Peralta Community College District

Project Manual for:

Bid No. 13-14/02

College of Alameda
Cougar Village Expansion
Modular Bid Submittal Increment 1

Located at:
College of Alameda
555 Atlantic Avenue (Ralph Appezzato Memorial Parkway)
Alameda, CA 94501

June 6, 2013

Peralta Community College District
Department of General Services
Johnnie Fudge, Director of Capital Projects
(510) 466-7213

Architect:

nbbj

Bid No.: 13-14/02
Advertisement Date: 6/6/13
Bid Date: 7/2/2013
(Project No.: 2399)
DOCUMENT 00010

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NOTICE INVITING BIDS

1 NOTICE. The Peralta Community College District (hereinafter “Owner”), will receive sealed Bids for the following public work:

   College of Alameda
   Cougar Village Expansion
   Modular Bid Submittal Increment 1
   (Bid No.: 13-14/02)
   (Project No. 2399)

2 BID SUBMISSION. Owner will receive sealed Bids no later than 2:00 p.m. on July 2, 2013. The Bid opening will be in accordance with procedures set forth in Document 00200 (Instructions to Bidders). All abbreviations and definitions of terms used in this Document 00100 are set forth in Section 01420 (References and Definitions).

DESCRIPTION OF THE WORK. The Work consists of all activities necessary to construct the above referenced projects as indicated on the Contract Documents, including but not limited to the drawings and the specifications. The Work includes, but is not limited to,

3 The addition of new portable buildings on the College of Alameda campus to temporarily house departments and students that are currently in buildings C & D, including general use classrooms. This package 1 is for the new portable buildings only with the goal being to select a portable manufacturer to provide all required Work for the Project as described within these documents or by the manufacturer’s own PC drawings. Once a manufacturer is selected and contracted with, the intent is for them to produce their required PC drawings which will be submitted to the Division of the State Architect (DSA), along with this documentation package, for review and approval by DSA. This package 1 Project does not include the Work of the renovations nor relocation of existing Cougar Village portables, nor of the underground utilities or other associated site work that is not within the standard responsibility of the portable manufacturer. Bidding Documents contain the full description of the Work.

4 CONTRACT TIME. The Work shall be substantially completed within 140 Calendar Days from the date when Contract Time commences to run. Part of the contract involves approval by DSA of the PC drawings – additional non-compensatory time will be awarded for DSA review and approval.

5 CONTACT INFORMATION.
   5.1.1 For information concerning the proposed work and to request Bidding Documents, contact:

   Johnnie Fudge
   Director of Capital Projects
   Phone: (510) 466-7213
   Email: jfudge@peralta.edu

   5.1.2 For an appointment to visit the Site, contact:

   Same as Above

6 MANDATORY PRE-BID MEETING AND SITE VISIT. Owner will conduct a Mandatory Pre-Bid Meeting and Site Visit at 10:00 a.m. on June 14, 2013 at the quad area of Building A, 555 Ralph Appezzato Memorial Parkway, Alameda, CA 94501. Each representative shall sign an attendance sheet identifying the Bidder represented. Any Bidder wishing to investigate subsurface conditions at the Site must schedule such a visit with Owner in accordance with Document 00200 (Instructions to Bidders).

7 STATEMENT OF QUALIFICATIONS. Each Bidder shall be required to submit, in accordance with Document 00200 (Instructions to Bidders) and Document 00450 (Statement of Qualifications for
Construction Work), a Statement of Qualifications. Owner will provide preliminary assessments of Bidder’s Statement of Qualifications prior to the bid due date.

**REQUIRED CONTRACTOR’S LICENSE(S).** A California class **A or B** contractor’s license is required to Bid this Contract. Joint ventures must secure a joint venture license prior to award of this Contract. Removal, handling, and/or disposal of hazardous materials may by law require hazardous substance removal certification by the Contractor’s State License Board.

**PREVAILING WAGE LAWS.** The successful Bidder must comply with all prevailing wage laws applicable to the Project and related requirements contained in the Contract Documents.

**INSTRUCTIONS.** Bidders shall refer to Document 00200 (Instructions to Bidders) for required documents and items to be submitted in sealed envelopes for deposit into the Bid box, and applicable times for submission.

**SUBSTITUTION OF SECURITIES.** Owner will permit successful Bidder to substitute securities for retention monies withheld to ensure performance of Contract, as set forth in Document 00680 (Escrow Agreement for Security Deposit in Lieu of Retention), in accordance with California Public Contract Code, Section 22300. By this reference, Document 00680 (Escrow Agreement for Security Deposit in Lieu of Retention) is incorporated in full in this Document 00100.

**RESTRICTIONS ON SUBSTITUTIONS.** As provided below, Owner will consider substitution requests only for “or equal” items. Bidders wanting to use “or equal” item(s) may submit Document 00660 (Substitution Request Form) no later than 60 Days after the issuance of the Notice of Award. As a limitation on Bidder's privilege to substitute “or equal” items, Owner has found that certain items are designated as Owner standards and certain items are designated to match existing items in use on a particular public improvement either completed or in the course of completion or are available from one source. As to such items, Owner will not permit substitution.

**PROCUREMENT OF BIDDING DOCUMENTS.** The Contract Documents, including the Instructions to Bidders and the plans and specifications for the work, may be examined at:

**(Available for purchase)**
ARC Northern California
1700 Jefferson Street,
Oakland, CA 94612
Tel. (510) 287-5485 Fax (510) 444-1264
www.e-arc.com
Email: oakland@e-arc.com
Attn: Christina

Note: The Bid and Contract Documents are available at ARC Northern California for non-refundable payment of the cost of reprographics and shipping per set. Payment shall be made to ARC Northern California.

**(Available for viewing)**
Department of General Services
Plan Room
Peralta Community College District
333 East 8th Street, Oakland, CA 94606
A copy of Contract Documents may be obtained online through the Peralta Website.

Website: www.peralta.edu
Click “Service Centers”, then click “Purchasing” and then click “List of Current RFPs/Bids” to download the bid packet.

Note: Drawings are not scalable/full size. For the scalable drawings, please purchase them from ARC Northern California.

13.1 The following plan room services have received sets of Bidding Documents for the Work contemplated herein:

Builders Exchange of Alameda
3055 Alvarado Street
San Leandro, CA 94577
Tel. 510-483-8880 Fax 510-352-1509
Email: beac@beac.com
Attn: Jan Sanchez

McGraw Hill Construction
11875 Dublin Blvd., Suite A118
Dublin, CA 94565
Tel. 925-833-9750 Fax 925-833-9754
Email: Gerry_mccarthy@mcgraw-hill.com
Attn: Gerry McCarthy

14 BID PREPARATION COST. Bidders are solely responsible for the cost of preparing their Bids.

15 RESERVATION OF RIGHTS. Owner specifically reserves the right, in its sole discretion, to reject any or all Bids, to re-bid, or to waive inconsequential defects in bidding not involving time, price or quality of the work. Owner may reject any and all Bids and waive any minor irregularities in the Bids.

16 SUBSTITUTIONS. Any and all substitutions for products that differ from the contract specifications shall be identified by the Contractor during the bid period and, if acceptable, shall be issued by the District as an addendum.

17 LIQUIDATED DAMAGES. Liquidated Damages shall be assessed at a cost of $2,000 per phase per calendar day. Bidder shall review Section 01100 Summary of Work regarding phasing.

END OF DOCUMENT
INSTRUCTIONS TO BIDDERS

Bids are requested by the Peralta Community College District (hereinafter “Owner”), for a general construction contract, or work described in general, as follows:

College of Alameda
Cougar Village Expansion
Modular Bid Submittal Increment 1
(Bid No.: 13-14/02)
(Project No. 2399)

1 RECEIPT OF BIDS.

1.1 Sealed bids will be received by Owner no later than the time specified for receipt of bids in Document 00100 (Notice Inviting Bids). Owner will receive Bids in two opaque sealed 10” x 13” envelopes labeled Envelope “A” and Envelope “B,” each containing the respective items described in paragraphs 4 and 5 below, respectively. All Bid envelopes will be time stamped to reflect their submittal time. Envelope “A” and Envelope “B” shall be due by 2 p.m. Owner will reject all Bids received after the specified time and will return such Bids to Bidders unopened. Bidders must submit Bids in accordance with this Document 00200.

2 BID SUBMITTAL LOCATION.

2.1 Bid shall be received and reviewed at

Peralta Community College District
Purchasing Department
Attn: David Bui
501 5th Avenue
Oakland, CA 94606
(510) 466-7225

Document 00201 (Bid Submittal Map) shows the location.
2.2

3 BID SUBMISSION.

3.1 Bidder should mark its Bid envelopes as “BID FOR THE PERALTA COMMUNITY COLLEGE DISTRICT, BID NUMBER 13-14/02, PROJECT NUMBER 2399, COLLEGE OF ALAMEDA, COUGAR VILLAGE EXPANSION, MODULAR BID SUBMITTAL INCREMENT 1.”, Envelope “A” or “Envelope “B,” as appropriate. Bids shall be deemed to include the written responses of the Bidder to any questions or requests for information of Owner made as part of Bid evaluation process after submission of Bid. Bidder’s failure to submit all required documents strictly as required entitles Owner to reject the bid as non-responsive.

CONTENTS OF ENVELOPE “A” - BID PRICE.

4 Envelope “A” shall include:

4.1.1 Document 00400 (Bid Form) completed in accordance with paragraph 6 of this Document 00200.
4.1.2 Bid security supplied and completed in accordance with paragraph 7 of this Document 00200.
4.1.3 Document 00430 (Subcontractors List) in accordance with paragraph 8 of this Document 00200.
4.1.4 Document 00481 (Non-Collusion Affidavit).

5 CONTENTS OF ENVELOPE “B” - BIDDER QUALIFICATIONS.

6 Envelope “B” shall include:

6.1.1 Statement of Qualifications submitted in accordance with paragraph 9 of this Document 00200 and Document 00450 (Statement of Qualifications for Construction Work).
6.1.2 Document 00420 (Bidder Registration Form). Bidder must complete this form and include comprehensive answers to all questions.
6.1.3 Document 00482 (Bidder Certifications). Bidder must complete this form as indicated.

7 REQUIRED BID FORMS.

7.1 All Bidders must submit Bids using, where applicable, documents supplied in this Project Manual, including without limitation Document 00400 (Bid Form) Document 00420 (Bidder Registration Form), Document 00430 (Subcontractors List), Document 00450 (Statement of Qualifications), Document 00460 (Schedule of Major Equipment and Material Suppliers), Document 00481 (Non-Collusion Affidavit) and Document 00482 (Bidder Certifications). Owner will reject as non-responsive any Bid not submitted on the required forms. Bids must be full and complete and legible. Bidders must complete all Bid items and supply all information required by Bidding Documents. Owner reserves the right in its sole discretion to reject any Bid as non-responsive as a result of any error or omission in the bid. Bidders may not modify the Bid Form or qualify their Bids. Bidders must submit clearly and distinctly written Bids. Bidders must clearly make any changes in their Bids by crossing out original entries, entering new entries, and initialing new entries. Owner reserves the right to reject any Bid not clearly written.

8 REQUIRED BID SECURITY.

8.1 Bidders must submit with their Bids either: cash, a cashier’s check, or certified check from a responsible bank in the United States, or corporate surety bond furnished by a surety authorized to do business in the State of California, of not less than ten percent of the total amount of Bid (excluding alternates, if any), payable to Owner. All Bidders choosing to submit a surety bond must submit it on the required form, Document 00411 (Bond Accompanying Bid). Owner will reject as non-responsive any Bid submitted without the necessary Bid security.

8.2 Owner may retain Bid securities and Bid bonds of other than the Apparent Low Bidder for a period of 90 Days after award or full execution of the Contract, whichever first occurs. Upon full execution of the Contract, and upon request by Bidder, Owner will return to the respective unsuccessful Bidders their Bid securities and Bid bonds.

9 REQUIRED SUBCONTRACTORS LIST.
9.1 All Bidders must submit with their Bids the required information on all Subcontractors in Document 00430 (Subcontractors List) for those Subcontractors who will perform any portion of Work, including labor, rendering of service, or specially fabricating and installing a portion of the Work of improvement according to detailed drawings contained in the plans and specifications, in excess of one half of one percent of total Bid. Violation of this requirement may result in Bid being deemed non-responsive and not being considered.

10 REQUIRED STATEMENT OF QUALIFICATIONS AND PRELIMINARY STATEMENT OF QUALIFICATIONS.

10.1 Bidders shall meet minimum qualification standards to be found a responsible bidder and eligible for award of the Contract. To facilitate bidding by all qualified Bidders, Owner will pre-assess Bidders at the outset of the bidding process, so that Bidders have information on their qualification status prior to investing the time and expense required to prepare a Bid.

10.2 Required Final Statement of Qualifications:

10.2.1 In order for a Bidder to be eligible to Bid on this Contract, it must submit with its bid a final Statement of Qualifications responsive to the requirements identified in Document 00450 (Statement of Qualifications for Construction Work) (“SOQ”), including without limitation qualification information for Subcontractors, superintendent, project management and schedulers, identified in Document 00450. Except as otherwise provided in paragraphs 20 and 21 of this Document 00200 or in Document 00450, Owner will make final determinations regarding Bidder responsibility based upon the SOQ submitted as part of Envelope “B” on Bid day. Information in the SOQ shall be current as of Bid Day.

10.3 Subcontractor Qualifications:

10.3.1 Bidders attention is drawn to the fact that the qualifications of Designated Subcontractors is deemed integral and part of Bidders qualifications and the determination by Owner of a Bidder as a responsible bidder.

11 MANDATORY PRE-BID MEETING[S] AND SITE VISIT.

11.1 Owner will conduct one Mandatory Pre-Bid Meeting and Site Visit at 10:00 a.m. on June 14, 2013 at the quad area of Building A, 555 Ralph Appezzato Memorial Parkway, Alameda, CA 94501.

11.2 The mandatory Pre-Bid Meeting and Site Visit will cover, among other matters, the requirements for the final SOQ. The Meetings will commence at the quad area of Building A, 555 Ralph Appezzato Memorial Parkway, Alameda, CA 94501 and will include a walking tour of the Project Site. Each Bidder must be represented at each Meeting and Site Visit. Each representative shall sign an attendance sheet identifying the Bidder represented.

11.3 Owner reserves the right to schedule and organize the Site Visits to minimize disruption to surrounding facilities and congestion. Any Bidder wishing to investigate subsurface conditions or otherwise conduct invasive investigations, explorations, test, or studies at this Site, shall schedule such examinations with Owner by providing Owner at least seven (7) days written notice. Additionally, any such Bidder must deliver an executed Document 00210 (Access, Indemnity and Release Agreement) and provide an insurance certificate as described therein by noon of the Day prior to the site examination. Bidders who intend only to observe Site conditions and not conduct such examinations are not required to provide an executed Document 00210 or an insurance certificate.

11.4 Bidders are encouraged to submit written questions in connection with the Meetings and Site Visits. Owner will transmit to all parties recorded as having received Bidding Documents such Addenda as Owner in its discretion considers necessary in response to written questions. Bidders shall not rely on oral statements. Oral statements will not be binding or legally effective.

12 OTHER REQUIREMENTS PRIOR TO BIDDING.

12.1 Submission of Bid signifies Bidder’s careful examination of Bidding Documents and complete understanding of the nature, extent, and location of Work to be performed. Bidder’s attention is directed to
Document 00700 (General Conditions), Article 2, that describes Bidder’s required pre-bid investigations, notices to Owner of questions and receipt of answers in Addenda. Bidders must advise Owner of any unresolved questions, ambiguities, or inconsistencies in the supplied bidding documents.

13 EXISTING DRAWINGS AND GEOTECHNICAL DATA.

13.1 Bidders may examine any available existing conditions information (e.g. record documents, specifications, studies, drawings of previous work on site) by giving Owner reasonable advance notice, as well as applicable environmental assessment information (if any) regarding the Project. Document 00320 (Geotechnical Data and Existing Conditions) applies to all supplied existing conditions information and geotechnical reports and all other information supplied regarding existing conditions either above ground or below ground. Owner will make copies available for the cost of printing. A Bidder must give two (2) days advanced notice if copies are desired.

14 ADDENDA.

14.1 Bidders must direct all questions about the meaning or intent of Bidding Documents to Owner (Attention: Facilities Project Manager or Director of Capital Projects) in writing, using attached form. Interpretations or clarifications considered necessary by Owner in response to such questions will be issued by Addenda mailed, faxed, or delivered to all parties recorded by Owner as having received Bidding Documents. Addenda will be written and will be issued to each Bidder to the address or fax number supplied to Owner by Bidder. Owner may not answer questions received less than ten (10) Days prior to the date for opening Bids. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect. To the extent that Owner, or any representative thereof, upon inquiry by Bidder, orally direct Bidder’s attention to specific provisions of the Contract Documents which cover the subject of the inquiry, the entire set of Contract Documents shall nonetheless govern.

14.2 In addition:

14.2.1 Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner.

14.2.2 Addenda shall be acknowledged by number with signature in Document 00400 (Bid Form) and shall be part of the Contract Documents. A complete listing of Addenda may be secured from Owner.

15 SUBSTITUTIONS.

15.1 Bidders must base their Bids on products and systems specified in Contract Documents or listed by name in Addenda.

15.1.1 Bidders wanting to use “or equal” item(s) may submit Document 00660 (Substitution Request Form) no later than the date specified in Document 00100. After that date, Owner will not accept “or equal” substitution requests. To assess “or equal” acceptability of product or system, submittals of substitutions shall contain the information required in Document 00660 and set forth in Section 01600 (Product Requirements). Insufficient information will be grounds for rejection of substitution. Owner shall, within a reasonable period of time after having received a request for substitution, issue in writing its decision as to whether the proposed substitute item is an “or equal” item for compatibility to Owner systems, durability, or quality. Owner’s decision shall be conclusive on all Bidders.

15.1.2 Approved substitutions made during the bid period, shall be listed in Addenda and become part of Contract Documents.

15.1.3 Substitutions may be requested after submitting Bids and Award of Contract only in accordance with Section 01600 (Product Requirements).

15.1.4 As a limitation on Bidder’s privilege to substitute “or equal” items, Owner has found that certain items are designed as Owner standards and certain items are designed to match existing items in use on a particular public improvement either completed or in the course of completion. As to such items, Owner will not permit substitution. Such items are noted in the Technical specifications. As a further limitation on Bidder’s privilege to substitute items, Owner has found that certain necessary items are only available from one source. As to such items, Owner will not permit substitution.
16 WAGE RATES.

16.1 Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are on file at Owner’s office and are deemed included in the Bidding Documents. Upon request, Owner will make available copies to any interested party. Also, Contractor shall post the applicable prevailing wage rates at the Site. The California Department of Industrial Relations website is www.dir.ca.gov.

17 EQUAL EMPLOYMENT OPPORTUNITY.

17.1 Contractor shall comply with all applicable federal, state, and local laws, rules, and regulations in regard to nondiscrimination in employment because of race, color, ancestry, national origin, religion, sex, marital status, age, medical conditions, disability, or any other reason.

18 DRAWINGS AND BIDDING DOCUMENTS.

18.1 Complete sets of Bidding Documents must be used in preparing Bids. Neither Owner nor Architect assume any responsibility for errors or misinterpretations resulting from use of incomplete sets of Bidding Documents. The Drawings bound in the Bidding Documents are reduced scale reproductions. The amount of reduction is indicated by a note or scale bar on the Drawings. Copies of full-scale Drawings, including individual Drawings, may be obtained from Architect for the cost of reproduction, plus shipping and handling. Full-size drawings will only be made available to firms who previously obtained a complete set of Bidding Documents. No return of full-size Drawings is required, and no refund will be made.

19 BID OPENING.

19.1 Owner will open all Bidders’ Envelopes “A” at 2:00 p.m. (after receipt of Envelop “B”) on the specified date, initially evaluate them for responsiveness, and determine an Apparent Low Bidder as specified herein. Owner will not open Envelopes “B” publicly, and except for the Apparent Low Bidder’s Envelope “B” and next apparent low bidder’s Envelope “B” (or as otherwise provided in this Document 00200), they will remain unopened.

19.2 Determination of Apparent Low Bidder (Envelope “A”).

19.2.1 All Bidders are required to submit Bids on all Bid items including any alternates. Apparent Low Bid will be determined in accordance with Public Contract Code Section 20103.8(b), and take into account only the specific alternate(s), if any, specifically identified as such in Document 00400 (Bid Form): Owner reserves the right to add to or deduct from the Contract any of the additive or deductive items at any time within 60 Days after commencement of Contract Time, etc.

19.3 Evaluation of Bidder Responsibility (Envelope “B”).

19.3.1 Owner will open Apparent Low Bidder’s Envelope “B” and check its contents for compliance with paragraph 5 above and this paragraph 20. Owner will notify Apparent Low Bidder in writing of any deficiencies found and will provide Bidder the opportunity to respond in writing with reasonable clarifications but will not allow any changes in the nature of Bidder as a business entity.

19.3.2 If any Apparent Low Bidder is determined to be non-responsive or non-responsible, Owner may proceed to examine the next Apparent Low Bidder’s Envelope “B” pursuant to any procedures determined in its reasonable discretion, and proceed for all purposes as if this Apparent Low Bidder were the original Apparent Low Bidder. Owner shall use reasonable efforts to make the responsive responsible Apparent Low Bidder’s Envelope “B” public on the fifth Day following opening of the Bidders’ Envelope “A”s, subject to paragraph 29 below.

19.3.3 Document 00450 sets forth the minimum criteria for a Bidder to be found responsible. Bidder’s attention is called to the requirements of Document 00450 for a Bidder to be found responsible to perform the Work.

20 BID EVALUATION.
20.1 Owner may reject any or all bids and waive any informalities or minor irregularities in the Bids. Owner also reserves the right, in its discretion, to reject any or all Bids and to re-Bid the Project. Owner reserves the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional Bids, and to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner. For purposes of this paragraph, an “unbalanced Bid” is one having nominal prices for some work items and enhanced prices for other work items.

20.1.1 In evaluating Bids, Owner will consider Bidders’ qualification, whether or not the Bids comply with the prescribed requirements, unit prices and other data, as may be requested in Document 00400 (Bid Form) or prior to the Notice of Award.

20.1.2 Subject to any pre-qualification process for the Bidders, Owner may otherwise conduct reasonable investigations and reference checks of Bidder, proposed Subcontractors, suppliers and other persons and organizations as Owner deems necessary to assist in the evaluation of any Bid. Owner shall also have the right to communicate directly with Bidder’s surety regarding Bidder’s bonds.

20.1.3 Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum or any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between written words and figures will be resolved in favor of the words.

20.1.4 Quantities stated in the Bidding Documents are approximate only and are subject to correction upon final measurement of the Work, and are subject further to the rights reserved by Owner to increase or diminish the amount of work under any classification as advantages to design or construction needs require.

20.1.5 Owner may determine whether a Bidder is qualified in its sole discretionary judgment.

21 AWARD.

21.1 If the Contract is to be awarded, it will be awarded to the lowest responsive, responsible Bidder. Following completion of all required Owner procedures and receipt of all Owner approvals, Owner will issue Document 00510 (Notice of Award) to successful Bidder. If a bid protest is filed, then Owner reserves the right to request that each Bidder agree to extend by an additional twenty (20) days the mandatory time periods specified in Document 00400 (Bid Form) for their bid to remain open, to which each Bidder may consent in its discretion.

22 BID PROTEST.

22.1 Any Bid protest must be submitted in writing to Owner’s offices before 2:00 p.m. of the fifth Day following posting in the District Website: http://web.peralta.edu/purchasing/documents-list-of-current-bids-rfps-and-rfqs/ of Document 00505 (Notice of Intent to Award for Construction). Time will be determined by clock in conference room of Owner’s Headquarters. Owner will use reasonable efforts to deliver by facsimile a copy of Document 00505 to all Bidders who submitted Bids no later than the Business Day after issuance, although any delay or failure to do so will not extend the Bid protest deadline described above.

22.2 Procedures for Submitting Bid Protests:

22.2.1 The initial protest must contain a complete statement of the basis for the protest.

22.2.2 The protest must refer to the specific portion of the document that forms the basis for the protest.

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

22.2.4 Only Bidders who Owner otherwise determines are responsive and responsible are eligible to protest a Bid; protests from any other Bidder will not be considered. In order to determine whether a protesting Bidder is responsive and responsible, Owner may open and evaluate information contained in any protesting Bidder’s Envelope “B”, and conduct the same investigation and evaluation as Owner is entitled to make regarding an Apparent Low Bidder.

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

22.3 **Exclusive Remedy**

22.3.1 The procedure and time limits set forth in this paragraph are mandatory and are Bidder’s sole and
exclusive remedy in the event of a Bid protest. Bidder’s failure to comply with these procedures
shall constitute a waiver of any right to further pursue the Bid protest, including filing a
Government Code Claim or legal proceedings. A Bidder may not rely on a protest submitted by
another Bidder, but must timely pursue its own protest.
23 POST-NOTICE OF AWARD REQUIREMENTS.

23.1 After Notice of Award, the successful Bidder must execute and submit the following documents to Owner by 2:00 p.m. of the tenth (10) Day following Notice of Award. Execution of Contract by Owner depends upon approval of these documents, and any other document identified in Owner’s Notice of Award:

23.1.1 Document 00520 (Agreement): To be executed by successful Bidder. Submit four originals, each bearing an original signature.

23.1.2 Document 00610 (Construction Performance Bond): To be executed by successful Bidder and surety, in the amount set forth in Document 00610 (Construction Performance Bond). Submit one original.

23.1.3 Document 00620 (Construction Labor and Material Payment Bond): To be executed by successful Bidder and surety, in the amount set forth in Document 00620 (Construction Labor and Materials Payment Bond). Submit one original.

23.1.4 Insurance certificates and endorsements required by Document 00700 (General Conditions) or Document 00821 (Supplementary Conditions – Insurance). Submit one original set.

23.1.5 Document 00630 (Guaranty). Submit four originals, each bearing an original signature.

23.1.6 Any other item described in Document 00510 (Notice of Award).

23.2 Owner shall have the right to communicate directly with Apparent Low Bidder’s proposed performance bond surety, to confirm the performance bond. Owner may elect to extend the time to receive faithful performance and labor and material payment bonds.

23.3 Successful Bidder’s failure to submit the documents required herein, in a proper and timely manner, entitles Owner to rescind its award, and to cause Bidder’s Bid security to be forfeited as provided herein.

24 FAILURE TO EXECUTE AND DELIVER DOCUMENTS.

24.1 If Bidder to whom Contract is awarded shall, within the period described in paragraph 24 of this Document 00200, fail or neglect to execute and deliver all required Contract Documents and file all required bonds, insurance certificates, and other documents, Owner may, in its sole discretion, foreclose on Bidder’s deposit surety bond, or deposit Bidder’s cashier’s check or certified check for collection, and retain the proceeds thereof as liquidated damages for Bidder’s failure to enter into the Contract Documents. Bidder agrees that calculating the damages Owner may suffer as a result of Bidder’s failure to execute and deliver all required Contract Documents would be extremely difficult and impractical and that the amount of Bidder’s required Bid security shall be the agreed and presumed amount of Owner’s damages. In addition, upon such failure Owner may determine the next Apparent Low Bidder and proceed accordingly.

25 MODIFICATION OF COMMENCEMENT OF WORK.

25.1 Owner expressly reserves the right to modify the currently anticipated date for the Commencement of Work under the Contract and to independently perform and complete work related to the Project, subject, however, to the procedures in Document 00700 (General Conditions).

26 WITHDRAWAL OF BIDS.

26.1 Bidders may withdraw their Bids at any time prior to the Bid opening time fixed in this Document 00200, only by written request for the withdrawal of Bid filed with Owner at Owner’s office. Bidder or its duly authorized representative shall execute request to withdraw Bid. The submission of a Bid does not commit Owner to award a contract for the Project, to pay costs incurred in the preparation of a Bid, or to procure or contract for any goods or services.

27 INELIGIBLE CONTRACTORS AND SUBCONTRACTORS.

27.1 Owner shall not accept a Bid from a Bidder who is ineligible to bid or work on, or be awarded, a public works project pursuant to California Labor Code section 1777.1 or 1777.7. Bidders and the Contractor who is awarded the project contract shall not utilize, or allow work by, any subcontractor who is ineligible to bid or work on, or be awarded, a public works project pursuant to California Labor Code section 1777.1 or 1777.7. (See California Public Contract Code section 6109.) The California Division of Labor Standards
Enforcement publishes a list of debarred contractors and subcontractors on the Internet at www.dir.ca.gov/DLSE/debar.html.

28 PUBLIC RECORDS ACT REQUESTS.

28.1 Per the Public Records Act, Owner will make available to the public Bidder’s SOQ (if bidder’s Envelope “B” is opened), all correspondence and written questions submitted during the Bid period, all Bid submissions opened in accordance with the procedures of the Document 00200, and all subsequent Bid evaluation information. All submissions not opened will remain sealed and eventually be returned to the submitter. Except as otherwise require by law, Owner will not disclose trade secrets or proprietary financial information submitted that has been designated confidential by Bidder (including but not limited to the SOQ). Any such trade secrets or proprietary financial information that a Bidder believes should be exempted from disclosure shall be specifically identified and marked as such. Blanket-type identification by designating whole pages or sections shall not be permitted and shall be invalid. The specific information must be clearly identified as such.

28.2 Upon a request for records regarding this Bid, Owner will notify Bidder involved within ten Days from receipt of the request when the records will be made available for inspection. If the Bidder timely identifies any “proprietary, trade secret, or confidential commercial or financial” information that Bidder determines is not subject to public disclosure, and requests Owner to refuse to comply with the records request, Bidder shall take all appropriate legal action and defend Owner’s refusal to produce the information in all forums; otherwise Owner will make such information available to the extent require by applicable law, without restriction.

28.3 Information disclosed in the SOQ and the attendant submissions are the property of Owner unless Bidder makes specific reference to data that is considered proprietary. Subject to the requirements in the Public Records Act, reasonable efforts will be made to prevent the disclosure of information except on a need-to-know basis during the evaluation process.

29 CONSTRUCTION PAYMENT BOND AND CONSTRUCTION LABOR AND MATERIALS BOND SURETY.

29.1 Document 00610 (Construction Performance Bond) and Document 00620 (Construction Labor and Material Payment Bond) shall be executed by a surety insurer admitted in the State of California by the Department of Insurance. Bidder shall verify Surety’s admission by either: (1) printing out information from the website of the Department of Insurance confirming that Surety is an admitted surety insurer; or, (2) obtaining a certificate from the County Clerk confirming that Surety is an admitted insurer. Bidder shall attach such verification to Document 00610 and Document 00620.

30 CONFORMED CONSTRUCTION DOCUMENTS.

30.1 Following Award of Contract, Owner may prepare a conformed set of Contract Documents reflecting Addenda issued during bidding, which will, failing reasonable objection, constitute the approved set of Contract Documents.

31 DEFINITIONS.

31.1 All abbreviations and definitions of terms used in this Document 00200 are set forth in Section 01420 (References and Definitions).

END OF DOCUMENT
ACCESS, INDEMNITY AND RELEASE AGREEMENT

Dated ______________________________

POTENTIAL BIDDER: __________________________________________

OWNER: Peralta Community College District (hereinafter “Owner”)

SITE: College of Alameda

PROJECT: Cougar Village Expansion Modular Bid Submittal Increment 1, BID NO. 13-14/02

In consideration of the above-referenced Owner’s permitting the undersigned potential bidder (“Bidder”) to have access to, and to conduct investigations, tests and/or inspections on the Site (“access”), and effective upon such access, Bidder hereby agrees as follows:

1. To the greatest extent permitted by law, including without limitation California Civil Code Section 2782, Bidder hereby releases, and shall defend, indemnify and hold harmless Owner, and its officers, employees, consultants (including without limitation Architect/Engineer), representatives, and agents, and all other parties having any other interest in the Site, against any claim or liability, including attorney’s fees, arising from or relating to any Site-related access, investigation, test, inspection and/or other access activity conducted by Bidder of any of Bidder’s officers, employees, consultants, representatives, and/or agents, regardless of whether claim or liability is caused in part by the negligence of Owner or by any released and indemnified party.

2. In connection with the release referenced in paragraph 1 above, Bidder hereby waives the provisions of California Civil Code Section 1542 which provides as follows:

   A general release does not extend to claims that the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her, must have materially affected his or her settlement with the debtor.

3. Bidder shall repair any damage to the Site or adjacent property resulting from activities by or on behalf of Bidder authorized hereunder, and comply with and be subject to all other requirements and obligations described or referenced in Document 00320 (Geotechnical Data and Existing Conditions).

4. Attached hereto (or to be delivered separately before Bidder’s visit to the Site) is a certificate for comprehensive general liability insurance satisfying the requirements of Document 00700 (General Conditions) and Document 00821 (Supplemental Conditions – Insurance).

5. Although this Access, Indemnity and Release Agreement is not a Contract Document (see Document 00520 Agreement), it shall be fully effective and binding regardless of whether Bidder submits a Bid for the subject Project, is awarded a contract for the Project or otherwise.

Name of Bidder

By: ____________________________                By: ____________________________
   Signature                                  Signature

Its: ____________________________________________
   Title (If Corporation: Chairman, President or Vice President)

END OF DOCUMENT
BID FORM

TO THE BOARD OF TRUSTEES of Peralta Community College District

THIS BID IS SUBMITTED BY:

____________________________________________________________________________________

(Firm/Company Name)

Re: Peralta Community College District
Cougar Village Expansion Modular Bid Submittal Increment 1 at
College of Alameda, 555 Ralph Appezzato Memorial Parkway, Bid Number: 2399

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with Peralta Community College District (hereinafter “Owner”) in the form included in the Contract Documents, Document 00520 (Agreement), to perform and furnish all Work as specified or indicated in the Contract Documents for the Contract Sum and within the Contract Time indicated in this Bid and in accordance with all other terms and conditions of the Contract Documents.

2. Bidder accepts all of the terms and conditions of the Contract Documents, Document 00100 (Notice Inviting Bids), and Document 00200 (Instructions to Bidders), including, without limitation, those dealing with the disposition of Bid Security. This Bid will remain subject to acceptance for 60 Days after the day of Bid opening.

3. In submitting this Bid, Bidder represents:

(a) Bidder has examined all of the Contract Documents and the following Addenda (receipt of all of which is hereby acknowledged).

<table>
<thead>
<tr>
<th>Addendum Number</th>
<th>Addendum Date</th>
<th>Signature of Bidder</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

(b) Bidder acknowledges receipt of Pre-Bid Conference minutes, if any.

(c) Bidder has visited the Site and performed all tasks, research, investigation, reviews, examinations, and analysis and given notices, regarding the Project and the Site, as required in Document 00700 (General Conditions), Article 2.

(e) Bidder has given Owner prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract Documents and as-built drawings and actual conditions and the written resolution thereof through Addenda issued by Owner is acceptable to Contractor.

4. Based on the foregoing, Bidder proposes and agrees to fully perform the Work within the time stated and in strict accordance with the Contract Documents for the following sums of money listed in the following Schedule of Bid Prices:
SCHEDULE OF BID PRICES

All Bid items, including lump sums and unit prices, must be filled in completely. Bid items are described in Section 01100 (Summary of Work). Quote in figures only, unless words are specifically requested.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Base Bid</td>
<td>$</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>3.</td>
<td>Allowance 1 Unforeseen Site Conditions</td>
<td>$50,000</td>
</tr>
<tr>
<td>4.</td>
<td>Allowance 2 Coordination with existing Portables</td>
<td>$25,000</td>
</tr>
</tbody>
</table>

Total | TOTAL BID PRICE | $ |

Total Bid Price: ____________________________________________________________ (Words)

| Alternate No. 1 | $ | $ |
| Alternate No. 2 | $ | $ |

(if there are alternates, include scope reference)

5. Selection of Apparent Low Bidder. The undersigned acknowledges that the Apparent Low Bidder will be the Bidder submitting the “Total Bid Price” (i.e., the total of Bid Items 1 through 7) reduced by the value of Alternate No. 1, based on the assumptions (if any) set forth in the Schedule of Bid Prices. [Although Alternate No. 1 will be considered in the calculation of Apparent Low Bidder, Owner may exercise Alternate No. 1 in its sole discretion.]

6. Subcontractors for work included in all Bid items are listed on the attached Document 00430 (Subcontractors List).

7. The undersigned Bidder understands that Owner reserves the right to reject this Bid.

8. If written notice of the acceptance of this Bid, hereinafter referred to as Notice of Award, is mailed or delivered to the undersigned Bidder within the time described in Paragraph 2 of this Document 00400 or at any other time thereafter before it is withdrawn, the undersigned Bidder will execute and deliver the documents required by Document 00200 (Instructions to Bidders) within the times specified therein. These documents include, but are not limited to, Document 00520 (Agreement), Document 00610 (Construction Performance Bond), and Document 00620 (Construction Labor and Material Payment Bond).

9. Notice of Award or request for additional information may be addressed to the undersigned Bidder at the address set forth below.

10. The undersigned Bidder herewith encloses cash, a cashier’s check, or certified check of or on a responsible bank in the United States, or a corporate surety bond furnished by a surety authorized to do a surety
business in the State of California, in form specified in Document 00200 (Instructions to Bidders), in the amount of ten percent (10%) of the Total Bid Price and made payable to Owner.

10. The undersigned Bidder agrees to commence Work under the Contract Documents on the date established in Document 00700 (General Conditions) and to complete all Work within the time specified in Document 00520 (Agreement).

11. The undersigned Bidder agrees that, in accordance with Document 00700 (General Conditions), liquidated damages for failure to complete all Work in the Contract within the time specified in Document 00520 (Agreement) shall be as set forth in Document 00520 (Agreement).

12. The names of all persons interested in the foregoing Bid as principals are:

**IMPORTANT NOTICE:** If Bidder or other interested person is a corporation, give the legal name of corporation, state where incorporated, and names of president and secretary thereof; if a partnership, give name of the firm and names of all individual co-partners composing the firm; if Bidder or other interested person is an individual, give first and last names in full.

**NAME OF BIDDER:**
__________________________________________________________

licensed in accordance with an act for the registration of Contractors, and with license number: __________________

__________________________________________
Expiration: __________________

__________________________________________
(Place of Incorporation, if Applicable)            (Principal)

__________________________________________
(Principal)

__________________________________________
(Principal)

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

__________________________________________
(Signature of Bidder)

**NOTE:** If Bidder is a corporation, set forth the legal name of the corporation together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation. If Bidder is a partnership, set forth the name of the firm together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership.

**Business Address:**
__________________________________________

__________________________________________

__________________________________________
Contractor’s Representative(s):  
______________________________  
(Name/Title)  
______________________________  
(Name/Title)  
______________________________  
(Name/Title)  

Officers Authorized to Sign Contracts  
______________________________  
(Name/Title)  
______________________________  
(Name/Title)  
______________________________  
(Name/Title)  

Telephone Number(s):  
______________________________  
(Area Code)   (Number)  
______________________________  
(Area Code)   (Number)  

Fax Number(s):  
______________________________  
(Area Code)   (Number)  
______________________________  
(Area Code)   (Number)  

Date of Bid:  
______________________________  

END OF DOCUMENT
KNOW ALL BY THESE PRESENTS:

That the undersigned ____________________________________________________________,
(Name of Contractor)
as Principal and the undersigned as Surety are held and firmly bound unto The Peralta Community College District
(hereinafter “Owner”), as obligee, in the penal sum of ____________________________________________________________ Dollars ($________________) lawful money of the United States of America being at least ten percent (10%) of the aggregate amount of said Principal’s Total Bid Price, for the payment of which, well and truly to be made, we bind ourselves, our successors, executors, administrators, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the said Principal is submitting a Bid for Owner Bid Number 13-14/02, The Peralta Community College District College of Alameda Cougar Village Expansion Modular Bid Submittal Increment 1 at Purchasing Department, 501 5th Avenue, Oakland CA 94606, Attn: David Bui.

THE CONDITION OF THIS OBLIGATION IS SUCH that if the Bid submitted by the said Principal be accepted and the Contract be awarded to said Principal and said Principal shall within the required periods enter into the Contract so awarded and provide the required Construction Performance Bond, Construction Labor and Material Payment Bond, insurance certificates, and all other endorsements, forms, and documents required under Document 00200 (Instructions to Bidders), then this obligation shall be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument this _____ day of ________________________, [20____.]
(Month)

(Corporate Seal) By ________________________________
Principal

By ________________________________
Surety

(Corporate Seal) By ________________________________
Attorney in Fact

END OF DOCUMENT
BIDDER REGISTRATION FORM

INSTRUCTIONS

In order to register to undertake work for Peralta Community College District (hereinafter “Owner”), Bidder must:

1) Fill out this registration form completely; do not leave blanks.

2) Provide certificates of insurance or a letter evidencing coverage complying with Paragraph 4.1 of Document 00700 (General Conditions) and Document 00821 (Supplementary Conditions – Insurance).

INDEPENDENT CONTRACTOR REGISTRATION

Contractor’s License # _______________________________________________________

Date: ___________________________________________ Fed I.D. # ______________________

Full Corporate Name of Company: _______________________________________________

Street Address: __________________________________________________________________

____________________________________________________________________________

Mailing Address: ______________________________________________________________

____________________________________________________________________________

Phone: ____________________________ Fax: ____________________________

Name of Principal Contact: ____________________________________________________

Type of Business: ____________________________________________________________

_____ Sole Proprietor              _____ Partnership

_____ Non-Profit 501(c)(3)         _____ Corporation

_____ other (please explain: _________________________________________________)

INSURANCE

Workers’ Compensation:

Carrier: ___________________________________________________________________

Address: ___________________________________________________________________

Phone and Fax: ___________________________________________________________________

Policy Number: ___________________________________________________________________

00420- 1                                Bidder Registration Form
General Liability:
Carrier: 
Address: 
Phone and Fax: 
Policy Number: 
Policy Limits: $
A.M. Best Rating: 

Automobile Liability:
Carrier: 
Address: 
Phone and Fax: 
Policy Number: 
Policy Limits: $
A.M. Best Rating: 

All-risk Course of Construction:
Carrier: 
Address: 
Phone and Fax: 
Policy Number: 
Policy Limits: $
A.M. Best Rating: 

Pollution Legal Liability Insurance (if applicable, as required by Document 00821 [Supplementary Conditions – Insurance]):
Carrier: 
Address: 
Phone and Fax: 
Policy Number: 
Policy Limits: $
A.M. Best Rating: 

00420- 2 Bidder Registration Form
BIDDER CERTIFIES, UNDER PENALTY OF PERJURY, THAT THE FOREGOING INFORMATION IS CURRENT AND ACCURATE AND AUTHORIZES OWNER, AND ITS AGENTS AND REPRESENTATIVES TO OBTAIN A CREDIT REPORT AND/OR VERIFY ANY OF THE ABOVE INFORMATION.

BIDDER’S NAME: ________________________________________________

By: _____________________________________________________________

Signature

Its: _____________________________________________________________

Title

Date_____________________________________________________________
SAFETY EXPERIENCE

The following statements as to the Bidder’s safety experience are submitted with the Bid, as part thereof, and the Bidder guarantees the truthfulness and accuracy of all information.

1. List Bidder’s interstate Experience Modification Rate for the last three years.
   20___ _____ 20___ _____ 20___ _____

2. Use Bidder’s last year's Cal/OSHA 200 log to fill in the following number of injuries and illnesses:
   a. Number of lost workday cases _______________
   b. Number of medical treatment cases _______________
   c. Number of fatalities _______________

3. Employee hours worked last year _______________

4. State the name of Bidder’s safety engineer/manager: ____________________________________

   Attach a resume or outline of this individual’s safety and health qualifications and experience.

I CERTIFY, UNDER PENALTY OF PERJURY, THAT THE FOREGOING INFORMATION IS CURRENT AND ACCURATE AND I AUTHORIZE OWNER, AND ITS AGENTS AND REPRESENTATIVES TO OBTAIN A CREDIT REPORT AND/OR VERIFY ANY OF THE ABOVE INFORMATION.

BIDDER’S NAME: ____________________________________________________________

By: ____________________________________________________________
    Signature

Its: ____________________________________________________________
    Title

Date _____________________________________________________________________

END OF DOCUMENT
Bidder submits the following information as to the subcontractors Bidder intends to employ if awarded the Contract.

<table>
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<tr>
<th>Full Name of Subcontractor and Address of Mill or Shop</th>
<th>Description of Work: Reference To Bid Items</th>
<th>Subcontractor’s License No.</th>
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(Bidder to attach additional sheets if necessary)

END OF DOCUMENT
STATEMENT OF QUALIFICATIONS FOR CONSTRUCTION WORK

1 GENERAL INFORMATION

1.1 In Document 00100 Peralta Community College District ("Owner") has indicated that it will receive sealed Bids for the Contract for the construction of the Cougar Village Expansion, consisting of Modular Bid Submittal Increment 1, Bid No. 13-14/02. The Contract will require Contractor to construct the Project, all in accordance with the scope of Work set forth in the Contract.

1.1.1 Owner will accept Bids only from Bidders duly licensed in accordance with the California Business & Professions Code. Additionally, Bidder must meet the following requirements, at a minimum, in order to be considered by Owner to be qualified for award of the Contract:

(1) Three years experience as a continuously operating entity engaged in the performance of similar work.
(2) Within the past five years completed three DSA projects of a similar nature and complexity with a contract dollar amount of at least $5 million each, or $30 million in the aggregate.

1.1.2 Bidder’s compliance with the minimum qualification requirements in paragraph 1.1.1 of this document 00450 will also be measured by the experience of the supervisory personnel who will have responsible charge of the various major components of the Work.

(1) If Bidder subcontracts portions of the Work, Owner, in its determination of whether the minimum qualification requirements have been met, will consider the qualifications of the Subcontractor’s supervisory personnel.
(2) The qualifications of the Key Personnel are to be submitted with the SOQ, by providing the information described in paragraph 2.7 of this document 00450.

2 REQUIRED CONTENTS OF SOQ SUBMISSION

2.1 Transmittal Letter.

2.1.1 The Transmittal Letter shall name the proposed prime contractor, its legal structure (i.e., corporation, partnership, limited partnership, joint venture), and all of the Subcontractors to be used on the Project, and the roles and responsibilities proposed for each firm. If a joint venture or partnership is proposed, Bidder shall identify partner and/or member of the joint venture and their roles and responsibilities.

2.2 Financial Capacity.

2.2.1 Include audited or reviewed financial statements for the three most recently completed fiscal years for Bidder and each member of any proposed consorting or joint venture. Also include audited or reviewed financial statements for the three most recently completed fiscal years for any parent companies) of Bidder and each member of any proposed consortium oriole venture.

2.3 Capability to Provide Required Performance and Payment Bonds.

2.3.1 Bidder shall include a letter from a surety duly licensed to do business in the State of California that meets the required performance and payment bonds in accordance with the requirements set forth in Documents 00610 (Construction Performance Bond) and 00620 (Construction Labor and material Payment bold). Such performance and payment bonds shall be in the minimum penal sums provided therein. Bidder shall include authorization that gives Owner the right to verify with the surety that the surety, based upon the Bid prices, will issue the required bonds under the conditions stated.
2.4 **Capability to Provide the Required Insurance.**

2.4.1 Bidder shall provide a letter from an insurance underwriters confirming that the insurer will provide Bidder the required coverage’s and amounts specified in document 00700 (General Conditions).

2.5 **Human and Physical Resources.**

2.5.1 Bidder shall identify, describe, and quantify for itself and separately for its designated Subcontractor(s) (as defined in Document 00200 Instructions to Bidders), the following technical information for the construction work:

   (1) Description and location of manufacturing facilities, naming products and quantifying production capacity and current demand;
   (2) Description of field organization(s), naming skills and equipment;
   (3) Description of safety program quality control procedures, and safety experience; and
   (4) Evidence of a valid California contractor's license and required licenses of all licensees of persons who are Key Personnel if the Bidder or any designated Subcontractors.

2.6 **Completed Questionnaire.**

2.6.1 Bidder shall include a completed Statement of Qualification Questionnaire in the form attached to this Document 00450 as Attachment “A”. Bidder shall make sure its answers to the Questionnaire describe for itself its Key Personnel proposed, and its designated Subcontractor(s), their public works construction projects of at least $10 million each. Add supplementary information if necessary.

2.7 **Resumes of Proposed Key Personnel.**

2.7.1 Bidder shall provide a resume for each named Key Personnel of Bidder, and Bidder’s (including but not limited to the superintendent) designated Subcontractor(s), to include the following:

   (1) Name and proposed assignment of Key Personnel; do not include home addresses or phone numbers
   (2) Years of experience;
   (3) Education - degrees, schools and years obtained;
   (4) Professional Registrations;
   (5) Fluency in English (Yes/No);
   (6) Experience directly related to Modular Building projects;
   (7) At least two client references, including contact names, addresses and telephone numbers.
   (8) Description of projects of a similar nature worked on in the past five years.

2.8 **Litigation History.**

2.8.1 Description of litigation history for the past three years, including names of involved parties, nature of dispute, and disposition.

3 **GENERAL CONDITIONS**

3.1 **General Conditions for Content.**

3.1.1 The SOQ shall be clear and concise to enable management-oriented personnel to make a thorough evaluation and arrive at a sound determination as to whether the SOQ meet Owner's requirement. To this end, the SOQ should be so specific, detailed and complete as to demonstrate clearly and fully that the Bidder has a thorough understanding of and has demonstrated knowledge of the requirements to perform the Work (or applicable portion thereof).

3.2 **Explanations to SOQ.**

3.2.1 Any explanation requested by a Bidder regarding the meaning or interpretation of this Document 00450 must be requested in writing and with sufficient time allowed for a reply to reach Bidder before the submission of its SOQ. Oral explanations or instructions will not be binding. Any information provided to any prospective Bidder concerning this Document 00450 will be furnished to all prospective Bidders as an Addendum to the Bidding Documents.

3.3 **Definitions.**
3.3.1 Except as set forth herein, all abbreviations and definitions of terms used in this document 00450 are as set forth in Document 00700 (General Conditions) or Section 01420 (References and Definitions).

STATEMENT OF QUALIFICATION QUESTIONNAIRE FOLLOWS ON NEXT PAGE
ATTACHMENT “A” – Statement of Qualification Questionnaire

Bidders shall complete the entire Statement of Qualification Questionnaire and submit it in accordance with Document 00200 (Instructions to Bidders) and Document 00450 (Statement of Qualifications). Failure to complete the questionnaire or inclusion of any false statement(s) shall be ground for immediate disqualification.

CONTACT INFORMATION

Company Name: ________________________________________________________________

Owner of Company: ______________________________________________________________

Contact Person: _________________________________________________________________

Address: _______________________________________________________________________

Phone: ___________________________ Fax: ___________________________

PART A: GENERAL INFORMATION

1. Does Bidder possess a valid and current California Contractor’s license for the work proposed? Yes ___ No ___

2. Does Bidder have a minimum of $5,000,000 liability insurance coverage? Yes ___ No ___

3. Has Bidder’s License been revoked at any time in the last five years? Yes ___ No ___

4. Has Bidder been “default terminated” by an owner (other than for convenience), or has a Surety completed a contract for Bidder within the last five years? Yes ___ No ___

5. Has Bidder been convicted more than twice for failure to pay prevailing wages in the last three years? Yes ___ No ___

6. Has Bidder attached copies of its reviewed or audited financial statements and accompanying notes for the last three years? Yes ___ No ___

Bidder may be disqualified if any answer to questions 1, 2, or 6 is No.
Bidder may be disqualified if any answer to questions 3, 4, or 5 is Yes.

PART B: SAFETY, PREVAILING WAGE, DISPUTES AND BONDS

(SAFETY)

1. Has Cal/OHSA, Federal OSHA, the EPA or any Air Quality Management Owner cited Bidder in the past five years? Yes ___ No ___ If yes, attach description of each citation.

2. How often does Bidder require documented safety meetings be held for:
   - Field Supervisor: Weekly _____ Bi-Weekly _____ Monthly _____ Less Than Monthly _____
   - Employees: Weekly _____ Bi-Weekly _____ Monthly _____ Less Than Monthly _____
   - Subcontractors: Weekly _____ Bi-Weekly _____ Monthly _____ Less Than Monthly _____

3. How often does Bidder conduct documented safety inspections?
   - Quarterly _____ Semi-annually _____ Annually _____ Other _____
4. Does Bidder have home office safety representatives who visit/audit the job site?
   Quarterly _____ Semi-annually _____ Annually _____ Other _____

5. What is Bidder’s Interstate Experience Modification Rate? ____________. (A rating in excess of 11 may constitute grounds for disqualification as non-responsible).

(PREVAILING WAGE PROVISIONS)

6. Has Bidder been fined, penalized or otherwise found to have violated any prevailing wage or labor code provision? If yes, attach description of each occurrence.
   Yes _____ No _____

(LICENSE PROVISIONS)

7. Has Bidder changed names or license numbers in the past 5 years? If so, please state reason for change.
   Yes _____ No _____ Reason:
   ____________________________________________________________________________
   ____________________________________________________________________________

(DISPUTES)

8. Has Bidder had any claims, litigation, or disputes ending in mediation or arbitration, or termination for cause associated with any project in the past 5 years? If yes, attach description of each instance including details of total claim amount, settlement amount, and owner’s name and phone number.
   Yes _____ No _____

(BONDING)

9. Bonding Capacity – Provide documentation from Bidder’s surety identifying the following:
   Name of bonding company/surety: _____________________________________________
   Name of Surety Agent: ________________________________________________________
   Surety Agent address: ________________________________________________________
   Surety Agent phone number: _________________________________________________
   Is surety a California-admitted surety? Yes _____ No _____
   Is surety listed in the current edition of the California Department of the Treasury’s Listing of approved sureties? Yes _____ No _____
   List surety’s A.M. Best Rating: _______________________________________________
   What is Bidder’s total bonding capacity? _______________________________________
   What percent does Bidder pay for bonds? _______________________________________

PART C: EXPERIENCE OF PRIME CONTRACTOR

The unique nature of this Project requires prior similar experience for the firm and the Key Personnel assigned. Summarize similar project experience below and provide the detailed project information requested:

Prime Contractor. List 3 Modular Building Projects DSA approved projects with a construction cost of at least $1 million each, or $30 million in the aggregate, completed in the past five years, and indicate who were the superintendent, project manager and scheduler:
List Key Personnel that will be assigned to the Work of the current Project and their experience/training with the projects listed above:

- **Project Manager:** ________________________________________________________________
- **Project Superintendent:** ___________________________________________________________
- **Project Scheduler:** _______________________________________________________________

**Recent Projects.**

Bidder shall provide information about five of its most currently completed projects. Names and references must be current and verifiable. If a separate sheet is used, it must contain all of the following information:

1. **Project Name:** ________________________________________________________________
   - Location: ______________________________________________________________________
   - Owner: _________________________________________________________________________
   - Owner Contact (name and phone): __________________________________________________________________________

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Construction Cost ($)</th>
<th>Year Completed</th>
<th>Name of Project Superintendent</th>
<th>Name of Project Manager</th>
<th>Name of Project Scheduler</th>
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</table>
Architect/Engineer: __________________________________________________________

Architect/Engineer Contact (name and phone number): __________________________________

Const. Mgr. or Project Mgr. (name and phone number): __________________________________

Description of Project, Scope of Work Performed: _______________________________________

__________________________________________________________________________________

Total Construction Cost: ______________________________________________________________

Total Change Order Amount: ___________________________________________________________

Did Change Orders exceed 10% of original contract sum? __________ If yes, please explain on separate sheet.

