. Temperature Range: Minus 50 to plus 284 deg F.
 - e. Color: Black.

I. MISCELLANEOUS IDENTIFICATION PRODUCTS

- 1. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- 2. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

3. PART 3 EXECUTION

A. INSTALLATION

- 1. Verify identity of each item before installing identification products.

2. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
3. Apply identification devices to surfaces that require finish after completing finish work.
4. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
5. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
6. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.
7. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
8. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
 - a. Outdoors: UV-stabilized nylon.
 - b. In Spaces Handling Environmental Air: Plenum rated.
9. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

B. IDENTIFICATION SCHEDULE

1. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl label bands. Install labels at 10-foot maximum intervals.
2. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:
 - a. Emergency Power
 - b. Power
 - c. UPS
3. Power-Circuit Conductor Identification, 600V or less: Provide factory color coded conductors as indicated in Division 26 "Low Voltage Power Conductors and Cables". Color coding tape may be field applied (if specified on the documents or permitted in writing by Owner's representative) to identify phase conductors in vaults, pull and junction boxes, manholes, handholes and other locations where conductors are spliced and terminated. Colors for factory-assembled cable, such as MC and AC, must match colors listed in first paragraph below. .
4. Color-Coding for Phase Identification, 600 V or Less: Use colors listed below for ungrounded service, feeders and branch-circuit conductors.
 - a. Color shall be factory applied.
 - b. Colors for 208/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Neutral : White
 - 5) Ground Green
 - c. Colors for 480/277-V Circuits:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - 4) Neutral : Grey

- 5) Ground : Green
- d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
5. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
6. Control-Circuit Conductor Termination Identification: For identification at terminations provide self-adhesive, self-laminating polyester labels with the conductor designation.
7. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source.
8. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
 - a. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 - b. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 - c. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
9. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
10. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels
 - a. Comply with 29 CFR 1910.145.
 - b. Identify system voltage with black letters on an orange background.
 - c. Apply to exterior of door, cover, or other access.
 - d. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
 - 1) Power transfer switches.
 - 2) Controls with external control power connections.
11. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
12. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems. Verify requirements with Owner's representative.
 - a. Labeling Instructions:
 - 1) Indoor Equipment: Engraved, laminated acrylic or melamine label.
 - 2) Outdoor Equipment: Engraved, laminated acrylic or melamine label
 - 3) Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
 - 4) Fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
 - b. Equipment to Be Labeled:
 - 1) Panelboards: Typewritten directory of circuits in the location provided by panel board manufacturer. Panelboard identification shall be engraved laminated acrylic label.
 - 2) Enclosures, electrical, telecom, alarm and communication system cabinets.

- 3) Access doors and panels for concealed electrical items.
- 4) Switchgear.
- 5) Switchboards.
- 6) Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panel boards or equipment supplied by the secondary. For pad-mount transformers- indicate type and size of fuses on a separate 3" X 5" plastic laminated label and install on the inside surface of the door of the transformer.
- 7) Substations.
- 8) Emergency power system boxes and enclosures.
- 9) Motor-control centers.
- 10) Enclosed switches including ATS.
- 11) Enclosed circuit breakers.
- 12) Enclosed controllers.
- 13) Variable-speed controllers.
- 14) Push-button stations.
- 15) Power transfer equipment including transfer switches.
- 16) Contactors.
- 17) Remote-controlled switches, dimmer modules, and control devices.
- 18) Battery-inverter units.
- 19) Battery racks.
- 20) Power-generating units.
- 21) Monitoring and control equipment.
- 22) UPS equipment.
- 23) Terminals, racks, and patch panels for voice and data communication and for signal and control functions.

END OF SECTION