Original Scheduled Date of Completion: _______________________________________________

Time Extensions Granted (number of Days): _____________________________________________

Actual Date of Completion: ___________________________________________________________

Number of Stop Notices filed by Subcontractors or Suppliers: ________________________________

2. Project Name: ______________________________________________________________________

Location: __________________________________________________________________________

Owner: ____________________________________________________________________________

Owner Contact (name and phone): ______________________________________________________

Architect/Engineer: _________________________________________________________________

Architect/Engineer Contact (name and phone number): ____________________________

Const. Mgr. Or Project Mgr. (name and phone number): _________________________________

Description of Project, Scope of Work Performed: _______________________________________

__________________________________________________________________________________

Total Construction Cost: ______________________________________________________________

Total Change Order Amount: ___________________________________________________________

Did Change Orders exceed 10% of original contract sum? __________ If yes, please explain on separate sheet.

Original Scheduled Date of Completion: _______________________________________________

Time Extensions Granted (number of Days): _____________________________________________

Actual Date of Completion: ___________________________________________________________

Number of Stop Notices filed by Subcontractors or Suppliers: ________________________________

3. Project Name: ______________________________________________________________________
Location: __________________________________________________________________________

Owner: ____________________________________________________________________________

Owner Contact (name and phone): __________________________________________________________________________

Architect/Engineer: ____________________________________________________________________________

Architect/Engineer Contact (name and phone number): ______________________________________________

Const. Mgr. Or Project Mgr. (name and phone number): __________________________________________

Description of Project, Scope of Work Performed: ________________________________________________

__________________________________________________________________________________

Total Construction Cost: ______________________________________________________________

Total Change Order Amount: _____________________________________________________________

Did Change Orders exceed 10% of original contract sum? ___________ If yes, please explain on separate sheet.

Original Scheduled Date of Completion: _________________________________________________

Time Extensions Granted (number of Days): ______________________________________________

Actual Date of Completion: _____________________________________________________________

Number of Stop Notices filed by Subcontractors or Suppliers: ________________________________

4. Project Name: ______________________________________________________________________

Location: __________________________________________________________________________

Owner: ____________________________________________________________________________

Owner Contact (name and phone): __________________________________________________________________

Architect/Engineer: __________________________________________________________________

Architect/Engineer Contact (name and phone number): ________________________________

Const. Mgr. Or Project Mgr. (name and phone number): ________________________________

Description of Project, Scope of Work Performed: ________________________________________________

__________________________________________________________________________________

Total Construction Cost: ______________________________________________________________

Total Change Order Amount: _____________________________________________________________

Did Change Orders exceed 10% of original contract sum? ___________ If yes, please explain on separate sheet.

Original Scheduled Date of Completion: _________________________________________________

Time Extensions Granted (number of Days): ______________________________________________
Actual Date of Completion: ___________________________________________________________

Number of Stop Notices filed by Subcontractors or Suppliers: _____________________________

5. Project Name: ______________________________________________________________________

Location: __________________________________________________________________________

Owner: ____________________________________________________________________________

Owner Contact (name and phone): _____________________________________________________

Architect/Engineer: __________________________________________________________________

Architect/Engineer Contact (name and phone number): __________________________________

Const. Mgr. Or Project Mgr. (name and phone number): _________________________________

Description of Project, Scope of Work Performed: _______________________________________

__________________________________________________________________________________

Total Construction Cost: ______________________________________________________________

Total Change Order Amount: __________________________________________________________

Did Change Orders exceed 10% of original contract sum? ___________ If yes, please explain on separate sheet.

Original Scheduled Date of Completion: ________________________________________________

Time Extensions Granted (number of Days): _____________________________________________

Actual Date of Completion: ___________________________________________________________________

Number of Stop Notices filed by Subcontractors or Suppliers: _________________________________

PART D: EXPERIENCE OF DESIGNATED SUBCONTRACTOR(S)

The unique nature of this Project requires prior similar experience of the designated Subcontractor(s) and the Key Personnel assigned. Summarize similar project experience below and provide the detailed project information requested for each of the designated Subcontractor(s). Also expressly indicate which, if any, of the designated Subcontractor(s) functions Bidder will perform itself.

**Mechanical Subcontractor:** List three similar typed projects completed in the past five years and indicate who were the superintendent and scheduler.

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<tr>
<th>Project Name</th>
<th>Construction Cost ($)</th>
<th>Year Completed</th>
<th>Name of Project Manager</th>
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</table>
List Key Personnel that will be assigned to the Work:

Project Manager: ________________________________________________________________

Project Superintendent: _________________________________________________________

**Electrical Subcontractor:** List three similar typed projects completed in the past five years and indicate who were the superintendent and scheduler.

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<th>Project Name</th>
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<th>Name of Project Manager</th>
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List Key Personnel that will be assigned to the Work:

Project Manager: ________________________________________________________________

Project Superintendent: _________________________________________________________

**Specialty Subcontractor:** List three similar typed projects completed in the past five years and indicate who were the superintendent and scheduler.

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List Key Personnel that will be assigned to the Work:

Project Manager: ________________________________________________________________

Project Superintendent: _________________________________________________________

**Recent Projects.**

Provide information about three of its most recently completed, similar projects for each of the designated Subcontractor(s). Names and references must be current and verifiable. Use additional sheets if necessary. If a separate sheet is used, it must contain all of the following information for each of the designated Subcontractor(s):

1. Project Name: ________________________________________________________________
Location: __________________________________________

Owner: __________________________________________

Owner Contact (name and phone): ________________________

Architect/Engineer: _________________________________

Architect/Engineer Contact (name and phone number): ________________________

Prime Contractor: _________________________________

Prime Contractor Contact (name and phone number): ________________________

Const. Mgr. Or Project Mgr. (name and phone number): ________________________

Description of Project, Scope of Work Performed: __________________________

Value of Construction Contract: ________________________

Value of Change Orders: ______________________________

Original Scheduled Date of Completion: ________________________

Time Extensions Granted (number of Days): ________________________

Actual Date of Completion: ________________________

Number of Stop Notices filed by Subcontractors or Suppliers: ________________________

2. Project Name: __________________________________________

Location: __________________________________________

Owner: __________________________________________

Owner Contact (name and phone): ________________________

Architect/Engineer: _________________________________

Architect/Engineer Contact (name and phone number): ________________________

Prime Contractor: _________________________________

Prime Contractor Contact (name and phone number): ________________________

Const. Mgr. Or Project Mgr. (name and phone number): ________________________

Description of Project, Scope of Work Performed: __________________________

Value of Construction Contract: ________________________

Value of Change Orders: ______________________________
Original Scheduled Date of Completion: _________________________________________________

Time Extensions Granted (number of Days): ______________________________________________

Actual Date of Completion: ____________________________________________________________

Number of Stop Notices filed by Subcontractors or Suppliers: ________________________________

3. Project Name: ______________________________________________________________________

Location: __________________________________________________________________________

Owner: ____________________________________________________________________________

Owner Contact (name and phone): ______________________________________________________

Architect/Engineer: __________________________________________________________________

Architect/Engineer Contact (name and phone number): ______________________________________

Prime Contractor: ___________________________________________________________________

Prime Contractor Contact (name and phone number):  _______________________________________

Const. Mgr. Or Project Mgr. (name and phone number): _____________________________________

Description of Project, Scope of Work Performed: __________________________________________

__________________________________________________________________________________

Value of Construction Contract: ________________________________________________________

Value of Change Orders: ________________________________________________________________

Original Scheduled Date of Completion: _________________________________________________

Time Extensions Granted (number of Days): ______________________________________________

Actual Date of Completion: ____________________________________________________________

Number of Stop Notices filed by Subcontractors or Suppliers: ________________________________

PART E: FINANCIAL INFORMATION

1. Has Bidder ever reorganized under the protection of bankruptcy laws?  
   Yes _____ No _____ If yes, please state when ________________

2. If Bidder has had the general liability carrier identified in Document 00420 (Bidder Registration and Safety 
   Experience Form) for less than 5 years, please provide additional information below for balance of the last 5 
   years:

   Agency Name: ______________________________________________________________________

   Contact Name: ______________________________________________________________________

   Phone Number: ______________________________________________________________________
Carrier: ________________________________ A.M. Best Rating: _________________________

Carrier: ________________________________ A.M. Best Rating: _________________________

Carrier: ________________________________ A.M. Best Rating: _________________________

3. Has Bidder ever had insurance terminated by a carrier? Yes _____ No _____
   If yes, explain on a separate signed sheet marked with correlating cross-reference to this paragraph of the questionnaire.

Bidder hereby declares under penalty of perjury that all the information provided in this questionnaire is true and correct.

________________________________________________
SIGNATURE

_______________________________________
TITLE

END OF DOCUMENT
DOCUMENT 00481

NON-COLLUSION AFFIDAVIT

PUBLIC CONTRACT CODE §7106

NON-COLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

STATE OF CALIFORNIA )
) ss.
COUNTY OF _________________)

__________________________, being first duly sworn,

(Name of Principal of Bidder)

deposes and says that he or she is ________________________________, (Office of Affiant)

of _________________________________________________________________________________, the party

(Name of Bidder)

making the foregoing Bid, that the Bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the Bid is genuine and not collusive or sham; that 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 bidder or anyone else to put in a sham Bid, or that anyone shall refrain from bidding, and that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the Bid price of Bidder or any other bidder, or to fix any overhead, profit or cost element of the Bid price, or of that of any other bidder, or to secure any advantage against OWNER, or anyone interested in the proposed contract; that all statements contained in the Bid are true; and further, that Bidder has not, directly or indirectly, submitted its 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 corporation, partnership, company association, organization, Bid depository, or to any member or agent thereof to effectuate a collusive or sham Bid.

Executed under penalty of perjury under the laws of the State of California:

______________________________
(Name of Bidder)

______________________________
(Signature of Principal)

Subscribed and sworn before me ________________________________

This _____________ day of ____________________________, 20____

Notary Public of the State of ________________________________

In and for the County of ________________________________

My Commission expires ________________________________ (Seal)
NOTE: If Bidder is a partnership or a joint venture, this affidavit must be signed and sworn to by every member of the partnership or venture.

NOTE: If Bidder [including any partner or venturer of a partnership or joint venture] is a corporation, this affidavit must be signed by the Chairman, President, or Vice President and by the Secretary, Assistant Secretary, Chief Financial Officer, or Assistant Treasurer.

NOTE: If Bidder’s affidavit on this form is made outside the State of California, the official position of the person taking such affidavit shall be certified according to law.

END OF DOCUMENT
BIDDER CERTIFICATIONS

Peralta Community College District
College of Alameda
Cougar Village Expansion
Modular Bid Submittal Increment 1
AT
555 Atlantic Avenue (Ralph Appezzato Memorial Parkway)
Alameda, CA 94501

BID NUMBER 13-14/02, (Project No. 2399)

TO BE EXECUTED BY ALL BIDDERS AND SUBMITTED WITH BID

The undersigned Bidder certifies to Peralta Community College District as set forth in sections 1 through 5 below.

1. STATEMENT OF CONVICTIONS

By my signature hereunder, I hereby swear, under penalty of perjury, that no more than one final, unappealable finding of contempt of court by a Federal Court has been issued against Bidder within the past two years because of failure to comply with an order of a Federal Court or to comply with an order of the National Labor Relations Board.

2. CERTIFICATION OF WORKER’S COMPENSATION INSURANCE

By my signature hereunder, as the Contractor, I certify that I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for worker’s compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this Contract.

3. CERTIFICATION OF PREVAILING WAGE RATES AND RECORDS

By my signature hereunder, as the Contractor, I certify that I am aware of the provisions of Section 1773 of the California Labor Code, which requires the payment of prevailing wage on public projects. Also, that the Contractor and any subcontractors under the Contractor shall comply with California Labor Code §1776, regarding wage records, and with California Labor Code §1777.5, regarding the employment and training of apprentices. It is the Contractor’s responsibility to ensure compliance by any and all subcontractors performing work under this Contract.

4. CERTIFICATION OF COMPLIANCE WITH PUBLIC WORKS CHAPTER OF LABOR CODE

By my signature hereunder, as the Contractor, I certify that I am aware of Sections 1777.1 and 1777.7 of the California Labor Code and Contractor and Subcontractors and am eligible to bid and work on public works projects.
5. CERTIFICATION OF ADEQUACY OF CONTRACT AMOUNT

By my signature hereunder, as the Contractor, pursuant to Labor Code Section 2810(a), I certify that, if awarded the Contract based on the undersigned’s Bid, the Contract will include funds sufficient to allow the Contractor to comply with all applicable local, state, and federal laws or regulations governing the labor or services to be provided. I understand that the County will be relying on this certification if it awards the Contract to the undersigned.

END OF DOCUMENT
NOTICE OF INTENT TO AWARD FOR CONSTRUCTION

DATE POSTED: ___________________________, 20____

CONTRACT NO. __________

PROJECT TITLE:

College of Alameda
Cougar Village Expansion
Modular Bid Submittal Increment 1
(Bid No.: 13-14/02)
(Project No. 2399)

Peralta Community College District intends to recommend to its [Board of Trustees / Supervisors / Directors] award of the above-referenced project to
(Name of Contractor) __________________________________________________________

SIGNATURE ____________________________ DATE ______________________

____________________________________ Title

END OF DOCUMENT
DOCUMENT 00510

NOTICE OF AWARD

Dated __________________________

TO: ____________________________________________________________

ADDRESS: ______________________________________________________________________________

CONTRACT NO.: ______________________________

CONTRACT FOR: PERALTA COMMUNITY COLLEGE DISTRICT ("OWNER")
COUGAR VILLAGE EXPANSION, MODULAR BID INCREMENT 1 AT COLLEGE OF
ALAMEDA, 555 RALPH APPEZZATO MEMORIAL PARKWAY, ALAMEDA, CA 94501

The Contract Sum of your contract is ________________________________________________________________

______________________________________________________________________ Dollars ($_____________).

1. Several copies of the proposed Contract Documents listed below accompany this Notice of Award.

2. You must comply with the following conditions precedent by 5:00 p.m. of the 20th Day following the date
   of this Notice of Award, that is, by [Day of the Week, Month Day, 20____].

   a. Deliver to Owner four fully executed counterparts of Document 00520 (Agreement). Each copy of
      Document 00520 (Agreement) must bear your original signature on the signature page and your initials
      on each page.

   b. Deliver to Owner one original of Document 00610 (Construction Performance Bond), executed by you
      and your surety.

   c. Deliver to Owner one original of Document 00620 (Construction Labor and Material Payment Bond),
      executed by you and your surety.

   d. Deliver to Owner one original set of the insurance certificates with endorsements required under
      Document 00700 (General Conditions) and Document 00821 (Supplementary Conditions – Insurance).

   e. Deliver to Owner four original copies of Document 00630 (Guaranty), each executed by you.

3. Failure to comply with these conditions within the time specified will entitle Owner to consider your Bid
   abandoned, to annul this Notice of Award, and to declare your Bid security forfeited.

4. Within 21 Days after you comply with the conditions in Paragraph 2 of this Document 00510, Owner will
   return to you one fully signed counterpart of Document 00520 (Agreement) with [insert number] copies of
the Project Manual (including Specifications and Drawings) and [insert number] sets of full-size Drawings.

5. Before you may start any Work at the Site, you must attend a preconstruction conference. The preconstruction conference may be arranged through [ENTER OWNER CONTACT INFORMATION]. Questions regarding bonds and insurance may be directed to [ENTER OWNER CONTACT / REPRESENTATIVE] at the same number. All other inquiries regarding the Project should be directed to [ENTER OWNER CONTACT / REPRESENTATIVE].

6. Upon commencement of the Work, you and each of your Subcontractors shall certify and provide Owner copies of payroll records on forms provided by the Division of Labor Standards Enforcement, in accordance with California Labor Code §1776.

OWNER: [ENTER NAME OF OWNER]

BY: ____________________________________________
    (Title)

________________________________________
    (Print Name)

ATTEST: ______________________________________
    Secretary

________________________________________
    (Print Name)

AUTHORIZED BY BOARD RESOLUTION:

NO: ______________________________________

ADOPTED: ________________________________, 20___

[Copy of Resolution Attached]

END OF DOCUMENT
AGREEMENT

THIS AGREEMENT, dated this [date] day of [Month], [201__], by and between [Name of Contractor] whose place of business is located at [Address of Contractor] (“Contractor”), and [Insert Name of Owner] (“Owner”), acting under and by virtue of the authority vested in Owner by the laws of the State of California.

WHEREAS, Owner, by its Resolution No. [insert number] adopted on the [date] day of [Month, Year] awarded to Contractor the following Contract:

   Project No. 2399, Bid No. 13-14/02
   College of Alameda Cougar Village Expansion Modular Bid Submittal Increment 1
   at 555 Ralph Appezzato Memorial Parkway
   Alameda, CA 94501

NOW, THEREFORE, in consideration of the mutual covenants hereinafter set forth, Contractor and Owner agree as follows:

1 SCOPE OF WORK OF THE CONTRACT

1.1 Work of the Contract

1.1.1. Contractor shall complete all Work specified in the Contract Documents, in accordance with the Specifications, Drawings, and all other terms and conditions of the Contract Documents (Work).

1.2 Price for Completion of the Work

1.2.1. Owner shall pay Contractor the following Contract Sum (Contract Sum) for completion of Work in accordance with Contract Documents as set forth in Contractor’s Bid, attached hereto.

   [ATTACHMENT]

2 COMMENCEMENT AND COMPLETION OF WORK

2.1 Commencement of Work

2.1.1. Contractor shall commence Work on the date established in the Notice to Proceed (Commencement Date).

2.1.2. Owner reserves the right to modify or alter the Commencement Date.

2.2 Completion of Work

2.2.1. Contractor shall achieve Substantial Completion of the entire Work within [_____] Days from the Commencement Date.

2.2.2. Contractor shall achieve Final Completion of the entire Work [_____] Days from the Commencement Date.

3 PROJECT REPRESENTATIVES

3.1 Owner’s Project Manager

3.1.1. Owner has designated [_______ or other] as its Project Manager to act as Owner’s Representative in all matters relating to the Contract Documents.

3.1.2. Project Manager shall have final authority over all matters pertaining to the Contract Documents and shall have sole authority to modify the Contract Documents on behalf of
Owner, to accept work, and to make decisions or actions binding on Owner, and shall have sole signature authority on behalf of Owner.

3.1.3. Owner may assign all or part of the Project Manager’s rights, responsibilities and duties to a Construction Manager, or other Owner Representative.

3.2 Contractor’s Project Manager

3.2.1. Contractor has designated [_______ or other] as its Project Manager to act as Contractor’s Representative in all matters relating to the Contract Documents.

3.3 Architect/Engineer

3.3.1. [Identify Architect/Engineer] furnished the Plans and Specifications and shall have the rights assigned to Architect/Engineer in the Contract Documents.

3.3.2. Architect/Engineer has designated [_______] as its project manager, to act as its representative for receiving and making communications authorized under the Contract Documents.

4 LIQUIDATED DAMAGES FOR DELAY IN COMPLETION OF WORK

4.1 Liquidated Damage Amounts

4.1.1. As liquidated damages for delay Contractor shall pay Owner ______________ dollars ($_______.00) for each Day that expires after the time specified herein for Contractor to achieve Substantial Completion of the entire Work, until achieved.

4.1.2. As liquidated damages for delay Contractor shall pay Owner ______________ dollars ($_______.00) for each Day that expires after the time specified herein for Contractor to achieve Final Completion of the entire Work, until achieved.

4.2 Scope of Liquidated Damages

4.2.1. Measures of liquidated damages shall apply cumulatively.

4.2.2. Limitations and stipulations regarding liquidated damages are set forth in Document 00700 (General Conditions).

5 CONTRACT DOCUMENTS

5.1 Contract Documents consist of the following documents, including all changes, Addenda, and Modifications thereto:

- Document 00510 Notice of Award
- Document 00520 Agreement
- Document 00550 Notice to Proceed
- Document 00610 Construction Performance Bond
- Document 00620 Construction Labor and Material Payment Bond
- Document 00630 Guaranty
- Document 00650 Release of Claims
- Document 00660 Substitution Request Form
- Document 00680 Escrow Agreement for Security Deposits
- Document 00700 General Conditions
- Document 00800 Supplementary Conditions
- Document 00805 Supplemental Conditions – Hazardous Materials
- Document 00806 Labor Compliance Program [If Required by Funding Source]
- Document 00821 Supplementary Conditions – Insurance and Indemnification
- Document 00822 Apprenticeship Programs
- Document 00910 Addenda
- Specifications Divisions 1 through [___]
- Drawings listed in Drawing No. ______ - ______ OR [Maps, Drawings and Sketches listed in Document 00015 (if any)]
5.2 There are no Contract Documents other than those listed above. The Contract Documents may only be amended, modified or supplemented as provided in Document 00700 (General Conditions).

6 MISCELLANEOUS

6.1 Terms and abbreviations used in this Agreement are defined in Document 00700 (General Conditions) and Section 01420 (References and Definitions) and will have the meaning indicated therein.

6.2 It is understood and agreed that in no instance are the persons signing this Agreement for or on behalf of Owner or acting as an employee, agent, or representative of Owner, liable on this Agreement or any of the Contract Documents, or upon any warranty of authority, or otherwise, and it is further understood and agreed that liability of Owner is limited and confined to such liability as authorized or imposed by the Contract Documents or applicable law.

6.3 The Contract Sum includes all allowances (if any).

6.4 In entering into a public works contract or a subcontract to supply goods, services or materials pursuant to a public works contract, Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. §15) or under the Cartwright Act (Chapter 2 (commencing with §16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time Owner tenders final payment to Contractor, without further acknowledgment by the parties.

6.5 Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are deemed included in the Contract Documents and on file at Owner’s Office, and shall be made available to any interested party on request. Pursuant to California Labor Code §§ 1860 and 1861, in accordance with the provisions of Section 3700 of the Labor Code, every contractor will be required to secure the payment of compensation to his employees. Contractor represents that it is aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor shall comply with such provisions before commencing the performance of the Work of the Contract Documents.

6.6 This Agreement and the Contract Documents shall be deemed to have been entered into in the County of [____], State of California, and governed in all respects by California law (excluding choice of law rules). The exclusive venue for all disputes or litigation hereunder shall be in the Superior Court for the County of [____].

IN WITNESS WHEREOF the parties have executed this Agreement in quadruplicate the day and year first above written.

CONTRACTOR: [CONTRACTOR'S NAME]

By: ______________________________  By: ______________________________
   (Signature)     (Signature)

Its: _______________________________  Its: ________________________________
   Title (If Corporation: Chairman, President or Vice President)     Title (If Corporation: Secretary, Assistant Secretary, Chief Financial Officer or Assistant Treasurer)

OWNER: [INSERT NAME OF OWNER]

By:_______________________________
(Signature)

________________________________________ (Print Name)

________________________________________ (Title)

Attest:___________________________________
     Secretary

________________________________________ (Print Name)

APPROVED AS TO FORM AND LEGALITY
THIS __ DAY OF ____, [201__]

By:_______________________________________
     Attorney for Owner

________________________________________ (Print Name)

RESOLUTION NO. _________________________

END OF DOCUMENT
NOTICE TO PROCEED

Dated: ______________________, 20____

To: _____________________________________________________________________________
   (Contractor)

Address: __________________________________________________________________________

CONTRACT FOR: Peralta Community College District
COLLEGE OF ALAMEDA, COUGAR VILLAGE EXPANSION, MODULAR BID
SUBMITTAL INCREMENT 1

BID NO: 13-14/02

You are notified that the Contract Time under the above Contract will commence to run on ______________________, 20____. On that date, you are to start performing your obligations with respect to Work at the Site under the Contract Documents. In accordance with Article 3 of Document 00520 (Agreement), the dates of Substantial Completion and Final Completion for the entire Work are ______________________, 20____ and ______________________, 20____, respectively.

Before you may start any Work at the Site, you must:

1. Submit certified Safety Program and related information
2. Submit copies of applicable permits
3. Submit approved fire protection plan, if applicable
4. [Other]

END OF DOCUMENT
CONSTRUCTION PERFORMANCE BOND

THIS CONSTRUCTION PERFORMANCE BOND ("Bond") is dated [Month, Day], 20____ is in the penal sum of _______________________, which is one hundred percent of the Contract Sum, and is entered into by and between the parties listed below to ensure the faithful performance of the Construction Contract listed below. This Bond consists of this page and the Bond Terms and Conditions, Paragraphs 1 through 12, attached to this page. Any singular reference to ____________________________________________ ("Contractor"), ____________________________________________ ("Surety"), ____________________________________________ ("Surety"), ____________________________________________ (hereinafter "Owner"), or other party shall be considered plural where applicable.

CONTRACTOR:

_________________________ ____________________________
Name        Name
_________________________ ____________________________
Address        Principal Place of Business
_________________________ ____________________________
City/State/Zip       City/State/Zip

CONSTRUCTION CONTRACT:

College of Alameda
Cougar Village Expansion
Modular Bid Submittal Increment 1
(Bid No.: 13-14/02)
(Project No. 2399)

College of Alameda
555 Ralph Appezzato Memorial Parkway

DATED ______________________, 20____ in the amount of $______________________________ (the "Penal Sum").

CONTRACTOR AS PRINCIPAL          SURETY

Company: (Corp. Seal)          Company: (Corp. Seal)

Signature: ____________________________      Signature: ____________________________

Name: ____________________________      Name: ____________________________
BOND TERMS AND CONDITIONS

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to Owner for the complete and proper performance of the Construction Contract, which is incorporated herein by reference.

2. If Contractor completely and properly performs all of its obligations under the Construction Contract, Surety and Contractor shall have no obligation under this Bond.

3. If there is no Owner Default, Surety’s obligation under this Bond shall arise after:
   3.1 Owner has declared a Contractor Default under the Construction Contract pursuant to the terms of the Construction Contract; and
   3.2 Owner has agreed to pay the Balance of the Contract Sum:
       3.2.1 To Surety in accordance with the terms of this Bond and the Construction Contract; or
       3.2.2 To a contractor selected to perform the Construction Contract in accordance with the terms of this Bond and the Construction Contract.

4. When Owner has satisfied the conditions of Paragraph 3, Surety shall promptly (within 60 Days) and at Surety’s expense elect to take one of the following actions:
   4.1 Arrange for Contractor, with consent of Owner, to perform and complete the Construction Contract (but Owner may withhold consent, in which case the Surety must elect an option described in Paragraphs 4.2, 4.3 or 4.4, below); or
   4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; provided, that Surety may not select Contractor as its agent or independent contractor without Owner’s consent; or
   4.3 Undertake to perform and complete the Construction Contract by obtaining bids from qualified contractors acceptable to Owner for a contract for performance and completion of the Construction Contract and, upon determination by Owner of the lowest responsive and responsible Bidder, arrange for a contract to be prepared for execution by Owner and the contractor selected with Owner’s concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract; and, if Surety’s obligations defined in Paragraph 6, below, exceed the Balance of the Contract Sum, then Surety shall pay to Owner the amount of such excess; or
   4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances and, after investigation and consultation with Owner, determine in good faith its monetary obligation to Owner under Paragraph 6, below, for the performance and completion of the Construction Contract and, as soon as practicable after the amount is determined, tender payment therefor to Owner with full explanation of the payment’s calculation. If Owner accepts Surety’s tender under this Paragraph 4.4, Owner may still hold Surety liable for future damages then unknown or unliquidated resulting from the Contractor Default. If Owner disputes the amount of Surety’s tender under this Paragraph 4.4, Owner may exercise all remedies available to it at law to enforce Surety’s liability under Paragraph 6, below.

5. If Surety does not proceed as provided in Paragraph 4, above, then Surety shall be deemed to be in default on this Bond ten Days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond. At all times Owner shall be entitled to enforce any remedy available to Owner at law or under the Construction Contract including, without limitation, and by way of
example only, rights to perform work, protect Work, mitigate damages, advance critical Work to mitigate schedule delay, or coordinate Work with other consultants or contractors.

6. Surety’s monetary obligation under this Bond is limited by the amount of this Bond identified herein as the Penal Sum. This monetary obligation shall augment the Balance of the Contract Sum. Subject to these limits, Surety’s obligations under this Bond are commensurate with the obligations of Contractor under the Construction Contract. Surety’s obligations shall include, but are not limited to:

6.1 The responsibilities of Contractor under the Construction Contract for completion of the Construction Contract and correction of Defective Work;

6.2 The responsibilities of Contractor under the Construction Contract to pay liquidated damages.

6.3 Additional legal, design professional and delay costs resulting from Contractor Default or resulting from the actions or failure to act of the Surety under Paragraph 4, above (but excluding attorney’s fees incurred to enforce this Bond).

7. No right of action shall accrue on this Bond to any person or entity other than Owner or its successors or assigns.

8. Surety hereby waives notice of any change, alteration or addition to the Construction Contract or to related subcontracts, purchase orders and other obligations, including changes of time. Surety consents to all terms of the Construction Contract, including provisions on changes to the Contract. No extension of time, change, alteration, Modification, deletion, or addition to the Contract Documents, or of the Work required thereunder, shall release or exonerate Surety on this Bond or in any way affect the obligations of Surety on this Bond unless such change, alteration, Modification, deletion or addition is a cardinal change.

9. Any proceeding, legal or equitable, under this Bond shall be instituted in any court of competent jurisdiction where a proceeding is pending between Owner and Contractor regarding the Construction Contract, or in the courts of the County of Kern, or in a court of competent jurisdiction in the location in which the Work is located. Communications from Owner to Surety under Paragraph 3.1 of this Bond shall be deemed to include the necessary agreements under Paragraph 3.2 of this Bond unless expressly stated otherwise.

10. All notices to Surety or Contractor shall be mailed or delivered (at the address set forth on the signature page of this Bond), and all notices to Owner shall be mailed or delivered as provided in Document 00520 (Agreement). Actual receipt of notice by Surety, Owner or Contractor, however accomplished, shall be sufficient compliance as of the date received at the foregoing addresses.

11. Any provision in this Bond conflicting with any statutory or regulatory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein.

12. Definitions

12.1 Balance of the Contract Sum: The total amount payable by Owner to Contractor pursuant to the terms of the Construction Contract after all proper adjustments have been made under the Construction Contract, for example, deductions for progress payments made, and increases/decreases for approved Modifications to the Construction Contract.

12.2 Construction Contract: The agreement between Owner and Contractor identified on the signature page of this Bond, including all Contract Documents and changes thereto.

12.3 Contractor Default: Material failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract, limited to “default”
or any other condition allowing a termination for cause as provided in Document 00700 (General Conditions).

12.4 Owner Default: Material failure of Owner, which has neither been remedied nor waived, to pay Contractor progress payments due under the Construction Contract or to perform other material terms of the Construction Contract, if such failure is the cause of the asserted Contractor Default and is sufficient to justify Contractor termination of the Construction Contract.

END OF DOCUMENT
DOCU\n\nM 00620
\nCONSTRUCTION LABOR AND MATERIAL PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS:

1.01 THAT WHEREAS, (Name of Owner) (“Owner”) has awarded to (Name of Contractor) as Principal Contract Number dated the day of , 20 (the “Contract”), titled THE PROJECT in the amount of $ , which Contract is by this reference made a part hereof, for the work of the following Contract:

(Describe Contract Work)

A. AND WHEREAS, Principal is required to furnish a bond in connection with the Contract to secure the payment of claims of laborers, mechanics, material suppliers, and other persons as provided by law;

B. NOW, THEREFORE, we, the undersigned Principal and (Name of Surety) , as Surety, are held and firmly bound unto Owner in the sum of 100% OF THE CONTRACT PRICE ($ ), for which payment well and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

C. THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its executors, administrators, successors, or assigns approved by Owner, or its subcontractors shall fail to pay any of the persons named in California Civil Code §3181, or amounts due under the State of California Unemployment Insurance Code with respect to work or labor performed under the Contract, or for any amounts required to be deducted, withheld, and paid over to the State of California Employment Development Department from the wages of employees of Principal and subcontractors pursuant to Section 13020 of the State of California Unemployment Insurance Code with respect to such work and labor, that Surety will pay for the same in an amount not exceeding the sum specified in this bond, plus reasonable attorneys’ fees, otherwise the above obligation shall become and be null and void.

D. This bond shall inure to the benefit of any of the persons named in California Civil Code §3181, as to give a right of action to such persons or their assigns in any suit brought upon this bond. The intent of this bond is to comply with the California Mechanic’s Lien Law.

E. Surety, for value received, hereby expressly agrees that no extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder, shall in any way affect the obligation of this bond; and it does hereby waive notice of any such extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder.

F. Surety’s obligations hereunder are independent of the obligations of any other surety for the payment of claims of laborers, mechanics, material suppliers, and other persons in connection with Contract; and suit may be brought against Surety and such other sureties, jointly and severally, or against any one or more of them, or against less than all of them without impairing Owner’s rights against the other.

G. Correspondence or claims relating to this bond shall be sent to Surety at the address set forth below.
IN WITNESS WHEREOF, we have hereunto set our hands this ____ day of __________, 20___.

**CONTRACTOR AS PRINCIPAL**

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**SURETY**

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END OF DOCUMENT
GUIARRANTY

TO: Peralta Community College District (hereinafter “Owner”), for construction of the Peralta Community College District College of Alameda, Cougar Village Expansion, Modular Bid Submittal Increment 1, Bid No.: 13-14/02, Project No.2399.

The undersigned guarantees that all construction performed on this Project, and all material and equipment incorporated therein, shall meet or exceed the requirements of the Contract Documents.

Contractor hereby grants to Owner for a period of one year following the date of Final Acceptance of the Work completed, or such longer period specified in the Contract Documents, its unconditional warranty of the quality and adequacy of all of the Work including, without limitation, all labor, materials and equipment provided by Contractor and its Subcontractors of all tiers in connection with the Work.

Neither final payment nor use nor occupancy of the Work performed by the Contractor shall constitute an acceptance of Work not done in accordance with this Guaranty or relieve Contractor of liability in respect to any express warranties or responsibilities for faulty materials or workmanship. Contractor shall remedy any defects in the Work and pay for any damage resulting therefrom, which shall appear within one year, or longer if specified, from the date of Final Acceptance of the Work completed.

If within one year after the date of Final Acceptance of the Work completed, or such longer period of time as may be prescribed by laws or regulations, or by the terms of Contract Documents, any Work is found to be Defective, Contractor shall promptly, without cost to Owner and in accordance with Owner’s written instructions, correct such Defective Work. Contractor shall remove any Defective Work rejected by Owner and replace it with Work that is not Defective, and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the Defective Work corrected or the rejected Work removed and replaced. Contractor shall pay for all claims, costs, losses and damages caused by or resulting from such removal and replacement. Where Contractor fails to correct Defective Work, or defects are discovered outside the correction period, Owner shall have all rights and remedies granted by law.

Inspection of the Work shall not relieve Contractor of any of its obligations under the Contract Documents. Even though equipment, materials, or Work required to be provided under the Contract Documents have been inspected, accepted, and estimated for payment, Contractor shall, at its own expense, replace or repair any such equipment, material, or Work found to be Defective or otherwise not to comply with the requirements of the Contract Documents up to the end of the guaranty period.

All abbreviations and definitions of terms used in this Agreement shall have the meanings set forth in the Contract Documents, including, without means of limitation, Document 00700 (General Conditions) and Section 01420 (References and Definitions).
The foregoing Guaranty is in addition to any other warranties of Contractor contained in the Contract Documents, and not in lieu of, any and all other liability imposed on Contractor under the Contract Documents and at law with respect to Contractor’s duties, obligations, and performance under the Contract Documents. In the event of any conflict or inconsistency between the terms of this Guaranty and any warranty or obligation of the Contractor under the Contract Documents or at law, such inconsistency or conflict shall be resolved in favor of the higher level of obligation of the Contractor.

Date: __________________________, [20____]

Contractor's name

By: 

Signature

Print Name

Title

Street Address

City, State, Zip code

END OF DOCUMENT
AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS

THIS AGREEMENT AND RELEASE OF ANY AND ALL CLAIMS ("Agreement and Release"), made and entered into this [date] day of [Month], [200_], by and between the Peralta Community College District ("District"), and [Name of Contractor] ("Contractor"), whose place of business is at [Address of Contractor].

RECITALS

A. The District and Contractor entered into Bid Number 13-14/02 (the "Contract") for construction of Peralta Community College District Cougar Village Expansion, Modular Bid Submittal Increment 1 located at College of Alameda, 555 Ralph Appezzato Memorial Parkway, Alameda, California.

B. The Work under the Contract has been completed.

AGREEMENT

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

1. Contractor will not be assessed liquidated damages except as detailed below:

   Original Contract Sum $ __________________________
   Modified Contract Sum $ __________________________
   Payment to Date $ __________________________
   Liquidated Damages $ __________________________
   Payment Due Contractor $ __________________________

2. Subject to the provisions of this Agreement and Release, the District will forthwith pay to Contractor the sum of [_________________________ Dollars and _________ Cents ($__________________)] under the Contract, less any amounts withheld under the Contract or represented by any Notice to Withhold Funds on file with the District as of the date of such payment.

3. Contractor acknowledges and hereby agrees that there are no unresolved or outstanding claims in dispute against the District arising from the Contract, except for the claims described in Paragraph 4 of this Document 00650. It is the intention of the parties in executing this Agreement and Release that this Agreement and Release shall be effective as a full, final and general release of all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities of Contractor against the District, and all if its agents, employees, consultants, inspectors, representatives, assignees and transferees, except for the Disputed Claims set forth in Paragraph 4 of this Document 00650. Nothing in this Agreement and Release shall limit or modify Contractor's continuing obligations described in Paragraph 6 of this Document 00650.

4. The following claims submitted under Document 00700 (General Conditions), Article 12, are disputed (hereinafter, the "Disputed Claims") and are specifically excluded from the operation of this Agreement and Release.
[Insert information in Chart below, affix attachment if necessary]

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5. Consistent with California Public Contract Code §7100, Contractor hereby agrees that, in consideration of the payment set forth in Paragraph 2 of this Document 00650, Contractor hereby releases and forever discharges the District, and all of its agents, employees, consultants, inspectors, assignees and transferees from any and all liability, claims, demands, actions or causes of action of whatever kind or nature arising out of or in any way concerned with the Work under the Contract.

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

7. Contractor shall immediately defend, indemnify and hold harmless the District, any of the District’s Representatives, Project Manager, and all of their agents, employees, consultants, inspectors, assignees and transferees, from any and all claims, demands, actions, causes of action, obligations, costs, expenses, damages, losses and liabilities that may be asserted against them by any of Contractor’s suppliers and/or Subcontractors of any tier and/or any suppliers to them for any and all labor, materials, supplies and equipment used, or contemplated to be used in the performance of the Contract, except for the Disputed Claims set forth in Paragraph 4 of this Document 00650.

8. Contractor hereby waives the provisions of California Civil Code §1542, which provide as follows:

   A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM OR HER, MUST HAVE MATERIALLY AFFECTED HIS SETTLEMENT WITH THE DEBTOR.

9. The provisions of this Agreement and Release are contractual in nature and not mere recitals and shall be considered independent and severable, and if any such provision or any part thereof shall be at any time held invalid in whole or in part under any federal, state, the District, municipal or other law, ruling, or regulation, then such provision, or part thereof shall remain in force and effect only to the extent permitted by law, and the remaining provisions of this Agreement and Release shall also remain in full force and effect, and shall be enforceable.

10. Contractor represents and warrants that it is the true and lawful owner of all claims and other matters released pursuant to this Agreement and Release, and that it has full right, title and authority to enter into this instrument. Each party represents and warrants that it has been represented by counsel of its own choosing in connection with this Agreement and Release.
11. All rights of the District shall survive completion of the Work or termination of the Contract, and execution of this Agreement and Release.

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

PERALTA COMMUNITY COLLEGE DISTRICT

By: ________________________________________________
Signature

Name: ________________________________________________
Print

Its: ________________________________________________
Title

ATTEST:

______________________________________________________
Secretary

______________________________________________________
Print

[CONTRACTOR]

By: ________________________________________________
Signature

Name: ________________________________________________
Print

Its: ________________________________________________
Title

[CONTRACTOR]

By: ________________________________________________
Signature
To: Johnnie Fudge, Director of Capital Projects, Peralta Community College District
   [(510) 466-7213]

Project: Peralta Community College District, Cougar Village Expansion, Modular Bid Submittal
         Increment 1 at College of Alameda, 555 Ralph Appezzato Memorial Parkway, Alameda
         California

Contractor:________________________________________________________

Subcontractor/Supplier:______________________________________________

Drawing Sheet Reference/Detail No: ____________________________________

The undersigned Bidder submits for consideration the following equipment instead of the specified item
for the above Project:

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Proposed Substitution:______________________________________________

The undersigned encloses the information required herein. If this Document 00660 is being submitted by
a Bidder wishing to use “equal” item(s) as provided in Document 00200 (Instructions to Bidders), the
undersigned Bidder must also enclose the technical information (other than cost) otherwise required for a
post-Award of Contract Request for Substitution (“RFS”) under Section 01600 (Product Requirements).
However, if this Document 00660 is being submitted under provisions of Contract Documents after Award
of Contract, the undersigned Contractor must include all information required under Section 01600
(Product Requirements).

The undersigned has (a) attached manufacturer’s literature, including complete technical data and
laboratory test results, if applicable, (b) attached an explanation of why proposed substitution is a true
equivalent to specified item, (c) included complete information on changes to Contract Documents that
the proposed substitution will require for its proper installation, and (d) filled in the blanks below:

A. Does the substitution affect dimensions shown on Drawings?

B. Are the manufacturer’s guarantees and warranties on the proposed substitution items identical to
   those on the specified items? If there are differences, please specify each and every difference in
detail.
C. What effect does the substitution have on other contractors, trades, or suppliers?

D. What are the differences between the proposed substitution and the specified item? If proposed substitution has a color or pattern, provide a color board showing proposed substitution in relation to the other adjacent colors and patterns.

E. Will granting the requested substitution cause any schedule delay? (If yes, please explain)

The undersigned Bidder certifies that the function, appearance, and quality of the proposed substitution are equivalent or superior to those of the specified item.

Submitted by:

For Use by PCCD:

Bidder/Contractor
[Note applicable]

[ ] Accepted [ ] Accepted as Noted

[ ] Not Accepted [ ] Received Too Late

Signature

By: PCCD’s Representative

Name

Date:

Address

Remarks:

City/State/Zip

Telephone:

Date:

END OF DOCUMENT
DOCUMENT 00670

ESCROW BID DOCUMENTS

1 REQUIREMENTS FOR ESCROW BID DOCUMENTS.

1.1 Within the time period established in Document 00200 (Instructions to Bidders), Contractor shall submit to Owner a set of Escrow Bid Documents as defined in paragraph 2 below. Escrow Bid Documents will be used only in the manner and for the purposes described in this Document 00670.

1.2 The submission of the Escrow Bid Documents, as with the bonds and insurance documents required under Document 00200 (Instructions to Bidders), is considered an essential part of the Contract award. Should Contractor fail to make the submission within the allowed time specified, Contractor may be deemed to have failed to enter into the Contract, Contractor shall forfeit the amount of its Bid security accompanying Contractor’s Bid, and Owner may award the Contract to the next lowest responsive responsible Bidder.

1.3 NO PAYMENTS WILL BE MADE, NOR WILL OWNER ACCEPT CHANGE ORDER REQUESTS UNTIL THE ABOVE-REQUIRED INFORMATION IS SUBMITTED AND APPROVED. ALTERNATIVELY, OWNER MAY DECLARE THE BID NON-RESPONSIVE.

1.4 Contractor shall submit the Escrow Bid Documents, in person by an authorized representative of the Contractor, to:

__________________
__________________
__________________

2 SCOPE OF ESCROW BID DOCUMENTS.

2.1 Within the time period specified in Document 00200 (Instructions to Bidders), Contractor shall submit one (1) copy of all documentary information received or generated by Contractor in preparation of Bid prices for the Contract Documents, as specified in paragraphs 5 and 6 of this Document 00670. This material is referred to in this Document 00670 as the “Escrow Bid Documents.” Contractor’s Escrow Bid Documents will be held in escrow as provided in this Document 00670.

2.2 Contractor represents and agrees, as a condition of award of the Contract, that the Escrow Bid Documents constitute all written information used in the preparation of its Bid, and that no other written Bid preparation information shall be considered in resolving disputes or claims or may be considered in legal proceedings. Contractor also agrees that nothing in the Escrow Bid Documents shall change or modify the terms or conditions of the Contract Documents. Contractor is advised that the Escrow Bid Documents will only be used as a guide in the resolution of disputes and claims.

3 OWNERSHIP OF ESCROW BID DOCUMENTS.

3.1 The Escrow Bid Documents are, and shall always remain, the property of Contractor, subject to joint review by Owner and Contractor, as provided in this Document 00670.

3.2 Owner stipulates and expressly acknowledges that the Escrow Bid Documents constitute trade secrets. This acknowledgement is based on Owner’s express understanding that the information contained in the Escrow Bid Documents is not known outside Contractor’s business, is known only to a limited extent and only by a limited number of Contractor’s employees, is safeguarded while in Contractor’s possession, is extremely valuable to Contractor and could be extremely valuable to Contractor’s competitors by virtue of it reflecting Contractor’s contemplated construction techniques. Owner further acknowledges that the Escrow Bid Documents and the information contained in them are made available to Owner only because such action is an express pre-requisite to award of the Contract. Owner agrees to safeguard the Escrow Bid Documents, and all information contained in them, against disclosure to the fullest extent permitted by law, consistent with paragraph 4 of this Document 00670.

4 USE OF ESCROW BID DOCUMENTS.
4.1 Escrow Bid Documents may be used in the determination of price adjustments and change orders and in the settlement of disputes and claims. If used in legal proceedings, Escrow Bid Documents shall be subject to an appropriate protective order limiting their disclosure.

5 FORMAT AND CONTENTS OF ESCROW BID DOCUMENTS.

5.1 Contractor may submit Escrow Bid Documents in their usual cost-estimating format; a standard format is not required. Contractor shall prepare and submit the Escrow Bid Documents in English.

5.2 Owner requires Contractor to itemize clearly in the Escrow Bid Documents the estimated costs of performing the work of each Bid item contained in Contractor’s Bid. Contractor shall separate Bid items into sub-items as required to present a detailed cost estimate and allow a detailed cost review. The Escrow Bid Documents shall include all Subcontractor bids or quotes, supplier bids or quotes, quantity take-offs, crews, equipment, calculations of rates of production and progress, copies of quotes from Subcontractors and suppliers, and memoranda, narratives, add/deduct sheets, and all other information used by Contractor to arrive at the prices contained in the Bid. Escrow Bid Documents shall include costs of scheduled maintenance, depreciation, fleet rental expense discounts and incentives, and similar cost adjustments if used by Contractor to calculate its Bid prices. Estimated costs shall be broken down into Contractor’s usual estimate categories such as direct labor, repair labor, equipment ownership and operation, expendable materials, permanent materials and subcontract costs as appropriate. Plant and equipment and indirect costs should be detailed in Contractor’s usual format. Contractor shall identify its allocation of indirect costs, contingencies, markup and other items to each Bid item.

5.3 Contractor shall identify all costs. For Bid items amounting to less than $10,000, Contractor may estimate costs without a detailed cost estimate, provided that Contractor includes applicable labor, equipment, materials and subcontracts, and allocates applicable indirect costs, contingencies and markup.

5.4 Bid documents provided by Owner should not be included in the Escrow Bid Documents unless needed to comply with these requirements.

6 SUBMITTAL OF ESCROW BID DOCUMENTS.

6.1 Contractor shall submit the Escrow Bid Documents within 14 Days after the award. The container shall be clearly marked on the outside with Contractor’s name, date of submittal, project name and the words “Escrow Bid Documents - Open only in the presence of Authorized Representatives of both Owner and Contractor.” Owner will review the Escrow Bid Documents for initial compliance. Owner has three Days after receipt of Bidder's Escrow Bid Documents to demand additional information.

6.2 By submitting Escrow Bid Documents, Contractor represents that the material in the Escrow Bid Documents constitutes all the documentary information used in preparation of the Bid and that Contractor has personally examined the contents of the Escrow Bid Documents container and has found that the documents in the container are complete. Contractor agrees that it will not introduce or rely on any other documents to prove how it prepared its Bid.

6.3 If Contractor’s proposal is based upon subcontracting any part of the Work, each Subcontractor whose total subcontract price exceeds five percent of the total Contract Sum proposed by Contractor, shall provide separate Escrow Documents to be included with those of Contractor. Such documents shall be opened and examined in the same manner and at the same time as the examination described above for Contractor.

6.4 If Contractor wishes to subcontract any portion of the Work after award, Owner retains the right to require Contractor to submit Escrow Documents for the Subcontractor before approval of the subcontract.

7 STORAGE, EXAMINATION, AND FINAL DISPOSITION OF ESCROW BID DOCUMENTS.

7.1 The Escrow Bid Documents will be placed in escrow until Final Completion of Work on the Project, in a mutually agreeable institution. Contractor shall pay the cost of storage for the Escrow Bid Documents until that time. The storage facilities shall be the appropriate size for all the Escrow Bid Documents and located conveniently to both Owner’s and, to the extent reasonably possible, Contractor’s offices, but in no event outside the County in which the Owner’s main office is located.

7.2 Both Owner and Contractor shall examine the Escrow Bid Documents, at any time deemed necessary by either Owner or Contractor, to assist in the negotiation of price adjustments and change orders or the settlement of disputes and claims. Examination of the Escrow Bid Documents is subject to the following conditions:
7.2.1 As trade secrets, the Escrow Bid Documents are proprietary and confidential under paragraph 3.2. of this Document 00670.

7.2.2 Owner and Contractor (and any Subcontractor, to the extent Escrow Bid Documents are required by a Subcontractor) shall each designate in writing to the other party(s) at least seven Days prior to any examination, representatives who are authorized to examine the Escrow Bid Documents. Except as otherwise provided in a court order, no other persons shall have access to the Escrow Documents.

7.2.3 Except as otherwise provided in a court order, access to the documents may take place only in the presence of duly designated representatives of both Owner and Contractor. If Contractor fails to designate a representative or appear for joint examination on seven Days’ notice, then Owner’s representative may examine the Escrow Bid Documents upon an additional three (3) Days’ notice.

7.2.4 Following Final Completion of Work on the Project and achievement of final settlement, Owner shall direct the escrow agent holding the Escrow Bid Documents in writing to return those documents to Contractor.

END OF DOCUMENT
ESCROW AGREEMENT FOR SECURITY DEPOSIT IN LIEU OF RETENTION

California Public Contract Code §22300

THIS ESCROW AGREEMENT (“Escrow Agreement”) is made and entered into this [Date] day of [Month], [20____], by and between Peralta Community College District (hereinafter “Owner”), whose address is [Enter Owner’s Address]; [Name of Contractor] (“Contractor”), whose place of business is located at [Contractor’s Address]; and [Owner, as escrow agent OR [Name of Bank], a state or federally chartered bank in the State of California, whose place of business is located at [Address] (“Escrow Agent”).

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

1. Pursuant to California Public Contract Code §22300, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by Owner pursuant to Contract Number [Insert number] entered into between Owner and Contractor for the Peralta Community College District Cougar Village Expansion, Modular Bid Submittal Increment 1 at College of Alameda, 555 Atlantic Avenue (Ralph Appezzato Memorial Parkway), Alameda California in the amount of [Contract Sum] dated [Date of Contract, 20____] (the “Contract”). Alternatively, on written request of Contractor, Owner shall make payments of the retention earnings directly to Escrow Agent. When Contractor deposits the securities as a substitute for Contract earnings, Escrow Agent shall notify Owner within ten Days of the deposit. The market value of the securities at the time of substitution shall be at least equal to the cash amount then required to be withheld as retention under terms of Contract between Owner and Contractor. Securities shall be held in name of ____________________________________, and shall designate Contractor as the beneficial owner.

2. Owner shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments pursuant to Contract provisions, provided that Escrow Agent holds securities in form and amount specified in Paragraph 1 of this Document 00680.

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

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

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

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

7. Owner shall have the right to draw upon the securities in event of default by Contractor. Upon seven Days written notice to Escrow Agent from Owner of the default, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by Owner.

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

9. Escrow Agent shall rely on written notifications from Owner and Contractor pursuant to Paragraphs 5 through 8, inclusive, of this Document 00680 and Owner and Contractor shall hold Escrow Agent harmless from Escrow Agent’s release and disbursement of securities and interest as set forth.

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

ON BEHALF OF OWNER:

Title
Name
Signature
Address
City/State/Zip Code

ON BEHALF OF CONTRACTOR:

Title
Name
Signature
Address
City/State/Zip Code

ON BEHALF OF ESCROW AGENT:

Title
Name
Signature
Address
City/State/Zip Code

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

OWNER

Title
Name
Signature

CONTRACTOR

Title
Name
Signature
At the time the Escrow Account is opened, Owner and Contractor shall deliver to Escrow Agent a fully executed counterpart of this Document 00680.

END OF DOCUMENT
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GENERAL CONDITIONS

1 INTERPRETATION OF CONTRACT

1.1 Defined Terms

1.1.1. All abbreviations and definitions of terms used and not otherwise defined in this Document 00700 are set forth in Section 01420 (References and Definitions). This Document 00700 subdivides at first level into Articles, and then into paragraphs, then into subparagraphs.

1.2 Contract Documents

1.2.1. Contract Documents are complementary; what is called for by one is as binding as if called for by all. Contract Documents shall not be construed to create a contractual relationship of any kind between (1) Architect/Engineer or any Owner Representative and Contractor; (2) Owner and/or its representatives and (except as provided in Article 13 below) a Subcontractor, sub-Subcontractor, or supplier of any Project labor, materials, or equipment; or (3) between any persons or entities other than Owner and Contractor.

1.3 Precedence Of Documents

1.3.1. In the case of discrepancy or ambiguity in the Contract Documents, the following order of precedence shall prevail:

(1) Modifications in inverse chronological order (i.e., most recent first), and in the same order as specific portions they are modifying;
(2) Document 00520 (Agreement), and terms and conditions referenced therein;
(3) Document 00800 (Supplementary Conditions);
(4) Document 00700 (General Conditions);
(5) Division 1 Specifications;
(6) Drawings;
(7) Written numbers over figures, unless obviously incorrect;
(8) Figured dimensions over scaled dimensions;
(9) Large-scale drawings over small-scale drawings.
(10) Division 2 through [ENTER FINAL DIVISION NUMBER] Specifications

1.3.2. Any conflict between Drawings and Division 2 through [ENTER FINAL DIVISION NUMBER] Specifications will be resolved in favor of the document of the latest date (i.e., the most recent document), and if the dates are the same or not determinable, then in favor of Specifications.

1.3.3. Any conflict between a bill or list of materials shown in the Contract Documents and the actual quantities required to complete Work required by Contract Documents, will be resolved in favor of the actual quantities.

1.3.4. In the event the Specifications include divisions above Division [ENTER FINAL DIVISION NUMBER] (e.g., Division 18 and above), then such divisions shall be included within the Contract Documents unless identified otherwise.

2 BID PERIOD INVESTIGATIONS AND SUBCONTRACTORS

2.1 Contractor’s Investigations Before Bidding

2.1.1. Prior to submitting its Bid, Contractor must investigate fully the Work of the Contract. Contractor must visit the Site, examine thoroughly and understand fully the nature and extent of the Contract Documents, Work, Site, locality, actual conditions and as-built conditions, and all other information made available for bidding. Contractor’s investigation shall include, but is not limited to, a thorough examination of all reports of exploration and tests of subsurface conditions, as-built drawings, drawings, product specification(s) or reports, available for Bidding purposes, of physical conditions, including Underground Facilities and information identified in Document 00320 (Geotechnical Data and Existing Conditions) and/or Document 00335 (Hazardous Materials Surveys) (if used), or which may appear in the Contract Documents, and all local conditions, and federal, state and local laws and regulations that in any manner may affect cost, progress,
performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto. Contractor shall completely and thoroughly correlate all such information and consider such information fully, prior to and as a condition of submitting its Bid. Contractor shall make inquiry as required in Document 00320 (Geotechnical Data and Existing Conditions.)

2.1.2. Prior to submitting its Bid, Contractor shall take care to note the existence of Underground Facilities, in particular, above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, chemical, hot water, and other similar items and utilities. Contractor shall carefully consider all supplied information, request additional information Contractor may deem necessary, and visually inspect the Site for above ground indications of Underground Facilities (such as, for example not by way of limitation, the existence of existing service laterals, appurtenances or other types of utilities, indicated by the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site.)

2.1.3. Prior to submitting its Bid, Contractor must correlate its experience, knowledge and the results of its required investigation with the terms and conditions of the Contract Documents, and must give Owner prompt written notice of all conflicts, errors, ambiguities, or discrepancies of any type, that it may discover in or among the Contract Documents, as-built drawings (if any) and/or actual conditions. Contractor shall give this notice during the Bid period and submission of a Bid indicates Contractor’s agreement that Owner responded to the notice through Addenda issued by Owner which is acceptable to Contractor

2.1.4. Prior to submitting its Bid, Contractor must consider fully the fact that information supplied regarding existing Underground Facilities at or contiguous to the Site is in many cases based on information furnished to Owner by others (e.g., the builders of such Underground Facilities or others), and that due to their age or their chain of custody since preparation, may not meet current industry standards for accuracy. Contractor must also consider local underground conditions and typical practices for Underground Facilities, either through its own direct knowledge or through its subcontractors, and fully consider this knowledge in assessing the existing information and the reasonableness of its reliance.

2.1.5. Prior to submitting its Bid, Contractor shall conduct (or request that Owner have conducted) any such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise, which may affect cost, progress, performance or furnishing of Work or which relate to any aspect of the means, methods, techniques, sequences or procedures of construction to be employed by Contractor and safety precautions and programs incident thereto or which Contractor deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of Contract Documents.

2.1.6. Prior to submitting its Bid, Contractor may rely on Owner supplied information regarding existing conditions only where such conditions are underground and not subject to reasonable verification. If existing information supplied by Owner indicates a discrepancy or a substantial risk of inaccuracy or omission, then Contractor must request specific additional information. Contractor shall advise Owner in writing during the Bid period of any questions, suppositions, inferences or deductions Contractor may have, for Owner’s review and response by Addenda, and may not assert any such matters later that were not brought forth during the Bid period.

2.1.7. During performance of the Contract, Contractor will be charged with knowledge of all information that it should have learned in performing this required pre-Bid investigation, and shall not be entitled to change orders (time or compensation) due to information or conditions that Contractor should have known as a part of this pre-Bid investigation.

2.2 Supplied Information On Underground Existing Conditions

2.2.1. Regarding Underground Facilities shown in the Contract Documents or supplied through Document 00320, Owner has compiled this information in good faith, relying on its records and third party records. Because of the nature and location of Owner and the Project, the existence of Underground Facilities is deemed inherent in the Work of the Contract, as is the fact that
Underground Facilities are not always accurately shown or completely shown on as-built records, both as to their depth and location. In Article 14 of this Document 00700, this Contract establishes a heightened standard for claims involving Underground Facilities. Contractor shall consider this fact in its bidding and in its planning and execution of the Work involving Underground Facilities.

2.2.2. Regarding subsurface conditions other than Underground Facilities, shown on the Contract Documents or supplied in Document 00320 (Existing Conditions), Contractor may rely only upon the general accuracy of actual reported depths, actual reported character of materials, actual reported soil types, actual reported water conditions, or actual obstructions shown or indicated in the Contract Documents. Owner is not responsible for the completeness of any subsurface condition information for bidding or construction, Contractor’s conclusions or opinions drawn from any subsurface condition information, or subsurface conditions that are not specifically shown. (For example, Owner is not responsible for soil conditions in areas contiguous to areas where a subsurface condition is shown.)

2.3 Supplied Information On Above Ground Existing Conditions

2.3.1. Regarding aboveground and as-built conditions shown on the Contract Documents or supplied through Document 00320 (Existing Conditions), such information has been compiled in good faith, however, Contractor must independently verify such information. Owner does not expressly or impliedly warrant or represent that information as to aboveground conditions or as-built conditions indicated in the Contract Documents or Document 00320, is correctly shown or indicated, or otherwise complete for construction purposes.

2.3.2. As a condition to bidding, Contractor shall verify by independent investigation all such aboveground and as-built conditions, and bring any discrepancies to Owner’s attention through written question. In submitting its Bid, Contractor shall rely on the results of its own independent investigation and shall not rely on Owner-supplied information regarding aboveground conditions and as-built conditions, and Contractor shall accept full responsibility for its verification work sufficient to complete the Work as intended.

2.4 Subcontractors

2.4.1. Consistent with Public Contract Code Sections 4101 et seq., Contractor shall not substitute any other person or firm in place of any Subcontractor listed in the Bid. Subcontractors shall not assign or transfer their subcontracts or permit them to be performed by any other contractor without Owner’s written approval. At Owner’s request, Contractor shall provide Owner with a complete copy of all executed subcontracts or final commercial agreements with Subcontractors and/or suppliers.

2.4.2. Subcontract agreements shall preserve and protect the rights of Owner under the Contract Documents so that subcontracting will not prejudice such rights. To the extent of the Work to be performed by a Subcontractor, Contractor shall require the Subcontractor’s written agreement (1) to be bound to the terms of Contract Documents and (2) to assume vis-à-vis Contractor all the obligations and responsibilities that Contractor assumes toward Owner under the Contract Documents. (These agreements include for example, and not by way of limitation, all warranties, claims procedures and rules governing submittals of all types to which Contractor is subject under the Contract Documents.)

2.4.3. Contractor shall provide for the assignment to Owner of all rights any Subcontractor may have against any manufacturer, supplier, or distributor for breach of warranties and guaranties relating to the Work performed by the Subcontractor under the Contract Documents.

2.4.4. Owner shall be deemed to be an intended third-party beneficiary of all Subcontracts (of any tier) for the provision of labor, services, supplies or material to the Project, and each such agreement shall so provide.

3 CONTRACT AWARD AND COMMENCEMENT OF THE WORK

3.1 Time Allowances For Performance Of Contract Documents

3.1.1. When Contractor and Owner have signed the Contract Documents, Owner will serve a Notice to Proceed upon Contractor to that effect, either by depositing notice in a post office or post office box.
3.2 Commencement Of Work

The Contract Time will commence to run on the 30th Day after the issuance of the Notice of Award or, if a Notice to Proceed is given, on the date indicated in the Notice to Proceed. Owner may give a Notice to Proceed at any time within 30 Days after the Notice of Award. Contractor shall not do any Work at the Site prior to the date on which the Contract Time commences to run.

4 INSURANCE AND INDEMNIFICATION

4.1 Insurance

4.1.1. See Document 00821 (Insurance and Indemnification), incorporated herein by this reference.

5 DRAWINGS AND SPECIFICATIONS

5.1 Intent

5.1.1. Drawings and Specifications are intended to describe a functionally complete and operable Project (and all parts thereof) to be constructed in accordance with the requirements of Contract Documents. Contractor shall perform any work, provide services and furnish any materials or equipment that may reasonably be inferred from the requirements of Contract Documents or from prevailing custom or trade usage as being required to produce this intended result. Contractor shall interpret words or phrases used to describe work (including services), materials or equipment, that have well-known technical or construction industry or trade meaning in accordance with that meaning. Drawings’ intent specifically includes the intent to depict construction that complies with all applicable laws, codes and standards.

5.1.2. As part of the “Work,” Contractor shall provide all labor, materials, equipment, machinery, tools, facilities, services, employee training and testing, hoisting facilities, shop drawings, storage, testing, security, transportation, disposal, the securing of all necessary or required field dimensions, the cutting or patching of existing materials, notices, permits, documents, reports, agreements and any other items required or necessary to timely and fully complete Work described and the results intended by Contract Documents and, in particular, Drawings and Specifications. Divisions and Specification Sections and the identification on any Drawings shall not control Contractor in dividing Work among Subcontractors or suppliers or delineating the Work to be performed by any specific trade.

5.1.3. Contractor shall perform reasonably implied parts of Work as “incidental work” although absent from Drawings and Specifications. Incidental work includes any work not shown on Drawings or described in Specifications that is necessary or normally or customarily required as a part of the Work shown on Drawings or described in Specifications. Incidental work includes any Work necessary or required to make each installation satisfactory, legally operable, functional, and consistent with the intent of Drawings and Specifications or the requirements of Contract Documents including required tasks to be performed under Division 1 of Specifications. Contractor shall perform incidental work without extra cost to Owner. Incidental work shall be treated as if fully described in Specifications and shown on Drawings, and the expense of incidental work shall be included in price Bid and Contract Sum.

5.2 Drawing Details

5.2.1. A typical or representative detail on Drawings shall constitute the standard for workmanship and
material throughout corresponding parts of Work. Where necessary, and where reasonably
inferable from Drawings, Contractor shall adapt such representative detail for application to such
Corresponding parts of Work. The details of such adaptation shall be subject to prior approval by
Owner. Repetitive features shown in outline on Drawings shall be in exact accordance with
corresponding features completely shown.

5.3 Interpretation Of Drawings And Specifications

5.3.1. Should any discrepancy appear or any misunderstanding arise as to the import of anything
contained in Drawings and Specifications, or should Contractor have any questions or requests
relating to Drawings or Specifications, Contractor shall refer the matter to Owner, in writing.
Owner will issue with reasonable promptness written responses, clarifications or interpretations as
Owner may determine necessary, which shall be consistent with the intent of and be reasonably
inferable from Contract Documents. Such written clarifications or interpretations shall be binding
upon Contractor. If Contractor believes that a written response, clarification or interpretation
justifies an adjustment in the Contract Sum or Contract Time, Contractor shall give Owner prompt
written notice as provided in Section 01250 (Modification Procedures). If the parties are unable to
agree to the amount or extent of the adjustment, if any, then Contractor shall perform the Work in
conformance with Owner’s response, clarification, or interpretation and may make a written claim
for the adjustment as provided in Article 12 of this Document 00700.

5.4 Checking Of Drawings

5.4.1. Before undertaking each part of Work, Contractor shall carefully study and compare Contract
Documents and check and verify pertinent figures shown in the Contract Documents and all
applicable field measurements. Contractor shall be responsible for any errors that might have been
avoided by such comparison. Figures shown on Drawings shall be followed; Contractor shall not
scale measurements. Contractor shall promptly report to Owner, in writing, any conflict, error,
ambiguity or discrepancy that Contractor may discover. Contractor shall obtain a written
interpretation or clarification from Owner before proceeding with any Work affected thereby.
Contractor shall provide Owner with a follow-up correspondence every ten days until it receives a
satisfactory interpretation or clarification.

5.5 Standards To Apply Where Specifications Are Not Furnished

5.5.1. The following general specifications shall apply wherever in the Specifications, or in any directions
given by Owner in accordance with or supplementing Specifications, it is provided that Contractor
shall furnish materials or manufactured articles or shall do work for which no detailed
specifications are shown. Materials or manufactured articles shall be of the best grade, in quality
and workmanship, obtainable in the market from firms of established good reputation. If not
ordinarily carried in stock, the materials or manufactured articles shall conform to industry
standards for first-class materials or articles of the kind required, with due consideration of the use
to which they are to be put. Work shall conform to the usual standards or codes, such as those cited
in Section 01420 (References and Definitions), for first-class work of the kind required. Contractor
shall specify in writing to Owner the materials to be used or Work to be performed under this
paragraph ten Business Days prior to furnishing such materials or performing such Work.

5.6 Deviation From Specifications and Drawings

5.6.1. Contractor shall perform Work in accordance with Drawings and Specifications, and Contractor
shall not be relieved of this responsibility by the activities of the Architect/Engineer in the
performance of their duties thereunder. Deviations from Drawings and from the dimensions therein
given, or from the Specifications, whether or not error is believed to exist, shall be made only when
approved in writing by Owner. Contractor may deviate from Drawings or the dimensions given in
the Drawings, and may deviate from the Specifications, only upon Owner’s advance written
approval of the proposed deviation, either by Change Order or by Instruction Bulletin.

5.6.2. Instruction Bulletins changing the approved drawings and technical specifications may also be used
to prevent undue delay.

5.6.3. Contractor acknowledges that changes are a normal feature of construction projects. Contractor
shall rely on its experience and proactively cooperate, coordinate and schedule RFI’s, submittals,
field questions, inspections, and document assembly, to facilitate the prompt and efficient use of the Change Order and Instruction Bulletin procedure as necessary to prevent delay in actual field construction.

5.6.4. Owner may order that locations, lines and grades for Work vary from those shown on Drawings. Changes may be made in locations, lines or grades for Work under any item of Contract Documents. No payment in addition to unit price fixed in the Contract Documents for Work under respective items will be allowed on account of variations from Drawings in unit price items. In lump sum contracts, or where there are no unit price items covering Work affected by variations of locations, lines or grades, all changes in the Contract Documents will be made as set forth in Article 14 of this Document 00700.

5.7 Ownership And Use Of Drawings, Specifications And Contract Documents

5.7.1. Drawings, Specifications and other Contract Documents were prepared for use for Work of Contract Documents only. No part of Contract Documents shall be used for any other construction or for any other purpose except with the written consent of Owner. Any unauthorized use of Contract Documents is prohibited and at the sole liability of the user.

6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

6.1 Owner’s Right To Perform Construction And To Award Separate Contracts

6.1.1. Owner may perform with its own forces, construction or operations related to the Project. Owner may also award separate contracts in connection with other portions of the Project or other construction or operations, on the Site or areas contiguous to the Site, under conditions similar to these Contract Documents, or may have utility owners perform other work. When separate contracts are awarded for different portions of the Project or other construction or operations on the Site, the term “Contractor” in these Contract Documents shall mean the Contractor herein.

6.1.2. Currently anticipated separate construction contracts (if any) are described in Section 01100.

6.2 Mutual Responsibility

6.2.1. Contractor shall afford all other contractors, utility owners and Owner (if Owner is performing work with its own forces), proper and safe access to the Site, and reasonable opportunity for the installation and storage of their materials. Contractor shall ensure that the execution of its Work properly connects and coordinates with others’ work, and shall cooperate with them to facilitate the progress of the Work.

6.2.2. Contractor shall coordinate its Work with the work of other separate contractors, Owner, and utility owners. Contractor shall hold coordination meetings with other contractors, Owner and its representatives, and utility owners as required by Section 01315 (Project Meetings).

6.2.3. Unless otherwise provided in the Contract Documents, Contractor shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. Contractor shall not endanger any work of other separate contractors, Owner or utility owners by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of Owner and the others whose work will be affected.

6.2.4. To the extent that any part of Contractor’s Work is to interface with work performed or installed by other contractors or utility owners, Contractor shall inspect and measure the in-place work. Contractor shall promptly report to Owner in writing any defect in in-place work that will impede or increase the cost of Contractor’s interface unless corrected. Owner will require the contractor responsible for the Defective Work to make corrections so as to conform to its contract requirements, or, if the defect is the result of an error or omission in the Contract Documents, issue a Change Order. If Contractor fails to measure, inspect and/or report to Owner in writing defects that are reasonably discoverable, Contractor shall bear all costs of accomplishing the interface acceptable to Owner. This provision shall be included in any and all other contracts or subcontracts for Work to be performed where such a conflict could exist.

6.3 Owner Authority Over Coordination
6.3.1. Owner will have authority over coordination of the activities of multiple contractors in cases where Owner performs work with its own forces or contracts with others for the performance of other work on the Project, or utilities work on the Site. Owner may at any time and in its sole discretion, designate a person or entity other than Owner to have authority over the coordination of the activities among the various contractors. Owner’s authority with respect to coordination of the activities of multiple contractors and utility owners shall not relieve Contractor of its obligation to other contractors and utility owners to coordinate its Work with other contractors and utility owners as specified in this Document 00700. Contractor shall promptly notify Owner in writing when another contractor on the Project fails to coordinate its work with the Work of Contract Documents.

6.3.2. Contractor shall suspend any part of the Work or carry on the same in such manner as directed by Owner when such suspension or prosecution is necessary to facilitate the work of other contractors or workers. No damages or claims by Contractor will be allowed if the suspension or Work change is due in whole or in part to Contractor’s failure to perform its obligation herein to coordinate its Work with other contractors and utility owners. Claims will be allowed only to the extent of fault by Owner if the suspension or Work change is due in whole or in part to another contractor’s failure to coordinate its work with Contractor, other contractors, and utility owners.

7 PAYMENT BY OWNER

7.1 Receipt And Processing Of Applications For Payment

7.1.1. As required by Section 01200 (Measurement and Payment), Contractor shall prepare the schedules, submit Applications for Payment and warrant title to all Work covered by each Application for Payment. Owner will review Contractor’s Applications for Payment and Owner will and make payment thereon, and Contractor shall make payments to Subcontractors, suppliers and others, as required by Section 01200 (Measurement and Payment).

8 CONTROL OF THE WORK

8.1 Subcontractors

8.1.1. Contractor is fully responsible for Contractor’s own acts and omissions. Contractor is responsible for all acts and omissions of its Subcontractors, suppliers, and other persons and organizations performing or furnishing any of the Work, labor, materials, or equipment under a direct or indirect contract with Contractor.

8.2 Supervision Of Work By Contractor

8.2.1. Contractor shall coordinate the Work and not delegate any responsibility for coordination to any subcontractor. Contractor shall anticipate the inter-relationship of all subcontractors and their relationship with the total Work. Contractor shall coordinate the work of subcontractors and material suppliers, so that their work is performed in a manner to minimize interference with and to facilitate the progress of the Work.

8.2.2. Contractor shall supervise, inspect, and direct Work competently and efficiently, devoting the attention and applying such personal skills and expertise as may be required and necessary to perform Work in accordance with Contract Documents. Contractor shall be solely responsible for and have control and charge of construction means, methods, techniques, sequences and procedures, safety precautions and programs in connection with the Work. Contractor shall be responsible to see that the completed Work complies accurately with Contract Documents.

8.2.3. Contractor shall designate and keep on the Site at all times during Work progress a competent resident Superintendent or Project Manager, who once designated, shall not be replaced without Owner’s express written consent. The Superintendent or Project Manager shall be Contractor’s representative at the Site and shall have complete authority to act on behalf of Contractor. All communications to and from the Superintendent or Project Manager shall be as binding as if given to or by Contractor.

8.3 Observation Of Work By Owner

8.3.1. Owner Representative(s). Owner Representative(s) will have limited authority to act on behalf of Owner as set forth in the Contract Documents. Except as otherwise provided in these Contract

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Documents or subsequently identified in writing by Owner, Owner will issue all communications to Contractor through Owner Representative, and Contractor shall issue all communications to Owner through Owner Representative in a written document delivered to Owner. Should any direct communications between Contractor and Owner’s consultants, architects or Architect/Engineers not identified in Article 2 of Document 00520 (Agreement) occur during field visits or by telephone, Contractor shall immediately confirm them in a written document copied to Owner.

8.3.2. Means And Methods Of Construction. Subject to those rights specifically reserved in the Contract Documents, Owner will not supervise, or direct, or have control over, or be responsible for, Contractor’s means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or Contractor’s failure to comply with laws and regulations applicable to the furnishing or performance of Work. Owner will not be responsible for Contractor’s failure to perform or furnish the Work in accordance with Contract Documents.

8.3.3. In exercising its responsibilities and authorities under the Contract Documents, Owner does not assume any duties or responsibilities to any Subcontractor or supplier and does not assume any duty of care to Contractor, Contractor’s Subcontractors or suppliers. Except as expressly set forth in the Contract Documents, in exercising their respective responsibilities and authorities under the Contract Documents, neither Architect/Engineer nor any Owner Representative assume any duties or responsibilities to any Subcontractor, sub-Subcontractor or supplier nor assume any duty of care to Contractor or any Subcontractor, sub-Subcontractor or suppliers.

8.3.4. Work shall be performed under Owner’s general observation and administration. Contractor shall comply with Owner’s directions and instructions in accordance with the terms of Contract Documents, but nothing contained in these General Conditions shall be taken to relieve Contractor of any obligations or liabilities under the Contract Documents. Owner’s failure to review or, upon review, failure to object to any aspect of Work reviewed, shall not be deemed a waiver or approval of any non-conforming aspect of Work.

8.3.5. Owner may engage an independent consultant or Architect/Engineer (collectively for purposes of this paragraph, “Consultant”) to assist in administering the Work. If so engaged, Consultant will advise and consult with Owner, but will have authority to act on behalf of Owner only to extent provided in the Contract Documents or as set forth in writing by Owner. Consultant will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with Work. Consultant will not be responsible for or have control over the acts or omissions of Contractor, Subcontractors or their agents or employees, or any other persons performing Work.

8.3.6. Consultant may review Contractor’s submittals, such as Shop Drawings, Product Data, and Samples, but only for conformance with design concept of Work and with information given in the Contract Documents.

8.3.7. Consultant may visit the Site at intervals appropriate to stage of construction to become familiar generally with the progress and quality of Work and to determine in general if Work is proceeding in accordance with Contract Documents. Based on its observations, Consultant may recommend to Owner that it disapprove or reject Work that Consultant believes to be defective or will not produce a complete Project that conforms to Contract Documents or will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by Contract Documents. Owner will also have authority to require special inspection or testing of Work, whether or not the Work is fabricated, installed or completed.

8.3.8. Consultant may conduct inspections to recommend to Owner the dates that Contractor has achieved Substantial Completion and Final Acceptance, and will receive and forward to Owner for review written warranties and related documents required by Contract Documents.

8.4 Access To Work

8.4.1. During performance of Work, Owner and its agents, officers, consultants, and employees may at any time enter upon Work, shops or studios where any part of the Work may be in preparation, or factories where any materials for use in Work are being or are to be manufactured, and Contractor shall provide proper and safe facilities for this purpose, and shall make arrangements with manufacturers to facilitate inspection of their processes and products to such extent as Owner’s interests may require. Other contractors performing work for Owner may also enter upon Work for
all purposes required by their respective contracts. Subject to the rights reserved in the Contract Documents, Contractor shall have sole care, custody, and control of the Site and its Work areas.

8.4.2. Owner may, at any time, and from time to time, during the performance of the Work, enter the Work Site for the for the purpose of installing any necessary work by Owner labor or other contracts, and for any other purpose in connection with the installation of facilities. In doing so, Owner shall endeavor not to interfere with Contractor and Contractor shall not interfere with other work being done by or on behalf of Owner.

8.4.3. If, prior to completion and final acceptance of all the Work, Owner takes possession of any structure or facility (whether completed or otherwise) comprising a portion of the Work with the intent to retain possession thereof (as distinguished from temporary possession contemplating return to Contractor), then, while Owner is in possession of the same, Contractor shall be relieved of liability for loss or damage to such structure other than that resulting from Contractor’s fault or negligence. Such taking of possession by Owner shall not relieve Contractor from any provisions of the Contract respecting such structure, other than to the extent specified in the preceding sentence, nor constitute a final acceptance of such structure or facility. See also Section 01100 (Summary).

8.4.4. If, following installation of any equipment or facilities furnished by Contractor, defects requiring correction by Contractor are found, Owner shall have the right to operate such unsatisfactory equipment or facilities and make reasonable use thereof until the equipment or facilities can be shut down for correction of defects without injury to Owner.

9 CONTRACTOR’S WARRANTY, GUARANTY, AND INSPECTION OF WORK

9.1 Warranty And Guaranty

9.1.1. General Representations and Warranties: Contractor represents and warrants that it is and will be at all times fully qualified and capable of performing every Phase of the Work. Contractor warrants that all construction services shall be performed in accordance with generally accepted professional standards of good and sound construction practices and all requirements of Contract Documents. Contractor warrants that Work, including but not limited to each item of materials and equipment incorporated therein, shall be new, of suitable grade of its respective kind for its intended use, and free from defects in design, architecture and/or engineering, materials, construction and workmanship. Contractor warrants that Work shall conform in all respects with all applicable requirements of federal, state and local laws, applicable construction codes and standards, licenses, and permits, Drawings and Specifications and all descriptions set forth therein, and all other requirements of Contract Documents. Contractor shall not be responsible, however, for the negligence of others in the specification of specific equipment, materials, design parameters and means or methods of construction where that is specifically shown and expressly required by Contract Documents.

9.1.2. Extended Guaranties: Any guaranty exceeding one year provided by the supplier or manufacturer of any equipment or materials used in the Project shall be extended for such term. Contractor expressly agrees to act as co-guarantor of such equipment and materials and shall supply Owner with all warranty and guaranty documents relative to equipment and materials incorporated in the Project and guaranteed by their suppliers or manufacturers.

9.1.3. Environmental and Toxics Warranty: The covenants, warranties and representations contained in this paragraph are effective continuously during Contractor’s Work on the Project and following cessation of labor for any reason including, but not limited to, Project completion. Contractor covenants, warrants and represents to Owner that:

(1) To Contractor’s knowledge after due inquiry, no lead or asbestos-containing materials were installed or discovered in the Project at any time during Contractor’s construction thereof. If any lead or asbestos-containing materials were discovered, Contractor made immediate written disclosure to Owner.

(2) To Contractor’s knowledge after due inquiry, no electrical transformers, light fixtures with ballasts or other equipment containing PCBs are or were located on the Project at any time during Contractor’s construction thereof.
(3) To Contractor’s knowledge after due inquiry, no storage tanks for gasoline or any other toxic substance are or were located on the Project at any time during Contractor’s construction thereof. If any such materials were discovered, Contractor made immediate written disclosure to Owner.

(4) Contractor’s operations concerning the Project are and were not in violation of any applicable environmental federal, state, or local statute, law or regulation dealing with hazardous materials substances or toxic substances and no notice from any governmental body has been served upon Contractor claiming any violation of any such law, ordinance, code or regulation, or requiring or calling attention to the need for any work, repairs, construction, alteration, or installation on or in connection with the Project in order to comply with any such laws, ordinances, codes, or regulations, with which Contractor has not complied. If there are any such notices with which Contractor has complied, Contractor shall provide Owner with copies thereof.

9.2 Inspection Of Work

9.2.1. All materials, equipment, and workmanship used in Work shall be subject to inspection and testing at all times during construction and/or manufacture in accordance with the terms of Contract Documents. Work and materials, and manufacture and preparation of materials, from beginning of construction until final completion and acceptance of Work, shall be subject to inspection and rejection by Owner, its agents, representatives or independent contractors retained by Owner to perform inspection services, or governmental agencies with jurisdictional interests. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor’s Site safety procedures and program so that they may comply therewith as applicable. Upon request or where specified, Owner shall be afforded access for inspection at the source of supply, manufacture or assembly of any item of material or equipment, with reasonable accommodations supplied for making such inspections.

9.2.2. Contractor shall give Owner and all inspection personnel timely notice of readiness of Work for all required inspections, tests or approvals, shall schedule and coordinate the same, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests. Contractor shall also coordinate, schedule and give adequate notice to the appropriate inspection personnel of any Work that can only be inspected as it is placed or assembled (for example, concrete or masonry work), to enable the constant presence of such inspection personnel during such Work.

9.2.3. In the event that a scheduled inspection is canceled in less than 24 hours notice by Contractor and Owner incurs costs associated with the cancellation, Contractor will reimburse Owner for the actual costs of the canceled inspections. The amount will be deducted from payment owed Contractor.

9.2.4. If applicable laws or regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested or approved by an employee of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, and furnish Owner with the required certificates of inspection, or approval. Owner will pay the cost of initial testing and Contractor shall pay all costs in connection with any follow-up or additional testing. Contractor shall also be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for the acceptance of materials or equipment to be incorporated in the Work, or of materials, mix designs, or equipment submitted for approval prior to Contractor’s purchase thereof for incorporation in the Work.

9.2.5. If Contractor covers any Work, or the work of others, prior to any required inspection, test or approval without written approval of Owner, Contractor shall uncover the Work at Owner’s request. Contractor shall bear the expense of uncovering Work and replacing Work.

9.2.6. In any case where Contractor covers Work contrary to Owner’s request, Contractor shall uncover Work for Owner’s observation or inspection at Owner’s request. Contractor shall bear the cost of uncovering Work.

9.2.7. Whenever required by Owner, Contractor shall furnish tools, labor and materials necessary to make examination of Work that may be completed or in progress, even to extent of uncovering or taking down portions of finished Work. Should Work be found unsatisfactory, cost of making examination and of reconstruction shall be borne by Contractor. If Work is found to be satisfactory,
Owner, in manner herein prescribed for paying for alterations, modifications, and extra Work, except as otherwise herein specified, will pay for examination.

9.2.8. Inspection of the Work by or on behalf of Owner, or Owner’s failure to do so, shall not under any circumstances be deemed a waiver or approval of any non-conforming aspect of the Work. Rather, in the absence of a written Change Order or Instruction Bulletin signed by Owner, Contractor’s duty to perform Work in conformance with the Contract Documents shall be absolute.

9.2.9. Any inspection, evaluation, or test performed by or on behalf of Owner relating to the Work is solely for the benefit of Owner, and shall not be relied upon by Contractor. Contractor shall not be relieved of the obligation to perform Work in accordance with the Contract Documents, nor relieved of any guaranty, warranty, or other obligation, as a result of any inspections, evaluations, or tests performed by Owner, whether or not such inspections, evaluations, or tests are permitted or required under the Contract Documents. Contractor shall be solely responsible for testing and inspecting Work already performed to determine whether such Work is in proper condition to receive later Work.

9.3 Correction Of Defective Work

9.3.1. If Contractor fails to supply sufficient skilled workers, suitable materials or equipment, or to furnish or perform the Work in such a way that the completed Work will conform to Contract Documents, Owner may order Contractor to replace any Defective Work, or stop any portion of Work to permit Owner (at Contractor’s expense) to replace such Defective Work. These Owner rights are entirely discretionary on the part of Owner, and shall not give rise to any duty on the part of Owner to exercise the rights for the benefit of Contractor or any other party.

9.3.2. Owner may direct Contractor to correct any Defective Work or remove it from the Site and replace it with Work that is not defective and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting from the correction or removal. Contractor shall be responsible for any and all claims, costs, losses and damages caused by or resulting from such correction or removal. A Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, Owner may decide the proper amount or, in its discretion may elect to leave the Contract Sum unchanged and deduct from moneys due Contractor, all such claims, costs, losses and damages caused by or resulting from the correction or removal. If Contractor disagrees with Owner’s calculations, it may make a claim as provided in Article 12 of this Document 00700. (Owner exercise of its rights under this paragraph 9 shall be entirely discretionary and, like all other Owner rights and remedies under the Contract, in addition to any other rights and remedies it may have under the Contract Documents or by law.)

9.3.3. Correction period:

(1) With respect to equipment and machinery supplied by Contractor and incorporated into the Work, if within one year after the date of Final Completion of the portion of the Work incorporating the equipment and/or machinery (or, to the extent expressed by Change Order or Certificate of Final Completion, one year after Owner’s written acceptance of such equipment), or such longer period as may be prescribed by laws or regulations, or by the terms of the Contract Documents, any equipment or machinery is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner’s written instructions, correct such Defective Work

(2) With respect to structures within the scope of Work, if within one year after the date of Final Acceptance, or such longer period of time as may be prescribed by laws or regulations, or by the terms of Contract Documents, any Work is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner’s written instructions, correct such Defective Work.

(3) Contractor shall remove any Defective Work rejected by Owner and replace it with Work that is not defective, and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the Defective Work corrected or the rejected Work removed and replaced.
(4) Contractor shall pay for all claims, costs, losses and damages caused by or resulting from such removal and replacement. Where Contractor fails to correct Defective Work, or defects are discovered outside the correction period, Owner shall have all rights and remedies granted by law.

9.3.4. Additionally, in special circumstances where a part of the Work is occupied or a particular item of equipment is placed in continuous service before Final Acceptance of all the Work, the correction period for that part of Work or that item may start to run from an earlier date if so provided by Change Order or Certificate of Substantial Completion.

9.3.5. Where Defective Work or rejected Work (and damage to other Work resulting therefrom) has been removed and replaced under this provision after the commencement of the correction period, the correction period hereunder with respect to such Work shall be extended for an additional period of one year after such removal and replacement has been satisfactorily completed.

9.3.6. If following installation of any equipment, machinery, or facilities furnished by Contractor, defects requiring correction by Contractor are found, Owner shall have the right to operate such defective equipment or facilities and make reasonable use thereof until the equipment, machinery, or facilities can be shut down for correction of defects without causing injury to Owner.

9.4 Acceptance And Correction Of Defective Work By Owner

9.4.1. Owner may accept Defective Work. Contractor shall pay all claims, costs, losses and damages attributable to Owner’s evaluation of and determination to accept such Defective Work. If Owner accepts any Defective Work prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, Owner may deduct from moneys due Contractor, all claims, costs, losses, damages, expenses and liabilities attributable to the Defective Work. If Contractor disagrees with Owner’s calculations, Contractor may make a claim as provided in Article 12 of this Document 00700. If Owner accepts any Defective Work after final payment, Contractor shall pay to Owner, an appropriate amount as determined by Owner.

9.4.2. Owner may correct and remedy deficiency if, after five Days’ written notice to Contractor, Contractor fails to correct Defective Work or to remove and replace rejected Work in accordance with paragraph 9 of this Document 00700; or provide a plan for correction of Defective Work acceptable to Owner; or perform Work in accordance with Contract Documents. In connection with such corrective and remedial action, Owner may exclude Contractor from all or part of the Site; take possession of all or part of Work and suspend Contractor’s Work related thereto; take possession of all or part of Contractor’s tools, appliances, construction equipment and machinery at the Site; and incorporate in Work any materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, its representatives, agents, employees, and other contractors and Owner’s consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph 9. Contractor shall be responsible for all claims, costs, losses, damages, expenses and liabilities incurred or sustained by Owner in exercising such rights and remedies. A Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to Work and the Contract Sum. If the parties are unable to agree to the amount of an appropriate decrease in the Contract Sum, Owner may deduct from moneys due Contractor, all claims, costs, losses and damages caused by or resulting from the correction or removal. If Contractor disagrees with Owner’s calculations, Contractor may make a claim as provided in Article 12 of this Document 00700.

9.5 Rights Upon Inspection Or Correction

9.5.1. Contractor shall not be allowed an extension of Contract Time because of any delay in the performance of Work attributable to the exercise by Owner of its rights and remedies under this Article 9. Where Owner exercises its rights under this Article 9, it retains all other rights it has by law or under the Contract Documents including, but not limited to, the right to terminate Contractor’s right to proceed with the Work under the Contract Documents and/or make a claim or back charge where a Change Order cannot be agreed upon.

9.5.2. Inspection by Owner shall not relieve Contractor of its obligation to have furnished material and
workmanship in accordance with Contract Documents. Payment for Work completed through periodic progress payments or otherwise shall not operate to waive Owner’s right to require full compliance with Contract Documents and shall in no way be deemed as acceptance of the Work paid therefor. Contractor’s obligation to complete the Work in accordance with Contract Documents shall be absolute, unless Owner agrees otherwise in writing.

9.6 **Samples And Tests Of Materials And Work**

9.6.1. Contractor shall furnish, in such quantities and sizes as may be required for proper examination and tests, samples or test specimens of all materials to be used or offered for use in connection with Work. Contractor shall prepare samples or test specimens at its expense and furnish them to Owner. Contractor shall submit all samples in ample time to enable Owner to make any necessary tests, examinations, or analyses before the time it is desired to incorporate the material into the Work.

9.7 **Proof Of Compliance Of Contract Provisions**

9.7.1. In order that Owner may determine whether Contractor has complied or is complying with requirements of Contract Documents not readily enforceable through inspection and tests of Work and materials, Contractor shall at any time, when requested, submit to Owner properly authenticated documents or other satisfactory proofs of compliance with all applicable requirements.

9.8 **Acceptance**

9.8.1. Inspection by Owner or its authorized agents or representatives, any order or certificate for the payment of money, any payment, acceptance of the whole or any part of Work by Owner, any extension of time, any verbal statements on behalf of Owner or its authorized agents or representatives shall not operate as a waiver or modification of any provision of the Contract Documents, or of any power reserved to Owner herein or therein or any right to damages provided in the Contract Documents. Any waiver of any breach of the Contract Documents shall not be held to be a waiver of any other subsequent breach.

10 **CONTRACTOR’S ORGANIZATION AND EQUIPMENT**

10.1 **Contractor’s Legal Address**

10.1.1. Address and facsimile number given in Contractor’s Bid are hereby designated as Contractor’s legal address and facsimile number. Contractor may change its legal address and facsimile number by notice in writing, delivered to Owner, which in conspicuous language advises Owner of a change in legal address or facsimile number, and which Owner accepts in writing. Delivery to Contractor’s legal address or depositing in any post office or post office box regularly maintained by the United States Postal Service, in a wrapper with postage affixed, directed to Contractor at legal address, or of any drawings, notice, letter or other communication, shall be deemed legal and sufficient service thereof upon Contractor. Facsimile to Contractor’s designated facsimile number of any letter, memorandum, or other communication on standard or legal sized paper, with proof of facsimile transmission, shall be deemed legal and sufficient service thereof upon Contractor.

10.2 **Contractor’s Office At The Work Site**

10.2.1. Contractor shall maintain an office at the Site, which office shall be headquarters of a Contractor representative authorized to transmit to and receive from Owner, communications, instructions or Drawings. Communications, instructions, or Drawings given to Contractor’s representative or delivered at the Site office in representative’s absence shall be deemed to have been given to Contractor.

10.3 **Contractor’s Superintendents Or Forepersons**

10.3.1. Contractor shall at all times be represented on Site by one or more superintendents, project managers or forepersons authorized and competent to receive and carry out any instructions that Owner may give, and shall be liable for faithful observance of instructions delivered to Contractor or to authorized representative or representatives on Site.

10.4 Proficiency In English

10.4.1. Supervisors, security guards, safety personnel and employees who have unescorted access to the Site shall possess proficiency in the English language in order to understand, receive and carry out oral and written communications or instructions relating to their job functions, including safety and security requirements.

10.5 Contractor’s And Subcontractors’ Employees

10.5.1. Contractor shall employ, and shall permit its Subcontractors to employ, only competent and skillful personnel to do Work. If Owner notifies Contractor that any of its employees, or any of its Subcontractors’ employees on Work is incompetent, unfaithful, disorderly or profane, or fails to observe customary standards of conduct or refuses to carry out any provision of the Contract Documents, or uses threatening or abusive language to any person on Work representing Owner, or violates sanitary rules, or is otherwise unsatisfactory, and if Owner requests that such person be discharged from Work, then Contractor or its Subcontractor shall immediately discharge such person from Work and the discharged person shall not be re-employed on the Work except with consent of Owner.

10.6 Contractor To List Trades Working

10.6.1. Contractor shall list the trades working on the Site and their scheduled activities on a daily basis, and provide a copy of that list to Owner.

10.7 Contractor’s Use Of The Site

10.7.1. Contractor shall not make any arrangements with any person to permit occupancy or use of any land, structure or building within the limits of the Work, for any purpose whatsoever, either with or without compensation, in conflict with any agreement between Owner and any owner, former owner or tenant of such land, structure or buildings. Contractor may not occupy Owner-owned property outside the limit of the Work as indicated on the Drawings unless it obtains prior written approval from Owner.

11 PROSECUTION AND PROGRESS OF THE WORK

11.1 Contractor To Submit Required Schedules

11.1.1. Contractor shall submit schedules and reports, Shop Drawings and Submittals in the appropriate quantity and within the required time, arrange conferences and meetings and proceed with the Work in accordance with Contract Documents, including Sections 01315 (Project Meetings), 01320 (Progress Schedules and Reports), and 01300 (Contractor Submittals).

11.1.2. Contractor shall submit to Owner for review and discussion at the Preconstruction Conference described in Section 01315 (Project Meetings), and again prior to the first payment application: the schedule of values submittals described in Section 01200 (Measurement and Payment), progress schedules and reports as required by Sections 01320 (Progress Schedules and Reports), and schedule of submittals described in Section 01330 (Contractor Submittals). No progress payment shall be due or owing to Contractor until such schedules are submitted to and acceptable to Owner and/or Architect/Engineer as meeting the requirements of the Contract Documents, including Sections 01200 (Measurement and Payment), 01320 (Progress Schedules and Reports) and 01330 (Contractor Submittals). Owner’s acceptance of Contractor’s schedules will not create any duty of care or impose on Owner any responsibility for the sequencing, scheduling or progress of Work nor will it interfere with or relieve Contractor from Contractor’s full responsibility therefor.

11.1.3. Before commencing any portion of Work, Contractor shall inform Owner in writing as to time and place at which Contractor wishes to commence Work, and nature of Work to be done, in order that proper provision for inspection of Work may occur, and to assure measurements necessary for record and payment. Information shall be given to Owner a reasonable time in advance of time at
which Contractor proposes to begin Work, so that Owner may complete necessary preliminary work without inconvenience or delay to Contractor.

11.2 Contractor To Submit Submittals And Shop Drawings

11.2.1. Contractor shall submit submittals and Shop Drawings to Owner (or Architect/Engineer if Owner so designates) for review in strict accordance with Section 01330 (Contractor Submittals). Submission of a Shop Drawing shall constitute Contractor’s representation that all requirements of Section 01330 (Contractor Submittals) have been complied with. All submittals will be identified as Owner may require and in the number of copies specified in Section 01330 (Contractor Submittals).

11.2.2. Contractor shall not perform Work that requires submission of a Shop Drawing or Sample or other submittal prior to submission and favorable review of the Shop Drawing or Sample or submittal. Where a Shop Drawing or Sample or other submittal is required by Contract Documents or the final Schedule of Shop Drawing and Sample Submittals accepted by Owner, any related Work performed prior to Owner’s approval of the pertinent submittal shall be at the sole expense, responsibility and risk of Contractor.

11.3 Contractor To Maintain Cost Data

11.3.1. Contractor shall maintain full and correct information as to the number of workers employed in connection with each subdivision of Work, the classification and rate of pay of each worker in form of certified payrolls, the cost to Contractor of each class of materials, tools and appliances used by Contractor in Work, and the amount of each class of materials used in each subdivision of Work. Contractor shall provide Owner with monthly summaries of this information. If Contractor maintains or is capable of generating summaries or reports comparing actual Project costs with Bid estimates or budgets, Contractor shall provide Owner with a copy of such report upon Owner’s request and whenever it is generated.

11.3.2. Contractor shall maintain daily job reports recording all significant activity on the job, including the number of workers on Site, Work activities, problems encountered and delays. Contractor shall provide Owner with copies for each Day Contractor works on the Project, to be delivered to Owner either the same Day or the following morning before starting work at the Site. Contractor shall take monthly progress photographs of all areas of the Work. Contractor shall maintain copies of all correspondence with Subcontractors and records of meetings with Subcontractors.

11.3.3. Owner shall have the right to audit and copy Contractor’s books and records of any type, nature or description relating to the Project (including but not limited to financial records reflecting in any way costs claimed on the Project), and to inspect the Site, including Contractor’s trailer, or other job Site office, and this requirement shall be contained in the subcontracts of Subcontractors working on Site. By way of example, Owner shall have the right to inspect and obtain copies of all Contract Documents, planning and design documents, Bid proposal and negotiation documents, cost records and job cost variance reports, design modification proposals, value engineering or other cost reduction proposals, revisions made to the original design, job progress reports, photographs, and as-built drawings maintained by Contractor. Owner and any other applicable governmental entity shall have the right to inspect all information and documents maintained under this paragraph 11 at any time during the Project and for a period of five years following Final Completion. This right of inspection shall not relieve Contractor of its duties and obligations under the Contract Documents. This right of inspection shall be specifically enforceable in a court of law, either independently or in conjunction with enforcement of any other rights in the Contract Documents.

11.3.4. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Contract Modifications, Change Orders, Work Directives, Force Account orders, and written interpretations and clarifications in good order and annotated to show all changes made during construction. These Project Record Documents, together with all approved Samples and a counterpart of all approved Shop Drawings, shall be maintained and available to Owner for reference. Upon completion of the Work, Contractor shall deliver to Owner, the Project Record Documents, Samples and Shop Drawings and as-built drawings.

11.4 Contractor To Supply Sufficient Workers And Materials
11.4.1. Unless otherwise required by Owner under the terms of Contract Documents, Contractor shall at all times keep on the Site materials and employ qualified workers sufficient to prosecute Work at a rate and in a sequence and manner necessary to complete Work within the Contract Time. This obligation shall remain in full force and effect notwithstanding disputes or claims of any type.

11.4.2. At any time during progress of Work should Contractor directly or indirectly (through Subcontractors) refuse, neglect, or be unable to supply sufficient materials or employ qualified workers to prosecute the Work as required, then Owner may require Contractor to accelerate the Work and/or furnish additional qualified workers or materials as Owner may consider necessary, at no cost to Owner. If Contractor does not comply with the notice within three Business Days of date of service thereof, Owner shall have the right (but not a duty) to provide materials and qualified workers to finish the Work or any affected portion of Work, as Owner may elect. Owner may, at its discretion, exclude Contractor from the Site, or portions of the Site or separate work elements during the time period that Owner exercises this right. Owner will deduct from moneys due or which may thereafter become due under the Contract Documents, the sums necessary to meet expenses thereby incurred and paid to persons supplying materials and doing Work. Owner will deduct from funds or appropriations set aside for purposes of Contract Documents the amount of such payments and charge them to Contractor as if paid to Contractor. Contractor shall remain liable for resulting delay, including liquidated damages and indemnification of Owner from claims of others.

11.4.3. Exercise by Owner of the rights conferred upon Owner in this subparagraph is entirely discretionary on the part of Owner. Owner shall have no duty or obligation to exercise the rights referred to in this subparagraph and its failure to exercise such rights shall not be deemed an approval of existing Work progress or a waiver or limitation of Owner’s right to exercise such rights in other concurrent or future similar circumstances. (The rights conferred upon Owner under this subparagraph are, like all other such rights, cumulative to Owner’s other rights under any provision of the Contract Documents.)

11.5 **Contractor To Locate Underground Facilities**

11.5.1. During construction, Contractor shall comply with Government Code Sections 4216 to 4216.9, and in particular Section 4216.2 which provides, in part: “Except in an emergency, every person planning to conduct any excavation shall contact the appropriate regional notification center at least two working days, but no more than 14 calendar days, prior to commencing that excavation, if the excavation will be conducted in an area which is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the excavator, and, if practical, the excavator shall delineate with white paint or other suitable markings the area to be excavated. The regional notification center shall provide an inquiry identification number to the person who contacts the center and shall notify any member, if known, who has a subsurface installation in the area of the proposed excavation.”

11.5.2. Contractor shall contact USA, and schedule the Work to allow ample time for the center to notify its members and, if necessary, for any member to field locate and mark its facilities. Contractor is charged with knowledge of all subsurface conditions reflected in USA records. Prior to commencing excavation or trenching work, Contractor shall provide Owner with copies of all USA records secured by Contractor. Contractor shall advise Owner of any conflict between information provided in Document 00320 (Geotechnical Data and Existing Conditions), the Drawings and that provided by USA records. Contractor’s excavation shall be subject to and comply with the Contract Documents, including without limitation Paragraphs 2 and 8 of this Document 00700.

11.5.3. Contractor shall also investigate the existence of existing service laterals, appurtenances or other types of utilities, indicated by the presence of an underground transmission main or other visible facilities, such as buildings, new asphalt, meters and junction boxes, on or adjacent to the Site, even if not shown or indicated in Document 00320 (Geotechnical Data and Existing Conditions), the Drawings or that provided by USA records. Contractor shall immediately secure all such available information and notify Owner and the utility owner, in writing, of its discovery.

11.6 **Contractor’s To Protect Underground Facilities**

11.6.1. At all times during construction, all operating Underground Facilities shall remain in operation, unless the Contract Documents expressly indicate otherwise. Contractor shall maintain such
Underground Facilities in service where appropriate; shall repair any damage to them caused by the
Work; and shall incorporate them into the Work, including reasonable adjustments to the design
location (including minor relocations) of the existing or new installations. Contractor shall take
immediate action to restore any in service installations damaged by Contractor’s operations.

11.6.2. Prior to performing Work at the Site, Contractor shall lay out the locations of Underground
Facilities that are to remain in service and other significant known underground installations
indicated by the Underground Facilities Data. Contractor shall further locate, by carefully
excavating with small equipment, potholing and principally by hand, all such utilities or
installations that are to remain and that are subject to damage. If additional utilities whose
locations are unknown are discovered, Contractor shall immediately report to Owner for disposition
of the same. Additional compensation or extension of time on account of utilities not shown or
otherwise brought to Contractor’s attention, including reasonable action taken to protect or repair
damage, shall be determined as provided in this Document 00700.

11.6.3. The cost of all of the following will be included in the Contract Sum and Contractor shall have full
responsibility for (a) reviewing and checking all available information and data including, but not
limited to, Document 00320 (Geotechnical Data and Existing Conditions) and information on file at
USA; (b) locating all Underground Facilities shown or indicated in the Contract Documents,
available information, or indicated by visual observation including, but not limited to, and by way
of example only, engaging qualified locating services and all necessary backhoeing and potholing;
(c) coordination of the Work with the owners of such Underground Facilities during construction;
and (d) the safety and protection of all such Underground Facilities and repairing any damage
thereto resulting from the Work.

11.7 Contractor To Not Disrupt Owner Operation

11.7.1. Contractor shall schedule and execute all Work in a manner that does not interfere with or disrupt
Owner operations, including but not limited to, parking, utilities (electricity, gas, water), noise,
access by employees and administration, access by vendors, physicians, patients and any other
person or entity using Owner facilities or doing business with Owner. Contractor shall produce and
supply coordination plans and requests to Owner, following Owner procedures, for all necessary
interference of construction with Owner, which Owner will reasonably cooperate with, as further
described in Section 01100.

12 CLAIMS BY CONTRACTOR / NON-JUDICIAL SETTLEMENT PROCEDURE

12.1 Scope

12.1.1. The claim notice and documentation procedure described in this Article 12 applies to all claims and
disputes arising under the Contract Documents, including without limitation any claim or dispute
by any Subcontractor or material supplier, and any claims arising under tort law as well as contract
law. All Subcontractor and supplier claims of any type shall be brought only through Contractor as
provided in this Article 12. Under no circumstances shall any Subcontractor or supplier make any
direct claim against Owner.

12.1.2. “Claim” means a written demand or written assertion by Contractor seeking,
as a matter of right,
the payment of money, the adjustment or interpretation of Contract Documents terms, or other relief
arising under or relating to Contract Documents. In order to qualify as a “claim,” the written
demand must state that it is a claim submitted under this Article 12. A voucher, invoice, proposed
change, Application for Payment, cost proposal, RFI, change order request, or other routine or
authorized form of request for payment is not a claim under the Contract Documents. If such
request is disputed as to liability or amount, then the disputed portion of the submission may be
converted to a claim under the Contract Documents by submitting a separate notice and claim in
compliance with claim submission requirements herein.

12.1.3. The provisions of this Article 12 constitute a non-judicial claim settlement procedure, and also step
one of a two step claim presentation procedure by agreement under Section 930.2 of the California
Government Code. Specifically, step one is compliance with this contract claims procedure and
filing/administering timely contract claims in accordance with the Contract Documents. Step two is
filing a timely Government Code Section 910 claim in accordance with the California Government
Code. Any Government Code Section 910 claims shall be presented in accordance with the
Government Code and shall affirmatively indicate Contractor’s prior compliance with the claims procedure herein and previous dispositions under this Article.

12.1.4. The provisions of this Article 12 shall survive termination, breach or completion of the Contract Documents. Contractor shall bear all costs incurred in the preparation and submission of a claim.

12.2 Procedure

12.2.1. Disputed Work. Should any clarification, determination, action or inaction by Owner or Architect/Engineer, Work, third party, or any other event whatsoever, in the opinion of Contractor, exceed the requirements of or not comply with Contract Documents in any way, or otherwise result in Contractor seeking additional compensation in time or money or damages for any reason (collectively “Disputed Work”), then Contractor shall so notify Owner. Contractor and Owner shall make good faith attempts to resolve informally any and all such issues, claims and/or disputes.

12.2.2. Duty to Work During Disputes. Notwithstanding any dispute or Disputed Work, Contractor shall continue to prosecute the Work and the Disputed Work in accordance with the determinations of Owner. Contractor’s sole remedy for Disputed Work is to pursue the remedies in this Article 12 and follow the determinations of Owner.

12.2.3. Timely Notice of Disputed Work Required. Before commencing any Disputed Work, or within ten (10) Days after Contractor’s first knowledge of the Disputed Work, whichever is earlier, Contractor shall file a written notice and preliminary cost proposal for the Disputed Work with Owner stating clearly and in detail its objection and reasons for contending the Disputed Work is outside or in breach of the requirements of Contract Documents. The written notice must identify the subcontractors, vendors, suppliers effected, if any, sufficient for Owner to visit the site to inspect the work and/or conduct a telephonic interview of the persons involved, and/or to photograph the work in question; and Contractor is encouraged to supply digital photographs by email if possible. The preliminary cost proposal must provide a good faith preliminary estimate of the labor (workers, crews), equipment and/or materials involved, and a corresponding good faith preliminary estimate of cost. If a written notice and preliminary cost proposal for Disputed Work is not issued within this time period, or if Contractor proceeds with the Disputed Work without first having given the notice of the Disputed Work, Contractor shall waive its rights to further claim on the specific issue.

12.2.4. Timely Notice of Potential Claims Required. Owner will review Contractor’s timely notice and preliminary cost proposal for Disputed Work and provide a decision. If, after receiving the decision, Contractor disagrees with it or still considers the Work required of it to be outside of the requirements of Contract Documents, then Contractor shall so notify Owner, in writing, within ten (10) Days after receiving the decision, by submitting a notice of potential claim, stating that a formal claim will be issued. (If Owner should fail to provide a decision on a notice and preliminary cost proposal within thirty (30) days, then Contractor shall submit a notice of potential claim within ten days following the thirtieth (30th) day, i.e., or by the 40th day following the notice and preliminary cost proposal.) Contractor shall continue to prosecute the Disputed Work to completion.

12.2.5. Quarterly Claims Required. At the end of each calendar year quarter (March 31, June 30, September 30 and December 31) of each year, for each and every notice of potential claim that Contractor may have submitted in that quarter, Contractor shall submit a formal claim in the form specified herein. Contractor may file a single consolidated claim each quarter, or may file separate claims each quarter, as Contractor sees fit, provided Contractor complies with the requirements below. (Contractor may defer until the next reporting period the filing of a formal claim for any notices of potential claim timely issued within the last 15 days of the prior quarter.) The formal claim(s) shall include all arguments, justification, cost or estimates, schedule analysis, and detailed documentation supporting Contractor’s position, for each notice of potential claim that Contractor intends to pursue as a formal claim (further described below).

12.2.6. Claim Updates Required. If Disputed Work persists longer than a single calendar quarter, then Contractor shall, every quarter until the Disputed Work ceases, submit to Owner a document titled “Claim Update” that shall update and quantify all elements of the claim as completely as possible. Contractor’s failure to submit a Claim Update or to quantify costs every quarter shall result in waiver of the claim for that period. Claims or Claim Updates stating that damages, total damages (direct and indirect), schedule impact and/or any time extension will be determined at a later date.
shall not comply with this subparagraph and shall result in Contractor waiving its claim(s). Contractor shall also maintain a continuing “claims log” that shall list all outstanding claims and their value, and provide such log to Owner quarterly.

12.2.7. **Claim Negotiations required.** Upon receipt of Contractor’s formal claim(s) including all arguments, justifications, cost or estimates, schedule analysis, and documentation supporting its position as required herein, Owner or its designee will review the issue and render a final determination. Contractor and Owner may mutually agree upon a claims resolution protocol, a neutral facilitator or mediator, or other alternative dispute resolution procedures, as appropriate. Owner may in its discretion conduct an administrative hearing on Contractor’s claim, in which case Contractor shall appear, participate, answer questions and inquiries, and present any further document, schedules or analysis requested by Owner to evaluate and decide Contractor’s claim.

### 12.3 Claim Format

12.3.1. Contractor shall submit the formal claim(s) with a cover letter and certification of the accuracy of the formal claim.

12.3.2. The formal claim(s) shall list separately each notice of potential claim that Contractor intends to pursue as a formal claim(s), and for each such item separately, Contractor shall provide the following:

1. **Summary of the claim,** including underlying facts, entitlement, schedule analysis, quantum calculations, contract provisions supporting relief;
2. **List of documents relating to claim** including Specifications, Drawings, clarifications/requests for information, schedules, notices of delay, and any others;
3. **Chronology of events and correspondence;**
4. **Analysis of claim merit;**
5. **Analysis of claim cost;** and
6. Attach supporting cost and schedule documents as required in this Article and elsewhere in the Contract Documents (e.g., Section 01320).

12.3.3. For each notice of potential claim that Contractor intends to pursue as a formal claim, Contractor shall establish in the formal claim a direct causal link between the separate item of cost/time requested, the separate notices of potential claim timely issued, and the specific changed Work asserted. Total cost claims shall not be allowed.

12.3.4. Claims shall be calculated in the same manner as Change Orders per Section 01250 (Modification Procedures). EXCEPT WHERE PROVIDED BY LAW, OR ELSEWHERE IN THESE CONTRACT DOCUMENTS (IF APPLICABLE), OWNER SHALL NOT BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES, AND CONTRACTOR SHALL NOT INCLUDE THEM IN ITS CLAIMS. CONTRACTOR SHALL BE LIMITED IN ITS RECOVERY ON CLAIMS TO THE CHANGE ORDER CALCULATIONS SET FORTH IN SECTION 01250 (MODIFICATION PROCEDURES).

### 12.4 Mediation

12.4.1. If Contractor’s claims submitted in accordance with this Article 12 at Project completion total less than $375,000, then claims resolution shall first proceed in the manner prescribed by Article 1.5, Chapter 1, Part 3 of Division 2 of the California Public Contract Code, found in Section 01410 (Regulatory Requirements).

12.4.2. If Contractor’s claims submitted in accordance with this Article 12 at Project completion exceed $375,000, then, as a condition precedent to litigation (or if otherwise permitted by the Contract Documents, arbitration) thereon, such claims must first be mediated. Mediation shall be non-binding and utilize the services of a mediator mutually acceptable to the parties and, if the parties cannot agree, a mediator selected by the American Arbitration Association from its panel of approved mediators trained in construction industry mediation, having a minimum of twenty (20) years experience in the construction industry. All statutes of limitation shall be tolled from the date of the demand for mediation until a date two weeks following the mediation’s conclusion. All unresolved Contractor claims shall be submitted to the same mediator. The cost of mediation shall be equally shared.

### 12.5 Subcontractor Claims
12.5.1. Contractor shall present as its claims all Subcontractor, sub-Subcontractor and supplier claims of any type, and prove them under the terms of the Contract Documents. Owner shall not be directly liable to any Subcontractor, any supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages or extra costs of any type arising out of or resulting from the Project.

12.6 **Waiver**

12.6.1. If Contractor fails to comply with this Article 12 as to any claim, then Contractor shall waive its rights to such claim.

12.6.2. All claim(s), Disputed Work items or issue(s) not raised in a timely notice, timely notice of potential claim and then timely claim submitted under this Article 12, may not be asserted in any subsequent Government Code section 910 claim, litigation or legal action.

12.6.3. Contractor may request an extension of time to comply with the claims procedure herein, but must do so in advance of time periods expiring and Owner must give its approval in writing (which approval may be withheld in Owner discretion.) As to any other feature of the claim procedure herein (and its claims waiver feature), it may not be waived or altered absent a written change order signed by both parties and approved as to form by their legal counsel.

12.6.4. Owner shall not be deemed to waive or alter any provision under this Article 12, if at Owner’s sole discretion, a claim is administered in a manner not in accord with this Article 12.

13 **LEGAL AND MISCELLANEOUS**

13.1 **Laws And Regulations**

13.1.1. Contractor shall keep fully informed of and shall comply with all laws, ordinances, regulations and orders of any properly constituted authority affecting the Contract Documents, Work and persons connected with Work, and shall, to the greatest extent permitted by law, protect and indemnify Owner and its officers, employees, consultants and agents against any claim or liability, including attorney’s fees, arising from or based on violation of law, ordinance, regulation or order, whether by Contractor or by Subcontractors, employees or agents. Authorized persons may at any time enter upon any part of Work to ascertain compliance of all applicable laws, ordinances, regulations and orders.

13.1.2. Whenever Drawings and Specifications require larger sizes or higher standards than are required by any applicable law, ordinance, regulation or order, Drawings and Specifications shall govern. Whenever Drawings and Specifications require something that will violate such laws, ordinances, regulations or orders, then such laws, ordinances, regulations or orders shall govern.

13.1.3. Contractor shall comply with applicable portions of Title 8 (Industrial Relations), Title 19 (Public Safety), Title 22 (Social Security, Division of Health) and Title 24 (California Building Standards Code), California Code of Regulations (Uniform Building Code) (most recent edition), Public Contract Code. Whenever Contract Documents require larger sizes or higher standards than are required by any applicable law, ordinance, regulation or order, Contract Documents shall govern. Whenever Contract Documents require something that will violate such laws, ordinances, regulations or orders, then such laws, ordinances, regulations or orders shall govern.

13.1.4. **[OPTIONAL]** Contractor shall maintain in the Project Office a current copy of Title 19 and Title 24 of the California Code of Regulations at all times during construction.

13.2 **Permits And Taxes**

13.2.1. Contractor shall procure all permits and licenses applicable to the Work (including environmental matters to the extent applicable), pay all charges and fees, including fees for street opening permits, comply with, implement and acknowledge effectiveness of all permits, initiate and cooperate in securing all required notifications or approvals therefore, and give all notices necessary and incident to due and lawful prosecution of Work, unless otherwise provided herein. Owner will pay applicable building permits, school, sanitation and water fees, except as otherwise provided in the Contract Documents. Contractor shall pay all sales and/or use taxes levied on materials, supplies, or equipment purchased and used on or incorporated into Work, and all other taxes properly assessed against equipment or other property used in connection with Work, without any increase in
the Contract Sum. Contractor shall make necessary arrangements with proper authorities having jurisdiction over roads, streets, pipelines, navigable waterways, railroads, and other works in advance of operations, even where Owner may have already obtained permits for the Work.

13.3 Suspension Of Work

13.3.1. Owner may, without cause, order Contractor in writing to suspend, delay or interrupt Work in whole or in part for such period of time as Owner may determine. An adjustment shall be made for increases in cost of performance of Work of the Contract Documents caused by any such suspension, delay or interruption, calculated using the measures set forth in Section 01250 (Modification Procedures). No adjustment shall be made to extent that:

(1) Performance is, was or would have been so suspended, delayed or interrupted by another cause for which Contractor is responsible; or
(2) An equitable adjustment is made or denied under any other provision of Contract Documents; or
(3) The suspension of Work was the direct or indirect result of Contractor’s failure to perform any of its obligations hereunder. Adjustments made in cost of performance may have a mutually agreed fixed or percentage fee; if the parties cannot agree, Contractor may file a claim under Article 12 of this Document 00700.

13.4 Termination Of Contract For Cause

13.4.1. Owner may declare Contractor in default of Contract Documents and Owner may terminate Contractor’s right to proceed under the Contract Documents for cause:

(1) Should Contractor make an assignment for the benefit of creditors; admit in writing its inability to pay its debts as they become due; file a voluntary petition in bankruptcy; be adjudged a bankrupt or insolvent; be the subject of an involuntary petition in bankruptcy which is not dismissed within 60 Days; file a petition or answer seeking for itself any reorganization, arrangement, composition, readjustment, liquidation, dissolution, or similar relief under any present or future statute, law, or regulation; file any answer admitting or not contesting the material allegations of a petition filed against Contractor in any such proceeding; or seek, consent to, or acquiesce in, the appointment of any trustee, receiver, custodian or liquidator of Contractor or of all or any substantial part of its properties or if Contractor, its directors or shareholders, take action to dissolve or liquidate Contractor; or

(2) Should Contractor commit a material breach of the Contract Documents. If Owner declares Contractor in default due to material breach, however, Owner must allow Contractor an opportunity to cure such breach within ten Days of the date of notice from Owner to Contractor providing notice of the default; or, if such breach is curable but not curable within such ten-Day period, within such period of time as is reasonably necessary to accomplish such cure. (In order for Contractor to avail itself of a time period in excess of ten Days, Contractor must provide Owner within the ten-Day period with a written plan [“cure plan”] acceptable to Owner to cure said breach which includes, for example, evidence of necessary resources, actual Subcontractor commitments, actual labor commitments, schedules and recovery schedules meeting Contract Document requirements and showing a realistic and achievable plan to cure the breach. Contractor must then diligently commence and continue such cure according to the written cure plan; or

(3) Should Contractor violate or allow (by a Subcontractor or other person or entity for which Contractor is responsible) a violation of any valid law, statute, regulation, rule, ordinance, permit, license or order of any governmental agency applicable to the Project or Work and does not cure (or cause to be cured) such violation within ten Days of the date of the notice from Owner to Contractor demanding such cure; or, if such violation is curable but not curable within such ten-Day period, within such period of time as is reasonably necessary to accomplish such cure. (In order for Contractor to avail itself of a time period in excess of ten Days, Contractor shall provide Owner within the ten-Day period with a written plan to cure said violation acceptable to Owner, and then diligently commence and continue performance of such cure according to the written plan.)

13.4.2. If Owner at any time reasonably believes that Contractor is or may be in default under the Contract Documents as provided above, then Owner may in its sole discretion notify Contractor of this fact
and request written assurances from Contractor of performance of Contract Documents and a written plan from Contractor to remedy any default under the terms of Contract Documents which Owner may advise Contractor of in writing. Contractor shall, within 10 Days of Owner’s request, deliver a written cure plan which meets the requirements of the written cure plan deliverable defined above. Failure of Contractor to provide such written assurances of performance and the required written cure plan, within ten Days of request, will constitute a material breach of Contract Documents sufficient to justify termination for cause.

13.4.3. In event of termination for cause, Owner will immediately serve written notice thereof upon Surety and Contractor. Surety shall have the rights and obligations set forth in Document 00610 (Construction Performance Bond). Subject to the Surety’s rights under the Performance Bond (which rights are waived upon a default thereunder), Owner may take over the Work and prosecute it to completion by contract or by any other methods it may deem advisable.

13.4.4. In the event of termination for cause:

(1) Owner will compensate Contractor for the value of the Work delivered to Owner upon termination as determined in accordance with the Contract Documents, subject to all rights of offset and back charges, and provided that Contractor provides Owner with updated as-builds and Project Record Documents showing the Work performed up to the date of termination. However, Owner will not compensate Contractor for its costs in terminating the Work or any cancellation charges owed to third parties.

(2) Contractor shall deliver to Owner possession of the Work in its then condition including, but not limited to, all designs, architectural and engineering, Project records, Project Record Documents, cost data of all types, Drawings and Specifications and contracts with vendors and Subcontractors, all other documentation associated with the Project, and all construction supplies and aids dedicated solely to performing the Work which, in the normal course of construction, would be consumed or only have salvage value at the end of the construction period. Contractor shall remain fully liable for the failure of any Work completed and materials and equipment provided through the date of such termination to comply with the provisions of the Contract Documents. The provisions of this subparagraph shall not be interpreted to diminish any right which Owner may have to claim and recover damages for any breach of Contract Documents or otherwise, but rather, Contractor shall compensate Owner for all loss, cost, damage, expense, and/or liability suffered by Owner as a result of such termination and failure to comply with Contract Documents.

(3) Owner’s rights under this subparagraph shall be specifically enforceable to the greatest extent permitted by law. Owner shall, to the extent applicable, have all other rights and remedies set forth in any Bidding Document.

13.4.5. Owner may terminate portions or parts of the Work for cause, provided these portions or parts (1) have separate geographic areas from parts or portions of the Work not terminated or (2) are limited to the work of one or more specific trades or Subcontractors. In such case, Contractor shall cooperate with a completing contractor as required under Article 6 of this Document 00700.

13.4.6. In the event a termination for cause is later determined to have been made wrongfully or without cause, then Contractor shall have no greater rights than if a termination for convenience had been effected (to include, as appropriate, the recovery rights specified therefore.) Any Contractor claim arising out of a termination for cause, however, shall be made in accordance with Article 12 of this Document 00700. No other loss cost, damage, expense or liability may be claimed, requested or recovered by Contractor.

13.5 Termination Of Contract For Convenience

13.5.1. Owner may terminate for convenience the performance of the Work under the Contract Documents in accordance with this clause in whole, or from time to time in part, whenever Owner shall determine that termination is in Owner’s best interest. Termination for convenience may only be effected by Owner delivering to Contractor a written “Notice of Termination for Convenience”, specifying the extent to which performance of the Work under the Contract Documents is terminated and the effective date of the termination.

13.5.2. After receiving a notice of termination for convenience under this subparagraph, and except as
otherwise directed by Owner, Contractor shall:

1. Stop Work under the Contract Documents on date and to extent specified in notice of termination for convenience;
2. Place no further orders or subcontracts for materials, services, or facilities except as necessary to complete portion of Work under the Contract Documents which is not terminated;
3. Terminate all orders and subcontracts to extent that they relate to performance of Work terminated by the notice of termination;
4. Assign to Owner in manner, at times, and to extent directed by Owner, all right, title, and interest of Contractor under orders and subcontracts so terminated. Owner shall have the right, in its sole discretion, to settle or pay any or all claims arising out of termination of orders and subcontracts;
5. Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with approval or ratification of Owner to extent Owner may require. Owner’s approval or ratification shall be final for purposes of this subparagraph;
6. Transfer title to Owner, and deliver in the manner, at the times, and to the extent, if any, directed by Owner, all fabricated or unfabricated parts, Work in process, completed Work, supplies, and all other material produced as part of, or acquired in connection with performance of, Work terminated by the notice of termination, and completed or partially completed drawings, drawings, specifications, information, and other property which, if the Project had been completed, would have been required to be furnished to Owner;
7. Use its best efforts to sell, in manner, at times, to extent, and at price or prices that Owner directs or authorizes, any property of types referred to in this subparagraph, but Contractor shall not be required to extend credit to any purchaser, and may acquire any such property under conditions prescribed and at price or prices approved by Owner. Proceeds of transfer or disposition shall be applied to reduce payments to be made by Owner to Contractor under the Contract Documents or shall otherwise be credited to the price or cost of Work covered by Contract Documents or paid in such other manner as Owner may direct;
8. Complete performance of the part of the Work which was not terminated by the notice of termination; and
9. Take such action as may be necessary, or as Owner may direct, to protect and preserve all property related to Contract Documents which is in Contractor’s possession and in which Owner has or may acquire interest.

13.5.3. After receipt of a notice of termination for convenience, Contractor shall submit to Owner its termination for convenience claim, in form and with all certifications required by Article 12 of this Document 00700. Contractor’s termination for convenience claim shall be submitted promptly, but in no event later than 6 months from effective date of the termination. Contractor and Owner may agree upon the whole or part of the amount or amounts to be paid to Contractor because of a total or partial termination of Work under this subparagraph. If Contractor and Owner fail to agree on the whole amount to be paid to Contractor because of the termination of the Work under this subparagraph, Owner’s total liability to Contractor by reason of the termination shall be the total (without duplication of any items) of:

1. The reasonable cost to Contractor, without profit, for all Work performed prior to the effective date of the termination, including Work done to secure the Project for termination. Reasonable cost may not exceed the applicable percentage completion values derived from the progress schedule and the schedule of values. Deductions shall be made for cost of materials to be retained by Contractor, cost of Work defectively performed, amounts realized by sale of materials, and for other appropriate credits against cost of Work. Reasonable cost will include reasonable allowance for Project overhead and general administrative overhead not to exceed a total of ten percent of direct costs of such Work. When, in Owner’s opinion, the cost of any item of Work is excessively high due to costs incurred to remedy or replace defective or rejected Work, reasonable cost to be allowed will be the estimated reasonable cost of performing the Work in compliance with requirements of Contract Documents and excessive actual cost shall be disallowed.
(2) A reasonable allowance for profit on actual and allowable cost of Work performed as determined in this subparagraph, provided that Contractor establishes to Owner’s satisfaction that Contractor would have made a profit had the Project been completed, and provided further that the profit allowed shall not exceed 5 percent of cost.

(3) Reasonable costs to Contractor of handling material returned to vendors, delivered to Owner or otherwise disposed of as directed by Owner.

(4) A reasonable allowance for Contractor’s internal administrative costs in preparing termination claim.

(5) Except as provided in this subparagraph, Owner shall not be liable for costs incurred by Contractor or Subcontractors after receipt of a notice of termination. Such non-recoverable costs include, but are not limited to, anticipated profits on Work not performed as of the date of termination, post-termination employee salaries, post-termination general administrative expenses, post-termination overhead or unabsorbed overhead, costs of preparing and submitting Contractor’s Bid, attorney’s fees of any type, and all costs relating to prosecution of claim or lawsuit.

(6) Owner shall have no obligation to pay Contractor under this subparagraph unless and until Contractor provides Owner with updated and acceptable as-builts and Project Record Documents for Work completed prior to termination.

13.5.4. In arriving at the amount due Contractor under this clause, there shall be deducted in whole (or in the appropriate part[s] if the termination is partial):

(1) All unliquidated advances or other payments on account previously made to Contractor, including without limitation all payments applicable to the terminated portion of Contract Documents;

(2) Any claim which Owner may have against Contractor in connection with Contract Documents; and

(3) The agreed price for, or proceeds of sale of, any materials, supplies, or other things kept by Contractor or sold under provisions of this subparagraph, and not otherwise recovered by or credited to Owner.

13.6 Contingent Assignment Of Subcontracts

13.6.1. Contractor hereby assigns to Owner each Subcontract for a portion of the Work, provided that:

(1) The assignment is effective only after Owner’s termination of Contractor’s right to proceed under the Contract Documents (or portion thereof relating to that Subcontract) pursuant to the termination for cause subparagraphs herein.

(2) The Assignment is effective only for the Subcontracts which Owner expressly accepts by notifying the Subcontractor in writing;

(3) The assignment is subject to the prior rights, if any, of the Surety, obligated by Document 00610 (Construction Performance Bond) provided under the Contract Documents, where the Surety exercises its rights to complete the Contract;

(4) After the effectiveness of an assignment, Contractor shall, at its sole cost and expense, sign all instruments and take all actions reasonably requested by Owner to evidence and confirm the effectiveness of the assignment in Owner; and

(5) Nothing in this subparagraph shall modify or limit any of Contractor’s obligations to Owner arising from acts or omissions occurring before the effectiveness of any Subcontract assignment, including but not limited to all defense, indemnity and hold-harmless obligations arising from or related to the assigned Subcontract.

13.7 Remedies and Contract Integration

13.7.1. Subject to Contract Documents provisions regarding Contractor claims, claim review, and claim resolution, and subject to the limitations therein, the exclusive jurisdiction and venue for resolving all claims, counter-claims, disputes and other matters in question between Owner and Contractor arising out of or relating to Contract Documents, any breach thereof or the Project shall be the Superior Court of the State of California for County of [ENTER APPLICABLE COUNTY]. All Owner remedies provided in the Contract Documents shall be taken and construed as cumulative and not exclusive; that is, in addition to each and every other remedy herein provided; and in all instances Owner shall have any and all other equitable and legal rights and remedies which it would
have according to law.

13.7.2. The Contract Documents, any Contract Modifications and Change Orders shall represent the entire and integrated agreement between Owner and Contractor regarding the subject matters hereof and thereof and shall constitute the exclusive statement of the terms of the parties’ agreement. The Contract Documents, and any Contract Modifications and Change Orders, shall supersede any and all prior negotiations, representations or agreements, written or oral, express or implied, that relate in any way to the subject matter of the Contract Documents or written modifications. Owner and Contractor represent and agree that, except as otherwise expressly provided in the Contract Documents, they are entering into the Contract Documents and any subsequent written modification in sole reliance upon the information set forth or referenced in the Contract Documents or Contract Modifications and the parties are not and will not rely on any other information.

13.7.3. In any proceeding to enforce the Contract Documents, Contractor and Owner agree that the finder of fact shall receive detailed instructions on the meaning and operation of the Contract Documents, including their conditions, limitations of liability, claims and time extension procedures, and any other provisions impacting major defenses and theories of liability of the parties. Detailed findings of fact shall be requested, to verify Contract enforcement.

13.7.4. Either party’s waiver of any breach or failure to enforce any of the terms, covenants, conditions or other provisions of the Contract Documents at any time shall not in any way affect, limit, modify or waive that party’s right thereafter to enforce or compel strict compliance with every term, covenant, condition or other provision hereof, any course of dealing or custom of the trade or oral representations notwithstanding.

13.8 Patents

13.8.1. Fees or claims for any patented invention, article or arrangement that may be used upon or in any manner connected with performance of the Work or any part thereof shall be included in the Bid price for doing the Work. To the greatest extent permitted by law, Contractor shall defend, indemnify and hold harmless Owner and each of its officers, employees, consultants and agents, including, but not limited to, the Board, Architect/Engineer and each Owner representative, from all damages, claims for damages, costs or expenses in law or equity, including attorney’s fees, arising from or relating to any claim that any article supplied or to be supplied under the Contract Documents infringes on the patent rights, copyright, royalties, trade name, trademark, service mark, trade secret or other intellectual property right of any person or persons or that the person or entity supplying the article does not have a lawful right to sell the same. Such costs or expenses for which Contractor agrees to indemnify and hold harmless the above indemnities include but are not limited to any and all license fees, whether such fees are agreed by any indemnities or ordered by a court or administrative body of any competent jurisdiction.

13.9 Substitution For Patented And Specified Articles

13.9.1. Except as noted specifically in Specifications, whenever in Specifications, material or process is designated by patent or proprietary name or by name of manufacturer, such designation shall be deemed to be used for purpose of facilitating description of material and process desired, and shall be deemed to be followed by the words “or equal” and Contractor may offer any substitute material or process that Contractor considers equal in every respect to that so designated and if material or process offered by Contractor is, in opinion of Owner, equal in every respect to that so designated, its use will be approved. However, Contractor may utilize this right only by timely submitting Document 00660 (Substitution Request Form) as provided in Document 00200 (Instructions to Bidders). A substitution will be approved only if it is a true “equal” item in every aspect of its design and quality, including but not limited to its dimensions, weights, service requirements, durability, functioning, impact on contiguous construction elements, overall schedule and design.

13.10 Interest Of Public Officers

13.10.1. No representative, officer, or employee of Owner, no member of the governing body of the locality in which the Project is situated, no member of the locality in which Owner was activated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the Project, during the tenure of the official or for one year thereafter, shall, as principal, agent, attorney or otherwise, be directly or indirectly interested, in the Contract
13.11 Limit Of Liability

13.11.1. OWNER, AND EACH OF ITS OFFICERS, BOARD MEMBERS, EMPLOYEES, CONSULTANTS AND AGENTS INCLUDING, BUT NOT LIMITED TO, ARCHITECT/ENGINEER AND EACH OTHER OWNER REPRESENTATIVE, SHALL HAVE NO LIABILITY TO CONTRACTOR FOR SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, EXCEPT TO THE LIMITED EXTENT THAT THESE CONTRACT DOCUMENTS OR APPLICABLE PUBLIC CONTRACTING STATUTES MAY SPECIFY THEIR RECOVERY.

13.12 Severability

13.12.1. Any provisions or portions thereof of Contract Documents that are prohibited by, unlawful, or unenforceable under any applicable law of any jurisdiction shall as to such jurisdiction be ineffective without affecting other provisions or portions thereof in the Contract Documents.

14 MODIFICATIONS OF CONTRACT DOCUMENTS

14.1 Alterations, Modifications And Force Account Work

14.1.1. No modification or deviation from the Drawings and Specifications will be permitted except by written addenda, written Change Order or written Supplemental Instruction.

14.1.2. Owner may, without notice to the sureties, make alterations, deviations, additions to, or deletions from Contract Documents; increase or decrease the quantity of any item or portion of the Work; expand, contract or otherwise change the Contract Time; delete any item or portion of the Work; and require extra Work. Contractor shall perform such Work under applicable provisions of the Contract Documents, unless specifically provided otherwise at the time the change is ordered. In the case of any ordered extra Work, Owner reserves the right to furnish all or portions of associated labor, material, and equipment, which Contractor shall accept and use without payment for costs, markup, profit, or otherwise for such Owner-furnished labor, materials, and equipment.

14.1.3. Owner may make changes to the Work during the course of construction to bring the Work into compliance with environmental requirements or standards established by state and federal statutes and regulations enacted after the Contract has been awarded. Contractor shall be compensated for changes affecting the Contract Time or Contract Sum of the Work as set forth in this Article 14 and in Section 01250 (Modification Procedures).

14.1.4. Changes affecting the Contract Time or Contract Sum of the Work shall be set forth in a written Change Order that shall specify:

(1) The Work performed in connection with the change to be made;
(2) The amount of the adjustment of the Contract Sum, if any, and the basis for compensation for the Work ordered; and
(3) The extent of the adjustment in the Contract Time, if any.

14.1.5. A Change Order will become effective when signed by Owner. If Owner exercises its right to decide disputed issues pertaining to changed Work as set forth in Articles 12 and 14 of this Document 00700, then the resulting Change Order shall be effective when signed by Owner, notwithstanding that Contractor has not signed it.

14.1.6. Changes not affecting the Contract Time or Contract Sum of the Work, in Owner’s discretion, may be set forth in a written RFI-Reply executed by Owner. Execution of such an RFI-Reply constitutes Contractor’s agreement to make the specified change without change to the Contract Sum or the Contract Time.

14.1.7. Changes or deviations from Contract Documents affecting the Contract Time or Contract Sum of the Work shall not be made without the authority of an effective Change Order or Construction Change Directive as provided in Section 01250 (Modification Procedures), except in cases of emergency discussed in Document 00700.

14.1.8. If changes ordered in design, workmanship or materials are of such a nature as to increase or decrease the cost of any part of the Work, the price fixed in the Contract Documents shall be increased or decreased by the amount that Contractor and Owner may agree upon as a reasonable and proper allowance for the cost increase or decrease. If an agreement cannot be reached, then
Owner will reach a determination, which shall be final, subject to Contractor’s rights under Article 12 of this Document 00700. In all cases Contractor shall perform the changed Work as directed by Owner subject to Contractor’s rights under Article 12 of this Document 00700.

14.1.9. Contractor shall, upon Owner’s request, permit inspection of the original unaltered Bid estimate, subcontract agreements, purchase orders relating to the change, and documents substantiating all costs associated with its cost proposal or claims arising from changes in the Work.

14.1.10. Changes in the Work made pursuant to this Article 14 and extensions of Contract Time necessary by reason thereof shall not in any way release the guaranties and warranties given by Contractor pursuant to provisions of the Contract Documents, nor shall such changes in the Work relieve or release the Sureties of bonds executed pursuant to said provisions. The Sureties, in executing such bonds, shall be deemed to have expressly agreed to any such change in the Work and to any extension of time made by reason thereof.

14.1.11. Procedures for Modifications of Contract Documents and for calculating the cost of extra Work are given in Section 01250 (Modification Procedures). Regarding delay and impact costs of any nature, Contractor may not seek delay compensation for on-Site or off-Site costs based on formulas, e.g., “Eichlary” or other formula. Rather, Contractor shall prove actual costs resulting from such delays. If Contractor requests compensation for delay to the construction, then Contractor shall prove and document actual costs plus markup per the cost categories and procedures in Section 01250 (Modification Procedures) in order to request, claim or prove compensation for delay.

14.1.12. Change Orders and authorization for extra cost must be approved by Owner’s Chief Executive Officer in advance of the work.

14.2 TIME ALLOWANCES

14.2.1. The Contract Time may only be changed by Change Order or by Contract Modification, and all time limits stated in the Contract Documents are of the essence of Contract Documents.

14.2.2. The Contract Time will be adjusted in an amount equal to the time lost due to:

(1) Changes in the Work ordered by Owner;
(2) Acts or neglect by Owner, Architect/Engineer, any Owner representative, utility owners or other contractors performing other work, provided that Contractor has fully and completely performed its responsibilities under the Contract Documents; or
(3) Fires, floods, epidemics, abnormal weather conditions beyond the parameters otherwise set forth in this subparagraph, earthquakes, civil or labor disturbances, strikes or acts of God, provided damages resulting therefrom are not the result of Contractor’s failure to protect the Work as required by Contract Documents.

14.2.3. The Contract Time shall not be extended for any cause identified immediately above, however, unless:

(1) Contractor actually has been prevented from completing any part of the Work within the Contract Time due to delay that is beyond Contractor’s control and due to reasons for which Contractor is not responsible (delays attributable to and within the control of a Subcontractor, or its subcontractors, or supplier shall be deemed to be delays within the control of Contractor);
(2) A claim for delay is made as provided herein; and
(3) Contractor submits a Time Impact Evaluation as required under Section 01320 (Progress Schedules and Reports) that demonstrates actual delay to critical Work activities that actually delay the progress of the Work in the amount of time requested.

14.3 Notice Of Delay
14.3.1. Within seven Days of the beginning of any delay, Contractor shall notify Owner in writing, by submitting a notice of delay that shall describe all anticipated delays resulting from the delay event in question. Any request for extension of time shall include a written schedule document that demonstrates delay to the critical path using a Time Impact Evaluation as specified in Section 01320 (Progress Schedules and Reports). Owner will determine all claims and adjustments in the Contract Time. No claim for an adjustment in the Contract Time will be valid and such claim will be waived if not submitted in accordance with the requirements of this subparagraph.

14.4 Non-Compensable Time Extensions; Adverse Weather Parameters.

14.4.1. Where Contractor is prevented from completing any part of the Work within the Contract Time due to delay beyond the control of both Owner and Contractor (including, but not limited to, adverse weather conditions exceeding Contract Documents parameters, earthquakes, Acts of God and epidemics, acts of other contractors or utilities), an extension of Contract Time, in an amount equal to the time lost due to such delay (without compensation), shall be Contractor’s sole and exclusive remedy for such delay.

14.4.2. Delays due to abnormal or adverse weather conditions will not be allowed for weather conditions that fall within the parameters listed or referenced immediately below in this subparagraph. Adverse weather delays may be allowed only if the number of workdays of adverse weather exceeds these parameters and Contractor proves that adverse weather actually caused delays to work that is on the critical path. Contractor shall give written notice of intent to claim an adverse weather day within one Day of the adverse weather day occurring. Rain parameters are as follows, pro-rated in the individual month Contractor starts and finishes Work:

(1) January, [6];
(2) February, [6];
(3) March, [6];
(4) April, [3];
(5) May, [1];
(6) June, [0];
(7) July, [0];
(8) August, [0];
(9) September, [0];
(10) October, [2];
(11) November, [4]; and
(12) December, [5].

[ENTER PROJECT RAIN PARAMETERS, IF DIFFERENT]
In order to qualify as an adverse weather delay with respect to the foregoing parameters, daily rainfall must exceed .1 of an inch or more at the Newark, California station, as measured by the National Oceanic & Atmospheric Administration, and Contractor shall prove that the rain actually caused delay to the Work, following the procedures in this paragraph and the Contract Documents. Notwithstanding the foregoing allowances, Contractor shall at all times employ all available mitigation measures to enable Work to continue. Delays due to abnormal or adverse weather conditions will not be allowed for weather conditions that fall within the parameters listed above.

14.4.3. Contractor shall include the foregoing precipitation parameters as a monthly activity in its progress schedule. As Work on the critical path is affected by precipitation, Contractor shall notify Owner and request that the days be moved to the affected activities. Any adverse weather days remaining shall be considered Project float.

14.4.4. Adverse weather delay for precipitation shall be recognized for the actual period of time Contractor proves it was delayed by precipitation exceeding the specified parameters. For example, and not by way of limitation, if precipitation exceeding the specified parameters does not in fact delay Contractor’s progress on the critical path, then no time extension shall be recognized; and conversely, if Contractor proves to Owner’s satisfaction that precipitation exceeding the specified parameters causes delay to Contractor for a period longer than the number of precipitation days incurred (e.g., if it rains or snows during grading work), then Contractor shall be entitled to a time extension equal to the actual period of such delay.
14.4.5. Contractor shall take reasonable steps to mitigate potential weather delays, such as dewatering the Site, lime treatment, and covering Work and material that could be affected adversely by weather. Failure to do so shall be cause for Owner to not grant a time extension due to adverse weather, where Contractor could have avoided or mitigated the potential delay by exercising reasonable care.

14.5 Compensable Time Extensions

14.5.1. Contractor may receive a time extension and be compensated for delays caused directly and solely by Owner. Provided Contractor provides proper notice and documentation under Section 01320, such compensation may include extended field or home office overhead, field supervision, escalation charges, acceleration costs and extended subcontractor costs.

14.5.2. Contractor shall not be entitled to any time extension or compensation, however, for any delays caused in whole or in part by Contractor’s failure to perform its obligations under the Contract Documents, or during periods of delay concurrently caused by Contractor and either Owner or others.

14.5.3. Contractor shall not be entitled to damages for delay to the Work caused by the following reasons:

(1) Owner’s right to sequence the Work in a manner which would avoid disruption to Owner’s tenants and their contractors or other prime contractors and their respective subcontractors, exercised as a result of Contractor’s failure to perform its cooperation and coordination responsibilities required by Contract Documents; Owner’s enforcement of any government act or regulation; or the provisions of the Contract Documents; and

(2) Extensive requests for clarifications to Contract Documents or Contract Modifications thereto, provided such clarifications or Contract Modifications are processed by Owner or its consultants in a reasonable time commensurate with Contract Documents requirements.

14.6 Liquidated Damages

14.6.1. Time is of the essence. Execution of Contract Documents by Contractor shall constitute acknowledgement by Contractor that Contractor understands, has ascertained and agrees that Owner will actually sustain damages in the amount fixed in the Contract Documents for each and every Day during which completion of Work required is delayed beyond expiration of time fixed for completion or extensions of time allowed pursuant to provisions hereof. Contractor and Owner agree that specified measures of liquidated damages shall be presumed to be the damages actually sustained by Owner as defined below, and that because of the nature of the Project, it would be impracticable or extremely difficult to fix the actual damages.

14.6.2. Liquidated damages shall be considered not as a penalty but as agreed monetary damage sustained by Owner for increased Project administration expenses, including extra inspection, construction management and architectural and engineering expenses related to the Project and Contract Documents because Contractor failed to perform and complete Work within time fixed for completion or extensions of time allowed pursuant to provisions hereof. Liquidated damages shall not be deemed to include within their scope additional damages or administrative costs arising from Defective Work, lost revenues, interest expenses, cost of completion of the Work, cost of substitute facilities, claims and fines of regulatory agencies, damages suffered by others or other forms of liability claimed against Owner as a result of delay (e.g., delay or delay related claims of other contractors, subcontractors or tenants), and defense costs thereof. Contractor shall be fully responsible for the actual amount of any such damages it causes, in addition to the liquidated damages otherwise due Owner.

14.6.3. Owner may deduct from any money due or to become due to Contractor subsequent to time for completion of entire Work and extensions of time allowed pursuant to provisions hereof, a sum representing then-accrued liquidated damages. Should Contractor fall behind the approved Progress Schedule, Owner may deduct liquidated damages based on its estimated period of late completion. Owner need not wait until Final Completion to withhold liquidated damages from Contractor’s progress payments. Should money due or to become due to Contractor be insufficient to cover aggregate liquidated damages due, then Contractor forthwith shall pay the remainder of the assessed liquidated damages to Owner.

14.7 Differing Site Conditions.
14.7.1. In the event that Contractor encounters underground conditions that exceed the scope of the Work, then Contractor shall promptly give Owner written notice of the condition, and shall give such notice before the conditions are disturbed, to include: (1) material that Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law, and is not within the scope of Work (“hazardous waste”); (2) subsurface or latent physical conditions at the site differing from those indicated by information about the site made available to Bidders prior to the deadline for submitting Bids, that Contractor did not and could not have known about by performing its required pre-Bid investigations; or (3) unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for the contract, that Contractor did not and could not have known about by performing its required pre-Bid investigations.

(1) Owner shall promptly investigate the underground conditions, and if it finds that (i.) the conditions do materially so differ in a manner Contractor did not anticipate and could not have anticipated, or do involve hazardous waste outside the scope of the Work, and (ii.) cause a decrease or increase in Contractor’s cost of, or the time required for, performance of any part of the Work, then (iii.) Owner shall initiate a change order under the procedures described in the contract, including but not limited to, issuing either a Request for Proposal or a Construction Change Directive under the procedures described in the Contract Documents, including without limitation Section 01250 (Modification Procedures).

(2) If Owner determines that underground conditions at the Site do not materially so differ in a manner Contractor did not anticipate and could not have anticipated, or do not involve hazardous waste outside the scope of the Work, or do not cause a decrease or increase in Contractor’s cost of, or the time required for, performance of any part of the Work, or for any other reason that that no change in terms of the Contract Documents is justified, Owner will so notify Contractor in writing, stating reasons.

(3) In the event that a dispute arises between Owner and Contractor whether the conditions do materially so differ, or involve hazardous waste, and cause a decrease or increase in Contractor’s cost of, or the time required for, performance of any part of the Work, Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all Work to be performed under the Contract. The Contractor shall retain any and all rights provided either by the Contract or by law which pertain to the resolution of disputes and protests between contracting parties.

14.7.2. Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time regarding claimed hazardous waste or materials, claimed Latent or materially different Site conditions (whether above or below grade) if:

(1) Contractor knew of the existence of such conditions at the time Contractor submitted its Bid; or

(2) Contractor should have known of the existence of such conditions at the time Contractor submitted its Bid, or should have learned of such conditions and mitigated their impact, as a result of having complied with the requirements of Contract Documents, including without limitation, the investigation requirements herein at Articles 2 and 10 of Document 00700;

(3) The information or conditions claimed by Contractor to be Latent or materially different consist of information, conclusions, opinions or deductions made from underground conditions reports, of the kind that this Document 00700 precludes reliance upon; or,

(4) Contractor was required to give written notice and failed to do so within the time required

14.7.3. If, because of a differing site condition as defined herein, Contractor does not agree to continue with the Work based on a reasonable belief that it is unsafe, or does not agree to resume Work under special conditions, Owner may order the disputed portion of Work deleted from the Work, or performed by others, or Owner may invoke its right to terminate Contractor’s right to proceed under the Contract Documents in whole or in part, for convenience or for cause as the facts may warrant. If Contractor does not agree with Owner’s determination of any adjustment in the Contract Sum or Contract Time as a result, Contractor may make a claim as provided in Article 12 of this Document.
14.8 Change Orders Related to Underground Facilities.

14.8.1 If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated in the materials supplied by Owner or in information on file at USA or is not otherwise reasonably known to Contractor by performing its obligations in Articles 2 and 10 of this Document 00700, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby (and in no event later than seven Days), and prior to performing any Work in connection therewith (except in an emergency as required by Article 15 of this Document 00700), identify the owner of such Underground Facility and give written notice to that owner and to Owner. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

14.8.2 Contractor shall be allowed an increase in the Contract Sum or an extension of the Contract Time, or both, for Underground Facilities either not shown or inaccurately shown in the Contract Documents, the information supplied pursuant to Document 00320 (Geotechnical Data and Existing Conditions) or in information on file at USA, only where the inaccuracy was (i.) material and outside of the normal experience on projects of this nature, (ii.) was not reasonably inferable from existing information, and (iii.) directly results in a material, justifiable and actual increase in the cost of Contractor’s work. For example, if surface conditions such as pavement repairs, valve covers, or other markings, indicate the presence of an Underground Facility, or if the Underground Facility could be determined or its cost impact mitigated by performing the obligations in Articles 2 and/or 10 of this Document 00700, then an increase in the Contract Price or an extension of the Contract Time will not be due, even if the Underground Facility was not indicated or was shown at a different place or a different elevation in the Contract Documents, in the information supplied to Contractor pursuant to Document 00320 (Geotechnical Data and Existing Conditions), or in information on file at USA.

14.8.3 Main Line and Trunk Line Utilities (Government Code Section 4215). Consistent with Government Code Section 4215, as between Owner and Contractor, Owner will be responsible for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the Site only if such utilities are not identified in the Contract Documents or Document 00320 (Geotechnical Data and Existing Conditions). Owner will compensate for the cost of locating and repairing damage not due to Contractor’s failure to exercise reasonable care, removing and relocating such main or trunk line utility facilities not indicated in the Contract Documents or Document 00320 (Geotechnical Data and Existing Conditions) with reasonable accuracy, and equipment on the Project necessarily idled during such work. Contractor shall not be assessed liquidated damages for delay in completion of the Project, when such delay was caused by the failure of Owner or the utility to provide for removal or relocation of such utility facilities.

15 WORKING CONDITIONS AND PREVAILING WAGES

15.1 Use Of Site/Sanitary Rules

15.1.1 All portions of the Work shall be maintained at all times in neat, clean and sanitary condition. Contractor shall furnish toilets for use of Contractor’s and Subcontractors’ employees on the Site where needed, and their use shall be strictly enforced. All toilets shall be properly secluded from public observation, and shall be located, constructed and maintained subject to Owner’s approval.

15.1.2 Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Site and land areas identified in and permitted by Contract Documents and other land and areas permitted by applicable laws and regulations, rights of way, permits and easements or as designated by Owner, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, any improvement located thereon, or to the owner or occupant thereof resulting from the performance of Work.

15.1.3 During the progress of the Work, Contractor shall keep the Site and the Project free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work, Contractor shall remove all waste materials, rubbish and debris from and about the Site as well as all tools, appliances, construction equipment and machinery and surplus
materials. Contractor shall leave the premises clean and ready for occupancy by Owner at Substantial Completion of Work. Contractor shall restore to original condition all property not designated for alteration by Contract Documents.

15.1.4. Contractor shall not load nor permit any part of any structure or pavement to be loaded in any manner that will endanger the structure or pavement, nor shall Contractor subject any part of Work or adjacent property to stresses or pressures that will endanger it. Contractor shall conduct all necessary existing conditions investigation regarding structural, mechanical, electrical or any other system existing, shall perform Work consistent with such existing conditions, and shall have full responsibility for insufficiencies or damage resulting from insufficiencies of existing systems, equipment or structures to accommodate performing the Work.

15.2 Protection Of Work, Persons, Property And Operations

15.2.1. Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with Work. Contractor shall comply with all safety requirements specified in any safety program established by Owner, or required by state, federal or local laws and ordinances. Contractor shall be responsible for all damage to Work, property or structures, all injuries to persons, and all damage and interruptions to Owner’s operations, arising from the performance of Work of the Contract Documents. Except as otherwise expressly approved by Owner in writing, Contractor shall at all times perform all Work in a manner which does not interrupt, damage or otherwise adversely impact any facilities, operations, or real or personal property of Owner, its officers, employees, agents, invitees, licensees, lessees or contractors.

15.2.2. Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property.

15.2.3. Contractor shall remedy all damage, injury, loss or interruption to any property or operations of Owner or continuous owners of property interests, caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, supplier, or any other person or organization directly or indirectly employed by any of them to perform or furnish any Work or anyone for whose acts any of them may be liable. Contractor’s duties and responsibility for safety and for protection of Work shall continue until such time as all the Work is completed and Final Acceptance of the Work. Owner and its agents do not assume any responsibility for collecting any indemnity from any person or persons causing damage to Contractor’s Work. Contractor shall give all notices required by potentially responsible insurance carriers and require that it subcontractors and suppliers do the same.

15.2.4. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

15.2.5. Owner may, at its option, retain such moneys due under the Contract Documents as Owner deems necessary until any and all suits or claims against Contractor for injury to persons, property or operations shall be settled and Owner receives satisfactory evidence to that effect.

15.3 Responsibility For Safety And Health

15.3.1. Contractor shall ensure that its and each tier of Subcontractors’ employees, agents and invitees comply with applicable health and safety laws while at the Site. These laws include the Occupational Safety and Health Act of 1970 and rules and regulations issued pursuant thereto, and Owner’s safety regulations as amended from time to time. Contractor shall comply with all Owner directions regarding protective clothing and gear.

15.3.2. Contractor shall be fully responsible for the safety of its and its Subcontractors’ employees, agents and invitees on the Site. Contractor shall notify Owner, in writing, of the existence of hazardous conditions, property or equipment at the Site that are not under Contractor’s control. Contractor shall be responsible for taking all the necessary precautions against injury to persons or damage to the property of Contractor, Subcontractors or persons from recognized hazards until the responsible
15.3.3. Contractor shall confine all persons acting on its or its Subcontractors’ behalf to that portion of the Site where Work under the Contract Documents is to be performed: Owner designated routes for ingress and egress thereto and any other Owner designated area. Except those routes for ingress and egress over which Contractor has no right of control, within such areas, Contractor shall provide safe means of access to all places at which persons may at any time have occasion to be present.

15.4 Emergencies

15.4.1. In emergencies affecting the safety or protection of persons or Work or property at the Site or adjacent thereto, Contractor, without special instruction or authorization from Owner, is obligated to act to prevent threat and damage, injury or loss, until directed otherwise by Owner. Contractor shall give Owner prompt written notice if Contractor believes that any significant changes in Work or variations from Contract Documents have been caused thereby. If Owner determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Change Order or Construction Change Directive will be issued to document the consequences of such action.

15.5 Use Of Roadways And Walkways

15.5.1. Contractor shall not unnecessarily interfere with use of any roadway, walkway or other facility for vehicular or pedestrian traffic. Before beginning any interference and only with Owner’s prior concurrence, Contractor may provide detour or temporary bridge for traffic to pass around or over the interference, which Contractor shall maintain in satisfactory condition as long as interference continues. Unless otherwise provided in the Contract Documents, Contractor shall bear the cost of these temporary facilities.

15.6 Nondiscrimination

15.6.1. No person or entity shall discriminate in the employment of persons upon public works because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sexual preference, or gender of such persons, except as provided in Section 12940 of the Government Code. Every contractor for public works violating the provisions of Section 1735 of the Labor Code is subject to all the penalties imposed for a violation of Chapter 1, Part 7, Division 2 of the Labor Code.

15.7 Prevailing Wages

15.7.1. Contractor shall pay to persons performing labor in and about Work provided for in the Contract Documents an amount equal to or more than the general prevailing rate of per diem wages for (1) work of a similar character in the locality in which the Work is performed and (2) legal holiday and overtime work in said locality. The per diem wages shall be an amount equal to or more than the stipulated rates contained in a schedule that has been ascertained and determined by the Director of the State Department of Industrial Relations and Owner to be the general prevailing rate of per diem wages for each craft or type of workman or mechanic needed to execute this Contract. Contractor shall also cause a copy of this determination of the prevailing rate of per diem wages to be posted at each Site.

15.7.2. Contractor shall forfeit, as a penalty to Owner, Fifty Dollars ($50.00) for each laborer, workman, or mechanic employed in performing labor in and about the Work provided for in the Contract Documents for each Day, or portion thereof, that such laborer, workman or mechanic is paid less than the said stipulated rates for any work done under the Contract Documents by him or her or by any Subcontractor under him or her, in violation of Articles 1 and 2 of Chapter 1 of Part 7 of Division II of the California Labor Code. The sums and amounts which shall be forfeited pursuant to this subparagraph and the terms of the Labor Code shall be withheld and retained from payments due to Contractor under the Contract Documents, pursuant to this Document 00700 and the Labor Code, but no sum shall be so withheld, retained or forfeited except from the final payment without a full investigation by either the State Department of Industrial Relations or by Owner. The Labor Commissioner pursuant to Labor Code Section 1775 shall determine the final amount of forfeiture.

15.7.3. Contractor shall insert in every subcontract or other arrangement which Contractor may make for
performance of work or labor on Work provided for in the Contract, provision that Subcontractor shall pay persons performing labor or rendering service under subcontract or other arrangement not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the Work is performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work fixed in the Labor Code.

15.7.4. Contractor stipulates that it shall comply with all applicable wage and hour laws, including without limitation Labor Code Sections 1776 and 1810-1815. Failure to so comply shall constitute a default under this Contract.

15.7.5. Contractor and its Subcontractors shall be responsible for compliance with Labor Code Sections 1810-1815.

(1) Eight hours of labor performed in execution of the Contract constitutes a legal day’s work. The time of service of any workman employed on the Project is limited and restricted to 8 hours during any one calendar day, and 40 hours during any one calendar week.

(2) Contractor and its Subcontractors shall keep an accurate record showing the name of and actual hours worked each calendar day and each calendar week by each worker employed by him or her in connection with the Project. The record shall be kept open at all reasonable hours to the inspection Owner and to the Division of Labor Standards Enforcement.

(3) Contractor or its Subcontractors shall, as a penalty to Owner, forfeit twenty-five dollars ($25) for each worker employed in the execution of the Contract Documents by the respective Contractor or Subcontractor for each calendar day during which the worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of Labor Code §§ 1810-1815.

(4) Work performed on the Project by employees of Contractor or its Subcontractors in excess of 8 hours per day, and 40 hours during any one week, shall be permitted upon compensation for all hours worked in excess of 8 hours per day at not less than 1 1/2 times the basic rate of pay.

15.7.6. Contractor and its Subcontractors shall be responsible for compliance with Labor Code Section 1776.

(1) Contractor and Subcontractors must 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 journeyman, apprentice, worker, or other employee employed by him or her in connection with the Work of the Contract documents. Each payroll record shall contain or be verified by a written declaration as required by Labor Code Section 1776.

(2) The payroll records enumerated above must be certified and shall be available for inspection at all reasonable hours at the principal office of Contractor as required by Labor Code Section 1776.

   a. Contractor shall inform Owner of the location of records enumerated above, including the street address, city and county, and shall, within five working Days, provide a notice of a change of location and address.

   b. Contractor or Subcontractor has 10 Days in which to comply subsequent to receipt of a written notice requesting the records enumerated above. In the event that Contractor or Subcontractor fails to comply with the ten-Day period, he or she shall, as a penalty to Owner on whose behalf the contract is made or awarded, forfeit $25.00 for each calendar Day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. Contractor is not subject to a penalty assessment pursuant to this subparagraph due to the failure of a Subcontractor to comply with this subparagraph.

(3) Contractor shall also deliver certified payrolls to Owner with each Application for Payment as described in Section 001200 (Measurement and Payment).

15.8 Environmental Controls
15.8.1. Contractor shall comply with all rules, regulations, ordinances, and statutes that apply to any work performed under the Contract Documents including, without limitation, any toxic, water and soil pollution controls and air pollution controls specified in Government Code, Section 11017. Contractor shall be responsible for insuring that Contractor’s employees, Subcontractors and the public are protected from exposure to airborne hazards or contaminated water, soil or other toxic materials used during or generated by activities on the Site or associated with the Project.

15.9 **Shoring Safety Plan**

15.9.1. At least five Days in advance of excavating any trench five feet or more in depth, Contractor shall submit to Owner a detailed plan showing the shoring, bracing and sloping design and other provisions to be made for worker protection from the hazard of caving ground during the excavation, as required by Labor Code Section 6705. A civil or structural engineer registered in California shall prepare and sign any plan that varies from the shoring system standards established by the State Construction Safety Orders.

15.9.2. During the course of Work, Contractor shall be responsible for determining where sloping, shoring, and/or bracing is necessary and the adequacy of the design, installation, and maintenance of all shoring and bracing for all excavation, including any excavation less than five feet in depth. Contractor will be solely responsible for any damage or injuries that may result from excavating or trenching. Owner’s acceptance of any drawings showing the shoring or bracing design or work schedule shall not relieve Contractor of its responsibilities under this subparagraph.

15.9.3. Cal/OSHA Permit. Contractor shall comply with Labor Code 6500 and shall obtain, as applicable, a permit as required by Cal/OSHA for each of the following:

   (1) Construction of trenches or excavations that are five feet or more in depth and into which a person is required to descend.

   (2) Construction or demolition of any building, structure, or scaffolding for falsework more than three stories high, or the equivalent height (36 feet).

   (3) Erection or dismantling of vertical shoring systems more than three stories high, or the equivalent height (36 feet).

   (4) The underground use of diesel engines in mines or tunnels.

**END OF DOCUMENT**
Peralta Community College District

SMALL LOCAL BUSINESS ENTERPRISE and
SMALL EMERGING LOCAL BUSINESS ENTERPRISE PROGRAM

The District is committed to ensure equal opportunity and equitable treatment in awarding and managing its public contracts and has established an annual overall program goal of twenty-five percent participation for small local businesses. To facilitate opportunities for small local business, the District will use a maximum 5% bidding preference for SLBE and SELBE firms. The preference is only used for computation purposes to determine the winning bidder, the contract is awarded at the actual bid amount. Please review the following guidelines to see if your firm qualifies for the preference.

The 5% bidding preference for an SLBE and SELBE firms are for construction, personal and professional services, goods and services, maintenance, repairs, and operations where responsibility and quality are equal. The preference will be 5% of the bid amount of the lowest responsive responsible bidder, and may not exceed $50,000.00 for any bid.

A Non-SLBE/SELBE Prime Contractor who utilizes 25% of total bid amount, with SLBE or SELBE subcontractors (who meet the District's Definition of an SLBE and SELBE), can also receive a maximum of 4% bidding preference, not to exceed $50,000.00 for any bid. (See below Subcontractors section.)

Definitions:

**SLBE**: A Small Local Business Enterprise is a business that has not exceeded gross annual revenue of 8.5 million dollars for a construction firm, or 6 million dollars for goods and non-professional services firm, or 3 million dollars for architecture, engineering and professional services firm, for the past three consecutive years and meets the below geographic location requirements.

**SELBE**: A Small Local Emerging Business Enterprise is a business that has not exceeded gross annual revenue of 1.5 million dollars for the past three consecutive years and meets the below geographic location requirements.

**Commercially Useful Function**: Shall mean a business is directly responsible for providing the materials, equipment, supplies or services to the District as required by the contract solicitation. The business performs work that is normal for its business services and carries out its obligation by actually performing, managing, or supervising the work involved. The business is not Commercially Useful if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of SLBE or SELBE participation.

**Geographic Location Requirements**:

- The business must be located at a fixed, established commercial address located in the District's market area of Albany, Alameda, Berkeley, Emeryville, Oakland, or Piedmont, and not a temporary or movable office, a post office box, or a telephone answering service.

- If the business has an office outside of the District’s market area as well as an office within the market area, the office within the District’s market area must be staffed on a full time permanent basis with someone employed by the business.

- If requested, the business that has an office outside of the District’s market area must provide proof of one or more past contracts citing the business address (such as contracts to perform work, to rent space or equipment, or for other business services) was within the
District’s market area at least one (1) year prior to the date of contract award. The one-year requirement does not apply to businesses whose sole establishment is located within the District’s market area.

**Subcontractors:**

Non-SLBE/SELBE Prime Contractors who use subcontractors, who meet the district definitions of SLBE and SELBE, may receive a maximum of 4% bidding preference if the following conditions are met:

1. 25% of total bid amount is with Subcontractors who meet the District’s definition of an SLBE and SELBE. The Prime Contractor must list each Subcontractor on the Subcontractor List form, clearly identifying the SLBE and SELBE status and the Dollar Amount of work each subcontractor will perform.
2. The Subcontractors must provide a Commercially Useful Function.
3. The Prime Contractor must maintain the Subcontractor percentages (based on the quoted dollar amounts) indicated in the Subcontractor List form at the time the Contract is awarded and throughout the term of the Contract.
4. The Prime Contractor must fill out sign the SLBE/SELBE Self Certification Affidavit and return it with the bid documents, and 48 hours after the bid opening the Prime Contractor must submit signed SLBE/SELBE Self Certification Affidavit from each of the SLBE and SELBE subcontractors listed in the Subcontractor form. The Subcontractor must agree to provide the requested documentation to verify the SLBE/SELBE status.
5. No Substitutions can be made to the SLBE and SELBE subcontractor without the prior written approval of the District. The District will approve a subcontractor substitution on the following conditions:
   a. A written statement from the subcontractor agreeing to the substitution.
   b. When the subcontractor has been given a reasonable opportunity to execute the subcontract, yet fails to, or refuses to execute the subcontract, or refuses to satisfy contractual obligations.
   c. When the subcontractor becomes insolvent.
   d. When the District determines the work performed by the subcontractor is not in accordance with the contact agreement, or the subcontractor is substantially and unduly delaying or disrupting the progress of work.

Firms that meet the District criteria for an SLBE and SELBE can complete the below self-certification affidavit signed under penalty of perjury. Firms claiming SLBE and SELBE status in the self-certification affidavit will be required to submit proof of residency and revenue 48 hours after bid opening. Such proof shall consist of a copy of a contract to perform work, to rent space or equipment, or for other business services, executed from their local address, and the firm’s tax returns for the past three consecutive years.
Peralta Community College District

SLBE/SELBE SELF CERTIFICATION AFFIDAVIT

I certify under penalty of perjury that my firm meets the District's definition of a Small Local Business Enterprise or a Small Emerging Local Business Enterprise and resides in the geographic location of the District's market area and qualifies for the below preference. The maximum preference will be five percent of the bid amount of the lowest responsible bidder, and may not exceed $50,000.00 for any bid. The preference is only used for computation purposes to determine the winning bidder; the contract is awarded at the actual bid amount. The District's Contract Compliance Office will determine whether this requirement has been fulfilled. Bidders may only claim one of the below preferences.

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<tr>
<th>Certification Status</th>
<th>Preference</th>
<th>Preference Claimed (check only one)</th>
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<tr>
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<td>SELBE</td>
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<td>25% of Subcontractors are</td>
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<td>SLBE/SELBE</td>
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<td>Not Applicable</td>
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1. I acknowledge and am hereby advised that upon a finding of perjury with the claims made in this self certification affidavit the District is authorized to impose penalties which may include any of the following:

   a) Refusal to certify the award of a contract
   b) Suspension of a contract
   c) Withholding of funds
   d) Revision of a contract for material breach of contract
   e) Disqualification of my firm from eligibility for providing goods and services to the Peralta Community College District for a period not to exceed five (5) years

2. I acknowledge and have been advised and hereby agree that my firm will be required to provide proof (and if applicable, my SLBE and SELBE Subcontractors will provide proof) of the status claimed on this self-certification affidavit 48 hours after bid opening. Proof of status claimed includes tax returns from the previous three years and past contracts to determine the size and geographical location of my firm.

3. I declare that the above provisions are attested to under penalty of perjury under the laws of the State of California.

Bid Number: ____________________  Bid Name: ____________________________________

Signed ___________________________________________  Date _______________________

Printed or typed name ____________________________  Title _______________________

Name of Company ___________________________  Telephone ______________  Fax ______________
It is the policy of the Peralta Community College District (Board Policy 2.40, Environmental Sustainability), to purchase products or services that help to minimize the adverse effects on human health and the environment, when compared to other products and services that serve the same purpose with comparable efficacy. The District recognizes that environmentally responsible purchasing will help create and sustain markets for environmentally sustainable products, and is committed to encouraging the procurement of products with high recycled content, FSC certified lumber, Energy Star rated equipment, low and no VOC paints, low-toxicity cleaning supplies and Green Seal approved chemicals, and will promote contracting with businesses in close proximity, to reduce our carbon footprint and to promote the District's SLBE program.

For Operation and Construction services the District is committed to:

- **Utilizing LEED** (Leadership in Energy and Environmental Design) or equivalent certification criteria as follows:
  - All new building projects shall qualify for at least LEED NC Silver certification and shall strive for higher levels of certification, especially where overall long-term building operations, student learning, and worker productivity savings can be realized through doing so.
  - All renovation projects over 10,000 square feet shall meet basic “LEED Existing Building” certification standards.

- **Maximizing energy efficiency** throughout the District, in particular, heating, cooling, lighting, information technology, mechanical, and water systems. It is the goal of the District to reduce dramatically our energy consumption for existing buildings and for all new buildings to exceed the State of California Building Code Title 24 energy efficiency requirements by no less than 35%.

- **Reduction of water consumption** for all uses, including for irrigation and domestic purposes.

- **Waste source reduction** and the re-use of materials. The District encourages all contractors to re-use and recycle as much construction and demolition debris as possible, and only when it is not feasible to do so, dispose of it in a landfill. All contractors must adhere to the District's Construction Debris Reporting Requirements.

- **Sustainable landscaping and grounds design**, construction and maintenance practices which promote integrated pest management and use of drought tolerant, fire safe, and native vegetation types.

All public work projects must adhere to the District Environmental Sustainability Policy 2.40. The formal policy is available for download at [www.peralta.edu](http://www.peralta.edu); click on the District Services Center tab and then Purchasing to view the environmentally sustainable purchasing policy.

**Signature**

I acknowledge and agree to adhere to the District’s Environmental Sustainability policy.

Contractor Name: _______________________  Title: _______________________________

Authorized Signature: ________________________________  Date:
DOCUMENT 00821

INSURANCE AND INDEMNIFICATION

1 INSURANCE REQUIREMENTS

1.1 At or before the date specified in Document 00200 (Instructions to Bidders), Contractor shall furnish to Owner satisfactory proof that Contractor has in force continuously for the entire period covered by the Contract the following classes of insurance in the form and with limits and deductibles specified below:

1.1.1 Comprehensive or Commercial General Liability Insurance covering claims for personal injury, bodily injury and property damage arising out of the Work and in a form providing coverage not less than that of a standard Commercial General Liability Insurance policy (“Occurrence Form”). Such insurance shall provide for all operations and include independent contractors, products liability, completed operations for one year after Final Completion of the last Phase to be completed and acceptance of the final payment for the Work, contractual liability, and coverage for explosion, collapse and underground hazards. The limits of such insurance shall not be coverage of less than \$5,000,000 each occurrence, \$5,000,000 general aggregate limit, and \$5,000,000 aggregate for products and completed operations. The policies shall be endorsed to provide Broad Form Property Damage Coverage.

1.1.2 Comprehensive Automobile Liability Insurance covering all owned, non-owned, and hired vehicles. Such insurance shall provide coverage not less than the standard Comprehensive Automobile Liability policy with limits not less than \$1,000,000 each person Bodily Injury, \$1,000,000 each occurrence Bodily Injury and \$1,000,000 each occurrence Property Damage (or \$1,000,000 combined single limit, each accident).

1.1.3 All-Risk Course of Construction Insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws, water damage, flood, and damage caused by frost and freezing, in the amount of 100 percent of the completed value of the Work to be performed under this Contract. Deductible shall not exceed \$25,000. Each loss shall be borne by Contractor.

1.1.4 Workers’ Compensation and Employer’s Liability Insurance for all persons whom the Contractor may employ in carrying out Work contemplated under Contract Documents, in accordance with the Act of Legislature of State of California, known as “Workers’ Compensation Insurance and Safety Act,” approved May 26, 1913, and all acts amendatory or supplemental thereto, in the statutory amount.

1.2 All policies of insurance shall be placed with insurers acceptable to Owner. The insurance underwriter(s) must be duly licensed to do business in the State of California and (other than for workers’ compensation) must have an A. M. Best Company rating of [A,VII] or better. Required minimum amounts of insurance may be increased should conditions of Work, in opinion of Owner, warrant such increase. Contractor shall increase required insurance amounts upon direction by Owner.

1.3 Required Endorsements:

1.3.1 The policies required under paragraphs 1.1.1, 1.1.2 and 1.1.3 of this Document 00821 shall be endorsed, in a form and manner acceptable to Owner, as follows:

(1) Name Owner, its Board of Trustees and their employees, representatives, consultants (including without limitation Architect and its consultants), and agents, as additional insureds, but only with respect to liability arising out of the activities of the named insured.

(2) Each such policy shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limit of the insurance company’s liability required under paragraphs 1.1.1, 1.1.2 and 1.1.3 of this Document 00821.
(3) Insurance shall be primary and no other insurance or self-insured retention carried or held by Owner shall be called upon to contribute to a loss covered by insurance for the named insured.

(4) Insurance shall contain a provision requiring the insurance carriers to waive their rights of subrogation against Owner and all additional insureds, as well as other insurance carriers for the Work.

(5) Declarations Pages Required. Contractor or its insurance broker shall submit a copy of the Declarations page for each policy under Sections 1.1.1, 1.1.2 and 1.1.3 above. The page shall include the name of the carrier, the policy number, the types of coverage and limits, the effective dates of the policy, and the broker’s name and license number.

(6) Certificates of insurance and endorsements shall have clearly typed thereon Owner Contract Number and title of Contract Documents. Written notice of cancellation, non-renewal, or reduction in coverage of any policy shall be mailed to Owner (Attention: Risk Manager / Purchasing Agent) at the address listed in Document 00520 (Agreement), 30 Days in advance of the effective date of the cancellation, non-renewal, or reduction in coverage. Contractor shall maintain insurance in full force and effect during entire period of performance of Contract Documents. Contractor shall keep insurance in force during warranty and guarantee periods, except that Contractor may discontinue All-Risk Course of Construction Insurance after Final Payment. At time of making application for extension of time, and during all periods exceeding the Contract Time resulting from any cause, Contractor shall submit evidence that insurance policies will be in effect during requested additional period of time. Upon Owner’s request, Contractor shall submit to Owner, within 30 Days, copies of the actual insurance policies or renewals or replacements.

1.4 Contractor shall pay all insurance premiums, including any charges for required waivers of subrogation or the endorsement of additional insureds. If Contractor fails to maintain insurance, Owner may take out comparable insurance, and deduct and retain amount of premium from any sums due Contractor under Contract Documents.

1.5 If injury occurs to any employee of Contractor, Subcontractor or sub-subcontractor for which the employee, or the employee’s dependents in the event of employee’s death, is entitled to compensation from Owner under provisions of the Workers’ Compensation Insurance and Safety Act, as amended, or for which compensation of any kind is claimed from Owner, Owner may retain out of sums due Contractor under Contract Documents, amount sufficient to cover such compensation, as fixed by the Act, as amended, until such compensation is paid, or until it is determined that no compensation is due. If Owner is compelled to pay compensation, Owner may, in its discretion, either deduct and retain from the Contract Sum the amount so paid, or require Contractor to reimburse Owner.

1.6 Nothing in this Document 00821 shall be construed as limiting in any way the extent to which Contractor or any Subcontractor may be held responsible for payment of damages resulting from their operations.

1.7 All Subcontractors shall maintain the same insurance required to be maintained by Contractor with respect to their portions of the Work, and Contractor shall cause the Subcontractors to furnish proof thereof to Owner within ten Days of Owner’s request. (However, Subcontractors need obtain only [$1,000,000] of Comprehensive General Liability insurance.)

1.8 If required by Owner, Contractor shall obtain and maintain Contractor’s Pollution Legal Liability Insurance in a form, with limits, and from an insuring entity reasonably satisfactory to Owner.

1.9 The following provisions apply to any licensed professional engaged by Contractor to perform portions of the Work (“Professional”).

1.9.1 Each Professional shall maintain the following insurance at its sole cost and expense:

(1) Provided such insurance is customarily required by Owner when professionals engaged in the profession practiced by Professional directly contract with Owner, Professional Liability Insurance, insuring against professional errors and omissions arising from Professional’s work on the Project, in an amount not less than [$1,000,000] combined
If Professional cannot provide an occurrence policy, Professional shall provide insurance covering claims made as a result of performance of Work on this Project and shall maintain such insurance in effect for not less than three years following Final Completion of the Project.

All insurance required by paragraphs 1.1.1, 1.1.2 and 1.1.4 of this Document 00821 shall satisfy all other provisions of this Document 00821 relating to that insurance, including without limitation providing required insurance certificates (containing the required endorsements) and declarations pages before commencing its Work on the Project.

2 RESPONSIBILITY OF CONTRACTOR AND INDEMNIFICATION

2.1 Contractor’s Responsibility For The Work

2.1.1 Except for damage caused by the sole negligence, willful misconduct or active negligence of Owner or its agents, Contractor shall be solely responsible for any loss or damage that may happen to any part of the Work, materials or other things used in performing the work, injury, sickness, disease, or death of any person as a result of the Work, or resulting damage to property.

2.1.2 Owner and each of its officers, employees, consultants and agents including, but not limited to the Board, Architect/Engineer and each Owner Representative, shall not be liable or accountable in any manner for loss or damage that may happen to any part of the Work; loss or damage to materials or other things used or employed in performing the Work; injury, sickness, disease, or death of any person as a result of the Work; or damage to property resulting from any cause whatsoever except their sole negligence, willful misconduct or active negligence, and Contractor releases all of the foregoing persons and entities from any and all such claims.

2.1.3 With respect to third-party claims against Contractor, Contractor waives any and all rights to any type of express or implied indemnity against Owner and each of its officers, employees, consultants and agents including, but not limited to Owner, the Board, Architect and its consultants, and each Owner representative.

2.1.4 Contractor also waives subrogation rights under applicable insurance policies, to the greatest extent permitted by law, and will require this same waiver of subrogation by its subcontractors, in all policies of insurance, against all other project participants, to include Contractor, subcontractors, Owner, the Architect, IOR, government agencies, engineers and inspectors.

2.2 Claims Arising From The Work

2.2.1 To the furthest extent permitted by law (including without limitation California Civil Code Section 2782), Contractor shall assume defense of, and indemnify and hold harmless, Owner and each of its officers, employees, consultants and agents, including but not limited to the Board, Architect/Engineer and each Owner representative, from claims, suits, actions, losses and liability of every kind, nature and description, including but not limited to claims and fines of regulatory agencies and attorney’s fees and consultant’s fees, directly or indirectly arising out of, connected with or resulting from performance of the Work, failure to perform the Work, or condition of the Work which is caused in whole or part by any act or omission of Contractor, Subcontractors, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

2.2.2 Contractor’s indemnity obligation shall not apply to any indemnified party to the extent of its sole negligence or willful misconduct; nor shall it apply to Owner or other indemnified party to the extent of its active negligence.

2.3 Scope Of Indemnification Obligation
2.3.1 Approval or purchase of any insurance contracts or policies shall in no way relieve from liability nor limit the liability of Contractor, its Subcontractors of any tier, or the officers or agents of any of them. In the event of loss, however, Contractor shall give all required notices to all insurance carriers, and shall require its subcontractors to do the same. Owner may, in its discretion, request evidence of such notices from Contractor.

2.4 Scope Of Contract Limitations Of Liability

2.4.1 To the furthest extent permitted by law (including, without limitation, Civil Code Section 2782), the indemnities, releases of liability and limitations of liability, claims procedures, and limitations of remedy expressed throughout Contract Documents shall apply even in the event of breach of contract, negligence (active or passive), fault or strict liability of the party(is) indemnified, released, or limited in liability, and shall survive the termination, rescission, breach, abandonment, or completion of the Work or the terms of the Contract Documents.

END OF DOCUMENT
APPRENTICESHIP PROGRAM

1  COMPLIANCE REQUIRED

1.1 Contractor and Subcontractors shall comply with the requirements of California Labor Code §§1776, 1777.5, and 1777.6 concerning the employment of apprentices by Contractor or Subcontractors. Willful failure to comply may result in penalties, including loss of the right to Bid on or receive public works contracts.

2  CERTIFICATION OF APPROVAL

2.1 California Labor Code §1777.5, as amended, requires a Contractor or Subcontractor employing tradespersons in any apprenticeable occupation to apply to the joint apprenticeship committee nearest the site of a public works project and which administers the apprenticeship program in that trade for a certification of approval. The certificate shall also fix the ratio of apprentices to journeypersons that will be used in performance of the Contract. The ratio of work performed by apprentices to journeypersons in such cases shall not be less than one hour of apprentices work for every five hours of labor performed by journeypersons (the minimum ratio for the land surveyor classification shall not be less than one apprentice for each five journeypersons), except:

2.1.1 When unemployment for the previous three month period in the area exceeds an average of 15 percent;
2.1.2 When the number of apprentices in training in the area exceeds a ratio of one to five;
2.1.3 When a trade can show that it is replacing at least 1/30 of its membership through apprenticeship training on an annual basis state-wide or locally; or
2.1.4 Assignment of an apprentice to any work performed under a public works contract would create a condition which would jeopardize his or her life or the life, safety, or property of fellow employees or the public at large or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyperson.

3  FUND CONTRIBUTIONS

3.1 Contractor is required to make contributions to funds established for administration of apprenticeship programs if Contractor employs registered apprentices or journeypersons in any apprenticeable trade on such contracts and if other contractors on the public works site are making such contributions.

4  APPRENTICESHIP STANDARDS

4.1 Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of the California Department of Industrial Relations, or from the Division of Apprenticeship Standards and its branch offices.

END OF DOCUMENT
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Project information.
   2. Work covered by Contract Documents.
   3. Work by Owner.
   4. Work under separate contracts.
   5. Purchase contracts.
   6. Owner-furnished products.
   7. Access to site.
   8. Coordination with occupants.
   10. Specification and drawing conventions.

1.2 PROJECT INFORMATION

A. Project Identification: College of Alameda, Cougar Village Expansion, Modular Bid Submittal, Package 1. NBBJ project number 100624.00
   1. Project Location: Alameda, California.

B. Owner: Peralta Community College District.
   1. Owner’s Representative: Johnnie Fudge, jfudge@peralta.edu

C. Architect: Mark B. Steppan, NBBJ.

D. Other Owner Consultants: The Owner has retained the following design professionals who have prepared designated portions of the Contract Documents:
   1. TMAD Taylor & Gaines

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of the Project is defined by the Contract Documents and consists of the following:
   1. The addition of new portable buildings on the College of Alameda campus to temporarily house departments and students that are currently in buildings C & D, including general use classrooms. This package 1 is for the new portable buildings only with the goal being to select a portable manufacturer to provide all required Work for the Project as described within these documents or by the manufacturer’s own PC drawings. Once a manufacturer is selected and contracted with, the intent is for them to produce their required PC drawings which will be submitted to the Division of the State Architect (DSA), along with this documentation package, for review and approval by DSA. This package 1 Project does not include the Work of the renovations nor relocation of existing Cougar Village portables, nor of the underground utilities or other associated site work that is not within the standard responsibility of the portable manufacturer.
1.4 WORK BY OWNER

A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

B. Concurrent Work: Owner will may perform concurrent work at Project site. Those operations will be conducted simultaneously with work under this Contract.

1.5 WORK UNDER SEPARATE CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

1.6 PURCHASE CONTRACTS

A. General: Owner has negotiated purchase contracts with suppliers of material and equipment to be incorporated into the Work. Owner will assign these purchase contracts to Contractor. Include costs for purchasing, receiving, handling, storage if required, and installation of material and equipment in the Contract Sum, unless otherwise noted.

1.7 OWNER-FURNISHED PRODUCTS

A. Owner will furnish products indicated. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products.

B. Owner-Furnished Products:
   2. Existing furniture that requires bracing.

1.8 ACCESS TO SITE

A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

B. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

C. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. **Limits:** Confine construction operations to the areas indicated on the Contract Documents.

2. **Driveways, Walkways and Entrances:** Keep driveways and roadways and entrances serving premises clear and available to Owner, Owner’s employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
   a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
   b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

D. **Condition of Existing Building:** Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.9 **COORDINATION WITH OCCUPANTS**

A. **Full Owner Occupancy:** Owner will occupy site and existing and adjacent buildings during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner’s day-to-day operations. Maintain existing exits unless otherwise indicated.
   1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
   2. Notify the Owner not less than 72 hours in advance of activities that will affect Owner’s operations.

B. **Partial Owner Occupancy:** Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner’s operations. Maintain existing exits unless otherwise indicated.
   1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
   2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

C. **Owner Limited Occupancy of Completed Areas of Construction:** Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.10 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.
   1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:30 a.m. to 5:00 p.m., Monday through Friday, except as otherwise indicated.
   1. Weekend Hours: As approved by the Owner.
   2. Early Morning Hours: As approved by the Owner.
   3. Hours for Utility Shutdowns: See Division 0.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
   1. Notify Construction Manager or Owner not less than three days in advance of proposed utility interruptions.
   2. Obtain Construction Manager's written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
   1. Notify Construction Manager or Owner not less than three days in advance of proposed disruptive operations.
   2. Obtain Construction Manager's or Owner's written permission before proceeding with disruptive operations.

E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor air intakes.

F. Controlled Substances: Use of tobacco products and other controlled substances within the existing buildings is not permitted.

G. Employee Identification: Provide identification tags for Contractor personnel working on the Project site. Require personnel to utilize identification tags at all times.
H. Employee Screening: Comply with Owner's requirements regarding any required screening of Contractor personnel working on the Project site.
   1. Maintain list of approved screened personnel with Owner's Representative.

1.11 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
   1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
   2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
   1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
   2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
   3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
DIVISION 1 GENERAL REQUIREMENTS

SECTION 01200

MEASUREMENT AND PAYMENT

1 PART 1 GENERAL

1.1 Summary

1.1.1 Section includes description of requirements and procedures for determining amount of Work performed and for obtaining payment for Work performed.

1.2 References

1.2.1 California Public Contract Code
1.2.2 Code of Civil Procedures
1.2.3 Government Code

1.3 Scope of Work

1.3.1 Work under Contract Documents, or under any Bid Item, allowance, or alternate, shall include all labor, materials, taxes, transport, handling, storage, supervision, administration, and all other items necessary for the satisfactory completion of Work, whether or not expressly specified or indicated.

1.4 Determination of Quantities

1.4.1 Quantity of work to be paid for under any item for which a unit price is fixed in Contract Documents shall be determined by Owner, of units of work satisfactorily completed in accordance with Contract Documents or as directed by Owner. Unless otherwise provided, determination of number of units of work so completed will be based, so far as practicable, on actual measurement or count within prescribed or ordered limits, and no payment will be made for work done outside of limits. Measurements and computations will be made by methods set forth in Contract Documents, including without limitation this Section 01200. If methods are not so set forth, measurements shall be made in any manner which Owner considers appropriate for class of Work measured (e.g., pre-assigned values, percentage completion, units completed or incremental milestones). Contractor must immediately inform Owner of any disputes regarding quantity measurements and shall immediately supply Owner with any documentation supporting the disputed measurements.

1.5 Scope of Payment

1.5.1 Except as otherwise expressly stated in Section 01100 (Summary), payment to Contractor at the unit price or other price fixed in Contract Documents for performing Work required under any item, or (if the Contract is on a single lump sum price basis) at the lump sum price fixed in the Contract Documents for performing all Work required under Contract Documents, and as either may be adjusted pursuant to any approved Change Order or Construction Change Directive, shall be full compensation for completing, in accordance with Contract Documents, all Work required under the item or under Contract Documents, and for all expense incurred by Contractor for any purpose in connection with the performance and completion of said Work, including all incidental work necessary for completion of the Work.

1.5.2 The Contract Sum, whether lump sum, unit price or otherwise, shall be deemed to include all costs necessary to complete required Work, all costs (if any) for loss or damage arising from nature of Work or prosecution of the Work, and from action of elements. Unless Contract Documents expressly provide otherwise, the Contract Sum shall be deemed to include:

   (1) Any and all costs arising from any unforeseen difficulties which may be encountered during, and all risks of any description connected with, prosecution of Work or prosecution of Bid Item (whether lump sum or unit price) until acceptance by Owner;

   (2) All expenses incurred due to suspension, or discontinuance of Work or discontinuance of Bid Item (whether lump sum or unit price) as provided in Contract Documents;

   (3) Escalation to allow for cost increases between time of Contract Award and completion of Work or completion of Bid Item (whether lump sum or unit price).

1.5.3 Whenever it is specified herein that Contractor is to do work or furnish materials of any class for which no
price is fixed in Contract Documents, it shall be understood that Contractor is to do such work or furnish such materials without extra charge or allowance or direct payment of any sort, and that cost of doing work or furnishing materials is to be included in price Bid, unless it is expressly specified herein, in particular cases, that work or material is to be paid for as extra work.

1.5.4 No payment shall be made for materials or equipment not yet incorporated into the Work, except as specified in Section 01100 (Summary).

1.5.5 Owner may, in its discretion, where Contractor requests payment on the basis of materials and equipment not incorporated in the Work, Contractor must satisfy the following conditions:

1.5.5.1 The materials and/or equipment shall be delivered and suitably stored at the Site or at another local location agreed to in writing, for example, a mutually acceptable bonded and insured warehouse;

1.5.5.2 Full title to the materials and/or equipment shall vest in Owner at the time of delivery to the Site, warehouse or other storage location;

1.5.5.3 Obtain a negotiable warehouse receipt, endorsed over to Owner for materials and/or equipment stored in an off-site warehouse. No payment will be made until such endorsed receipts are delivered to Owner;

1.5.5.4 Stockpiled materials and/or equipment shall be available for Owner inspection, but Owner shall have no obligation to inspect them and its inspection or failure to inspect shall not relieve Contractor of any obligations under the Contract Documents. Materials and/or equipment shall be segregated and labeled or tagged to identify these specific Contract Documents;

1.5.5.5 After delivery of materials and/or equipment, if any inherent or acquired defects are discovered, defective materials and/or equipment shall be removed and replaced with suitable materials and/or equipment at Contractor’s expense;

1.5.5.6 At Contractor’s expense, insure the materials and/or equipment against theft, fire, flood, vandalism, and malicious mischief, as well as any other coverages required under the Contract Documents;

1.5.5.7 Contractor’s Application for Payment shall be accompanied by a bill of sale, invoice or other documentation warranting that Owner has received the materials and equipment free and clear of all liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect Owner interest therein, all of which must be satisfactory to Owner. This documentation shall include, but not be limited to, conditional releases of mechanics’ liens and stop notices from all those providing materials and equipment as to which the Application for Payment relates, as well as unconditional releases of the same from the same as to the previous Application for Payment for which they have not already been provided.

1.5.6 Amounts previously paid for materials and equipment prior to incorporation into the Work shall be deducted from amounts otherwise due Contractor as they are incorporated.

1.6 Basis of Payment

1.6.1 Lump Sum: When estimated quantity for specific portion of Work is not indicated and unit is designated as lump sum, payment will be on a lump sum basis for Work satisfactorily completed in accordance with Contract Documents.

1.6.2 Owner does not expressly, or by implication, agree, warrant, or represent in any manner, that actual amount of Work will correspond with amount shown or estimated and reserves right to increase or decrease amount of any class or portion of Work, to leave out entire Bid Item or Items, or to add work not originally included in Bid or Contract Documents, when in its judgment such change is in best interest of Owner. No change in Work shall be considered a waiver of any other condition of Contract Documents. No claim shall be made for anticipated profit, for loss of profit, for damages, or for extra payment whatever, except as otherwise expressly provided for in Contract Documents, because of any differences between the amount of work actually done and estimated amount as set forth herein, or for elimination of Bid Items.

1.7 Progress Payments

1.7.1 If requested by Contractor, progress payments will be made monthly.

1.7.2 Schedule of Values:

1.7.2.1 Within twenty Days from issuance of Notice of Award and prior to Contractor’s first Application for Payment, submit a detailed breakdown of its Bid by Permit/Bid Items, scheduled Work items and/or activities, including (for each DSA Permit/Bid items) coordination responsibilities and Project Record Documents responsibilities. Where more than one Subcontractor comprises the
work of a Work item or activity, the Schedule of Values shall show a separate line item for each subcontract. Furnish such breakdown of the total Contract Sum by assigning dollar values (cost estimates) to each applicable Progress Schedule network activity, which cumulative sum equals the total Contract Sum. The format and detail of the breakdown shall be as directed by Owner to facilitate and clarify future progress payments to Contractor for direct Work under Contract Documents. This breakdown shall be referred to as the Schedule of Values.

(2) Contractor’s overhead, profit, insurance, cost of bonds (except to the extent expressly identified in a Bid Item) and/or other financing, as well as “general conditions costs,” (e.g., Site cleanup and maintenance, temporary roads and access, off-Site access roads, temporary power and lighting, security, and the like), shall be prorated through all activities so that the sum of all the Schedule of Values line items equals Contractor’s total Contract Sum, less any allowances designated by Owner. Scheduling, record documents and quality assurance control shall be separate line items.

(3) Owner will review the breakdown in conjunction with the Progress Schedule to ensure that the dollar amounts of this Schedule of Values are, in fact, fair market cost allocations for the Work items listed. Upon favorable review by Owner, Owner will accept this Schedule of Values for use. Owner shall be the sole judge of fair market cost allocations.

(4) Owner will reject any attempt to increase the cost of early activities, i.e., “front loading,” resulting in an inaccurate reallocation of moneys until such “front loading” is corrected. Repeated attempts at “front loading” may result in suspension or termination of the Work for default, or refusal to process progress payments until such time as the Schedule of Values is acceptable to Owner.

1.7.3 Applications for Payment: Contractor shall establish and maintain records of cost of the Work in accordance with generally accepted accounting practices. In addition:

(1) On or before the 22nd day of each month, Contractor shall submit to Owner a marked up copy of an Application for Payment for the cost of the Work put in place during the period of the current month. This marked up copy of percentages complete will allow Owner and the IOR to inspect and confirm these percentages. Owner will then return the results of its review to the Contractor so it can prepare its monthly billing in time for the Schedule update/payment meeting as noted in Section 1320 1.5 B. The agreed Application for Payment shall be for the total value of activities completed or partially completed, including approved activity costs, based upon Schedule of Values prices (or Bid item prices if unit price) of all labor and materials incorporated in the Work up until midnight of the 25th Day of that one month period, less the aggregate of previous payments. Accumulated retainage shall be shown as a separate item in payment summary. Contractor shall submit in a form acceptable to Owner an itemized cost breakdown of Contractor’s record of Cost of the Work together with supporting data and any certification required by Owner. If Contractor is late submitting its Application for Payment (or the preliminary marked up Application for Payment), the Application may be processed at any time during the succeeding one-month period, resulting in processing of Contractor’s Application for Payment being delayed for more than a Day for Day basis.

(2) Applications for Payment may include, but are not necessarily limited to the following:
   a. Material, equipment, and labor incorporated into the Work, less any previous payments for the same;
   b. Up to 75 percent of the cost of equipment identified in paragraph 1.5.4 of this Section 01200 (if any), if purchased and delivered to the Site or stored off Site, as may be approved by Owner.
   c. Up to 50 percent of the cost of materials identified in paragraph 1.5.4 of this Section 01200 (if any), specifically fabricated for the Project that are not yet incorporated into the Work.

(3) At the time any Application for Payment is submitted, certify in writing the accuracy of the Application and that Contractor has fulfilled all scheduling requirements of Document 00700 (General Conditions) and Section 01320 (Progress Schedules and Reports), including updates and revisions. A responsible officer of Contractor shall execute the certification.

(4) No progress payment will be processed prior to Owner receiving all requested, acceptable schedule update information. Failure to submit a schedule update complying with Section 01320 justifies denying the entire Application for Payment.

(5) Each Application for Payment shall list each Change Order and Construction Change Directive (“CCD”) executed prior to date of submission, including the Change Order/CCD Number, and a
description of the work activities, consistent with the descriptions of original work activities.
Submit a monthly Change Order/CCD status log to Owner.

(6) If Owner requires substantiating data, submit information requested by Owner, with cover letter identifying Project, Application for Payment number and date, and detailed list of enclosures. Submit one copy of substantiating data and cover letter for each copy of Application for Payment submitted.

(7) If Contractor fails or refuses to participate in work reconciliations or other construction progress evaluation with Owner, Contractor shall not receive current payment until Contractor has participated fully in providing construction progress information and schedule update information to Owner.

1.7.4 Progress Payments

(1) Owner will review Contractor’s Application for Payment following receipt. If adjustments need to be made to percent of completion of each activity, Owner will make appropriate notations and return to Contractor. Contractor shall revise and resubmit. All parties shall update percentage of completion values in the same manner, i.e., express value of an accumulated percentage of completion to date.

(2) Each Application for Payment may be reviewed by Owner and/or inspectors to determine whether the Application for Payment is proper, and shall be rejected, revised, or approved by Owner pursuant to the Schedule of Values prepared in accordance with paragraph 1.7.2 of this Section 01200.

(3) If it is determined that the Application for Payment is not proper and suitable for payment, Owner will return it to Contractor as soon as practicable, but no later than seven Days after receipt, together with a document setting forth in writing the reasons why the Application for Payment is not proper. If Owner determines that portions of the Application for Payment are not proper or not due under the Contract Documents, then Owner may approve the other portions of the Application for Payment, and in the case of disputed items or defective Work not remedied, may withhold up to 150 percent of the disputed amount from the progress payment.

(4) Pursuant to Public Contract Code Section 20104.50, if Owner fails to make any progress payment within 30 Days after receipt of an undisputed and properly submitted Application for Payment from Contractor, Owner shall pay interest to Contractor equivalent to the legal rates set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure. The 30-Day period shall be reduced by the number of Days by which Owner exceeds the seven-Day return requirement set forth herein.

(5) As soon as practicable after approval of each Application for Payment for progress payments, Owner will pay to Contractor in manner provided by law, an amount equal to 90 percent of the amounts otherwise due as provided in the Contract Documents, or a lesser amount if so provided in Contract Documents, provided that payments may at any time be withheld if, in judgment of Owner, Work is not proceeding in accordance with Contract, or Contractor is not complying with requirements of Contract, or to comply with stop notices or to offset liquidated damages accruing or expected.

(6) Before any progress payment or final payment is due or made, Contractor shall submit satisfactory evidence that Contractor is not delinquent in payments to employees, Subcontractors, suppliers, or creditors for labor and materials incorporated into Work. This specifically includes, without limitation, conditional lien release forms for the current progress payment and unconditional release forms for past progress payments. Owner also may elect in its sole discretion to pay progress payments by joint check to Contractor and each Subcontractor having an interest in that progress payment in such amount.

(7) Owner reserves and shall have the right to withhold payment for any equipment and/or specifically fabricated materials that, in the sole judgment of Owner, are not adequately and properly protected against weather and/or damage prior to or following incorporation into the Work.

(8) Granting of progress payment or payments by Owner, or receipt thereof by Contractor, shall not be understood as constituting in any sense acceptance of Work or of any portion thereof, and shall in no way lessen liability of Contractor to replace unsatisfactory work or material, though unsatisfactory character of work or material may have been apparent or detected at time payment was made.
(9) When Owner shall charge sum of money against Contractor under any provision of Contract Documents, amount of charge shall be deducted and retained by Owner from amount of next succeeding progress payment or from any other moneys due or that may become due Contractor under Contract. If, on completion or termination of Contract, such moneys due Contractor are found insufficient to cover Owner charges against it, Owner shall have right to recover balance from Contractor or Sureties.

1.7.5 Retention Changes

(1) Following satisfactory and timely completion of at least 50% of the total Work of the Contract Documents, following Contractor’s request, Owner may, in its sole discretion, elect to do one or more of the following:
   a. Notwithstanding paragraph 1.7.D.5 above, pay any or all subsequent Applications for Payment for progress payments at the rate of 95 percent of the amounts otherwise due.
   b. Release to Contractor any retention otherwise held by Owner.

(2) Owner reserves the right to revoke any election under paragraph 1.7.E.1 at any time.

(3) Nothing in this paragraph 1.7.E shall lessen or diminish any Owner right or remedy, including without limitation Owner right to require Contractor to perform all Work within the time otherwise required in the Contract Documents.

1.8 Substitution of Securities in Lieu of Retention

1.8.1 In accordance with the provisions of Public Contract Code Section 22300, substitution of securities for any moneys withheld under Contract Documents to ensure performance is permitted under following conditions:

   (1) At request and expense of Contractor, securities listed in Section 16430 of the Government Code, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by Contractor and Owner which are equivalent to the amount withheld under retention provisions of Contract shall be deposited with Controller or with a state or federally chartered bank in California, as the escrow agent, who shall then pay such moneys to Contractor. Upon satisfactory completion of Contract, securities shall be returned to Contractor.

   (2) Alternatively, Contractor may request and Owner shall make payment of retentions earned directly to the escrow agent at the expense of Contractor. At the expense of Contractor, Contractor may direct the investment of the payments into securities and receive the interest earned on the investments upon the same terms provided for in this Section 01200 for securities deposited by Contractor. Upon satisfactory completion of Contract Documents, Contractor shall receive from escrow agent all securities, interest, and payments received by the escrow agent from Owner, pursuant to the terms of this Section 01200. Pay to each Subcontractor, not later than 20 Days after receipt of the payment, the respective amount of interest earned, net of costs attributed to retention withheld from each Subcontractor, on the amount of retention withheld to insure the performance of Contractor.

   (3) Contractor shall be beneficial owner of securities substituted for moneys withheld and shall receive any interest thereon.

   (4) Enter into escrow agreement with Controller according to Document 00680 (Escrow Agreement for Security Deposits in Lieu of Retention), as authorized under Public Contract Code Section 22300, specifying amount of securities to be deposited, terms and conditions of conversion to cash in case of default of Contractor, and termination of escrow upon completion of Contract Documents.

   (5) Public Contract Code Section 22300 is hereby incorporated in full by this reference.

1.9 Final Payment

1.9.1 As soon as practicable after all required Work is completed in accordance with Contract Documents, including commissioning, punch list, testing, record documents and Contractor maintenance after Final Acceptance, Owner will pay to Contractor, in manner provided by law, unpaid balance of Contract Sum of Work (including without limitation retentions), or whole Contract Sum of Work if no progress payment has been made, determined in accordance with terms of Contract Documents, less sums as may be lawfully retained under any provisions of Contract Documents or by law.

1.9.2 Prior progress payments shall be subject to correction in the final payment. Owner determination of amount
due as final payment shall be final and conclusive evidence of amount of Work performed by Contractor under Contract Documents and shall be full measure of compensation to be received by Contractor.

1.9.3 Contractor and each assignee under an assignment in effect at time of final payment shall execute and deliver at time of final payment, and as a condition precedent to Owner obligation to make final payment, Document 00650 (Agreement and Release of Any and All Claims) discharging Owner, its officers, agents, employees, and consultants of and from liabilities, obligations, and claims arising under Contract Documents.

1.10 Effect of Payment

1.10.1 Payment will be made by Owner, based on Owner observations at the Site and the data comprising the Application for Payment. Payment will not be a representation that Owner has:

(1) Made exhaustive or continuous on-Site inspections to check the quality or quantity of Work;
(2) Reviewed construction means, methods, techniques, sequences, or procedures;
(3) Reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by Owner to substantiate Contractor’s right to payment; or
(4) Made examination to ascertain how or for what purpose Contractor has used money previously paid on account of the Contract Sum.

2 PART 2 PRODUCTS – NOT USED

3 PART 3 EXECUTION – NOT USED

END OF SECTION
DIVISION 1 GENERAL REQUIREMENTS

SECTION 01250

MODIFICATION PROCEDURES

1 PART 1 GENERAL

1.1 Summary

1.1.1 Section includes:

(1) Description of general procedural requirements for alterations, modifications, and extras.

1.1.2 Reference

(1) Public Contract Code Section 7105 (d)(2).

1.2 General

1.2.1 Any change in scope of Work or deviation from Contract Documents including, without limitation, extra work, or alterations or additions to or deductions from the original Work, shall not invalidate the original Contract, and shall be performed under the terms of the Contract Documents.

1.2.2 Only Contractor or Owner may initiate changes in scope of Work or deviation from Contract Documents.

(1) Contractor may initiate changes by submitting a Change Order Request (COR), Notice of Concealed or Unknown Conditions, or Notice of Hazardous Waste Conditions.

a. A COR shall be submitted to request changes in the Contract Documents. (see attached form at the end of this Section 1250)

b. Notices of Concealed or Unknown Conditions shall be submitted in accordance with Document 00700 (General Conditions).

c. Notices of Hazardous Waste Conditions shall be submitted in accordance with Document 00700 (General Conditions).

(2) Contractor shall submit RFI’s for clarifications in the Contract Documents and the Contractor shall be responsible for its costs to implement and administer RFIs throughout the Contract duration. (see attached form at the end of this Section 1250). Regardless of the number of RFIs submitted, Contractor shall not be entitled to additional compensation for the effort required to submit the RFIs. Contractor shall be responsible for both Owner and its Architect/Engineer’s administrative costs for answering RFIs where the answer could reasonably be found by reviewing the Contract Documents, as determined by Owner; at Owner discretion, such costs may be deducted from progress payments or final payment.

(3) Owner may initiate changes by issuing a Supplemental Instruction, which may revise, add to or subtract from the Work.

(4) Owner may initiate changes in the Work or Contract Time by issuing an RFQ to Contractor. Such RFQs will detail all proposed changes in the Work and request a quotation of changes in Contract Sum and Contract Time from Contractor. (see attached form at end of this Section 1250)

(5) Owner may also, by Construction Change Directive (“CCD”), order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly. A CCD shall be used in the absence of total agreement on the terms of a Change Order and may, upon express written notice designating it as a CCD, consist of a Change Order executed by Owner only.

1.3 Procedures

1.3.1 Cost Proposal and Procedures: Whenever Contractor is required in this Section 01250 to prepare a Cost Proposal, and whenever Contractor is entitled to submit a Cost Proposal and elects to do so, Contractor shall prepare and submit to Owner for consideration a Cost Proposal using the form attached to this Section 01250. All Cost Proposals must contain a complete breakdown of costs of credits, deducts and extras; itemizing materials, labor, taxes, overhead and profit and any requested changes to Contract Time. All Subcontractor Work shall be so indicated. Individual entries on the Cost Proposal form shall be determined as provided in paragraphs 1.4 and 1.5 of this Section 01250. After receipt of a Cost Proposal with a detailed breakdown, Owner will act promptly thereon.
If Owner accepts a Cost Proposal, Owner will prepare Change Order for Owner and Contractor signatures.

If Cost Proposal is not acceptable to Owner because it does not agree with cost and/or time included in Cost Proposal, Owner will submit in a response what it believes to be a reasonable cost and/or adjustment, if any. Except as otherwise provided in this Section 01250, Contractor shall have seven (7) Days in which to respond to Owner with a revised Cost Proposal.

When necessity to proceed with a change does not allow Owner sufficient time to conduct a proper check of a Cost Proposal (or revised Cost Proposal), Owner may order Contractor to proceed on basis to be determined at earliest practical date. In this event, value of change, with corresponding equitable adjustment to Contract, shall not be more than increase or less than decrease proposed.

1.3.2 Request for Information: Whenever Contractor requires information regarding the Project or Contract Documents, or receives a request for information from a Subcontractor, Contractor may prepare and deliver an RFI to Owner. Contractor shall use RFI format provided by Owner. Contractor must submit time critical RFIs at least 30 days before scheduled start date of the affected Work activity. Contractor shall reference each RFI to an activity of Progress Schedule and shall note time criticality of the RFI, indicating time within which a response is required. Contractor’s failure to reference RFI to an activity on the Progress Schedule and note time criticality on the RFI shall constitute Contractor’s waiver of any claim for time delay or interruption to the Work resulting from any delay in responding to the RFI.

Owner will respond within ten (10) Days from receipt of RFI with a written response to Contractor. Contractor shall distribute response to all appropriate Subcontractors.

If Contractor is satisfied with the response and does not request change in Contract Sum or Contract Time, then the response shall be executed without a change.

If Contractor believes the response is incomplete, Contractor shall issue another RFI (with the same RFI number with the letter “A” indicating it is a follow-up RFI) to Owner clarifying original RFI. Additionally, Owner may return RFI requesting additional information should original RFI be inadequate in describing condition.

If Contractor believes that the response results in change in Contract Sum or Contract Time, Contractor shall notify Owner with the issuance of a COR within seven Days after receiving the response. If Owner disagrees with Contractor, then Contractor may give notice of intent to submit a Claim as provided in Article 12 of Document 00700 (General Conditions), and submit its Claim as provided therein. If Owner agrees with Contractor, then Contractor must submit a Cost Proposal within twenty-one (21) Days of receiving the response to the RFI and COR. Contractor’s failure to deliver either the foregoing notice and Claim or Cost Proposal by the respective deadlines stated in the foregoing sentences shall result in waiver of the right to file a Cost Proposal or Claim.

1.3.3 Supplemental Instruction: Owner may issue Supplemental Instruction to Contractor.

If Contractor is satisfied with Supplemental Instruction and does not request change in Contract Sum or Contract Time, then Supplemental Instruction shall be executed without a Change Order.

If Contractor believes that Supplemental Instruction results in change in Contract Sum or Contract Time, then Contractor must submit a COR with the appropriate Cost Proposal to Owner within twenty-one (21) Days of receiving the Supplemental Instruction.

1.3.4 Construction Change Directives: If at any time Owner believes in good faith that a timely Change Order will not be agreed upon using the foregoing procedure, Owner may issue a CCD with its recommended cost and/or time adjustment. Upon receipt of CCD, Contractor shall promptly proceed with the change of Work involved and concurrently respond to Owner’s CCD within ten (10) Days.

(1) Contractor’s response must be any one of following:
   a. Return CCD signed, thereby accepting Owner response, time and cost.
   b. Submit a (revised if applicable) Cost Proposal with supporting documentation (if applicable, reference original Cost Proposal number followed by letter A, B, etc. for each revision), if Owner so requests.
   c. Give notice of intent to submit a claim as described in Article 12 of Document 00700 (General Conditions), and submit its claim as provided therein.

(2) If the CCD provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:
a. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation.

b. Cost to be determined in a manner agreed.

(3) CCD signed by Contractor indicates the agreement of Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

(4) If Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by Owner on the basis of reasonable expenditures and savings of those performing the Work attributable to the change including, in case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. If the parties still do not agree on the price for a CCD, Contractor may file a Claim per Article 12 of Document 00700 (General Conditions). Contractor shall keep and present an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this paragraph shall be limited to those provided in paragraphs Error! Reference source not found. and 1.5 of this Section 01250.

(5) Pending final determination of cost to Owner, amounts not in dispute may be included in Applications for Payment. The amount of credit to be allowed by Contractor to Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by Owner. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

1.3.5 Owner Requested RFQ: In response to an RFQ, Contractor shall furnish a Cost Proposal within twenty-one (21) Business Days of Owner RFQ. Upon approval of Cost Proposal, Owner will issue a Change Order directing Contractor to proceed with extra Work. If the parties do not agree on the price for an RFQ, Owner may either issue a CCD or decide the issue per Article 12 of Document 00700 (General Conditions). Contractor shall perform the changed Work notwithstanding any claims or disagreements of any nature.

1.3.6 Differing Site Conditions and/or Hazardous Waste Conditions: Contractor shall submit Notices of Differing Site Conditions and/or Hazardous Waste Conditions to resolve problems regarding differing underground Site conditions encountered in the execution of the Work pursuant to Article 14 of Document 00700 (General Conditions). If Owner determines that a change in Contract Sum or Contract Time is justified, Owner will issue RFQ or CCD.

1.3.7 All Changes:

(1) Documentation of Change in Contract Sum and Contract Time:
   a. Contractor shall document each proposal for a change in cost or time with sufficient data to allow evaluation of the proposal.
   b. Contractor shall, on request, provide additional data to support computations for:
      (i) Quantities of products, materials, labor and equipment.
      (ii) Taxes, insurance, and bonds.
      (iii) Overhead and profit.
      (iv) Justification for any change in Contract Time and new Progress Schedule showing revision due, if any.
      (v) Credit for deletions from Contract, similarly documented.
   c. Contractor shall support each claim for additional cost, and for Work performed on a cost-and-percentage basis, with additional information including:
      (i) Credit for deletions from Contract, similarly documented.
      (ii) Origin and date of claim.
      (iii) Dates and times Work was performed and by whom.
      (iv) Time records and wage rates paid.
      (v) Invoices and receipts for products, materials, equipment and subcontracts, similarly documented.

1.3.8 Correlation of Other Items:

(1) Contractor shall revise Schedule of Values and Application for Payment forms to record each authorized Change Order or CCD as a separate line item and adjust the Contract Sum as shown thereon prior to the next monthly pay period.

(2) Contractor shall revise the Progress Schedules prior to the next monthly pay period.

(3) Contractor shall enter changes in Project Record Documents prior to the next monthly pay period.
1.3.9 Responses: For all responses for which the Contract Documents, including without limitation this Section 01250, do not provide a specific time period, recipients shall respond within a reasonable time.

1.3.10 Disputes: For all disputes arising from the procedures herein, Contractor shall follow Article 12 of Document 00700.

1.4 Cost Determination

1.4.1 Total cost of extra Work or of Work omitted shall be the sum of actually incurred labor costs, material costs, equipment rental costs and specialist costs as defined herein plus overhead and profit as allowed herein. This limit applies in all cases of claims for extra Work, whether calculating Cost Proposals, Change Orders or CCDs, or calculating claims of all types, and applies even in the event of fault, negligence, strict liability, or tort claims of all kinds, including strict liability or negligence. Contractor may recover no other costs arising out of or connected with the performance of extra Work, of any nature. No special, incidental or consequential damages may be claimed or recovered against Owner, its representatives or agents, whether arising from breach of contract, negligence or strict liability, unless specifically authorized in the Contract Documents.

1.4.2 Overhead and Profit: (Overhead shall be as defined in paragraph Error! Reference source not found. of this Section 01250)

(1) Overhead and profit on labor for extra Work shall be 15 percent.
(2) Overhead and profit on materials for extra Work shall be 15 percent.
(3) Overhead and profit on equipment rental for extra Work shall be 10 percent.
(4) When extra Work is performed by a first tier Subcontractor, Contractor shall receive a 5 percent markup on Subcontractors’ total costs of extra Work. First tier Subcontractor’s markup on its Work shall not exceed 15 percent.
(5) When extra Work is performed by a lower tier Subcontractor, Contractor shall receive a total of 5 percent markup on the lower tier Subcontractors’ total costs of extra Work. Contractor and first tier Subcontractors and lower tier Subcontractors shall divide the 10 percent markup as mutually agreed.
(6) Notwithstanding the foregoing, in no case shall the total markup on any extra Work exceed 20 percent of the direct cost, notwithstanding the actual number of contract tiers.
(7) On proposals covering both increases and decreases in Contract Sum, overhead, profit, and commission shall be allowed on the net increase only as determined in paragraph 1.4 above. When the net difference is a deletion, no percentage for overhead profit and commission shall be allowed, but rather an appropriate percentage deduction shall be issued in the amount of the net difference.
(8) The markup shall include profit, small tools, cleanup, engineering, supervision, warranties, cost of preparing the cost proposal, jobsite overhead, and home office overhead. No markup will be allowed on taxes, insurance, and bonds.

1.4.3 Taxes:

(1) All State sales and use taxes, County and applicable City sales taxes, shall be included.
(2) Federal and Excise tax shall not be included.

1.4.4 Owner-Operated Equipment: When owner-operated equipment is used to perform extra Work, Contractor will be paid for operator as follows:

(1) Payment for equipment will be made in accordance with paragraph 1.5.3 of this Section 01250.
(2) Payment for cost of labor will be made at no more than rates of such labor established by collective bargaining agreements for type of worker and location of Work, whether or not owner-operator is actually covered by such an agreement.

1.4.5 Accord and Satisfaction: Every Change Order and accepted CCD shall constitute a full accord and satisfaction, and release, of all Contractor (and if applicable, Subcontractor) claims for additional time, money or other relief arising from or relating to the subject matter of the change including, without limitation, impacts of all types, cumulative impacts, inefficiency, overtime, delay and any other type of claim. Contractor may elect to reserve its rights to disputed claims arising from or relating to the changed Work at the time it signs a Change Order or approves a CCD, but must do so expressly in a writing delivered concurrently with the executed Change Order or approved CCD, and must also submit a Claim for the reserved disputed items pursuant to Article 12 of Document 00700 no later than thirty (30) days of Contractor’s first written notice of its intent to reserve rights.
1.5 COST BREAKDOWN

1.5.1 Labor: Contractor will be paid cost of labor for workers (including forepersons when authorized by Owner) used in actual and direct performance of extra Work. Labor rate, whether employer is Contractor, Subcontractor or other forces, will be sum of following:

(1) Actual Wages: Actual wages paid shall include any employer payments to or on behalf of workers for health and welfare, pension, vacation, and similar purposes.

(2) Labor surcharge: Payments imposed by local, county, state, and federal laws and ordinances, and other payments made to, or on behalf of, workers, other than actual wages as defined in paragraph 1.5.1(1) of this Section 01250, such as taxes and worker’s compensation insurance. Such labor surcharge shall not exceed that set forth in California Department of Transportation official labor surcharges schedule which is in effect on date upon which extra Work is accomplished and which schedule is incorporated herein by reference as though fully set forth herein.

1.5.2 Material: Only materials furnished by Contractor and necessarily used in performance of extra Work will be paid for. Cost of such materials will be cost, including sales tax, to purchaser (Contractor, Subcontractor or other forces) from supplier thereof, except as the following are applicable:

(1) If cash or trade discount by actual supplier is offered or available to purchaser, it shall be credited to Owner notwithstanding fact that such discount may not have been taken.

(2) For materials salvaged upon completion of extra Work, salvage value of materials shall be deducted from cost, less discounts, of materials.

(3) If cost of a material is, in opinion of Owner, excessive, then cost of material shall be deemed to be lowest current wholesale price at which material is available in quantities concerned delivered to Site, less any discounts as provided in paragraph 1.5.2(1) of this Section 01250.

1.5.3 Equipment Rental: For Contractor- or Subcontractor-owned equipment, payment will be made at rental rates listed for equipment in California Department of Transportation official equipment rental rate schedule which is in effect on date upon which extra Work is accomplished and which schedule is incorporated herein by reference as though fully set forth herein. If there is no applicable rate for an item of equipment, then payment shall be made for Contractor- or Subcontractor-owned equipment at rental rate listed in the most recent edition of the Association of Equipment Distributors (AED) book. For rented equipment, payment will be made based on actual rental invoices. Equipment used on extra Work shall be of proper size and type. If, however, equipment of unwarranted size or type and cost is used, cost of use of equipment shall be calculated at rental rate for equipment of proper size and type, as determined by Owner. Rental rates paid shall be deemed to cover cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals. Unless otherwise specified, manufacturer’s ratings, and manufacturer-approved modifications, shall be used to classify equipment for determination of applicable rental rates. Individual pieces of equipment or tools not listed in said publication and having a replacement value of $100 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor as payment is included in payment for labor. Rental time will not be allowed while equipment is inoperative due to breakdowns.

(1) For equipment on Site, rental time to be paid for equipment shall be time equipment is in operation on extra Work being performed or on standby as approved by Owner. The following shall be used in computing rental time of equipment:

a. When hourly rates are listed, less than 30 minutes of operation shall be considered to be ½ hour of operation.

b. When daily rates are listed, less than four hours of operation shall be considered to be ½ Day of operation.

(2) For equipment that must be brought to Site to be used exclusively on extra Work, cost of transporting equipment to Site and its return to its original location shall be determined as follows:

a. Owner will pay for costs of loading and unloading equipment.

b. Cost of transporting equipment in low bed trailers shall not exceed hourly rates charged by established haulers.

c. Cost of transporting equipment shall not exceed applicable minimum established rates of California Public Utilities Commission.

d. Owner will not make any payment for transporting and loading and unloading equipment if equipment is used on Work in any other way than upon extra Work.
Rental period may begin at time equipment is unloaded at Site of extra Work and terminate at end of the performance of the extra Work or Day on which Owner directs Contractor to discontinue use of equipment, whichever first occurs. Excluding Saturdays, Sundays, and Owner legal holidays, unless equipment is used to perform extra Work on such Days, rental time to be paid per Day shall be four hours for zero hours of operation, six hours for four hours of operation and eight hours for eight hours of operation, time being prorated between these parameters. Hours to be paid for equipment that is operated less than eight hours due to breakdowns, shall not exceed eight less number of hours equipment is inoperative due to breakdowns.

1.5.4 Work Performed by Special Forces or Other Special Services: When Owner and Contractor, by agreement, determine that special service or item of extra Work cannot be performed by forces of Contractor or those of any Subcontractors, service or extra Work item may be performed by specialist. Invoices for service or item of extra Work on basis of current market price thereof may be accepted without complete itemization of labor, material, and equipment rental costs when it is impracticable and not in accordance with established practice of special service industry to provide complete itemization. In those instances wherein Contractor is required to perform extra Work necessitating a fabrication or machining process in a fabrication or machine shop facility away from Site, charges for that portion of extra Work performed in such facility may, by agreement, be accepted as a specialist billing. Owner must be notified in advance of all off-Site Work. In lieu of overhead and profit provided in paragraph 1.4.2 of this Section 01250, 15 percent will be added to specialist invoice price, after deduction of any cash or trade discount offered or available, whether or not such discount may have been taken.

1.6 Force-Account Work

1.6.1 If it is impracticable because of nature of Work, or for any other reason, to fix an increase or decrease in price definitely in advance, the Contractor may be directed to proceed at a not-to-exceed (NTE) maximum price which shall not under any circumstances be exceeded. Subject to such limitation, such extra Work shall be paid for at actual necessary cost for Force-Account Work or at the negotiated cost, as determined by Owner. The cost for Force-Account Work shall be determined pursuant to paragraphs Error! Reference source not found. and 1.5 of this Section 01250.

1.6.2 Force-Account Work shall be used when it is not possible or practical to price out the changed Work prior to the start of that Work. In these cases, Force-Account Work will be utilized during the pricing and negotiation phase of the change. Once negotiations have been concluded and a bilateral agreement has been reached, the tracking of the Work under Force-Account is no longer necessary. Force-Account Work shall also be used when negotiations between Owner and Contractor have reached an impasse and a bilateral agreement on the value of the changed Work cannot be reached. Owner may approve other uses of Force-Account Work.

1.6.3 Whenever any Force-Account Work is in progress, definite price for which has not been agreed on in advance, Contractor shall report to Owner each Business Day in writing in detail amount and cost of labor and material used, and any other expense incurred in Force-Account Work on preceding Day, by using the Cost Proposal form attached hereto. No claim for compensation for Force-Account Work will be allowed unless report shall have been made.

1.6.4 Whenever Force-Account Work is in progress, definite price for which has not been agreed on in advance, Contractor shall report to Owner when 75 percent of the NTE amount has been expended.

1.6.5 Force-Account Work shall be paid as extra Work under this Section 01250. Methods of determining payment for Work and materials provided in this paragraph 1.6 shall not apply to performance of Work or furnishings of material that, in judgment of Owner, may properly be classified under items for which prices are otherwise established in Contract Documents.

1.7 Owner-Furnished Materials

1.7.1 Owner reserves right to furnish materials as it deems advisable, and Contractor shall have no claims for costs and overhead and profit on such materials.

1.8 Overhead Defined

1.8.1 The following constitutes charges that are deemed included in overhead for all Contract Modifications, including Force-Account Work or CCD Work, whether incurred by Contractor, Subcontractors, or suppliers, and Contractor shall not invoice or receive payment for these costs separately:

(1) Drawings: field drawings, Shop Drawings, etc., including submissions of drawings
(2) Routine field inspection of Work proposed
(3) General Superintendence
(4) General administration and preparation of cost proposals, schedule analysis, change orders and other supporting documentation as necessary
(5) Computer services
(6) Reproduction services
(7) Salaries of project Architect/Engineer, superintendent, timekeeper, storekeeper and secretaries
(8) Janitorial services
(9) Temporary on-Site facilities:
   a. Offices
   b. Telephones
   c. Plumbing
   d. Electrical: Power, lighting
   e. Platforms
   f. Fencing, etc.
   g. Water
(10) Home office expenses
(11) Insurance and Bond premiums
(12) Procurement and use of vehicles and fuel used coincidentally in Work otherwise included in the Contract Documents
(13) Surveying
(14) Estimating
(15) Protection of Work
(16) Handling and disposal fees
(17) Final cleanup
(18) Other incidental Work

1.9 RECORDS AND CERTIFICATION

1.9.1 Force-Account (cost reimbursement) charges shall be recorded daily and summarized in Cost Proposal form attached hereto. Contractor or authorized representative shall complete and sign form each day. Contractor shall also provide with the form: the names and classifications of workers and hours worked by each; an itemization of all materials used; a list by size type and identification number of equipment and hours operated; and an indication of all Work performed by specialists.

1.9.2 No payment for Force-Account Work shall be made until Contractor submits original invoices substantiating materials and specialists charges.

1.9.3 Owner shall have the right to audit all records in possession of Contractor relating to activities covered by Contractor’s claims for modification of Contract, including Force-Account Work and CCD Work.

1.9.4 Further, Owner will have right to audit, inspect, or copy all records maintained in connection with this Contract, including financial records, in possession of Contractor relating to any transaction or activity occurring or arising out of, or by virtue of, the Contract. If Contractor is a joint venture, right of Owner shall apply collaterally to same extent to records of joint venture sponsor, and of each individual joint venture member. This right shall be specifically enforceable, and any failure of Contractor to voluntarily comply shall be deemed an irrevocable waiver and release of all claims then pending that were or could have been subject to the Article 12 of Document 00700.

2 PART 2 PRODUCTS – NOT USED

3 PART 3 EXECUTION – NOT USED

END OF SECTION

COST PROPOSAL FORM FOLLOWS ON NEXT PAGE
COST PROPOSAL (CP)

PROJECT

Contract Number ___

CP Number: __________________________

Date: __________________________

In Response To __________________________

To: [ENTER NAME OF OWNER]

Attention: __________________________

[ENTER OWNER ADDRESS]

Telephone (___) [_________]

Fax: (___) [_________]

From: [INSERT CONTRACTOR'S NAME/ADDRESS]

This Cost Proposal is in response to the above-referenced ________ [insert RFP, etc. as applicable].

Brief description of change(s): __________________________

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<th>SUB 2</th>
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REQUESTED CHANGE IN CONTRACT TIME (DAYS)

By Contractor: Signature: Date:

END OF SECTION
DIvision 1 General Requirements  

Section 01315  

Project Meetings  

1  

Part 1 General  

1.1  

Summary  

1.1.1  

Section includes descriptions of the required Project meetings for the Work. These meetings include:  

(1) Preconstruction Conference.  
(2) Schedule Review Meetings.  
(3) Weekly Progress Meetings.  
(4) Progress Schedule and Billing Meetings.  
(5) Safety Meetings.  

1.2  

Preconstruction Conference  

1.2.1  

Owner or its representative will call for and administer Preconstruction Conference at time and place to be announced (usually the week prior to start of Work at the Site).  

1.2.2  

Contractor, all major Subcontractors, and major suppliers shall attend Preconstruction Conference.  

1.2.3  

Agenda will include, but not be limited to, the following items.  

(1) Schedules  
(2) Personnel and vehicle permit procedures  
(3) Use of premises  
(4) Location of the Contractor’s on-Site facilities  
(5) Security  
(6) Housekeeping  
(7) Submittal and RFI procedures  
(8) Inspection and testing procedures, on-Site and off-Site  
(9) Utility shutdown procedures  
(10) Control and reference point survey procedures  
(11) Injury and Illness Prevention Program  
(12) Contractor’s Initial Schedule  
(13) Contractor’s Schedule of Values  
(14) Contractor’s Schedule of Submittals  
(15) Project Directory  
(16) Contractor’s Emergency Contact List  
(17) Environmental, Safety and Health procedures  

D. Owner will distribute copies of minutes to attendees. Attendees shall have seven (7) Days to submit comments or additions to minutes. Minutes will constitute final memorialization of results of Preconstruction Conference.  

1.3  

Initial Schedule Review Meetings  

1.3.1  

Pre-Construction Review of Initial Draft Schedules. Contractor shall meet with Owner prior to Start Date of the Work under Contract Documents and conduct initial review of Contractor’s draft Shop Drawing and Sample Submittal Schedule, draft Schedule of Values, and Initial Schedule. Authorized representative in Contractor’s organization, designated in writing, who will be responsible for working and coordinating with Owner relative to preparation and maintenance of Progress Schedule shall attend the initial schedule review meeting.  

1.3.2  

Pre-Payment Review of Second Draft Schedules.  

(1) Unless otherwise provided in the Contract Documents, at least fifteen (15) Days before submission of the first application for payment, a conference attended by Contractor, Owner, and others as appropriate, will be held to review acceptability of the schedules submitted in accordance with this Paragraph, first reviewed at the Preconstruction Conference. Contractor shall have an additional seven (7) Days to make corrections and adjustments and to complete and resubmit the schedules. Schedules shall be updated and completed as required by Sections 01200
Contractor shall have its manager, superintendent, scheduler, and key Subcontractor representatives, as required by Owner, in attendance. The meeting will take place over a continuous one (1) Day period. Owner review will be limited to submittal conformance to Contract Documents’ requirements including, but not limited to, coordination requirements. Owner review may also include:

b. Directions to include activities and information missing from submittal.
c. Requests of Contractor to clarify its schedule.

(3) Within five (5) Days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by Owner at the meeting.

1.3.3 Owner will administer Schedule Review Meetings and shall distribute minutes of Schedule Review Meetings to attendees. Attendees shall have five (5) Days to submit comments or additions to minutes. Minutes will constitute final memorialization of results of Schedule Review Meetings.

1.4 Weekly Progress Meetings

1.4.1 Owner will schedule and administer weekly progress meetings throughout duration of Work. Progress meetings will be held weekly unless otherwise directed by Owner.

1.4.2 Progress meetings shall be attended by Contractor’s job superintendent, major Subcontractors and suppliers, Owner, and others as appropriate to agenda topics for each meeting.

1.4.3 Agenda will contain the following items, as appropriate:

1. Progress meetings and all decisions made at progress meetings are final.
2. After the receipt of minutes, Contractor shall review the minutes, prepare a response to all questions and comments expressed by Owner, and distribute the response to all attendees. Attendees have five (5) Days to submit comments or additions to minutes. Minutes will constitute final memorialization of results of meeting.

1.5 Progress Schedule and Billing Meetings

1.5.1 A meeting will be held on approximately the 25th of each month or as otherwise agreed to with Owner (but no more than once every thirty {30} days) to review the schedule update submittal and progress payment application.

1.6 Special Meetings
1.6.1 Any party may call special meetings by notifying all desired participants and Owner five (5) Days in advance, giving reason for meeting. Special meetings may be held without advance notice in emergency situations.

1.6.2 At any time during the progress of Work, Owner shall have authority to require Contractor attend meeting of any or all of the Subcontractors engaged in Work or in other work, and notice of such meeting shall be duly observed and complied with by Contractor.

1.6.3 Contractor shall schedule and conduct coordination meetings as necessary to discharge coordination responsibilities in Document 00700 (General Conditions). Contractor shall give Owner five (5) Days written notice of coordination meetings. Contractor shall maintain minutes of coordination meetings. Attendees shall have seven (7) Days to submit comments or additions to minutes. Minutes will constitute final memorialization of results of coordination meetings.

1.6.4 Contractor to submit minutes of meetings to all attendees within three (3) days of the meeting.

1.7 Safety Meetings

1.7.1 Conduct monthly Contractor Safety Committee meetings.
1.7.2 Conduct weekly toolbox safety talks.

2 PART 2 PRODUCTS – NOT USED

3 PART 3 EXECUTION – NOT USED

END OF SECTION
PART 1 GENERAL

1.1 Summary

1.1.1 Perform scheduling of Work under this Contract in accordance with requirements of this Section 01320.
   (1) Development of schedule, cost, and resource loading of the Progress Schedule, monthly payment requests, and project status reporting requirements of the Contract Documents shall employ scheduling as required in this Section 01320.
   (2) The Schedule shall be cost-loaded based on Schedule of Values as approved by Owner.
   (3) Submit schedules and reports as specified in 00700 (General Conditions).

1.1.2 Upon Award of Contract, immediately commence development of Initial Schedule to ensure compliance with schedule submittal requirements.

1.1.3 Contractor’s obligations under this Section 01320 are hereby deemed material obligations justifying Owner remedies for default if Contractor fails to perform. Nothing in this paragraph 1.1.3 of this Section 01320 or the lack of an express statement that any other Contract Documents provision is or is not material shall be considered in determining whether any such other provision is material.

1.1.4 Employ competent scheduling personnel or a schedule consultant with experience required herein on a minimum of two prior, similar projects, and with first-hand knowledge of this Project.

1.2 General

1.2.1 Progress Schedule shall be based on, and incorporate milestone and completion dates specified, in Contract Documents.

1.2.2 Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times in Document 00520 (Agreement), unless an earlier (advanced) time of completion is requested by Contractor and agreed to by Owner. A Change Order shall formalize any such agreement.
   (1) Owner is not required to accept an earlier (advanced) schedule, i.e., one that shows early completion date(s) for the Contract Time.
   (2) Contractor is not entitled to extra compensation in event agreement is reached on an earlier (advanced) schedule and Contractor completes its Work, for whatever reason, beyond completion date shown in earlier (advanced) schedule but within the Contract Time.
   (3) A schedule showing the Work completed in less than the Contract Time, which has been accepted by Owner, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the Work and Contract Substantial Completion. Project Float is a resource available to both Owner and Contractor.
   (4) Float Ownership: Neither Owner nor Contractor owns float. The Project owns the float. As such, liability for delay of any Substantial Completion or Final Completion date rests with the party whose actions, last in time, actually cause delay to a Substantial Completion or Final Completion date.
      a. For example, in the event of unexcused delay by Party A and Party B, and if Party A uses some, but not all of the float and Party B later uses remainder of the float as well as additional time beyond the float, Party B shall be liable for the time that represents a delay to the Substantial Completion date.
      b. Under this scenario, Party A would not be responsible for the time since it did not consume all of the float and additional float remained; therefore, the Substantial Completion Date was unaffected.

1.2.3 Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
1.2.4 Failure of Progress Schedule to include any element of the Work or any inaccuracy in Progress Schedule will not relieve Contractor from responsibility for accomplishing the Work in accordance with the Contract. Owner acceptance of Schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests, and shall not, in any manner, impose a duty of care upon Owner, or act to relieve Contractor of its responsibility for means and methods of construction.

1.2.5 Transmit to Owner by email, no less than monthly, current progress schedule in electronic form, to include the entire electronic file without abridgment, inclusive of all updates.

1.3 Initial and Original Progress Schedule

1.3.1 Initial Schedule submitted for review at the Preconstruction Conference shall serve as Contractor’s schedule for up to thirty (30) Days after the Notice to Proceed.

1.3.2 Initial Schedule must indicate detailed plan for the Work to be completed in first thirty (30) Days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; and procurement of materials and equipment. Show Work beyond thirty (30) Days in summary form.

1.3.3 Contractor shall submit its Original Schedule for review no later than first progress payment. Original Schedule and all updates shall comply with all standards herein.

1.3.4 All Schedules shall be time-scaled.

1.3.5 All Schedules shall be cost-and resource-loaded. Accepted cost-and resource-loaded Schedule will be used as basis for monthly progress payments. Use of Initial Schedule for progress payments shall not exceed thirty (30) Days.

1.3.6 Except as otherwise expressly provided in this Section 01320, meet with Owner to review and discuss each Schedule (i.e., Initial, Original and monthly updates) within seven (7) Days after each Schedule has been submitted to Owner.

1.3.7 Initial Schedule shall identify the following milestone events:

1.3.8 Original Schedule and all updates shall identify all Work activities in proper sequence for the completion of the Work. Work activities shall include the following:

(1) Owner review and comment on any Schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements).

(2) Contractor shall make corrections to Schedule necessary to comply with Contract requirements and shall adjust Schedule to incorporate any missing information requested by Owner. Resubmit Initial Schedule if requested by Owner.

(1) Notice to Proceed date
(2) Substantial completion and project completion at each construction phase
(3) Start and completion dates for Work in each occupied space
(4) Utility connections
(5) Inspections

(1) Major Contractor-furnished equipment, materials, and building elements, and scheduled activities requiring submittals or Owner prior approval.

a. Show dates for the submission, review, and approval of each submittal. Dates shall be shown for the procurement, fabrications, delivery, and installation of major equipment, materials, and building elements, and for scheduled activities designated by Owner.

b. A minimum of fifteen (15) working days shall be allotted for Owner review for each submittal.

(2) System test dates
(3) Dates Contractor request designated working spaces, storage areas, access, and other facilities to be provided by Owner
(4) Dates Contractor requests orders and decisions from Owner
(5) Dates Contractor requests Owner-furnished equipment
(6) Dates Contractor requests Owner-furnished utilities
(7) Connection and relocation of existing utilities
(8) Connecting to or penetrating existing structures
(9) Dates Contractor requests access to areas requiring removal of Asbestos containing materials by Owner
1.3.9 If Contractor is of the opinion that any of the Work included on its Schedule has been impacted, submit to Owner a written Time Impact Evaluation (TIE) in accordance with paragraph 1.8 of this Section 01320. The TIE shall be based on the most current update of the Initial Schedule.

1.4 Schedule Format and Level of Detail

1.4.1 Utilize Primavera computer-scheduling software, for all scheduling including schedule updates, and employ scheduling personnel experienced and competent in it. For all activities or impacts shown in schedule, Contractor shall complete all data points in the software to specifically include the activities, their durations, their logic ties and their resources.

1.4.2 Each Schedule (Initial, Original and updates) shall indicate all separate fabrication, procurement and field construction activities required for completion of the Work, including but not limited to the following:

1. The intent is to provide a common basis of acceptance, understanding, and communication, as well as interface with other contractors.
2. Activities related to the delivery of Contractor and Owner-furnished equipment to be Contractor-installed per Contract shall be shown.
3. All activities shall be identified through codes or other identification to indicate the building (i.e. buildings, Site work) and Contractor/Subcontractor responsibility to which they pertain.
4. Break up the Work schedule into activities of durations of approximately twenty-one (21) Work Days or less each, except for non-field construction activities or as otherwise deemed acceptable by Owner.
5. Show the critical path in red. For each activity, show early start, late start, early finish, late finish, durations measured in Days, float, resources, predecessor and successor activities, planned workday/week for the activity, material quantities, and scheduled/actual progress payments.

1.4.3 Seasonal weather conditions (which do not constitute a delay as defined herein) shall be considered in the planning and scheduling of all work influenced by high or low ambient temperatures or presence of high moisture for the completion of the Work within the allotted Contract Time.

1.4.4 Failure by Contractor to include any element of Work required for performance of the Work on the detailed construction schedule shall not excuse Contractor from completing all Work required within the Contract Time.

1.4.5 A three-week “look ahead,” detailed daily bar chart schedule shall be updated and issued weekly in hard copy and electronically.

1.4.6 Monthly updates shall include schedule sorts in hard copy, by bid item (geographic work area) with critical items shown in red float and with early/late start and finish dates, to facilitate meaningful review and assessment of schedule.

1.5 Monthly Schedule Update Submittals

1.5.1 Following acceptance of Contractor’s Initial Schedule, Contractor shall monitor progress of Work and adjust Schedule each month to reflect actual progress and any anticipated changes to planned activities.

1. The following items will be reviewed: Percent complete of each activity; TIEs for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays and critical issues.

1.5.2 A meeting will be held on approximately the 25th of each month to review the Schedule update submittal and progress payment application.

1. At this meeting, at a minimum, the following items will be reviewed: Percent complete of each activity; TIEs for Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated Contractor delays and critical issues.
2. These meetings are considered a critical component of overall monthly schedule update submittal; have appropriate personnel attend. At a minimum, Contractor’s General Superintendent and
Scheduler shall attend these meetings.

(3) Plan on the meeting taking no less than four hours.

1.5.3 Within five Days after monthly Schedule update meeting, Contractor shall submit on CD the updated Schedule, and reports and charts, both in hard copy and on a CD.

1.5.4 Within five (5) Days of receipt of above-noted revised submittals, Owner will either accept or reject monthly schedule update submittal.

(1) If accepted, percent complete shown in monthly update will be basis for Application for Payment by Contractor. The schedule update shall be submitted as part of Contractor’s Application for Payment and a basis of such payment.

(2) If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.

1.5.5 Neither updating, changing or revising of any report, curve, schedule or narrative submitted to Owner by Contractor under this Contract, nor Owner review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying, in any way, the Contract Substantial Completion date or milestone dates or of modifying or limiting, in any way, Contractor’s obligations under this Contract.

1.6 Schedule Revisions

1.6.1 Updating the Schedule (Initial and Original) to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, however, revisions to activity durations and sequences are expected on a monthly basis.

1.6.2 To reflect revisions to the Schedule, provide Owner with a written narrative with a full description and reasons for each Work activity that is revised. For revisions affecting the sequence of Work, provide a schedule diagram that compares the original sequence to the revised sequence of Work. Contractor shall clearly show and discuss any changes in the critical path, and provide the written narrative and schedule diagram for revisions three (3) Days in advance of the monthly schedule update meeting.

1.6.3 Schedule revisions shall not be incorporated into any schedule update until Owner has reviewed the revisions. Owner may request further information and justification for schedule revisions and, within three (3) Days, provide Owner with a complete written narrative response to Owner request.

1.6.4 If Owner does not accept Contractor’s revision, and Contractor disagrees with Owner position, Contractor has seven (7) Days from receipt of Owner letter rejecting the revision, to provide a written narrative providing full justification and explanation for the revision. Contractor’s failure to respond in writing within seven (7) Days of Owner written rejection of a schedule revision shall be contractually interpreted as acceptance of Owner position, and Contractor waives its rights to subsequently dispute or file a claim regarding Owner position. If Contractor files a timely response as provided in this paragraph, and the parties are still unable to agree, then Owner and Contractor’s rights shall be as provided in Document 00700 (General Conditions), Article 12.

1.6.5 At Owner discretion, Contractor can be required to provide Subcontractor certifications of performance regarding proposed schedule revisions affecting said Subcontractors.

1.7 Recovery Schedule

1.7.1 If a Schedule update shows a substantial completion date twenty-one (21) Days beyond any Contract Substantial Completion date, or individual Milestone completion dates, Contractor shall submit to Owner within seven (7) Days the proposed revisions to recover the lost time. As part of this submittal, Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of Work. If Owner requests, Contractor shall show the intended critical path; secure appropriate Subcontractor and supplier consent to the recovery Schedule; submit a narrative explaining trade flow and construction flow changes, duration changes, added/deleted activities, critical path changes and identify all near critical paths and man hour loading assumptions for major Subcontractors.

1.7.2 The revisions shall not be incorporated into any Schedule update until Owner has reviewed the revisions.

1.7.3 If Owner does not accept Contractor’s revisions, Owner and Contractor shall follow the procedures in paragraphs 1.6.3, 1.6.4 and 1.6.5 of this Section 01320.

1.7.4 At Owner discretion, Contractor can be required to provide Subcontractor certifications for revisions affecting said Subcontractors.
1.8  **Time Impact Evaluation for Change Orders and Other Delays**

1.8.1  When Contractor is directed to proceed with changed work or otherwise requests a time extension, Contractor shall prepare and submit, within fourteen (14) Days from the direction to proceed, a TIE that includes both a written narrative and a schedule diagram depicting how the changed work affects other schedule activities. The schedule diagram shall show how Contractor proposes to incorporate the changed work in the schedule, and how it impacts the current Schedule update critical path or otherwise. Contractor is also responsible for requesting time extensions based on the TIE’s impact on the critical path. The diagram shall be tied to the main sequence of scheduled activities to enable Owner to evaluate the impact of changed work to the scheduled critical path. Use attached form.

1.8.2  Comply with the requirements of paragraph 1.8.1 of this Section 01320 for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.

1.8.3  Contractor is responsible for all costs associated with the preparation of TIEs, and the process of incorporating TIEs into the current schedule update. Provide Owner with four copies of each TIE both in hard copy and CD.

1.8.4  Once agreement has been reached on a TIE, the Contract Time will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Time may be extended in an amount Owner allows, and Contractor may submit a claim for additional time claimed by Contractor as provided in Document 00700 (General Conditions).

1.9  **Time Extensions**

1.9.1  Contractor is responsible for requesting time extensions for time impacts that, in the opinion of Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accordance with Document 00700 (General Conditions).

1.9.2  Where an event for which Owner is responsible impacts the projected Substantial Completion date, Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. Contractor shall also include a detailed cost breakdown of the labor, equipment, and material Contractor would expend to mitigate Owner-caused time impact. Contractor shall submit mitigation plan to Owner within fourteen (14) Days from the date of discovery of said impact. Contractor is responsible for the cost to prepare the mitigation plan.

1.9.3  Failure to request time, provide TIE, or provide the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.

1.9.4  No time will be granted under the Contract Documents for cumulative effect of changes.

1.9.5  Owner will not be obligated to consider any time extension request unless requirements of Contract Documents are complied with.

1.9.6  Failure of Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.

1.9.7  Notwithstanding any other provision of this Section 01320, if Contractor does not submit a TIE within the required fourteen (14) Days for any issue, Contractor hereby agrees that Contractor does not require a time extension for that issue.

1.10  **Project Status Reporting**

1.10.1  In addition to submittal requirements for scheduling identified in this Section 01320, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each Schedule as specified herein. Status reporting shall be in form specified in this paragraph 1.10 below.

1.10.2  Contractor shall prepare monthly written narrative reports of status of Project for submission to Owner. Written status reports shall include:

1.  Status of major Project components (percent complete, amount of time ahead or behind schedule) and an explanation of how Project will be brought back on schedule if delays have occurred.

2.  Progress made on critical activities indicated on each Schedule, including inspections.

3.  Explanations for any lack of work on critical path activities planned to be performed during last month.

4.  Explanations for any schedule changes, including changes to logic or to activity durations.

5.  List of critical activities scheduled to be performed during the next month.
(6) Status of major material and equipment procurement.
(7) Any delays or other problems encountered during reporting period and recommendations for action to prevent such delays or problems from re-occurring.
(8) Printed report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on weekly and monthly basis.
   a. Actual resource shall be accumulated in field by Contractor, and shall be as noted on Contractor’s daily reports. These reports will be basis for information provided in monthly and weekly printed reports.
   b. Contractor shall explain all variances and mitigation measures.
(9) Contractor may include any other information pertinent to status of Project. Include additional status information requested by Owner at no additional cost.
(10) Status reports, and the information contained therein, shall not be construed as claims, notice of delay, or requests for changes or compensation.

1.10.3 At the close of each workday provide Owner with report of Contractor and its Subcontractors’ work activities for that day, including trades, equipment, work activities worked on, staff levels, and equipment deliveries. Use Owner supplied “Contractor Daily Project Report (attached), completing all portions applicable to that work day or other, as furnished by Owner.

1.10.4 Submit all reports and schedule files on CD, in addition to written copies.

1.10.5 Submit all DSA, -required reports in the time, format and detail required by DSA.

2 PART 2 PRODUCTS – NOT USED

3 PART 3 EXECUTION – NOT USED

END OF SECTION
DIVISION 1 GENERAL REQUIREMENTS

SECTION 01330

SUBMITTAL PROCEDURES

1 PART 1 GENERAL

1.1 Summary

1.1.1 Section Includes:

(1) Description of general requirements for Submittals for the Work:
   a. Procedures
   b. Schedule of Shop Drawing and Sample Submittals
   c. Safety Program
   d. Progress Schedule
   e. Product Data
   f. Shop Drawings
   g. Samples
   h. Coordination Drawings
   i. Quality Assurance Control Submittals
      (i) Design Data
      (ii) Test Reports
      (iii) Certificates
      (iv) Manufacturers’ Instructions
      (v) Material Safety Data Sheets
   j. Installation, Operations, and Maintenance Manuals
   k. Computer Programs
   l. Project Record Documents

(2) Delay of Submittals

(3) Optional Review Meeting

1.2 Procedures

1.2.1 Submit at Contractor’s expense, seven (7) sets, the following items (“Submittals”) required by Contract Documents:

(1) Schedule of Shop Drawing and Sample Submittals
(2) Safety Plans
(3) Progress Schedule
(4) Product Data; Shop Drawings
(5) Samples
(6) Coordination Drawings
(7) Quality Assurance Control Data
(8) Machine Inventory Sheets
(9) Installation, Operation, and Maintenance Manuals
(10) Computer Programs
(11) Project Record Documents

1.2.2 Contractor shall submit these Submittals to Owner for review and approval in accordance with accepted Schedule of Shop Drawings and Samples Submittals. If no such schedule is agreed upon, then all Shop Drawing, Samples, and product data Submittals shall be submitted within twenty-one (21) Days after receipt of Notice of Award from Owner.

1.2.3 Contractor shall transmit each item with the appropriate Submittal transmittal form (form is located within the Prolog System). Contractor shall also identify Project, Contractor, Subcontractor, major supplier, pertinent Drawing sheet and detail number, and Specification Section number as appropriate. Where manufacturer’s standard drawings or data sheets are used, they shall be marked clearly to show those portions of the data that are applicable to this Project. Inapplicable portions shall be marked out. Submittals shall be submitted based on each Specification Section. Submittals containing information about more than one Specification Section will be returned for re-submittal. Submittals shall include all...
information requested by each Specification Section. (No partial Submittals.) Incomplete Submittals will be returned not reviewed by Owner.

1.2.4 The data shown on the Submittals shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to show Owner the materials and equipment Contractor proposes to provide and to enable Owner to review the information for the limited purposes specified in this Section 01330. Submittals shall be identified clearly as to material, supplier, pertinent data such as catalog numbers and the use for which it is intended and otherwise as Owner may require to enable Owner to review the Submittal. The quantity of each Submittal to be submitted will be as required by individual Specification Sections or this Section 01330.

1.2.5 At the time of each submission, Contractor shall give Owner specific written notice of all variations, if any, that the transmitted Submittal may have from the requirements of the Contract Documents, and the reasons therefore. This written notice shall be in a written communication attached to the Submittal transmittal form. In addition, Contractor shall cause a specific notation to be made on each Submittal submitted to Owner for review and approval of each such variation. If Owner accepts deviation, Owner will note its acceptance on the returned Submittal transmittal form and, if necessary, issue appropriate Contract Modification.

1.2.6 Submittal coordination and verification is Contractor’s responsibility; this responsibility shall not be delegated in whole or in part to Subcontractors or suppliers. Before submitting each Submittal, review and coordinate each Submittal with other Submittals and with the requirements of the Work and the Contract Documents, and determine and verify:

1. (1) All field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar information with respect there to;

2. (2) All materials with respect to intended use, fabrication, shipping, handling, storage, assembly and installation pertaining to the performance of the Work; and

3. (3) All information relative to Contractor’s sole responsibilities and of means, methods, techniques, sequences and procedures of construction and safety precautions and programs incident thereto.

1.2.7 Contractor’s submission to Owner of a Submittal shall constitute Contractor’s representation that it has satisfied its obligations under the Contract Documents, and as set forth immediately above in this paragraph 1.2 of Section 01330, with respect to Contractor’s review and approval of that Submittal.

1.2.8 Designation of work “by others,” if shown in Submittals, shall mean that work will be responsibility of Contractor rather than Subcontractor or supplier who has prepared Submittals.

1.2.9 After review by Owner of each of Contractor’s Submittals, one set of material will be returned to Contractor with actions defined as follows:

1. (1) NO EXCEPTIONS TAKEN - Accepted subject to its compatibility with future Submittals and additional partial Submittals for portions of the Work not covered in this Submittal, does not constitute approval or deletion of specified or required items not shown on the Submittal.

2. (2) MAKE CORRECTIONS NOTED (NO RESUBMISSIONS REQUIRED) - Same as item 1 above, except that minor corrections as noted shall be made by Contractor.

3. (3) REVISE AS NOTED AND RESUBMIT - Rejected because of major inconsistencies or errors that shall be resolved or corrected by Contractor prior to subsequent review by Owner.

4. (4) REJECTED - RESUBMIT - Submitted material does not conform to Drawings and/or Specifications in major respect, i.e.: wrong size, model, capacity, or material.

1.2.10 Contractor shall make a complete and acceptable Submittal at least by second submission. Owner reserves the right to deduct monies from payments due Contractor to cover additional costs of review beyond the second submission. Illegible Submittals will be rejected and returned to Contractor for resubmission. Contractor shall be in breach of the Contract if Contractor’s first re-submittal, following a Submittal which Owner determines falls within categories (3) or (4) above, does not fall within categories (1) or (2) above.

1.2.11 Favorable review will not constitute acceptance by Owner of any responsibility for the accuracy, coordination and completeness of the Submittals. Accuracy, coordination, and completeness of Submittals shall be sole responsibility of Contractor, including responsibility to back-check comments, corrections, and modifications from Owner review before fabrication. Contractor, Subcontractors, or suppliers may prepare Submittals, but Contractor shall ascertain that Submittals meet requirements of Contract Documents, while conforming to structural space and access conditions at point of installation. Owner review will be only to assess if the items covered by the Submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as indicated by the Contract Documents. Favorable review of
Submittal, method of work, or information regarding materials and equipment Contractor proposes to furnish shall not relieve Contractor of responsibility for errors therein and shall not be regarded as assumption of risks or liability by Owner, or any officer or employee thereof, and Contractor shall have no claim under Contract Documents on account of failure or partial failure or inefficiency or insufficiency of any plan or method of work or material and equipment so accepted. Favorable review shall be considered to mean merely that Owner has no objection to Contractor using, upon Contractor’s own full responsibility, plan or method of work proposed, or furnishing materials and equipment proposed.

1.2.12 Owner review will not extend to the means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

1.2.13 Contractor shall submit complete initial Submittal for those items where required by individual Specification Sections. Complete Submittal shall contain sufficient data to demonstrate that items comply with Specifications, shall meet minimum requirements for submissions cited in Specification Sections, shall include motor data and seismic anchorage certifications, where required, and shall include necessary revisions required for equipment other than first named. If Contractor submits incomplete initial Submittal when complete Submittal is required, Submittal may be returned to Contractor without review.

1.2.14 Reproduce and distribute copies of shop drawings and copies of product data which carry the Architect’s review stamp to:

(1) Jobsite file
(2) Record Documents file
(3) Other affected contractors, if any
(4) Subcontractors
(5) Supplier or fabricator
Distribute samples which carry the Architect’s stamp as directed.

1.2.15 After Owner review of Submittal, Contractor shall revise as noted and resubmit as required. Contractor shall also identify changes made since previous Submittal, and:

(1) Begin no fabrication or work that requires Submittals until return of Submittals not requiring re-submittal. Do not extrapolate from Submittals covering similar work.

(2) Normally, Submittals will be processed and returned to Contractor within twenty-one (21) Days of receipt.

1.2.16 Contractor shall distribute copies of reviewed Submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

1.2.17 All Submittals shall be number-identified by Contractor, prior to submission to Owner, in accordance with the following:

(1) Sequentially number each Submittal (i.e., “1”, “2”, “3”, etc.) as the basis for number identification of Submittals.

(2) Affix the Submittal number under which each Submittal is made on every copy of each Shop Drawing, product data, sample, certification, etc.

(3) Number Installation, Operation, and Maintenance Manuals with original root number of the approved Submittal for the item.

(4) If the Submittal is a re-submittal (including without limitation after an initial Submittal is rejected, returned without review or marked ‘Revise as Noted and Resubmit’), add the suffix designation “A” (i.e., a re-submittal of Submittal 1 would be numbered 1A). Subsequent re-submittals would be identified by the Submittal number and sequential letters (i.e., “B”, “C”, “D”, etc.).

(5) All Submittals shall include all information requested by each Specification Section. No partial Submittals will be accepted unless previously authorized by Owner. In the event a partial Submittal is authorized, each subsequent different Submittal (as opposed to re-submittal) is given a new number.

(6) Submittals shall contain:
   a. The submittal number
   b. The date of submission and the dates of any previous submissions
   c. The project title and number
   d. Contract identification
   e. The names of:
      (i) Contractor
      (ii) Supplier
1.2.18 Submission Requirements:

(1) Deliver Submittals to Owner at least thirty (30) Days before dates reviewed Submittals will be needed.

(2) Initial Submittal of Installation, Operation, and Maintenance Manuals shall be forty-five (45) Days after the date Submittals that pertain to the applicable portion of the Installation, Operation, and Maintenance Manual is satisfactorily reviewed.

(3) The following table lists the number of initial Submittals required from Contractor for each type of submission, to whom Contractor shall distribute the information, and Owner distribution of reviewed submissions. If Contractor needs more copies of reviewed Submittals returned to it, then either submit additional copies or make copies from the returned transparency Submittal. Submittals requiring resubmission will require the same quantity and distribution as an initial Submittal.

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<td>Other Documents</td>
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(4) Accompany Submittals with Submittal transmittal form, in duplicate, containing:

   a. Date, revision date, and Submittal log number.
   b. Project name and Owner Contract number.
   c. Contractor’s name, address, and job number.
   d. Specification Section number clearly identified.
   e. The quantity of Shop Drawings, Product Data, or Samples submitted.
   h. Other pertinent data.

1.2.19 Resubmission requirements:

(1) Shop Drawings:
   a. Revise initial Shop Drawings as required and resubmit as specified for initial Submittals.
   b. Indicate on Shop Drawings any changes that have been made other than those requested by Owner.

(2) Product Data and Samples:
   a. Submit new Product Data and Samples as required for initial Submittals.
1.2.20 **Number of resubmissions:**

(1) One (1) re-examination of Contractor’s Submittals that have been returned for correction or replacement will be included in Owner budget. Any additional re-examination of Contractor’s Submittals will be considered additional scope services to be paid by Contractor through Owner. Contractor shall pay Owner (or Owner may deduct from any progress or final payment), for engineering personnel, on an hourly basis at 2.5 times direct payroll expenses, and for consultant personnel time at 1.25 times the amount billed Owner.

1.3 **Schedule of Shop Drawing and Sample Submittals**

1.3.1 Contractor shall submit preliminary Schedule of Shop Drawing and Sample Submittals as required by Document 00700 (General Conditions). Contractor shall submit two copies of final and accepted Schedule of Shop Drawings and Sample Submittals as required by paragraph 1.2.1(1) of this Section 01330.

1.3.2 Schedule of Shop Drawing and Sample Submittals will be used by Owner to schedule its activities relating to review of Submittals. Schedule of Submittals shall indicate a spreading out of Submittals and early Submittals of long-lead-time items and of items that require extensive review.

1.3.3 Schedule of Shop Drawing and Sample Submittals will be reviewed by Owner and shall be revised and resubmitted until accepted by Owner.

1.3.4 Unless otherwise specified, Contractor shall make Submittals in groups containing all associated items to assure that information is available for checking each item when it is received. Contractor shall identify on the Submittal which Submittals should be reviewed together.

1.3.5 Contractor shall prepare the Submittal Schedule and coordinate it with the Contract Schedule. No submittals will be processed before the Submittal Schedule has been submitted to and accepted by the Architect, except in such cases where the processing of submittals is required before the acceptance of the Submittal Schedule.

1.3.6 In preparing the Submittal Schedule, Contractor must first determine from the Contract Schedule the date the particular item is needed for the Work. Working backwards, Contractor will add the required number of days for shipment, time for fabrication, and similar items to determine the date of the first submittal.

1.3.7 The Submittal Schedule shall be adjusted to meet the needs of the construction process and Contract Schedule. Submit two (2) copies of the Submittal Schedule after it is completed and each time it is updated by Contractor.

1.4 **Safety Program**

1.4.1 Submit three (3) copies of Safety Program specific to these Contract Documents to Owner within the time set forth in Section 01540 (Site Security and Safety), paragraph 1.5.

1.5 **Progress Schedule**

1.5.1 See Section 01320 (Progress Schedules and Reports) for schedule and report requirements. Section 01320 shall control in any conflict with Section 01330.

1.5.2 Submit one (1) reproducible and three (3) print copies of schedule at each of the following times:

(1) Initial Progress Schedule at the Preconstruction Conference.
(2) Original Schedule within twenty (20) Days of the Notice to Proceed date.
(3) Adjustments to the Schedule as required.
(4) Schedule updates monthly, seven (7) Days prior to monthly progress meeting.

1.5.3 Submit four (4) copies of the reports listed in Section 01320 (Progress Schedules and Reports) with:

(1) Initial Schedule
(2) Original Schedule
(3) Each monthly Schedule update

1.5.4 Progress Schedules and Reports shall be submitted via email and on CD or thumb drives, using software described in paragraph 1.4.5 of Section 01320, in addition to hard copies specified in this paragraph 1.5. Electronic files shall be complete copies, including all programs and electronic coding.

1.6 **Product Data**

1.6.1 Within ten (10) Days after Start Date of the Contract Time, Contractor shall submit two (2) copies of complete list of major products proposed for use, with name of manufacturer, telephone number, trade
name, and model number of each product. Tabulate product data by Specification Section.

1.6.2 For products specified only by reference standards, Contractor shall give manufacturer, trade name, model or catalog designation, and reference standards.

1.6.3 Product or Catalog Data:
(1) Manufacturer’s standard drawings shall be modified to delete non-applicable data or include applicable data.
(2) For manufacturer’s catalog sheets, brochures, diagrams, schedules, charts, illustrations and other standard descriptive data, Contractor shall:
   a. Mark each copy to identify pertinent materials, products, or models.
   b. Show dimensions and clearances required, performance characteristics and capacities, wiring diagrams and controls.
   c. Include applicable MSDS.

1.6.4 Supplemental Data. Contractor shall:
(1) Submit number of copies that Contractor requires, plus four (4) copies that will be retained by Owner.
(2) Mark each copy to identify applicable products, models, options, and other data, and supplement manufacturer’s standard data to provide information unique to Project.

1.6.5 Contractor shall provide copies for Project Record Documents described in Section 01770 (Contract Closeout).

1.7 Shop Drawings

1.7.1 Minimum Sheet Size: 8½ inches by 11 inches. All others: Multiples of 8½ inches by 11 inches, 34 inches by 44 inches maximum.

1.7.2 Original sheet or reproducible transparency will be marked with Owner review comments and returned to Contractor.

1.7.3 Mark each copy to identify applicable products, models, options, and other data; supplement manufacturers’ standard data to provide information unique to Work.

1.7.4 Include manufacturers’ installation instructions when required by Specification Section.

1.7.5 If Contractor submits Shop Drawings for items that Shop Drawings are not specified, Owner will not be obliged to review them.

1.7.6 Contractor is responsible for procuring copies of Shop Drawings for its own use as it may require for the progress of the Work.

1.7.7 Shop Drawings shall be drawn to scale and completely dimensioned, giving plan view together with such sectional views as are necessary to clearly show construction detail and methods.

1.8 Samples

1.8.1 Contractor shall submit full range of manufacturers’ standard colors, textures, and patterns for Owner selection.

1.8.2 Contractor shall submit samples to illustrate functional and aesthetic characteristics of product, with integral parts and attachment devices. Contractor shall coordinate Submittal of different categories for interfacing work.

1.8.3 Contractor shall include identification on each sample, giving full information.

1.8.4 Sizes: Unless otherwise specified, Contractor shall provide the following:
(1) Paint Chips: Manufacturers’ standard
(2) Flat or Sheet Products: Minimum 6 inches square, maximum 12 inches square
(3) Linear Products: Minimum 6 inches, maximum 12 inches long
(4) Bulk Products: Minimum 1 pint, maximum 1 gallon

1.8.5 Full size samples may be used in Work upon approval by Owner.

1.8.6 Field Samples and Mock-ups (if applicable):
(1) Contractor shall erect field samples and mock-ups at Site in accordance with requirements of Specification Sections. If testing is conducted, record and certify results and full Contract compliance.
(2) Contractor shall modify or make additional field samples and mock-ups as required to provide appearance and finishes approved by Owner.
(3) Approved field samples and mock-ups may be used in Work upon approval by Owner.
(4) Contractor shall construct or prepare as many additional Samples as may be required, as directed by Owner, until desired textures, finishes, and/or colors are obtained.
1.8.7 No review of a Sample shall be taken in itself to change or modify the requirements in the Contract Documents.
1.8.8 Finishes, materials, and workmanship in the completed Work shall match accepted Samples.
1.8.9 Remove mock-ups at conclusion of Work.

1.9 Coordination Drawings
1.9.1 For all areas of the Work, obtain shop drawings from each discipline and produce a coordinated, composite shop drawing that indicates the relationship of the mechanical pipes, ductwork and equipment with all automatic sprinkler pipes, electrical conduits, electrical equipment, structural members and existing utilities. Indicate clearances between Work of the mechanical, structural, electrical existing utilities and the Work of other trades.
   (1) Prepare and submit Coordination drawings sufficiently in advance (i.e., 90 days or more) of scheduled date for affected area.
   (2) Use minimum scales of one-quarter inch per foot for floor plans and one-half inch per foot for sections.

1.10 Quality Assurance Control Submittals
1.10.1 Test Reports:
   (1) Contractor shall submit three (3) copies; one (1) copy will be marked with Owner review comments and returned to Contractor.
   (2) Contractor shall indicate that material or product conforms to or exceeds specified requirements.
   (3) Reports may be from recent or previous tests on material or product, but shall be acceptable to Owner. Comply with requirements of each individual Specification Section.
1.10.2 Certificates:
   (1) Contractor shall submit five (5) copies; one (1) copy will be marked with Owner review comments and returned to Contractor.
   (2) Contractor shall indicate that material or product conforms to or exceeds specified requirements.
   (3) Contractor shall submit supporting reference data, affidavits, and certifications as appropriate.
   (4) Certificates may be recent or from previous test results on material or product, but shall be acceptable to Owner.
1.10.3 Manufacturers’ Instructions. Contractor shall:
   (1) Submit three (3) copies; one (1) copy will be marked with Owner review comments and returned to Contractor.
   (2) Include manufacturers’ printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing.
   (3) Identify conflicts between manufacturers’ instructions and Contract Documents.
1.10.4 Material Safety Data Sheets:
   (1) In addition to Material Safety Data Sheets (MSDS) otherwise required by the Contract Documents, Contractor shall submit five (5) copies for any paints, solvents, thinners, varnish, lacquer, glues and adhesives, mastics, or other materials needed for the Project as required by the individual Specification Sections or as otherwise specified in the Contract Documents.
   (2) MSDS required for a Submittal shall be submitted with product data in order for the Submittal to be reviewed.

1.11 Installation, Operations, and Maintenance Manuals
1.11.1 Sheet Size: 8½ x 11 inch
1.11.2 Drawing Size: Contractor shall reduce drawings or diagrams to an 8½ x 11 inch or 11 x 17 inch size. However, where reduction is not practical to ensure readability, fold larger drawings separately and place in vinyl envelopes bound into the binder. Identify vinyl envelopes with drawing numbers.
1.11.3 Binding: Contractor shall bind in stiff, metal-hinged, three-ring binder(s) with standard three-hole punching.
1.11.4 Multiple Items: Multiple items may be combined into one binder; tab each section with plastic-coated dividers.
1.11.5 Page Protectors: Contractor shall provide plastic sheet lifters prior to first page and following last page.
1.11.6 Binder title: Contractor shall include the following title on front and spine of binder:

Peralta Community College District
Cougar Village Expansion, Modular Bid Submittal Package 1
INSTALLATION, OPERATION, AND MAINTENANCE MANUAL, 20____

1.11.7 Contents:
(1) Introductory Information shall include:
   a. Title page providing the same information as paragraph 1.11.6 above
   b. Contractor’s name, address, and telephone number
   c. Table of Contents
(2) Include, at a minimum, the following detailed information for each item as applicable and as required by individual Specification Sections:
   a. Equipment function, normal operating characteristics, limiting operations.
   b. Assembly, disassembly, installation, alignment, adjustment, and checking instructions.
   c. Operating instructions for startup, routine and normal operation, regulation and control, shutdown, and emergency conditions.
   d. Lubrication and maintenance instructions including specific type and amount of lubricant and recommended lubrication interval.
   e. Guide to "troubleshooting."
   f. Parts list and predicted life of parts subject to wear.
   g. Outline, cross-section, and assembly drawings; engineering data; and electrical diagrams, including elementary diagrams, labeled wiring diagrams, connection diagrams, word description of wiring diagrams and interconnection diagrams.
   h. Test data and performance curves.
   i. A list of recommended spare parts with a price list and a list of spare parts provided under this Contract.
   j. Copies of parts lists or other documents packed with equipment when delivered.
   k. Instrumentation or tag numbers relating the equipment back to the Contract Documents.
(3) Index

1.11.8 Final Submittal: Upon favorable review of Installation, Operation, and Maintenance Manual(s) by Owner, Contractor shall deliver nine (9) additional hard copies and one (1) electronic media format copy of the final approved Installation, Operation, and Maintenance Manual(s). Electronic media format copy shall include all tables, charts, drawings, codes and all other matters reflected in hard copies. Contractor shall complete the Equipment and Tasks lists in digital format for each piece of equipment supplied.

1.11.9 Electronic Media Format: Compatible with Microsoft® Word 2000 for Windows, AutoCAD 2000 Land Development Desktop for Windows in drawing format (.DWG), or Adobe (.PDF) unless directed otherwise by Owner. All files shall be delivered on a unique CD-ROM.

1.11.10 Draft Submittal: The Draft Submittal of Installation, Operation, and Maintenance Manuals shall be submitted to Owner prior to equipment startup.

1.12 Computer Programs

1.12.1 When any equipment requires operation by computer programs, Contractor shall submit copy of program on appropriate diskette, plus a hard-copy and an electronic copy (Adobe .PDF format) of all user manuals and guides for operating the programs and making changes in the programs for upgrading and expanding the databases. All programs shall be Windows 2000 compatible. Contractor shall provide required licenses to Owner at no additional cost.

1.13 Project Record Documents

1.13.1 Contractor shall submit one (1) copy of each of the Project Record Documents listed in Section 01770 (Contract Closeout).

1.14 Delay of Submittals

1.14.1 Delay of Submittals by Contractor is considered avoidable delay. Liquidated damages incurred because of late Submittals will be assessed to Contractor.

1.15 Optional review meeting
1.15.1 At the Contractor’s request, in order to facilitate the timeliness of the review process, Owner may schedule a meeting to review the materials submitted. If this option is exercised, the following requirements apply:

1) Contractor shall request a meeting date with Owner at least ten (10) Business Days in advance.

2) Contractor shall provide the complete package of Submittal information at least five (5) Business Days in advance of the meeting.

3) The meeting shall take place at Owner office. Owner will provide the authorized staff to review and respond on the Submittal information during the meeting.

4) Contractor shall make available for this meeting the job superintendent and/or foreman, Contractor’s safety officer, and someone knowledgeable of all the items submitted and authorized to make substitutions or changes.

2 PART 2 PRODUCTS – NOT USED

3 PART 3 EXECUTION – NOT USED

END OF SECTION

TRANSMITTAL SHEETS ARE FOUND IN THE PROLOG SYSTEM

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Remarks:

* The action designated above is in accordance with the following legend:

A – No Exceptions Taken
B – Make Corrections Noted (No Resubmission Required)
C – Make Corrections Noted and Resubmit
D – Not Approved
  1. Not enough information for review
  2. No reproducibles submitted
  3. Copies illegible
  4. Not enough copies submitted
  5. Wrong sequence number
  6. Wrong resubmittal number
  7. Wrong Specification section number
  8. Wrong form used
  9. See comments
  10. 

E – Owner review not required
  1. Submittal not required
  2. Supplemental information. Submittal retained for informational purposes only
  3. Information reviewed and approved on prior Submittal
  4. See comments

Comments

By [Contractor] [File] [Field] [Owner] [Other]

Date
### EXHIBIT B
**INSTALLATION, OPERATION, AND MAINTENANCE MANUAL**

**TRANSMITTAL NO. ______**

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<th>Dwg. or Data No.</th>
<th>Action Taken*</th>
</tr>
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### Remarks:

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* The action designated above is in accordance with the following legend:

- **A** – No exceptions taken
- **B** – Make Corrections Noted (No Resubmission Required)
- **C** – Make Corrections Noted and Resubmit
- **D** – Not Approved – this manual Submittal is deficient in the following area:
  1. Equipment record sheets
  2. Functional description
  3. Assembly, disassembly, installation, alignment, adjustment, and checkout instructions
  4. Operating instructions
  5. Lubrication and maintenance instructions
  6. Troubleshooting guide
  7. Parts list and ordering instructions
  8. Organization (indexing and tabbing)
  9. Wiring diagrams and schematics specific to installation
  10. Outline, cross section, and assembly diagrams
  11. Test data and performance curves
  12. Tag or equipment identification numbers
  13. See comments

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**Comments**

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**Distribution:**

- Contractor □
- File □
- Field □
- Owner □
- Other □

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* By Date
DIVISION 1 GENERAL REQUIREMENTS

SECTION 01410

REGULATORY REQUIREMENTS

1 PART 1 GENERAL

1.1 Summary

1.1.1 Section includes: regulatory requirements applicable to Contract Documents.
1.1.2 Specific reference in the Specifications to codes and regulations or requirements of regulatory agencies shall mean the latest printed edition of each adopted by the regulatory agency in effect at the time of the opening of bids, except as may be otherwise specifically stated in the Contract Documents.
1.1.3 Should any conditions develop not covered by the Contract Documents wherein the finished Work will not comply with current codes, a change order detailing and specifying the required Work shall be submitted to and approved by Owner before proceeding with the Work.

1.2 References to Regulatory Requirements

1.2.1 Codes, laws, ordinances, rules, regulations and ordinances referred to shall have full force and effect as though printed in full in these Specifications. Code, laws, ordinances, rules, regulations and ordinances are not furnished to Contractor, because Contractor is assumed to be familiar with these requirements. The listing of applicable codes, laws, regulations and ordinances for hazardous waste abatement Work in the Contract Documents is supplied to Contractor as a courtesy and shall not limit Contractor’s responsibility for complying with all applicable laws, regulations or ordinances having application to the Work. Where conflict among the requirements or with these Specifications occurs, the most stringent requirements shall be used.

1.2.2 Conform to all applicable codes, laws, ordinances, rules and regulations.

1.2.3 Precedence:

(1) Where specified requirements differ from the requirements of applicable codes, ordinances and standards, the more stringent requirements shall take precedence.

(2) Where Drawings or Specifications require or describe products or execution of better quality, higher standard or greater size than required by applicable codes, ordinances and standards, Drawings and Specifications shall take precedence so long as such increase is legal.

(3) Where no requirements are identified on Drawings or in Specifications, comply with all requirements of applicable codes, ordinances and standards of governing authorities having jurisdiction.

1.3 Codes

1.3.1 Codes that apply to Contract Documents include all Codes applicable to hospital construction (see generally http://www.oshpdd.state.ca.us/oshpddKEY Const.htm), including, but not limited to, the following:

(1) CBC (Part 2, Title 24, CCR, including, without means of limitation, Sections 16A, 102A.23, 308, 420A, 504-506, 904.2.6, 1019 and 1604)

(2) CEC (Part 3, Title 24, CCR)

(3) CMC (Part 4, Title 24, CCR)

(4) CPC (Part 5, Title 24, CCR)

(5) State Elevator Safety Regulations (Part 7, Title 24, CCR)

(6) UBC

(7) UPC

(8) UMC

(9) NEC

(10) Part 1 of CBC – Administrative Regulations

(11) Part 8 – California Fire Code

1.4 Laws, Statutes, Ordinances, Rules and Regulations

1.4.1 During prosecution of Work to be done under Contract Documents, Contractor shall comply with
applicable laws, ordinances, rules and regulations, including, but not limited to, the following:

(1) **Federal**
   a. Americans With Disabilities Act of 1990
   b. 29 CFR, Section 1910.1001, Asbestos
   c. 40 CFR, Subpart M, National Emission Standards for Asbestos
   d. Executive Order 11246
   e. Federal Endangered Species Act
   f. Clean Water Act

(2) **State of California**
   a. California Code of Regulations, Titles 5, 8, 17, 19, 21, 22, 24 and 25
   b. California Public Contract Code
   c. California Health and Safety Code
   d. California Government Code
   e. California Labor Code
   f. California Civil Code
   g. California Code of Civil Procedure
   h. CPUC General Order 95, Rules for Overhead Electric Line Construction
   i. CPUC General Order 128, Rules for Construction of Underground Electric Supply and Communications Systems
   j. Cal/OSHA
   k. OSHA: Hazard Communications Standards
   l. California Endangered Species Act
   m. Water Code
   n. Fish and Game Code

(3) **State of California Agencies**
   a. State and Consumer Services Agency
   b. Office of the State Fire Marshall
   c. Office of Statewide Health Planning and Development
   d. Department of Fish and Game
   e. Bay Area Air Quality Management Owner
   f. San Francisco Bay Regional Water Quality Control Board
   g. Division of the State Architect

(4) **Local Agencies:**
   a. [ENTER APPLICABLE CITIES AND COUNTIES]
   b. [ENTER APPLICABLE LOCAL AGENCIES (e.g., Fire Departments)]

(5) **Other Requirements:**
   b. References on Drawings or in Specifications to “code” or “building code” not otherwise identified shall mean the codes specified in this Section 01410, together with all additions, amendments, changes, and interpretations adopted by code authorities of the jurisdiction.

1.4.2 Contractor shall have access to all of the foregoing within 24 hours.

1.4.3 Other Applicable Laws, Ordinances and Regulations:

1. Work shall be accomplished in conformance with all applicable laws, ordinances, rules and regulations of federal, state, and local governmental agencies and jurisdictions having authority over the Project.

2. Work shall be accomplished in conformance with all rules and regulations of public utilities and utility Owners.

3. Where such laws, ordinances rules, and regulations require more care or greater time to accomplish Work, or require better quality, higher standards or greater size of products, Work shall be accomplished in conformance to such requirements with no change to the Contract Time and Contract Sum, except where changes in laws, ordinances, rules and regulations occur subsequent to the time of opening of the bids.

1.4.4 Change Orders and Claims:
The California Public Contract Code, including but not limited to Section 7105(d)(2), and the California Government Code Section 930.2 et seq., apply to all contract procedures for changes, time extensions, change orders (time or compensation) and claims. Federal law (U.S. v. Holpuch 326 U.S. 234) shall supplement but not supersede California law on these requirements.

Any change, waiver, or omission to implement contract change order and claim procedures shall have no legal effect unless expressly permitted in a fully executed change order approved by Contractor, Owner and approved as to form by their respective legal counsel.

### 1.5 Conflicts

1.5.1 If conflict is between referenced regulatory requirements, Contractor shall comply with the one establishing the more stringent requirement.

1.5.2 If conflict is between referenced regulatory requirements and Contract Documents, Contractor shall comply with the one establishing the more stringent requirement.

### 1.6 Required Provisions on Contract Claim Resolution

1.6.1 The California Public Contract Code specifies required provisions on resolving contract claims less than $375,000, which are set forth below, and constitute a part of this Contract.

1. For the purposes of this section, “Claim” means a separate demand by Contractor of $375,000 or less for (1) a time extension, (2) payment or money or damages arising from Work done by or on behalf of Contractor arising under the Contract Documents and payment of which is not otherwise expressly provided for or the Claimant is not otherwise entitled to, or (3) an amount the payment of which is disputed by Owner. In order to qualify as a Claim, the written demand must state that it is a Claim submitted under paragraph 12 of Document 00700 (General Conditions) and be submitted in compliance with all requirements of Document 00700 (General Conditions), paragraph 12. Separate Claims which total more than $375,000 do not qualify as a “separate demand of $375,000 or less,” as referenced above, and are not subject to this section.

2. A voucher, invoice, payment application, or other routine or authorized form of request for payment is not a Claim for purposes of this section. If such request is disputed as to liability or amount, then the disputed portion of the submission may be converted to a Claim under this section by submitting a separate claim in compliance with Contract Documents claim submission requirements.

3. Caution. This section does not apply to tort claims and nothing in this section is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 and Chapter 2 of Part 3 of Division 3.6 of Title 1 of the California Government Code.

1.6.2 Procedure:

1. The Claim must be in writing, submitted in compliance with all requirements of Document 00700 (General Conditions), paragraph 12, including, but not limited to, the time prescribed by and including the documents necessary to substantiate the Claim, pursuant to Document 00700 (General Conditions), paragraph 12.3. Claims must be filed on or before the day of final payment. Nothing in this section is intended to extend the time limit or supersede notice requirements for the filing of claims as set forth in Document 00700 (General Conditions), paragraph 12 or elsewhere in the Contract Documents.

2. For Claims of fifty thousand dollars ($50,000) or less
   a. Owner shall respond in writing within forty-five (45) days of receipt of the Claim, or
   b. Owner may request in writing within thirty (30) days of receipt of the Claim, any additional documentation supporting the Claim or relating to any defenses or claims Owner may have against Claimant.
      i. If additional information is thereafter required, it shall be requested and provided in accordance with this section upon mutual agreement of Owner and Claimant.
      ii. Owner’s written response to the Claim, as further documented, shall be submitted to Claimant within fifteen (15) days after receipt of further documentation or within a period of time no greater than taken by Claimant in producing the additional information, whichever is greater.

3. For Claims over Fifty Thousand Dollars ($50,000) and less than or equal to $375,000:
a. Owner shall respond in writing within sixty (60) days of receipt of the Claim, or
b. Owner may request in writing within thirty (30) days of receipt of the Claim, any additional documentation supporting the Claim or relating to any defenses or claims Owner may have against Claimant.
   (i) If additional information is thereafter required, it shall be requested and provided in accordance with this section, upon mutual agreement of Owner and Claimant;
   (ii) Owner’s written response to the Claim, as further documented, shall be submitted to Claimant within thirty (30) days after receipt of further documentation or within a period of time no greater than taken by Claimant in producing the additional information, whichever is greater.

(4) Meet and Confer:
   a. If Claimant disputes Owner’s written response, or Owner fails to respond within the time prescribed above, Claimant shall notify Owner, in writing, either within fifteen (15) days of receipt of Owner’s response or within fifteen (15) days of Owner’s failure to timely respond, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon demand Owner will schedule a meet and confer conference within thirty (30) days for settlement of the dispute.
   b. Following the meet and confer conference, if the Claim or any portion remains in dispute, Claimant may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the California Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time Claimant submits its written claim as set forth herein, until the time that Claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

1.7 Compliance with Americans With Disabilities Act

1.7.1 Contractor acknowledges that, pursuant to the Americans with Disabilities Act (ADA), programs, services and other activities provided by a public entity to the public, whether directly or through a Contractor, must be accessible to the disabled public. Contractor shall provide the services specified in the Contract Documents in a manner that complies with the ADA and any and all other applicable federal, state and local disability rights legislation. Contractor agrees not to discriminate against disabled persons in the provision of services, benefits or activities provided under the Contract Documents and further agrees that any violation of this prohibition on the part of Contractor, its employees, agents or assigns shall constitute a material breach of the Contract Documents.

2 PART 2 PRODUCTS – NOT USED

3 PART 3 EXECUTION – NOT USED

END OF SECTION
DIVISION 1 GENERAL REQUIREMENTS

SECTION 01420

REFERENCES AND DEFINITIONS

1 PART 1 GENERAL

1.1 Summary

1.1.1 Section Includes: Reference standards, abbreviations, symbols, and definitions used in Contract Documents.

1.1.2 Full titles are given in this Section for standards cited in other Sections of Specifications.

1.1.3 Material and workmanship specified by reference to number, symbol, or title of specific standard such as state standard, commercial standard, federal specifications, technical society, or trade association standard, or other similar standard, shall comply with requirements of standards except when more rigid requirements are specified or required by applicable codes.

1.1.4 Standards referred to, except as modified herein, shall have full force and effect as though printed in the Contract Documents. Standards are not furnished to Contractor because manufacturers and trades involved are assumed to be familiar with their requirements.

1.2 Reference to Standards and Specifications of Technical Societies; Reporting and Resolving Discrepancies

1.2.1 Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code, or laws or regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated in the Contract Documents.

1.2.2 If during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such law or regulation applicable to the performance of the Work or of any such standard, specification, manual, or code or of any instruction of any supplier, Contractor shall report it in writing at once to Owner’s Representative and Architect/Engineer, and Contractor shall not proceed with the Work affected thereby until consent to do so is given by Owner.

1.2.3 Except as otherwise specifically stated in the Contract Documents or as may be provided by Change Order, CCD, or Supplemental Instruction, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

(1) The provisions of any such standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

(2) The provisions of any such laws or regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such law or regulation).

1.2.4 No provision of any such standard, specification, manual, code, or instruction shall be effective to change the duties and responsibilities of Owner, Owner’s Representative, Architect/Engineer or Contractor, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents, nor shall it be effective to assign to Owner, Architect/Engineer, or any of their consultants, agents, representatives or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

1.2.5 Comply with the applicable portions of standards and specifications published by the technical societies, institutions, associations, and governmental agencies referred to in Specifications.

(1) Comply with referenced standards and specifications; latest revision in effect at the time of opening of Bids, unless otherwise identified by date.

a. Exception: Comply with issues in effect as listed in governing legal requirements.

1.2.6 Referenced Grades, Classes, and Types: Where an alternative or optional grade, class, or type of product or execution is included in a reference but is not identified in Drawings or in Specifications, provide the
highest, best, and greatest of the alternatives or options for the intended use and prevailing conditions.

1.2.7 Jobsite Copies:

(1) Obtain and maintain at the Site copies of reference standards identified on Drawings and in Specifications in order to properly execute the Work.

(2) At a minimum, the following shall be readily available at the Site:
   a. Safety Codes: State of California, Division of Industrial Safety regulations.

1.2.8 Edition Date of References:

(1) When an edition or effective date of a reference is not given, it shall be understood to be the current edition or latest revision published as of the date of opening Bids.

(2) All amendments, changes, errata and supplements as of the effective date shall be included.

1.2.9 ASTM and ANSI References: Specifications and Standards of the American Society for Testing and Materials (ASTM) and the American National Standards Institute (ANSI) are identified in the Drawings and Specifications by abbreviation and number only and may not be further identified by title, date, revision, or amendment. It is presumed that Contractor is familiar with and has access to these nationally- and industry-recognized specifications and standards.

1.3 Abbreviations

1.3.1 Listed hereinafter are the various organizations or references which may appear in the Contract Documents, along with their respective acronyms and/or abbreviations:

<table>
<thead>
<tr>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>AA</td>
<td>Aluminum Association</td>
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<tr>
<td>AABC</td>
<td>Associated Air Balance Council</td>
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<tr>
<td>AAMA</td>
<td>Architectural Aluminum Manufacturers Association</td>
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<tr>
<td>AAP</td>
<td>Affirmative Action Program</td>
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<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
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<tr>
<td>ABMA</td>
<td>American Boiler Manufacturers Association</td>
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<td>ABPA</td>
<td>American Board Products Association</td>
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<td>ACI</td>
<td>American Concrete Institute</td>
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<tr>
<td>ADA</td>
<td>Americans with Disabilities Act</td>
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<td>AED</td>
<td>Association of Equipment Distributors</td>
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<tr>
<td>AGA</td>
<td>American Gas Association</td>
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<tr>
<td>AIA</td>
<td>American Institute of Architects</td>
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<tr>
<td>AIMA</td>
<td>Acoustical and Insulation Association</td>
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<tr>
<td>AISC</td>
<td>American Institute of Steel Construction</td>
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<tr>
<td>AISI</td>
<td>American Iron and Steel Institute</td>
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<tr>
<td>AITC</td>
<td>American Institute of Timber Construction</td>
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<tr>
<td>AMCA</td>
<td>Air Moving and Conditioning Association, Inc.</td>
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<tr>
<td>ANSI</td>
<td>American National Standards Institute (formerly American Standards Association)</td>
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<tr>
<td>APA</td>
<td>American Plywood Association</td>
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<tr>
<td>ARI</td>
<td>Air-Conditioning and Refrigeration Institute</td>
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<tr>
<td>ASHRAE</td>
<td>American Society of Heating, Refrigeration, and Air-Conditioning Engineers</td>
</tr>
<tr>
<td>ASME</td>
<td>American Society of Mechanical Engineers</td>
</tr>
<tr>
<td>ASTM</td>
<td>American Society for Testing and Materials</td>
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<tr>
<td>AWCI</td>
<td>Association of the Wall and Ceiling Industries</td>
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<tr>
<td>AWPA</td>
<td>American Wood-Preservers Association</td>
</tr>
<tr>
<td>AWPB</td>
<td>American Wood Preservers Bureau</td>
</tr>
<tr>
<td>AWS</td>
<td>American Welding Society</td>
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<tr>
<td>AWWA</td>
<td>American Water Works Association</td>
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<tr>
<td>BHMA</td>
<td>Building Hardware Manufacturer’s Association</td>
</tr>
<tr>
<td>BIA</td>
<td>Brick Institute of America</td>
</tr>
<tr>
<td>BIL</td>
<td>Basic Insulation Level</td>
</tr>
<tr>
<td>CAC</td>
<td>California Administrative Code</td>
</tr>
<tr>
<td>Cal/OSHA</td>
<td>California Occupational Safety and Health Administration</td>
</tr>
</tbody>
</table>
Caltrans  State of California, Department of Transportation
CBC  California Building Code
CCD  Construction Change Directive
CCR  California Code of Regulations
CEC  California Electric Code
CFR  Code of Federal Regulations
CISPI  Cast Iron Soil Pipe Institute
CLMFI  Chain Link Fence Manufacturers Institute
CMC  California Mechanical Code
CO  Change Order
CPC  California Plumbing Code
CPM  Critical Path Method
CPUC  California Public Utilities Commission
CRA  California Redwood Association
CRSI  Concrete Reinforcing Steel Institute
CS  Commercial Standards, U.S. Department of Commerce
CSA  Canadian Standards Association
CTI  Ceramic Tile Institute
DHI  Door and Hardware Institute
DSA  Division of State Architect (formerly known as the Office of the State Architect)
EPA  Environmental Protection Agency
FGMA  Flat Glass Marketing Association
FM  Factory Mutual
FS  Federal Specifications
GA  Gypsum Association
HPMA  Hardwood Plywood Manufacturers Association
HVAC  Heating, Ventilating and Air Conditioning
I.D.  Identification
IACS  International Annealed Copper Standards
IAPMO  International Association of Plumbing and Mechanical Officials
ICBO  International Conference of Building Officials
ICEA  Insulated Cable Engineers Association
IEEE  Institute of Electrical and Electronic Engineers, Inc.
IES  Illuminating Engineering Society
ISA  Instrumentation Society of America
JATC  Joint Apprenticeship Training Committee
JV  Joint Venture
LBE  Local Business Enterprise
M.I.  Middle Initial
M/WBE  Minority and/or Woman-Owned Business Enterprise
MBE  Minority Business Enterprise
MIA  Masonry Institute of America
MIA  Marble Institute of America
MLSFA  Metal Lath/Steel Framing Association
MS  Military Specifications
MSDS  Material Safety Data Sheet
MSS  Manufacturers Standardization Society of the Valve & Fitting Industry
NAAMM  National Association of Architectural Metal Manufacturers
NACE  National Association of Corrosion Engineers
NBS  National Bureau of Standards
NEC  National Electric Code
NEMA  National Electric Manufacturers Association
NESC  National Electrical Safety Code
NFPA  National Fire Protection Association
1.3.2 Abbreviations in Specifications:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AWG</td>
<td>American Wire Gauge</td>
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<tr>
<td>accord</td>
<td>Accordance</td>
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<tr>
<td>Co.</td>
<td>Company</td>
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<td>Corp.</td>
<td>Corporation</td>
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<td>cm.</td>
<td>centimeter (centimeters)</td>
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<td>cu.</td>
<td>Cubic</td>
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<td>Div.</td>
<td>Division</td>
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<tr>
<td>dia.</td>
<td>diameter</td>
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</table>

References and Definitions
ft.  foot (feet)
g./gr.  gram (grams)
gal.  gallon (gallons)
gpd  gallons per day
gpm  gallons per minute
hr.  hour
kg.  kilogram (kilograms)
in.  inch (inches)
Inc.  Incorporated
km.  kilometer (kilometers)
Kw  Kilowatt
l.  liter (liters)
lbs.  pounds
m  meter (meters)
Mfg.  manufacturing
Mg.  milligram (milligrams)
ml./mls.  milliliter (milliliters)
mm.  millimeter (millimeters)
No.  number
o.c.  on centers
O.D.  outside diameter
psi  pounds per square inch
psf  pounds per square foot
sq.  square
T & G  tongue and groove
U.S.  United States
yd.  yard (yards)

1.3.3 Abbreviations on Drawings:
   (1) Additional abbreviations, used only on drawings, are indicated thereon.

1.4 Symbols
1.4.1 Symbols in Specifications:

:  “shall be” or “shall” - where used within sentences or paragraphs
#1  Number
1#  Pound
&  And
%  Percent
°  Degree
/  per, except where used to combine words; example: power/fuel, and
   in that case it means and
"  inch (inches)
'  foot (feet)
@  At

1.4.2 Symbols on Drawings:
   (1) Symbols, used only on Drawings, are indicated thereon.

1.5 Definitions
1.5.1 Wherever any of the words or phrases defined below, or a pronoun used in place thereof, is used in any part of the Contract Documents, it shall have the meaning here set forth. In the Contract Documents, the neuter gender includes the feminine and masculine, and the singular number includes the plural. While Owner has made an effort to identify all defined terms with initial caps, the following definitions shall apply regardless
of case unless the context otherwise requires:

(1) Addenda: Written or graphic instruments issued prior to the opening of Bids, which clarify, correct, or change the bidding requirements or the Contract Documents. Addenda shall not include the minutes of the Pre-Bid Meeting and/or Site Visit.

(2) Agreement (Document 00520): Agreement is the basic contract document that binds the parties to construction Work. Agreement defines relationships and obligations between Owner and Contractor and by reference incorporates Conditions of Contract, Drawings, and Specifications and contains Addenda and all Modifications subsequent to execution of Contract Documents.

(3) Alternate: Work added to or deducted from the Base Bid, if accepted by Owner.

(4) Application for Payment: Written application for monthly or periodic progress or final payment made by Contractor complying with the Contract Documents.

(5) Approved Equal: Approved in writing by Owner as being of equivalent quality, utility and appearance.

(6) Architect/Engineer: If used elsewhere in the Contract Documents, “Architect/Engineer” shall mean a person holding a valid California State Engineer’s or Architect’s license representing the Owner in the administration of the Contract Documents. Architect/Engineer may be an employee of or an independent consultant to Owner. When Architect/Engineer is referred to within the Contract Documents and no Architect/Engineer has in fact been designated, then the matter shall be referred to Owner. The term Architect/Engineer shall be construed to include employees of Architect/Engineer and/or employees that Architect/Engineer supervises. When the designated Architect/Engineer is an employee of Owner, his or her authorized representatives on the Project will be included under the term Architect/Engineer. If Architect/Engineer is an employee of Owner, Architect/Engineer is the beneficiary of all Contractor obligations to Owner, including without limitation, all releases and indemnities.

(7) Asbestos: Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by OSHA or Cal/OSHA.

(8) Bid: The offer or proposal of the Bidder submitted on the prescribed form(s) setting forth the prices for the Work to be performed.

(9) Bidder: One who submits a Bid.

(10) Bidding Documents: All documents comprising the Project Manual (including all documents and specification sections listed on Document 00010 [Table of Contents]), including documents supplied for bidding purposes only and Contract Documents.

(11) Board: The Board of [Trustees / Supervisors / Directors] of [Enter Name of Owner].

(12) Business Day: Any Day other than Saturday, Sunday, and days which are designated as holidays by Owner. If a holiday falls on a Saturday, the preceding Friday will be the holiday. If a holiday falls on a Sunday, the following Monday will be the holiday. Refer to the Owner web site for a list of Owner observed holidays.

(13) By Others: Work that is outside scope of Work to be performed by Contractor under this Contract, which will be performed by Owner, other contractors, or other means.

(14) By Owner: Work that will be performed by Owner or its agents at Owner expense.

(15) Change Order: A written instrument prepared by Owner and signed by Owner and Contractor, stating their agreement upon all of the following:
   a. a change in the Work;
   b. the amount of the adjustment in the Contract Sum, if any; and
   c. the amount of the adjustment in the Contract Time, if any.

(16) City: The City of [ENTER APPLICABLE CITY (e.g., City where Project is located)] California.

(17) Code Inspector: A local or state agency responsible for the enforcement of applicable codes and regulations.

(18) Concealed: Work not exposed to view in the finished Work, including within or behind various construction elements.

(19) Construction Change Directive: A written order prepared and signed by Owner, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both.

(20) Consultant: See Document 00805 (Supplemental General Conditions – Hazardous Materials) (if
(21) Construction Manager: See Document 00520 (Agreement) (if this term is used).

(22) Contract Conditions: Consists of two parts: General Conditions and Supplemental Conditions.
   a. General Conditions are general clauses that are common to the Owner Contracts, including Document 00700.
   b. Supplemental conditions modify or supplement General Conditions to meet specific requirements for this Contract, Document series 00800.


(24) Contract Modification: Either:
   a. a written amendment to Contract signed by Contractor and Owner; or
   b. a Change Order; or
   c. a Construction Change Directive; or
   d. a written directive for a minor change in the Work issued by Owner.

(25) Contract Sum: The sum stated in the Agreement and, including authorized adjustments, the total amount payable by Owner to Contractor for performance of the Work and the Contract Documents. The Contract Sum is also sometimes referred to as the Contract Price or the Contract Amount.

(26) Contract Time: The number or numbers of Days or the dates stated in the Agreement
   a. to achieve Substantial Completion of the Work or designated milestones; and/or
   b. to complete the Work so that it is ready for final payment and is accepted.

(27) Contractor: The person or entity identified as such in the Agreement and referred to throughout the Contract Documents as if singular in number and neutral in gender. The term “Contractor” means the Contractor or its authorized representative.

(28) Contractor’s Employees: Persons engaged in execution of Work under Contract as direct employees of Contractor, as Subcontractors, or as employees of Subcontractors.

(29) County: The County of Alameda, California.

(30) Day: One calendar day of 24 hours measured from midnight to the next midnight, unless the word “day” is specifically modified to the contrary.

(31) Defective: An adjective which, when modifying the word “Work,” refers to Work that is unsatisfactory or unsuited for the use intended, faulty, or deficient, that does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents (including but not limited to approval of samples and “or equal” items), or has been damaged prior to final payment (unless responsibility for the protection thereof has been assumed by Owner). Owner is the judge of whether Work is defective.

(32) Drawings: The graphic and pictorial portions of Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

(33) Equal: Equal in opinion of Owner. Burden of proof of equality is responsibility of Contractor.

(34) Exposed: Work exposed to view in the finished Work, including behind louvers, grilles, registers and various other construction elements.

(35) Final Acceptance or Final Completion: Owner acceptance of the Work as satisfactorily completed in accordance with Contract Documents. Requirements for Final Acceptance/Final Completion include, but are not limited to:
   a. All systems having been tested and accepted as having met requirements of Contract Documents.
   b. All required instructions and training sessions having been given by Contractor.
   c. All Project Record Documents having been submitted by Contractor, reviewed by Owner and accepted by Owner.
   d. All punch list work, as directed by Owner, having been completed by Contractor.
   e. Generally all Work, except Contractor maintenance after Final Acceptance, having been completed to satisfaction of Owner.

(36) Force Account: Work directed to be performed without prior agreement as to lump sum or unit price cost thereof, and which is to be billed at cost for labor, materials, equipment, taxes, and other
costs, plus a specified percentage for overhead and profit.

37. Furnish: Supply only, do not install.
38. Indicated: Shown or noted on the Drawings.
39. Install: Install or apply only, do not furnish.
40. Latent: Not apparent by reasonable inspection, including but not limited to, the inspections and research required as a condition to bidding under the General Conditions.
41. Law: Unless otherwise limited, all applicable laws including without limitation all federal, state, and local laws, statutes, standards, rules, regulations, ordinances, and judicial and administrative decisions
42. Material: This word shall be construed to embrace machinery, manufactured articles, materials of construction (fabricated or otherwise), and any other classes of material to be furnished in connection with Contract, except where a more limited meaning is indicated by context.
43. Milestone: A principal event specified in Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all Work.
44. Modification: Same as Contract Modification.
45. Naturally Occurring Asbestos (NOA): Asbestos naturally contained in serpentine or other rock, which may be released from the rock and become airborne when the rock is disturbed. See Section 801 (Supplemental General Conditions – Naturally Occurring Asbestos) (if that section is used).
46. Not in Contract: Work that is outside the scope of Work to be performed by Contractor under Contract Documents.
47. Notice of Completion: Shall have the meaning provided in California Civil Code Section 3093, and any successor statute.
48. Off Site: Outside geographical location of the Project.
49. Owner: [ENTER NAME OF OWNER], organized under the laws of the State of California.
50. Owner-Furnished, Contractor-Installed: Items furnished by Owner at its cost for installation by Contractor at its cost under Contract Documents.
51. Owner Representative(s): See Document 00520 (Agreement).
52. Partial Utilization: Use by Owner of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all of the Work.
53. PCBs: Polychlorinated byphenyls.
54. Phase: A specified portion of the Work (if any) specifically identified as a Phase in Document 00520 (Agreement) or Document 01100 (Summary).
55. Product Data: That information (including brochures, catalogue cuts, MSDS, etc.) supplied by the vendor describing the technical and commercial characteristics of the supplier equipment or materials, and accompanying commercial terms such as warranties, instructions and manuals.
56. Progress Report: A periodic report submitted by Contractor to Owner with progress payment invoices accompanying actual work accomplished to the Progress Schedule. See Section 01320 (Progress Schedules and Reports) and Document 00700 (General Conditions).
57. Project: Total construction of which Work performed under Contract Documents may be whole or part.
58. Project Float: As defined in Section 01320, paragraph 1.2.2(3).
59. Project Manager: See Document 00520 (Agreement) (if this term is used).
61. Project Record Documents: All Project deliverables required under Sections 01700 et seq., including without limitation, as-built drawings, operations and maintenance manuals Installation, Operation, and Maintenance Manuals, and Machine Inventory Sheets.
63. Request for Information (“RFI”): A document prepared by Contractor requesting information regarding the Project or Contract Documents as provided in Document 01250 (Modification Procedures). The RFI system is also a means for Owner to submit Contract Document clarifications or supplements to Contractor.
64. Request for Proposals (“RFP”): A document issued by Owner to Contractor whereby Owner may initiate changes in the Work or Contract Time as provided in Contract Documents. See Document 01250 (Modification Procedures).
65. Request for Substitution (“RFS”): A document prepared by Contractor requesting substitution of
materials as permitted and to the extent permitted in Contract Documents. See Section 01600 (Product Requirements).

RFI-Reply: A document consisting of supplementary details, instructions, or information issued by Owner that clarifies or supplements Contract Documents, and with which Contractor shall comply. RFI- Replies do not constitute changes in Contract Sum or Contract Time except as otherwise agreed in writing by Owner. RFI-Replies will be issued through the RFI administrative system.

Samples: Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

Shop Drawings: All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

Shown: As indicated on Drawings.

Site: The particular geographical location of Work performed pursuant to Contract Documents.

Specifications: The written portion of the Contract Documents consisting of requirements for materials, equipment, construction systems, standards, and workmanship for the Work; performance of related services; and are contained in Divisions 1 through 16 (or higher, if used.)

Specified: As written in Specifications.

Subcontractor: A person or entity that has a direct contract with Contractor to perform a portion of the Work at the Site. The term “Subcontractor” is referred to throughout the Contract Documents as if singular in number and neutral in gender and means a Subcontractor or an authorized representative of the Subcontractor. The term “Subcontractor” does not include a separate contractor or subcontractors of a separate contractor.

Substantial Completion: The Work (or a specified part thereof) has progressed to the point where, in the opinion of Owner as evidenced by a Certificate of Substantial Completion, the Work is sufficiently complete, in accordance with Contract Documents and in compliance with applicable Codes, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if no such certificate is issued, when the Work (or specified part) is complete and ready for final payment as evidenced by written recommendation of Owner for final payment. The terms “Substantially Complete” and “Substantially Completed” as applied to all or part of the Work refer to Substantial Completion thereof.

Supplemental Instruction: A written directive from Owner to Contractor ordering alterations or modifications that do not result in change in Contract Sum or Contract Time, and do not substantially change Drawings or Specifications. See Document 01250 (Modification Procedures).


Testing and Special Inspection Agency: An independent entity engaged by Owner to inspect and/or test the workmanship, materials, or manner of construction of buildings or portions of buildings, to determine if such construction complies with the Contract Documents and applicable codes.

Underground Facilities: All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities that have been installed underground to furnish any of the following services or materials: Electricity, gases, chemicals, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

Unit Price Work: Shall be the portions of the Work for which a unit price is provided in Document 00520 (Agreement) or Section 01100 (Summary).

Work: The entire completed construction, or the various separately identifiable parts thereof, required to be furnished under the Contract Documents within the Contract Time. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents including everything shown in the Drawings and set forth in the Specifications. Wherever the word “work” is used, rather than the word “Work,” it shall be understood to have its ordinary and customary meaning.

1.5.2 Wherever words “as directed,” “as required,” “as permitted,” or words of like effect are used, it shall be understood that direction, requirements, or permission of Owner is intended. Words “sufficient,”
“necessary,” “proper,” and the like shall mean sufficient, necessary, or proper in judgment of Owner. Words “approved,” “acceptable,” “satisfactory,” “favorably reviewed,” or words of like import, shall mean approved by, or acceptable to, or satisfactory to, or favorably reviewed by Owner.

1.5.3 Wherever the word “may” or “ought” is used, the action to which it refers is discretionary. Wherever the word “shall” or “will” is used, the action to which it refers is mandatory.

2 PART 2 PRODUCTS – NOT USED

3 PART 3 EXECUTION – NOT USED

END OF SECTION
CONSTRUCTION WASTE MANAGEMENT

SECTION 01505

PART 1 GENERAL

1.01 SUMMARY

A. Section specifies diversion of construction and demolition debris from landfill.

B. Related requirements specified elsewhere include:
   1. Section 5000 Temporary Facilities and Controls
   2. Section 01520 Storm Water Pollution

1.02 SYSTEM DESCRIPTION

A. Performance Requirement: Divert a minimum of 75 percent of construction and demolition waste from landfill.

1.03 DEFINITIONS

A. "Conversion Rate" means the rate set forth in the LEED™ Reference Guide, for use in estimating the weight or volume of materials identified in the Waste Management Plan.

B. "Divert" means to use material for any purpose other than disposal in a landfill or transfer facility.

C. "Good faith" shall be as defined by law.

D. "Net cost" means that the following have been subtracted from the cost of separating and recycling:
   1. Revenue from the sale of recycled or salvaged materials
   2. Landfill tipping fees saved due to diversion of materials from the landfill.

E. "Recycling Service" means an off-site service that provides processing of material and diversion from landfill.

F. "Hauler" means the entity who transports construction and demolition debris to either a landfill or a recycling service.

1.04 SUBMITTALS

A. Submit specified Waste Management Plan to indicate how waste will be diverted from landfills.

B. Submit certification from recycling services that are not listed in Alameda County Waste Management Authority’s “Builders’ Guide to Re-use & Recycling, A Directory For Construction and Demolition Materials”.

C. Demolition Recycling AB75 Forms
1.05 QUALITY ASSURANCE

A. Recycling service company qualifications; any of the following:


2. Any recycling services that will certify in writing that accepted waste will be diverted from landfill, not dumped illegally, or dumped at sea.

1.06 WASTE MANAGEMENT PLAN

A. Plan Development: Use written and graphic representation to indicate proposed deconstruction and salvage opportunities and potential markets for salvaged materials. The plan should include estimated costs associated with recycling, salvaging and reusing materials and should also address source reduction of materials use.

1. Include in Plan on-site recycling of construction debris and also off-site diversion from landfill.

2. Propose means and methods for collecting and separating each type of debris deemed reusable or recyclable.

3. Identify the off-site recycling service and hauler of each designated debris item, who have agreed to accept and divert that item from landfill, in the proposed quantities anticipated. Schedule each item and list off-site recycling service and hauler company name, telephone number, address, and person contacted.

4. Include a "good faith" estimate of each type of construction waste that would be generated if no diversion methods were implemented. Submit with calculations based upon weight of each material. Convert volume measurements to weights in accordance with the defined Conversion Rate. The following items are subject to the "good faith" estimate and diversion requirement:

   a. Asphalt concrete
   b. Portland cement concrete
   c. Brick, clay products and ceramic tile
   d. Aggregate
   e. Clean earth fill
   f. Metals
   g. Wood products, including pallets
   h. Plant and tree trimmings
   i. Mixed Waste
      1) Gypsum board
      2) Plastic piping
      3) Glass, excluding that used for containers
      4) Insulations
      5) Acoustical ceiling tiles, panels and boards
      6) Resilient floorings
      7) Carpets, and polyurethane foam pads
      8) Cardboard and paper products
6. Submit within 15-calendar days after receipt of Notice of Award of Bid, or prior to any waste removal, whichever occurs sooner.

B. Plan Implementation

1. Maintain log of each load, of each category item diverted from landfill. Log in separately debris sent to a Class III landfill and materials sent to recycling facilities.

   a. Include in log the type of load, load weight, name of hauling service; recycling service or landfill, and date accepted by recycling service or by landfill.

   b. Owner reserves the right to audit the log at any time, retain and make available, all weight tickets, copies of receipts and invoices.

   c. Units of measure: Use same units as stated in the approved plan "good faith" estimate of construction waste that would be generated if no remedial methods were implemented.

2. Material handling

   a. Separation facilities

      1) Designate a specific on site area or areas to facilitate separation of materials for potential reuse, salvage, recycling, and return.
      2) Keep waste bins and pile areas neat and clean. Clearly mark bins for each category of waste. Do not commingle non-recyclable waste with materials designated for reuse or recycling.

   b. Environmental controls during handling, storage, or transport: Do not permit designated materials to become contaminated or to contaminate site or surrounding areas.

3. Training and coordination

   a. Furnish copies of the Waste Management Plan to all on-site supervisors, each subcontractor, the Owner, and the Architect.

   b. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all entities at the appropriate stages of the Project.

   c. Meetings: Include construction waste management on the agenda of meetings. At a minimum, discuss waste management goals and issues at the following meetings:

      1) Pre-bid meetings.
      2) Pre-construction meeting.
      3) Regularly scheduled job-site meetings.

C. Hazardous waste: Separate hazardous waste. Store and dispose of according to local regulations.

PART 2 PRODUCTS - Not Used
PART 3 EXECUTION - Not Used

END OF SECTION
PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Preventing pollution of storm water runoff from construction site by keeping pollution out of storm drains, reducing exposure and discharge of materials and wastes to storm water, and by reducing erosion and sedimentation. Storm drains discharge runoff to creeks and the Bay without treatment.
   2. Construction operations and materials subject to compliance with the Collaborative for High Performance Schools (CHPS) requirements.

B. Related Sections:
   1. Section 03100 - Project Management and Coordination.
   2. Section 05000 - Temporary Facility and Controls
   3. Section 01505 - Construction Waste Management

1.2 QUALITY ASSURANCE

A. Regulatory Requirements: For sites over one (1) acre in size, comply with the following:
   2. Erosion Control Ordinance for the City where Project is located.
   3. In addition to the standards described in this Section, comply with pertinent requirements of other government agencies having jurisdiction over this Work.

B. A weekly inspection, and more often if necessary, shall be conducted by the District to verify that requirements for storm water control are being met.

1.3 GENERAL REQUIREMENTS

A. Comply with Erosion and Sedimentation Control requirements for CHPS Sustainable Sites, Storm water Management, Prerequisite #2.

B. Comply with Section 01560 - Construction Waste Management.

C. The following general requirements shall be met on all projects within the District.

   1. Non-hazardous Material/Waste Management
      a. Designated Area: Propose designated areas of the project site, for approval by the District Representative, suitable for material delivery, storage, and waste collection that, to the maximum extent practicable, are near construction entrances and away from catch basins, gutters, drainage courses, and creeks.
      b. Granular Material:
         1) Store granular material at least ten feet away from basin and curb returns.
2) Do not allow granular material to enter the storm drains or creeks.

3) When rain is forecast within 24 hours or during wet weather, the District Representative may require the Contractor to cover granular material with a tarpaulin and to surround the material with sand bags.

c. Dust Control: Use reclaimed water to control dust on a daily basis or as directed by the District Representative.

d. Cleaning Paved Storage Areas: Thoroughly clean all on-site paved areas used for storage of materials or otherwise utilized or involved during the work immediately after the materials are removed from storage. Cleaning shall be accomplished by sweeping and not with use of water.

e. Recycling:
   1) To the extent practicable, recycle aggregate base material, asphalt concrete, and Portland cement concrete as described in these Specifications.
   2) In addition, to the maximum extent practicable, reuse or recycle any useful construction materials generated during the project. Refer to Section 01560.

f. Disposal:
   1) Maintain the project site in a clean and orderly manner at all times. To the extent practicable, the Contractor shall collect scrap, debris, and waste material, and dispose of such materials properly. The District Representative may direct the Contractor to clean and dispose of such materials at any time should the situation, in his opinion, constitute a danger.
   2) Inspect dumpsters for leaks and contact trash hauling contractors to replace or repair dumpsters that leak.
   3) Do not discharge water on-site from cleaning dumpsters.
   4) Arrange waste collection before dumpsters overflow.

2. Hazardous Material/Waste Management

a. Storage:
   1) Label and store all hazardous materials, such as pesticides, paints, thinners, solvents, and fuels; and all hazardous wastes, such as waste oil and Antifreeze; in accordance with the Sonoma County Hazardous Materials Storage Ordinance and all applicable State and Federal regulations.
   2) Store all hazardous materials and all hazardous wastes in accordance with secondary containment regulations, and it is recommended that these materials and waste be covered, as needed, to avoid potential management of collected rainwater as a hazardous waste.
   3) Keep an accurate, up-to-date inventory, including Material Safety Data Sheets (MSDS), of hazardous materials and hazardous wastes stored on-site, to assist emergency response personnel in the event of a hazardous materials incident.

b. Usage:
   1) When rain is forecast within 24 hours or during wet weather, the District Representative may prevent the Contractor from applying chemicals in outside areas.
2) Do not over apply pesticides or fertilizers and shall follow material manufacturers instructions regarding uses, protective equipment ventilation, flammability, and mixing of chemicals. Over-application of a pesticide constitutes a “label violation” subject to an enforcement action by the Sonoma County Agriculture Department.

c. Disposal:
   1) Arrange for regular hazardous waste collection to comply with time limits on storage of hazardous waste.
   2) Dispose of hazardous waste only at authorized and permitted Treatment, Storage, and Disposal Facilities, and use only licensed hazardous waste haulers to remove the waste off-site, unless quantities to be transported are below applicable threshold limits for transportation specified in State and Federal regulations.
   3) If the Contractor qualifies as a “Conditionally Exempt Small Quantity Generator” as defined under State and Federal regulation, then the Contractor may dispose of this waste through a city-sponsored program. Information this program may be requested by calling (415)496-6980.

3. Spill Prevention and Control:
   a. Keep a stockpile of spill cleanup materials, such as rags, or absorbents, readily accessible on-site.
   b. Immediately contain and prevent leaks and spills from entering storm drains, and properly clean up and dispose of the waste and clean up materials. If the waste is hazardous, the Contractor shall handle the waste as described in section A.2.c above.
   c. Do not wash any spilled material into streets, gutters, storm drains, or creek and shall not bury spilled hazardous materials.
   d. Report any hazardous materials spill to the Sonoma County Department of Environmental Health, and to the District’s Representative.

4. Vehicle/Equipment Cleaning:
   a. Do not perform vehicle or equipment cleaning on-site or in the street using soaps, solvents, degreasers, steam cleaning equipment, or equivalent methods.
   b. Perform vehicle or equipment cleaning, with water only, in a designated, beamed area that will not allow rinse water to run off-site or into streets, gutters, storm drains, or creeks.

5. Vehicle / Equipment Maintenance and Fueling:
   a. Do not perform maintenance and fueling of vehicles or equipment in a designated, beamed area a drip pan that will not allow run-on of storm water or run-off spills.
   b. Use secondary containment such as a drip pan to catch leaks or soils and time that vehicle or equipment fluids are dispensed, changed, or poured.
   c. Keep a stockpile of spill cleanup materials, such as rags or absorbents, readily accessible on-site.
d. Clean up leaks and spills of vehicle or equipment fluids immediately and dispose of the waste and cleanup materials as hazardous waste, as described in section A.2.c above.

e. Do not wash any spilled material into streets, gutters, storm drains, or creeks and shall not bury spilled hazardous materials.

f. Report any hazardous materials spill to the Sonoma County Department of Environmental Health and the District’s Representative.

g. Inspect vehicle and equipment arriving on-site for leaking fluids and shall promptly repair leaking vehicles and equipment. Drip pans shall be used to catch leaks until repair is made.

h. Recycle waste oil and antifreeze, to the maximum extent practicable.

i. Comply with Federal, State, and City requirements for above ground storage tanks.

6. Contractors Training and Awareness:

a. Train all employees/subcontractors on the storm water pollution prevention requirements contained these Specifications.

b. Inform subcontractors of the storm water pollution prevention contract requirements and include appropriate subcontract provisions to ensure that these requirements are met.

c. Post warning signs in areas treated with chemicals.

d. Paint new catch basins, constricted as part of the project with a “No Dumping” stencil.

1.4 ACTIVITY – SPECIFIC REQUIREMENTS

A. The following activity-specific requirements shall be met on all projects within the District that include the listed activities.

1. Paving Operations:

   a. Project Site Management:

      1) When rain is forecast within 24 hours or during wet weather, the District Representative may prevent the Contractor from paving.

      2) The District Representative may direct the Contractor to protect drainage courses by using control measure, such as earth dike*, straw bale* and sand bags* to divert runoff or trap and filter sediment.

      3) Cover drip pans or absorbent material under paving equipment when not in use.

      4) Cover catch basins and manholes when paving or applying seat coat, tack coat, slurry seal, or fog seal.

      5) If the paving operation includes an on-site mixing plant, the Contractor shall comply with Sonoma County General Industrial Activities Storm Water Permit requirements.

b. Paving Waste Management: Do not sweep or wash down excess sand (placed as part of a sand seal or to absorb excess oil) into gutters, storm drains, or creeks. Instead, either collect the sand or return it to the stockpile, or dispose of it in a trash container. Do not use water to wash down fresh asphalt concrete pavement.

2. Saw Cutting:
a. During saw cutting, cover or barricade catch basins using control measures, such as fitter fabric*, straw bales*, sand bags, and fine gravel dams, to keep slurry out of the catch basin.

b. Sanitary and storm drain systems. When protecting a catch basin, ensure that the entire opening is covered.

c. Shovel, absorb, or vacuum saw cut slurry and pick up the waste before moving to the next location or at the end of each working day, whichever is sooner.

d. If saw cut slurry enters catch basins, remove the slurry from the storm drain system immediately.

3. Contaminated Soil Management:
   a. On all Projects involving grading or excavation, look for contaminated soil as evidenced by site history, discoloration, odor, differences in soil properties, abandoned underground tanks or pipes, or buried debris. If the project is not within an area of known soil contamination and no evidence of soil contamination is found, then testing of the soil shall only be required if directed by the District Representative. Follow section 8.3.b, if contamination is found.

   b. If the project is within an area of known soil contamination or evidence of soil contamination is found, then soil from grading or excavation operations shall be tested.

   c. If the project is found to be within an area of soil contamination not identified by the District in the project specifications, a change order shall be negotiated to cover additional work performed by the Contractor.

4. Concrete, Grout and Mortar Waste Management:
   a. Material Management: Concrete, grout and mortar; store and keep covered away from drainage areas and ensure that these materials do not enter the storm drain system.

   b. Concrete Truck/Equipment Wash Out:
      1) Do not wash out concrete trucks or equipment into streets, gutters, storm drains, or creeks.

      2) Perform washout of concrete trucks or equipment off-site or in designated area on-site where the water will flow onto dirt or into a temporary pit in a dirt area. Let the water percolate into the soil and dispose of the hardened concrete in a trash container, if a suitable dirt area is not available, then collect tie wash water and remove it off-site.

   c. Exposed Aggregate Concrete Wash Water:
      1) Avoid creating runoff by draining water from washing of exposed aggregate concrete to a dirt area. If a suitable dirt area is not available, then the Contractor shall filter the wash water through straw vales or equivalent material before discharging to the storm drain.

      2) Collect and return sweepings from exposed aggregate concrete to a stockpile or dispose of the waste in a trash container.

5. Painting:
   a. Painting Cleanup
      1) Designated Area:
a) Conduct cleaning of painting equipment and tools in a designated area that will not allow run-on of storm water or runoff of spills.
b) The Contractor shall not allow wash water from cleaning of painting equipment and tools into streets, gutters, storm drains, or creeks.

2) Water-based Paint:
   a) The Contractor shall remove much excess paint as possible from brushes, rollers, and equipment before starting cleanup.
   b) To the maximum extent practicable, the Contractor shall dispose of wash water from aqueous cleaning of equipment and tools to the sanitary sewer.
   c) Otherwise, the Contractor shall direct wash water onto dirt area and spade in.

3) Oil-based Paint:
   a) The Contractor shall remove as much excess paint as possible from brushes, rollers and equipment before starting cleanup.
   b) To the maximum extent practicable, the Contractor shall filter paint thinner and solvents for reuse.
   c) The Contractor shall dispose of waste thinner and solvent, and sludge from cleaning of equipment and tools as hazardous waste, as described in section A2.c above.

6. Material/Waste Management:
   1) Store paint, solvents, chemicals, and waste materials in compliance with the Sonoma County Hazardous Materials Storage Ordinances and all applicable State and Federal regulations. Store these materials in a designated area that will not allow run-on of storm water or runoff of spills.
   2) Dispose of excess thinners, solvents, oil and water based paint as hazardous waste.
   3) Dispose of dry, empty paint cans, buckets, old brushes, rollers, rags, and drop cloths in the trash.

7. Earthwork: Maximize the control of erosion and sediment by using the BMP’s for erosion and sedimentation in the California Storm Water Best Management Practice Handbook-Construction Activity.

PART 2 – PRODUCTS
Not Used

PART 3 – EXECUTION
Not Used

END OF SECTION
PART 1 GENERAL

1. Summary

1.1 Section Includes:

1.1.1 Description of Contract closeout procedures including:
   a. Final Completion
   b. Final Cleaning
   c. Project record documents
   d. Material, Equipment and Finish Data
   e. Project Guarantee
   f. Warranties
   g. Turn-In
   h.

1.2 Final Completion

1.2.1 Final Completion occurs when Work meets requirements for Owner Final Acceptance. When Contractor considers Work is Finally Complete, submit written certification that:

   (1) Contractor has inspected Work for compliance with Contract Documents, and all requirements for Final Acceptance have been met.
   (2) Except for Contractor maintenance after Final Acceptance, Work has been completed in accordance with Contract Documents and deficiencies listed with Certificate of Substantial Completion have been corrected. Equipment and systems have been tested in the presence of Owner, and are operative.
   (3) Work is complete and ready for final inspection.
   (4) Work has been completed in accordance with Contract Documents.
   (5) Equipment and systems have been tested in presence of Architect and are operational.

1.2.2 In addition to submittals required by Contract Documents, provide submittals required by governing authorities and submit final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.

1.2.3 Within seven (7) days from receipt of the “Contractor’s Notice of Completion,” Owner shall make an inspection of the Work and note any deficiencies.

1.2.4 When Owner finds Work is acceptable and final closeout submittals are complete, Owner will issue final Change Order reflecting approved adjustments to Contract Sum not previously made by Change Order. Should Owner determine that Work is incomplete or defective:

   (1) Owner promptly will so notify Contractor, in writing, listing the incomplete or Defective items.
   (2) Promptly remedy the deficiencies and notify Owner when it is ready for reinspection.
   (3) When Owner determines that the Work is acceptable under the Contract Documents, Owner will request Contractor to make closeout submittals.

1.2.5 Final adjustments of accounts:

   (1) Owner shall prepare a final Change Order for submittal to Contractor, showing adjustments to the Contract Sum that were not previously made into a Contract Modification.

1.3 Final Cleaning

1.3.1 Contractor shall comply with all applicable requirements in Section 01740 (Cleaning).

1.4 Material, Equipment and Finish Data

1.4.1 Submit two sets of data for primary materials, equipment, and finishes as required under each
Specification Section prior to final inspection, bound in 8-½ inches by 11 inches three-ring binders with durable plastic covers to Owner for Owner records.

1.5 **Project Guarantee**

1.5.1 Requirements for Contractor’s guarantee of completed Work are included in Article 9 of Document 00700 (General Conditions). Guarantee Work done under Contract against failures, leaks, or breaks or other unsatisfactory conditions due to Defective equipment, materials, or workmanship, and perform repair work or replacement required, at Contractor’s sole expense, for period of one year from date of Final Acceptance.

1.5.2 Neither recordation of Final Acceptance nor final certificate for payment nor provisions of the Contract nor partial or entire use or occupancy of premises by Owner shall constitute acceptance of Work not done in accordance with Contract Documents nor relieve Contractor of liability in respect to express warranties or responsibility for faulty materials or workmanship.

1.5.3 Owner may make repairs to Defective Work as set forth in Document 00700 (General Conditions).

1.5.4 If, after installation, operation, or use of materials or equipment to be provided under Contract proves to be unsatisfactory to Owner, Owner shall have right to operate and use materials or equipment until said materials and equipment can, without damage to Owner, be taken out of service for correction or replacement. Period of use of Defective materials or equipment pending correction or replacement shall in no way decrease guarantee period required for acceptable corrected or replaced items of materials or equipment.

1.5.5 Nothing in this Section 01770 shall be construed to limit, relieve, or release Contractor’s, Subcontractors’, and equipment suppliers’ liability to Owner for damages sustained as result of latent defects in equipment caused by negligence of suppliers’ agents, employees, or Subcontractors. Stated in another manner, warranty contained in the Contract Documents shall not amount to, nor shall it be deemed to be, waiver by Owner of any rights or remedies (or time limits in which to enforce such rights or remedies) it may have for Defective workmanship or Defective materials under laws of this State pertaining to acts of negligence.

1.6 **Warranties**

1.6.1 Execute Contractor’s Submittals and assemble warranty documents, and Installation, Operations and Maintenance manuals described in Section 01330 (Submittal Procedures), executed or supplied by Subcontractors, suppliers, and manufacturers.

1.6.2 Submit material prior to final Application for Payment.

1.6.3 Warranties are intended to protect Owner against failure of Work and against deficient, defective and faulty materials and workmanship, regardless of sources.

1.6.4 Limitations: Warranties are not intended to cover failures that result from the following:

   (1) Unusual or abnormal phenomena of the elements.
   (2) Vandalism after Substantial Completion.
   (3) Insurrection or acts of aggression including war.

1.6.5 Related Damages and Losses: Remove and replace Work which is damaged as result of Defective Work, or which must be removed and replaced to provide access for correction of warranted Work.

1.6.6 Warranty Reinstatement: After correction of warranted Work, reinstate warranty for corrected Work to date of original warranty expiration or to a date not less than one year after corrected Work was done, whichever is later.

1.6.7 Replacement Cost: Replace or restore failing warranted items without regard to anticipated useful
service lives.

1.6.8 Warranty Forms: Submit drafts to Owner for approval prior to execution. Forms shall not detract from or confuse requirements or interpretations of Contract Documents.

1.6.9 Rejection of Warranties: Owner reserves right to reject unsolicited and coincidental product warranties that detract from or confuse requirements or interpretations of Contract Documents.

1.6.10 Term of Warranties: For materials, equipment, systems, and workmanship, warranty period shall be one year minimum from date of Final Completion of entire Work except where:

1.6.11 Warranty of Title: No material, supplies, or equipment for Work under Contract shall be purchased subject to any chattel mortgage, security agreement, or under a conditional sale or other agreement by which an interest therein or any part thereof is retained by seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all Work to deliver premises, together with improvements and appurtenances constructed or placed thereon by Contractor, to Owner free from any claim, liens, security interest, or charges, and further agrees that neither Contractor nor any person, firm, or corporation furnishing any materials or labor for any Work covered by Contract shall have right to lien upon premises or improvement or appurtenances thereon. Nothing contained in this paragraph, however, shall defeat or impair right of persons furnishing materials or labor under bond given by Contractor for their protection or any rights under law permitting persons to look to funds due Contractor in hands of Owner.

1.7 Turn-In

1.7.1 Upon acceptance of the Work by Owner, and prior to final payment and before Owner issues a Final Certificate for Payment issued in accordance with the General Conditions, the following shall be submitted as directed by Project Manager:

1.7.2 Contract Documents will not be closed out and final payment will not be made until all personnel Identification Media, vehicle permits, keys issued to Contractor during prosecution of Work, and letters from property owners pursuant to Paragraph 1.2.6 of Document 01740 (Cleaning), are turned in to Owner.

2 PART 2 PRODUCTS – NOT USED

3 PART 3 EXECUTION – NOT USED

END OF SECTION
DIVISION 1 GENERAL REQUIREMENTS

SECTION 01780

PROJECT RECORD DOCUMENTS

1 PART 1 GENERAL

1.1 Summary

1.1.1 This section specifies general, administrative and procedural requirements for Project Record Documents. Contractor shall have complete responsibility for preparation of marked-up and final Record Documents.

1.1.2 Project Record Documents required include:

1. Marked-up copies of Contract Plans
2. Marked-up copies of Shop Drawings, including Contractor's design documents and drawings
3. Newly prepared Drawings
4. Marked-up copies of Specifications, Addenda and Change Orders
5. Marked-up Project Data submittals
6. Record Samples
7. Field records for variable and concealed conditions
8. Record information on Work that is recorded only schematically
9. Final, complete, edited and drafted versions of the above documents.

1.1.3 Specific Project Record Documents requirements that expand requirements of this Section are included in the individual Sections of Divisions 2 through 334100.

1.1.4 General Project closeout requirements are included in Section 01770 (Contract Closeout).

1.1.5 Maintenance of Documents and Samples:

1. Store Project Record Documents and samples in the field office apart from Contract Documents used for construction.
2. Not permit Project Record Documents to be used for construction purposes.
3. Maintain Project Record Documents in good order, and in a clean, dry, legible condition.
4. Make documents and samples available at all times for inspection by Owner.

1.1.6 Owner will provide one (1) full-size set of the construction drawings and one (1) project manual for the Contractor's use for recording as-built conditions.

1.2 Project Record Drawings

1.2.1 Mark-up Procedure: During the construction period, maintain a set of blueline or blackline prints of Contract Plans and Shop Drawings for Project Record Document purposes. Label each document (on first sheet or page) ‘PROJECT RECORD’ in two (2) in. high printed letters. Keep record documents current. Note: A reference by number to a Change Order, RFI, RFQ, Field Order or other such document is not acceptable as sufficient record information on any record document. Do not permanently conceal any Work until required information has been recorded.

1. Mark these Drawings to indicate the actual installation where the installation varies from the installation shown originally. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later. Items required to be marked include but are not limited to:

a. Dimensional changes to the Drawings
b. Revisions to details shown on the Drawings
c. Depths of various elements of foundation in relation to main floor level or survey datum.
d. Horizontal and vertical location of underground duct banks, utilities and appurtenances referenced to permanent surface improvements.
e. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.

f. Establish locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stubouts, invert elevations, and similar items.

g. Provide actual numbering of each electrical circuit.

h. Field changes of dimension and detail.

i. Revisions to routing of piping and conduits

j. Revisions to electrical circuitry

k. Actual equipment locations

l. Duct size and routing

m. Changes made by Change Order

n. Details not on original Contract Plans

(2) Mark completely and accurately Project Record Drawing prints of Contract Plans or Shop Drawings, whichever is the most capable of showing actual physical conditions. Where Shop Drawings are marked, show cross-reference on Contract Plans location.

(3) Mark Project Record Drawing sets with red erasable colored pencil; use other colors to distinguish between changes for different categories of the Work at the same location.

(4) Mark important additional information that was either shown schematically or omitted from original Drawings.

(5) Note Construction Change Directive numbers; alternate numbers; Change Order numbers and similar identification.

(6) Responsibility for Mark-up: Where feasible, the individual or entity who obtained Project Record Drawing data, whether the individual or entity is the installer, subcontractor, or similar entity, is required to prepare the mark-up on Project Record Drawings.

a. Accurately record information in an understandable and legible drawing technique.

b. Record data as soon as possible after it has been obtained. In the case of concealed installations, record and check the mark-up prior to concealment.

1.2.2 Preparation of final Record Drawings: Immediately prior to inspection for Certification of Substantial Completion, review completed marked-up Project Record Drawings with Owner. When authorized, prepare a full set of corrected AutoCAD files and prints of Contract Plans and Shop Drawings.

(1) Incorporate changes and additional information previously marked on print sets. Delete, cloud, redraw, and add details and notations where applicable. Identify and date each Drawing; include the printed designation ‘PROJECT RECORD DRAWINGS’ in a prominent location on each Drawing. Submit AutoCAD files and two sets of prints for review.

(2) Refer instances of uncertainty to Owner for resolution.

(3) Distribution: Whether or not changes and additional information were recorded, organize and bind original marked-up set of prints that were maintained during the construction period into manageable sets. Bind the set with durable paper cover sheets, with appropriate identification, including titles, dates and other information on cover sheets. Submit the marked-up Project Record Drawings set to Owner.

1.2.3 Shop Drawings and Samples: Maintain as record documents; legibly annotate Shop Drawings and Samples to record changes made after review.

1.3 Project Record Specifications

1.3.1 During the construction period, Contractor shall maintain one copy of the Project Specifications, including addenda and modifications issued, for Project Record Document purposes.

(1) Mark the Project Record Specifications to indicate the actual installation where the installation varies substantially from that indicated in Specifications and Modifications.
issued. Note related Project Record Drawing information, where applicable. Give particular attention to substitutions, selection of product options, change order work, and information on concealed installation that would be difficult to identify or measure and record later.

a. In each Specification Section where products, materials or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.

b. Record the name of the manufacturer, catalog number, supplier and installer, and other information necessary to provide a record of selections made and to document coordination with Project Record Product Data submittals and maintenance manuals.

c. Note related Project Record Product Data, where applicable, for each principal product specified, indicate whether Project Record Product Data has been submitted in maintenance manual instead of submitted as Project Record Product Data.

1.3.2 Upon completion of mark-up, submit Project Record Specifications to Owner for Owner records.

1.4 Project Record Data

1.4.1 During the construction period, Contractor shall maintain one (1) copy of each Project Record Product Data submittal for Project Record Document purposes.

(1) Mark Project Record Product Data to indicate the actual product installation where the installation varies from that indicated in Project Record Product Data submitted. Include significant changes in the product delivered to the site, and changes in manufacturer's instructions and recommendations for installation.

(2) Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

(3) Note related Change Orders and mark-up of Project Record Drawings, where applicable.

(4) Upon completion of mark-up, submit a complete set of Project Record Product Data to Owner for Owner records.

(5) Where Project Record Product Data is required as part of maintenance manuals, submit marked-up Project Record Product Data as an insert in the manual, instead of submittal as Project Record Product Data.

(6) The prime Contractor is responsible for mark-up and submittal of record Project Record Product Data for its own Work.

1.5 Material, Equipment and Finish Data

1.5.1 Provide data for primary materials, equipment and finishes as required under each specification section.

1.5.2 Submit two (2) sets prior to final inspection, bound in 8-1/2 inches by 11 inches three-ring binders with durable plastic covers; provide typewritten table of contents for each volume.

1.5.3 Arrange by Specification division and give names, addresses, and telephone numbers of subcontractors and suppliers. List:

(1) Trade names.
(2) Model or type numbers.
(3) Assembly diagrams.
(4) Operating instructions.
(5) Cleaning instructions.
(6) Maintenance instructions.
(7) Recommended spare parts.
(8) Product data.

1.6 Miscellaneous Project Record Submittals

1.6.1 Refer to other Specification Sections for miscellaneous record keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial
Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to Owner for Owner records. Categories of requirements resulting in miscellaneous records include, but are not limited to the following:

(1) Field records on excavations and foundations
(2) Field records on underground construction and similar work
(3) Survey showing locations and elevations of underground lines
(4) Invert elevations of drainage piping
(5) Surveys establishing building lines and levels
(6) Authorized measurements utilizing unit prices or allowances
(7) Records of plant treatment
(8) Ambient and substrate condition tests
(9) Certifications received in lieu of labels on bulk products
(10) Batch mixing and bulk delivery records
(11) Testing and qualification of tradespersons
(12) Documented qualification of installation firms
(13) Load and performance testing
(14) Inspections and certifications by governing authorities
(15) Leakage and water-penetration tests
(16) Fire resistance and flame spread test results
(17) Final inspection and correction procedures

2 PART 2 – PRODUCTS

2.1 Not applicable to this section.

3 PART 3 – EXECUTION

3.1 Recording

3.1.1 Post changes and modifications to the Documents as they occur. Do not wait until the end of the Project. Owner may periodically review Project Record Documents to assure compliance with this requirement.

3.2 Submittal

3.2.1 At completion of Project, deliver record documents to Owner.
3.2.2 Accompany submittal with transmittal letter containing:

(1) Date
(2) Project title and number
(3) Contractor's name and address
(4) Number and title of each record document
(5) Certification that each document as submitted is complete and accurate, and signature of Contractor, or Contractor’s authorized representative.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.
   1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to the Contractor. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:
   1. Lump-sum allowances.

C. Related Sections:
   1. 01 2200 - Unit Prices: For procedures for using unit prices.
   2. Divisions 02 through 49 Sections for items of Work covered by allowances.

1.2 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect’s request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.3 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

C. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

D. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.4 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.
1.5 LUMP-SUM ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials under allowance shall be included as part of the Contract Sum and not part of the allowance.

1.6 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.
PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Include the sum of $50,000 for unforeseen site conditions.

B. Allowance No. 2: Include the sum of $25,000 for coordination with existing portables.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Sections:
   1. 01 6000 - Product Requirements: For requirements for submitting comparable product submittals for products by listed manufacturers.
   2. Divisions 02 through 49 Sections for specific requirements and limitations for substitutions.

1.2 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
   1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
   2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Owner.

1.3 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
      b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
      c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
      d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.

f. Certificates and qualification data, where applicable or requested.

g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.

h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.

i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.

j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

k. Cost information, including a proposal of change, if any, in the Contract Sum.

l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.

m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor[ through Construction Manager] of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.


   b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

A. Coordination: Modify or adjust affected work as necessary to integrate work of the approved substitutions.
PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
   a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   b. Substitution request is fully documented and properly submitted.
   c. Requested substitution will not adversely affect Contractor's construction schedule.
   d. Requested substitution has received necessary approvals of authorities having jurisdiction.
   e. Requested substitution is compatible with other portions of the Work.
   f. Requested substitution has been coordinated with other portions of the Work.
   g. Requested substitution provides specified warranty.
   h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
   i. Requested substitution is consistent with the Owner's District Standards.

B. Substitutions for Convenience: Not allowed, unless otherwise indicated.

C. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
   a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
   b. Requested substitution does not require extensive revisions to the Contract Documents.
   c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   d. Substitution request is fully documented and properly submitted.
e. Requested substitution will not adversely affect Contractor's construction schedule.

f. Requested substitution has received necessary approvals of authorities having jurisdiction.

g. Requested substitution is compatible with other portions of the Work.

h. Requested substitution has been coordinated with other portions of the Work.

i. Requested substitution provides specified warranty.

j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (NOT USED)

END OF SECTION
Substitution Request Number: __________

TO: NBBJ <insert office location>
   Attn: __________________________________________

FROM: <insert Contractor name>

Specification Section: <00 0000 - Section Title>________________________________________

Article and Paragraph(s): __________________________________________

Specified Item: __________________________________________

Proposed Substitution: __________________________________________

☐ SUBSTITUTION FOR CAUSE: Required due to change in project conditions as follows:
   ■ Unavailability of Product: __________________________________________
   ■ Unsuitability: __________________________________________
   ■ Regulatory Change: __________________________________________
   ■ Unavailability of Required Warranty: __________________________________________

☐ SUBSTITUTION FOR CONVENIENCE:
   ☐ Not Allowed in accordance with Section 01 1250 - Substitution Procedures.
   ☐ Not required, but may offer advantage to Owner as follows:
      ■ Description: __________________________________________
The Undersigned certifies that:
- Proposed substitution meets requirements stipulated in Section 01 2500 - Substitution Procedures.
- Proposed substitution has been fully investigated and determined to be equal or superior to specified item.
- Same warranty will be furnished for proposed substitution as for specified item.
- Proposed substitution will have no adverse effect on other Work and will not affect or delay progress schedule.
- Cost data stated is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are waived.
- Proposed substitution does not affect dimensions and functional clearances.

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

Submitted By (Contractor):_______________________________________________________

Signature __________________________________________________ Date _____________

Printed Name and Title _________________________________________________________

Signature must be by person having authority to legally bind his firm to the above terms. Failure to provide legally binding signature will result in retraction of approval

ARCHITECT'S REVIEW AND ACTION

____Substitution Approved
____Substitution Approved as Noted
____Substitution Rejected

Signature: __________________________________________________ Date _____________

Printed Name and Title _________________________________________________________

Additional Comments:
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

B. Related Sections:
   1. 01 2500 - Substitution Procedures: For administrative procedures for handling requests for substitutions made after Contract award.

1.2 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
   1. Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
   2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
      a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
      b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      c. Include costs of labor and supervision directly attributable to the change.
      d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
      e. Quotation Form: Use form provided by Owner.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
   1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 01 2500 - Substitution Procedures if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form provided by Owner.

1.4 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Construction Manager will issue a Change Order for signatures of Owner and Contractor on form provided by Owner.

1.5 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Construction Manager may issue a Construction Change Directive on form provided by Owner. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for the Schedule of Values.

B. Related Sections:
   1. 01 2600 - Contract Modification Procedures: For administrative procedures for handling changes to the Contract.
   2. 01 3200 - Construction Progress Documentation: For administrative requirements governing the preparation and submittal of the Contractor's construction schedule.
   3. 01 3300 - Submittal Procedures: For administrative requirements governing the preparation and submittal of the submittal schedule.

1.2 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
   1. Correlate line items in the schedule of values with other required administrative forms and schedules, including the following:
      a. Application for Payment forms with continuation sheets.
      b. Submittal schedule.
      c. Items required to be indicated as separate activities in Contractor's construction schedule.
   2. Submit the schedule of values to Architect through Construction Manager at earliest possible date but no later than ten days before the date scheduled for submittal of initial Applications for Payment.
   3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.
   4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values correlated with each element.
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. General project coordination procedures.
   2. Administrative and supervisory personnel.
   3. Coordination drawings.
   4. Requests for Information (RFIs).
   5. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Sections:
   1. 01 3200 - Construction Progress Documentation: For preparing and submitting Contractor's construction schedule.
   2. 01 7300 - Execution: For procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
   3. 01 7700 - Closeout Procedures: For coordinating closeout of the Contract.

1.2 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
   3. Make adequate provisions to accommodate items scheduled for later installation.

B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Contractor's construction schedule.
   2. Preparation of the schedule of values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.
   5. Progress meetings.
   6. Preinstallation conferences.
   7. Project closeout activities.
   8. Startup and adjustment of systems.
   9. Project closeout activities.

1.3 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings in accordance with requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1.4 KEY PERSONNEL

A. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and email addresses. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
   1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.5 REQUESTS FOR INFORMATION (RFIS)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
   1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor’s work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
   1. Project name.
   2. Project number.
   3. Date.
   4. Name of Contractor.
   5. Name of Architect.
   6. RFI number, numbered sequentially.
   7. RFI subject.
   8. Specification Section number and title and related paragraphs, as appropriate.
   9. Drawing number and detail references, as appropriate.
   10. Field dimensions and conditions, as appropriate.
   11. Contractor’s suggested resolution. If Contractor’s solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
   12. Contractor’s signature.
   13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
      a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Form with content indicated above, acceptable to Architect.

D. Architect’s and Construction Manager’s Action: Architect and Construction Manager will review each RFI, determine action required, and respond. Allow seven working days for Architect’s response for each RFI. RFIs received by Architect or Construction Manager after 1:00 p.m. will be considered as received the following working day.
   1. The following RFIs will be returned without action:
      a. RFIs that, in the opinion of the Architect, are frivolous or invalid.
      b. Requests for information already indicated in the Contract Documents.
      c. Requests for approval of submittals.
      d. Requests for approval of substitutions.
      e. Requests for coordination information already indicated in the Contract Documents.
      f. Requests for adjustments in the Contract Time or the Contract Sum.
      g. Requests for interpretation of Architect’s actions on submittals.
      h. Incomplete RFIs or inaccurately prepared RFIs.
   2. Architect’s action may include a request for additional information, in which case Architect’s time for response will date from time of receipt of additional information.
   3. Architect’s action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 2600 - Contract Modification Procedures.
a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within 10 days of receipt of the RFI response.

E. On receipt of Architect's and Construction Manager's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Construction Manager within seven days if Contractor disagrees with response.

F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:
   1. Project name.
   2. Name and address of Contractor.
   3. Name and address of Architect and Construction Manager.
   4. RFI number including RFIs that were returned without action or withdrawn.
   5. RFI description.
   6. Date the RFI was submitted.
   7. Date Architect's and Construction Manager's response was received.
   8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

1.6 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
   1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner, Construction Manager and Architect of scheduled meeting dates and times.
   2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
   3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, Construction Manager, and Architect, within three days of the meeting.

B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
   1. Attendees: Authorized representatives of Owner, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   2. Agenda: Discuss items of significance that could affect progress, including the following:
      a. Tentative construction schedule.
      b. Phasing.
      c. Critical work sequencing and long-lead items.
d. Designation of key personnel and their duties.

e. Procedures for processing field decisions and Change Orders.

f. Procedures for RFIs.

g. Procedures for testing and inspecting.

h. Procedures for processing Applications for Payment.

i. Distribution of the Contract Documents.

j. Submittal procedures.

k. Preparation of record documents.

l. Use of the premises and existing buildings.

m. Work restrictions.

n. Working hours.

o. Owner's occupancy requirements.

p. Responsibility for temporary facilities and controls.

q. Procedures for moisture and mold control.

r. Procedures for disruptions and shutdowns.

s. Construction waste management and recycling.

t. Parking availability.

u. Office, work, and storage areas.

v. Equipment deliveries and priorities.

w. First aid.

x. Security.

y. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, Construction Manager of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:


b. Options.

c. Related RFIs.

d. Related Change Orders.

e. Purchases.

f. Deliveries.

g. Submittals.

h. Review of mockups.

i. Possible conflicts.

j. Compatibility problems.

k. Time schedules.

l. Weather limitations.

m. Manufacturer's written instructions.

n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at weekly intervals.
1. Attendees: In addition to representatives of Owner, Construction Manager, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
   a. Contractor’s Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor’s construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      1) Review schedule for next period.
   b. Review present and future needs of each entity present, including the following:
      1) Interface requirements.
      2) Sequence of operations.
      3) Status of submittals.
      4) Status of documentation.
      5) Deliveries.
      6) Off-site fabrication.
      7) Access.
      8) Site utilization.
      9) Temporary facilities and controls.
10) Progress cleaning.
11) Quality and work standards.
12) Status of correction of deficient items.
13) Field observations.
14) Status of RFIs.
15) Status of proposal requests.
16) Pending changes.
17) Status of Change Orders.
18) Pending claims and disputes.
19) Documentation of information for payment requests.

3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
   a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Sections:
   1. 01 2973 – Schedule of Values: For submitting the schedule of values.
   2. 01 7823 - Operation and Maintenance Data: For submitting operation and maintenance manuals.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's and Construction Manager's responsive action. Action submittals are those submittals indicated in individual Specification Sections and limited to the following:
   1. Product Data
   2. Shop Drawings
   3. Samples
   4. Product Schedules
   5. Submittal Schedule
   6. Applications for Payment
   7. Schedule of Values
   8. Subcontract List

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's and Construction Manager's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as informational submittals and may include the following:
   1. Preconstruction Submittals.
   2. Schedules.
   3. Certificates and certifications.
   4. Special warranty forms.
   5. Sustainable design submittals.
   6. Test and inspection reports.
   7. Construction photographs.
   8. Meeting minutes.

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

1.3 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Architect and Construction Manager and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.

2. Initial Submittal: Submit concurrently with start-up construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:

a. Scheduled date for first submittal.
b. Specification Section number and title.
c. Submittal category: Action, informational.
d. Name of subcontractor.
e. Description of the Work covered.
f. Scheduled date for Architect's and Construction Manager's final release or approval.
g. Scheduled dates for purchasing.
h. Scheduled dates for installation.
i. Activity or event number.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect's Digital Data Files: Electronic copies of digital data files the Contract Drawings may be provided by Architect for Contractor's use in preparing submittals.


a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.

b. Digital Drawing Software Program: The Contract Drawings are available in `<Insert name and version of digital drawing software program and operating system>`.

c. Contractor shall execute a data licensing agreement in the form of an Agreement form acceptable to the Owner and Architect.
B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
   3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
   4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
      a. Architect and Construction Manager reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's and Construction Manager's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
   1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect and Construction Manager will advise Contractor when a submittal being processed must be delayed for coordination.
   2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
   3. Resubmittal Review: Allow 15 days for review of each resubmittal.
   4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
   5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Construction Manager, through Architect, before being returned to Contractor.

D. Paper Submittals: Place a permanent label or title block on each paper copy submittal item for identification.
   1. Indicate name of firm or entity that prepared each submittal on label or title block.
   2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect and Construction Manager.
   3. Include the following information for processing and recording action taken:
      a. Project name.
      b. Date.
      c. Name of Architect.
      d. Name of Construction Manager.
e. Name of Contractor.
f. Name of subcontractor.
g. Name of supplier.
h. Name of manufacturer.
i. Submittal number or other unique identifier, including revision identifier.
   1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06 1000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
j. Number and title of appropriate Specification Section.
k. Drawing number and detail references, as appropriate.
l. Location(s) where product is to be installed, as appropriate.
m. Other necessary identification.

E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
   a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect and Construction Manager.
4. Include the following information on an inserted cover sheet:
   a. Project name.
   b. Date.
   c. Name and address of Architect.
   d. Name of Construction Manager.
   e. Name of Contractor.
   f. Name of firm or entity that prepared submittal.
   g. Name of subcontractor.
   h. Name of supplier.
   i. Name of manufacturer.
   j. Number and title of appropriate Specification Section.
   k. Drawing number and detail references, as appropriate.
   l. Location(s) where product is to be installed, as appropriate.
   m. Related physical samples submitted directly.
   n. Other necessary identification.
5. Include the following information as keywords in the electronic file metadata:
   a. Project name.
   b. Number and title of appropriate Specification Section.
   c. Manufacturer name.
   d. Product name.

F. Options: Identify options requiring selection by the Architect.
G. Deviations: Identify deviations from the Contract Documents on submittals.

H. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect or Construction Manager observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
   1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect and Construction Manager.

I. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect and Construction Manager will discard submittals received from sources other than Contractor.
   1. Transmittal Form: Provide locations on form for the following information:
      a. Project name.
      b. Date.
      c. Destination (To:).
      d. Source (From:).
      e. Contractor's signed approval.
      f. Names of subcontractor, manufacturer, and supplier.
      g. Category and type of submittal.
      h. Submittal purpose and description.
      i. Specification Section number and title.
      j. Indication of full or partial submittal.
      k. Drawing number and detail references, as appropriate.
      l. Transmittal number, numbered consecutively.
      m. Submittal and transmittal distribution record.
      n. Remarks.
      o. Signature of transmitter.
   2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect and Construction Manager on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

J. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
   1. Note date and content of previous submittal.
   2. Note date and content of revision in label or title block and clearly indicate extent of revision.
   3. Resubmit submittals until they are marked with approval notation from Architect's and Construction Manager's action stamp.

K. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

L. Use for Construction: Use only final submittals that are marked with approval notation from Architect's and Construction Manager's action stamp.
PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Post electronic submittals as PDF electronic files directly to Architect's FTP site specifically established for Project.

2. Submit electronic submittals via email as PDF electronic files.

3. Action Submittals: Submit seven paper copies of each submittal, unless otherwise indicated. Architect, through Construction Manager, will return five copies.

4. Informational Submittals: Submit number required to have Architect and Construction Manager plus number the district needs. Submit paper copies of each submittal, unless otherwise indicated. Architect and Construction Manager will not return copies.

5. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 7700 - Closeout Procedures.

6. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
   a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
   b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

7. Test and Inspection Reports Submittals: Comply with requirements specified in Section 01 4000 - Quality Requirements.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.

2. Mark each copy of each submittal to show which products and options are applicable.

3. Include the following information, as applicable:
   a. Manufacturer's catalog cuts.
   b. Manufacturer's product specifications.
   c. Standard color charts.
   d. Statement of compliance with specified referenced standards.
e. Testing by recognized testing agency.
f. Application of testing agency labels and seals.
g. Notation of coordination requirements.
h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:
   a. Wiring diagrams showing factory-installed wiring.
   b. Printed performance curves.
   c. Operational range diagrams.
   d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format:
   a. PDF electronic file.
   b. Seven paper copies of Product Data, unless otherwise indicated. Architect, through Construction Manager, will return five copies.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based upon Architect's digital data drawing files is otherwise permitted.

   1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
      a. Identification of products.
      b. Schedules.
      c. Compliance with specified standards.
      d. Notation of coordination requirements.
      e. Notation of dimensions established by field measurement.
      f. Relationship and attachment to adjoining construction clearly indicated.
      g. Seal and signature of professional engineer if specified.

   2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 42 inches (750 by 1067 mm).

   3. Submit Shop Drawings in the following format:
      a. PDF electronic file.
      b. Three opaque (bond) copies of each submittal plus 1 reproducible. Architect, through Construction Manager, will return one copy.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

   1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.

   2. Identification: Attach label on unexposed side of Samples that includes the following:
      a. Generic description of Sample.
      b. Product name and name of manufacturer.
      c. Sample source.
      d. Number and title of applicable Specification Section.
3. **Disposition:** Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

4. **Samples for Initial Selection:** Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
   a. Number of Samples: Submit seven full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect, through Construction Manager, will return submittal with options selected.

5. **Samples for Verification:** Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
   a. Number of Samples: Submit seven sets of Samples. Architect and Construction Manager will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project record sample.
      1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. **Product Schedule:** As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
   1. Type of product. Include unique identifier for each product.
   2. Manufacturer and product name, and model number if applicable.
   3. Number and name of room or space.
   4. Location within room or space.
   5. Submit product schedule in the following format:
      a. PDF electronic file.

F. **Contractor’s Construction Schedule:** Comply with requirements specified in General Conditions.
G. Application for Payment: Comply with requirements specified in General Conditions.

H. Schedule of Values: Comply with requirements specified in Section 01 2973 – Schedule of Values.

I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
   1. Name, address, and telephone number of entity performing subcontract or supplying products.
   2. Number and title of related Specification Section(s) covered by subcontract.
   3. Drawing number and detail references, as appropriate, covered by subcontract.
   4. Submit subcontract list in the following format:
      a. PDF electronic file.
      b. Number of Copies: Seven paper copies of subcontractor list, unless otherwise indicated. Architect, through Construction Manager, will return two copies.

J. Coordination Drawings: Comply with requirements specified in Section 01 3100 - Project Management and Coordination.

K. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.


M. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

N. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

Q. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
R. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

S. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

T. Schedule of Tests and Inspections: Comply with requirements specified in Section 01 4000 - Quality Requirements.

U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

W. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

X. Maintenance Data: Comply with requirements specified in Section 01 7832 - Operation and Maintenance Data.

Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 MATERIAL SAFETY DATA SHEETS (MSDSS)

A. Collect and file on the jobsite as required by OSHA and other authorities.

B. Do not submit to the Architect. If the Owner requires that MSDSs be submitted for the Owner's purposes, submit directly to the Owner, without passing through the Architect.
2.3 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
   1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally-signed PDF electronic file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
   1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect and Construction Manager.

B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Section 01 7700 - Closeout Procedures.

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S AND CONSTRUCTION MANAGER'S ACTION

A. General: Architect and Construction Manager will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Submittals: Architect and Construction Manager will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect and Construction Manager will stamp each submittal with an action stamp and will mark stamp appropriately as follows:
   1. "Approved": The submittal is approved and no further submittal is required.
   2. "Approved as Noted" (No Resubmission Necessary): The submittal is approved, with minor corrections marked or noted. No further submittal is required, except
that if the noted corrections are made on the original by the Contractor before
distribution, then two copies shall be forwarded to the Architect for record.

3. "Partially Approved As Noted" (Revise and Resubmit As Noted): Portions of the
submittal are acceptable and approved, as noted; however, there are other
portions which are not approved, or yet to be provided. Those portions not
approved or incomplete must be resubmitted as noted. Contractor may, at the
Contractor's discretion and risk, proceed with ordering or installation of the
approved portions but must resubmit as noted by the Architect. The submittal, in
its entirety, will be approved only upon acceptable submission of non-approved
or missing portions, assuming that nothing in the resubmittal conflicts with the
previously approved portions.

4. "Not Approved" (Revise and Resubmit As Noted): This submittal does not meet
the requirements of the Contract Documents. Resubmit information on an item,
component, or layout that will conform to the requirements of the Contract
Documents.

5. "No Action Required" (For Information Only): This submittal is not required by
the Contract Documents, or was provided for information purposes only, or no
action has been requested by the Contractor. A copy has been retained by the
Architect, and a copy is being returned "with no action taken".

6. "Reviewed Only For:" Only the portions of this submittal which are subject to
conformance to a particular A/E discipline’s Contract Documents have been
reviewed and action taken accordingly. Refer to associated comments as noted
for specific A/E review action taken.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of
partial submittals has received prior approval from Architect and Construction Manager.

D. Incomplete submittals are not acceptable, will be considered nonresponsive, and will
be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be
discarded.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
   1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
   2. Specified tests, inspections, and related actions do not limit Contractor’s other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
   3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections:
   1. Divisions 02 through 49 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect or Construction Manager.

C. Preconstruction Testing: Tests and inspections performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

D. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

E. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
F. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

H. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
   1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.

I. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Contractor's Quality-Control Manager Qualifications: For supervisory personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems.
   1. Seismic-force resisting system, designated seismic system, or component listed in the designated seismic system quality assurance plan prepared by the Architect.
2. Main wind-force resisting system or a wind-resisting component listed in the wind-force-resisting system quality assurance plan prepared by the Architect.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
   1. Specification Section number and title.
   2. Entity responsible for performing tests and inspections.
   3. Description of test and inspection.
   4. Identification of applicable standards.
   5. Identification of test and inspection methods.
   6. Number of tests and inspections required.
   7. Time schedule or time span for tests and inspections.
   8. Requirements for obtaining samples.
   9. Unique characteristics of each quality-control service.

1.5 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
   1. Project quality-control manager may also serve as Project superintendent.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: Include in quality-control plan a comprehensive schedule of Work requiring testing or inspection, including the following:
   1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
   2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to
bring work into compliance with standards of workmanship established by Contract requirements.

F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.6 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
   1. Date of issue.
   2. Project title and number.
   3. Name, address, and telephone number of testing agency.
   4. Dates and locations of samples and tests or inspections.
   5. Names of individuals making tests and inspections.
   6. Description of the Work and test and inspection method.
   8. Complete test or inspection data.
   9. Test and inspection results and an interpretation of test results.
  10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.

B. Manufacturer’s Technical Representative’s Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
   1. Name, address, and telephone number of technical representative making report.
   2. Statement on condition of substrates and their acceptability for installation of product.
   3. Statement that products at Project site comply with requirements.
   4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
   5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
   6. Statement whether conditions, products, and installation will affect warranty.
   7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative’s Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
   1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.7 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
   1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
   1. Contractor responsibilities include the following:
      a. Provide test specimens representative of proposed products and construction.
      b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
      c. Provide sizes and configurations of test assemblies to adequately demonstrate capability of products to comply with performance requirements.
      d. Build site-assembled test assemblies using installers who will perform same tasks for Project.
      e. When testing is complete, remove test specimens, assemblies; do not reuse products on Project.
   2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Owner and Architect, through Construction Manager, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.8 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
   1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
   2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
   3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
   a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 3300 - Submittal Procedures.

D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

1. Notify Architect, Owner and Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.9 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in Statement of Special Inspections attached to this Section, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect, Construction Manager, Owner and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect and Owner, through Construction Manager, with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.
PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 ACCEPTABLE TESTING AGENCIES

A. Acceptable Testing Agencies:
   1. Signet Testing Labs, Inc.
   2. Consolidated Testing Labs.

3.2 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:
   1. Date test or inspection was conducted.
   2. Description of the Work tested or inspected.
   3. Date test or inspection results were transmitted to Architect.
   4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect’s, Owner’s and Construction Manager’s reference during normal working hours.

3.3 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 7300 - Execution.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION
PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the United States."

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Sections:
   1. 01 1000 - Summary: For work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, Construction Manager, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Sewer Service: Pay sewer service use charges for sewer usage by all entities for construction operations.

C. Water Service: Pay water service use charges for water used by all entities for construction operations.

D. Electric Power Service: Pay electric power service use charges for electricity used by all entities for construction operations.

E. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

F. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
C. **Moisture-Protection Plan:** Describe procedures and controls for protecting materials and construction from water absorption and damage, including delivery, handling, and storage provisions for materials subject to water absorption or water damage, discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water damaged Work.

   1. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

D. **Dust-Control and HVAC-Control Plan:** Submit coordination drawing and narrative that indicates the dust-control and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:

   1. Locations of dust-control partitions at each phase of the work.
   2. HVAC system isolation schematic drawing.
   3. Location of proposed air filtration system discharge.
   4. Other dust-control measures.
   5. Waste management plan.

1.4 **QUALITY ASSURANCE**

A. **Electric Service:** Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. **Tests and Inspections:** Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

C. **Accessible Temporary Egress:** Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

1.5 **PROJECT CONDITIONS**

A. **Temporary Use of Permanent Facilities:** Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

**PART 2 - PRODUCTS**

2.1 **MATERIALS**

A. **Chain-Link Fencing:** Minimum 2-inch, 0.148-inch-thick, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top rails.
B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10 mils minimum thickness, with flame-spread rating of 15 or less per ASTM E 84.

C. Dust Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.

D. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, Construction Manager, and construction personnel office activities and to accommodate project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
   1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
   2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with not less than 1 receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack and marker boards.
   3. Drinking water and private toilet.
   5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
   6. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
   1. Store combustible materials apart from building.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
   1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction and clean HVAC system as required in Section 01 7700 - Closeout Procedures.

C. Air Filtration Units: HEPA primary and secondary filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.
   1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
   1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

D. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

E. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
   1. Toilets: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
F. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

G. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
   1. Prior to commencing work, isolate the HVAC system in area where work is to be performed in accordance with approved coordination drawings.
      a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
      b. Maintain negative air pressure within work area using HEPA-equipped air filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
   2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust containment devices.
   3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

H. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
   1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.

I. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

J. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
   1. Install electric power service overhead, unless otherwise indicated.
   2. Connect temporary service to Owner's existing power source, as directed by Owner.

K. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
   1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
   2. Install lighting for Project identification sign.
L. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.
   1. Provide additional telephone lines for the following:
      a. Provide a dedicated telephone line for each facsimile machine in each field office.
      b. Provide one telephone line(s) for Owner's use.
   2. At each telephone, post a list of important telephone numbers.
      a. Police and fire departments.
      b. Ambulance service.
      c. Contractor's home office.
      d. Architect's office.
      e. Engineers' offices.
      f. Owner's office.
      g. Principal subcontractors' field and home offices.
   3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

M. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access project electronic documents and maintain electronic communications. Equip computer with not less than the following:
   1. Processor: Intel Pentium D or Intel CoreDuo, 1.8 GHz processing speed.
   2. Memory: 2 gigabyte.
   4. Display: 19-inch LCD monitor with 128 Mb dedicated video RAM.
   5. Full-size keyboard and mouse.
   8. Productivity Software:
      a. Microsoft Office Professional, XP or higher, including Word, Excel, and Outlook.
      b. Adobe Reader 7.0 or higher.
      c. WinZip 7.0 or higher.
   9. Printer: "All-in-one" unit equipped with printer server, combining color printing, photocopying, scanning, and faxing, or separate units for each of these 3 functions.
   10. Internet Service: Broadband modem, router and ISP, equipped with hardware firewall, providing minimum 3 Mbps upload and 10 Mbps download speeds at each computer.
   11. Internet Security: Integrated software, providing software firewall, virus, spyware, phishing and spam protection in a combined application.
3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
   1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
   2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings.
   1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.

C. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
   1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
   2. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.

D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
   1. Protect existing site improvements to remain including curbs, pavement, and utilities.
   2. Maintain access for fire-fighting equipment and access to fire hydrants.

E. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
   1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
   2. Remove snow and ice as required to minimize accumulations.

G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
   1. Identification Signs: Provide Project identification signs as indicated on Drawings.
   2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
      a. Provide temporary, directional signs for construction personnel and visitors.
3. Maintain and touchup signs so they are legible at all times.

H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 01 Section "Execution" for progress cleaning requirements.

I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
1. Comply with work restrictions specified in Division 01 Section "Summary."

B. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

C. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

D. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.

E. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

F. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

H. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

I. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
   1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

J. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
   1. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
   2. Insulate partitions to control noise transmission to occupied areas.
   3. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
   4. Protect air-handling equipment.
   5. Provide walk-off mats at each entrance through temporary partition.

   1. Prohibit smoking in construction areas.
   2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
   3. Develop and supervise an overall fire-prevention and protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
   4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE CONTROL


B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
   1. Protect porous materials from water damage.
   2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
   1. Do not load or install gypsum board or other porous materials or components, or items with high organic content, into partially enclosed building.
   2. Keep interior spaces reasonably clean and protected from water damage.
   3. Periodically collect and remove waste containing cellulose or other organic matter.
   4. Discard or replace water-damaged material.
   5. Do not install material that is wet.
   6. Discard, replace or clean stored or installed material that begins to grow mold.
   7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.
   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.

D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
   1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
   2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth.
of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers’ standard warranties on products; special warranties; and comparable products.

B. Related Sections:
   1. 01 2500 - Substitution Procedures: For requests for substitutions.
   2. 01 4200 - References: For applicable industry standards for products specified.

1.2 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased or acquired stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
   3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
   2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor through Construction Manager of approval or rejection of proposed comparable product request within 15 days of
receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
   a. Form of Approval: As specified in Section 01 3300 - Submittal Procedures.
   b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 3300 - Submittal Procedures. Show compliance with requirements.

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
   1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
   2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:
   1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
   2. 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.
   3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
   4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:
   1. Store products to allow for inspection and measurement of quantity or counting of units.
   2. Store materials in a manner that will not endanger Project structure.
   3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
   4. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer’s written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.

6. Protect stored products from damage and liquids from freezing.

7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.

2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.

3. Refer to Divisions 02 through 49. Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 7700 - Closeout Procedures.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.

3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

4. Where products are accompanied by the term "as selected," Architect will make selection.

6. **Or Equal:** For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

**B. Product Selection Procedures:**

1. **Product:** Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

2. **Manufacturer/Source:** Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

3. **Products:**
   a. **Restricted List:** Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered, unless otherwise indicated.
   b. **Nonrestricted List:** Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.

4. **Manufacturers:**
   a. **Restricted List:** Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered, unless otherwise indicated.
   b. **Nonrestricted List:** Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

5. **Basis-of-Design Product:** Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

**C. Visual Matching Specification:** Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 2500 - Substitution Procedures for proposal of product.
D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.

2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.

3. Evidence that proposed product provides specified warranty.

4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.

5. Samples, if requested.

PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
   2. Field engineering and surveying.
   3. Installation of the Work.
   4. Coordination of Owner-installed products.
   5. Progress cleaning.
   6. Starting and adjusting.
   7. Protection of installed construction.
   8. Correction of the Work.

B. Related Sections:
   1. 01 7700 - Closeout Procedures: For submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.2 SUBMITTALS

A. Qualification Data: For land surveyor.

B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

D. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.3 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, telecommunication system, and other construction affecting the Work.
1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
1. Description of the Work.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect according to requirements in Section 01 3100 - Project Management and Coordination.

### 3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Construction Manager promptly.

B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
   1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
   2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
   3. Inform installers of lines and levels to which they must comply.
   4. Check the location, level and plumb, of every major element as the Work progresses.
   5. Notify Architect and Construction Manager when deviations from required lines and levels exceed allowable tolerances.
   6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Construction Manager.

### 3.4 FIELD ENGINEERING

A. Identification: Owner will identify existing benchmarks, control points, and property corners.
B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
   1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect or Construction Manager. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect and Construction Manager before proceeding.
   2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
   1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
   2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
   3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
   1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
   2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
   1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 OWNER-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for Owner's construction personnel.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
   1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
   2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive
Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.7 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
   2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
   3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
      a. Utilize containers intended for holding waste materials of type to be stored.
   4. Coordinate progress cleaning for joint-use areas where more than one installer has worked.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.
   2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls."

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 4000 - Quality Requirements.

3.9 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.10 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
   1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Substantial Completion procedures.
   2. Final completion procedures.
   3. Warranties.
   4. Final cleaning.

B. Related Sections:
   1. 01 7300 - Execution: For progress cleaning of Project site.
   2. 01 7823 - Operation and Maintenance Data: For operation and maintenance manual requirements.
   3. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

D. Certificates of Release: From authorities having jurisdiction.

E. Certificate of Insurance: For continuing coverage.

F. Field Report: For pest control inspection.

G. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.3 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
   1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.

3. Submit closeout submittals specified in individual Divisions 02 through 33 Sections, including specific warranties, maintenance service agreements, final certifications, and similar documents.

4. Submit maintenance material submittals specified in individual Divisions 02 through 33 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect or Construction Manager. Label with manufacturer's name and model number where applicable.
   a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's or Construction Manager's signature for receipt of submittals.

5. Submit test/adjust/balance records.

6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 15 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
   1. Advise Owner of pending insurance changeover requirements.
   2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
   3. Complete startup and testing of systems and equipment.
   4. Perform preventive maintenance on equipment used prior to Substantial Completion.
   5. Advise Owner of changeover in heat and other utilities.
   6. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
   7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
   8. Complete final cleaning requirements, including touchup painting.
   9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 15 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect and Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. **Reinspection:** Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. **Results of completed inspection will form the basis of requirements for final completion.**

### 1.4 FINAL COMPLETION PROCEDURES

**A. Submittals Prior to Final Completion:** Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 01 2973 – Schedule of Values.

2. **Certified List of Incomplete Items:** Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. **Certificate of Insurance:** Submit evidence of final, continuing insurance coverage complying with insurance requirements.

4. Submit pest-control final inspection report.

**B. Inspection:** Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect and Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. **Reinspection:** Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

### 1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

**A. Organization of List:** Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. **Organize list of spaces in sequential order, starting with exterior areas first.**

2. **Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.**

3. Include the following information at the top of each page:

   a. **Project name.**
   b. **Date.**
   c. **Name of Architect and Construction Manager.**
   d. **Name of Contractor.**
   e. **Page number.**

4. **Submit list of incomplete items in the following format:**

   a. **PDF electronic file.**
   b. **Three paper copies of product schedule or list, unless otherwise indicated. Architect, through Construction Manager, will return two or as appropriate copies.**
1.6 Warranties

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
   1. Bind warranties in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
   2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
   3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
   4. Scan warranties and assemble complete warranty submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide table of contents at beginning of document.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
   1. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.
B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer’s written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
   a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
   b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
   c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
   d. Remove tools, construction equipment, machinery, and surplus material from Project site.
   e. Remove snow and ice to provide safe access to building.
   f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
   g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
   h. Sweep concrete floors broom clean in unoccupied spaces.
   i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer’s recommendations if visible soil or stains remain.
   j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
   k. Remove labels that are not permanent.
   l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.  
      1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.
   m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
   n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
   o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
   p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
   q. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter upon inspection.
   r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
   s. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

D. Construction Waste Disposal: Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls."

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
   1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
   2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
      a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
   3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
   4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
   1. Operation and maintenance documentation directory.
   2. Emergency manuals.
   3. Operation manuals for systems, subsystems, and equipment.
   4. Product maintenance manuals.
   5. Systems and equipment maintenance manuals.

B. Related Sections:
   1. 01 3300 - Submittal Procedures: For submitting copies of submittals for operation and maintenance manuals.
   2. Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.2 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual specification sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
   1. Where applicable, clarify and update reviewed manual content to correspond to modifications and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:
      a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically-linked operation and maintenance directory.
      b. Enable inserted reviewer comments on draft submittals.
   2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect, through Construction Manager, will return two copies.

C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.
D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
   1. Correct or modify each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
   1. List of documents.
   2. List of systems.
   3. List of equipment.
   4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
   1. Title page.
   2. Table of contents.

B. Title Page: Include the following information:
   1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Architect.
8. Name and contact information for Commissioning Agent.
9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
   1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
   1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
   2. File Names and Bookmarks: Enable bookmarking of individual documents based upon file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel upon opening file.

F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
   1. Binders: Heavy-duty, three-ring, vinyl-covered, post-type binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
      a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.

3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.


5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:
   1. Type of emergency.
   2. Emergency instructions.
   3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
   1. Fire.
   2. Flood.
   5. Power failure.
   7. System, subsystem, or equipment failure.
   8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:
   1. Instructions on stopping.
   2. Shutdown instructions for each type of emergency.
   3. Operating instructions for conditions outside normal operating limits.
   4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
   2. Performance and design criteria if Contractor is delegated design responsibility.
   3. Operating standards.
   4. Operating procedures.
   5. Operating logs.
   6. Wiring diagrams.
   7. Control diagrams.
   8. Piped system diagrams.
   9. Precautions against improper use.
   10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:
   1. Product name and model number. Use designations for products indicated on Contract Documents.
   2. Manufacturer's name.
   3. Equipment identification with serial number of each component.
   4. Equipment function.
   5. Operating characteristics.
   6. Limiting conditions.
   7. Performance curves.
   8. Engineering data and tests.
   9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:
   1. Startup procedures.
   2. Equipment or system break-in procedures.
   3. Routine and normal operating instructions.
   4. Regulation and control procedures.
   5. Instructions on stopping.
   7. Seasonal and weekend operating instructions.
   8. Required sequences for electric or electronic systems.
   9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.
2.5 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:
   1. Product name and model number.
   2. Manufacturer's name.
   3. Color, pattern, and texture.
   5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
   1. Inspection procedures.
   2. Types of cleaning agents to be used and methods of cleaning.
   3. List of cleaning agents and methods of cleaning detrimental to product.
   4. Schedule for routine cleaning and maintenance.
   5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties: Include copies of warranties and lists of circumstances and conditions that would affect validity of warranties or bonds.
   1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
   1. Standard maintenance instructions and bulletins.
   2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
   3. Identification and nomenclature of parts and components.
   4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
   1. Test and inspection instructions.
   2. Troubleshooting guide.
   3. Precautions against improper maintenance.
   4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   5. Aligning, adjusting, and checking instructions.
   6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
   1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
   2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties: Include copies of warranties and lists of circumstances and conditions that would affect validity of warranties or bonds.
   1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
   1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
   2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
   1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
   1. Do not use original project record documents as part of operation and maintenance manuals.

G. Comply with Section 01 7700 - Closeout Procedures for schedule for submitting operation and maintenance documentation.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Contractor shall transport, furnish and install portable buildings as shown on drawings and as specified herein; including all decks, ramps, stairs and railings.

B. Portable Buildings Condition: New or Used

C. Lease term: Three (3) years with option for extension of term as per owner request. Compensation for time extension of term shall be negotiated at fair market value.

D. Portable building lessor shall agree to field modifications as shown on drawings and as specified in Section 13-2430: Portable Buildings – Improvements.

E. Contractor shall remove complete all portable buildings at the end of lease term.

1.2 REGULATORY REQUIREMENTS

A. Comply with requirements of Section 01410: Regulatory Requirements.

B. DSA Pre-approved portable buildings. Provide PC numbers.

C. Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board’s ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.3 SUBMITTALS

A. Comply with requirements of Section 01330: Submittals.

B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

D. Samples for Initial Selection: For factory-applied colors and finishes.

1.4 QUALITY ASSURANCE

A. Comply with requirements of Section 04000: Quality Requirements.

B. Manufacturer Qualifications: Company specializing in manufacturing fabricated buildings with a minimum documented experience of twenty years

1.5 COORDINATION

A. Comply with requirements of Section 03100: Project Management and Coordination.
B. Coordinate installation of anchorages for fabricated buildings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Pre-installation Conference: Conduct conference at Project site.

1.6 WARRANTIES
A. Maintenance: Manufacturer shall maintain integrity of building envelope, structural, mechanical and electrical systems for the entire duration of the lease term.

PART 2 -PRODUCTS

2.1 MANUFACTURERS
A. 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. Gary Doupnik Manufacturing, Inc.
   2. Mobile Modular.
   4. Williams Scotsman

2.2 MATERIALS
A. Concrete: In accordance to ACI 301, as follows:

   1. Minimum Compressive Strength: 3000 psi at 28 days.

B. Construction Lumber:

   Lumber used in the construction of DSA buildings should meet applicable code at time of original building manufacture date. Where it does not conflict with code, all lumber should be rated with a moisture content not to exceed 19% at time of purchase and should follow general guidelines for installation as to moisture content at time of use which should not exceed 15% in any case.

C. Exterior Siding:

   1. DuraTemp 19/32" with grooves at 8: OC or approved equal.
   2. No horizontal seams in the exterior siding will be accepted without approval. Any horizontal seams, if approved, must be properly (using “Z” bar flashing) in order to insure watertight integrity of the joint.
   3. Skirting: Provide as shown on drawings, paint to match building, plywood 5/8" thick, or approved equal.
D. Exterior Trim:

All trim will be 7/16" Truwood lap siding by Weyerhauser with a beveled edge or approved equal.

E. Exterior Paint:

1. For all buildings utilize Dunn Edwards low sheen (exterior/interior acrylic finish), sheen enamel for the door and window trim and also for the top fascia and bottom bellyband trim.
2. Color: As selected by Architect

F. Roofing:

1. A galvanized steel (26 gauge or thicker) interlocking standing seam with mechanical crimp, “Unicover” roof as manufactured by Placer Engineering with five (5) year warranty or approved equal.
2. All sheathing must be APA rated plywood. Particleboard, waferboard or OSB products are not acceptable.
3. All modules are to be provided with an attic ventilation system. The intent of this system is to ventilate space between the ceiling tile and the fiberglass roof insulation. This system does not need to be mechanical in nature nor should it be connected to the HVAC system.

G. Flooring:

1. Subfloor: All subflooring must be APA rated T & G “STURD-I-FLOOR” plywood (no particleboard, waferboard or OSB products). Minimum 50lb floor load.
2. Floor Coverings: All floor coverings shall be provided under Section 13-3430: Portable Buildings – Improvements.

H. Interior Partitions:

1. All interior partitions shall be provided under Section 13-3430: Portable Buildings – Improvements.

I. Windows:

1. Design/Locations: Additional/Locations of exterior windows shall be provided as shown in drawing.
2. Exterior standard windows 8’x4’ – XOX-dual pane clear anodized aluminum frame, dual glazed tempered glass with gray tint (48%) with insect screen.

J. Doors and Frames:
1. Design/Location: Additional doors and locations of exterior doors, including door openings, shall be provided as shown on drawings.

2. Exterior: Standard door 3'-0"x 6'-8"x1-3/4", 18 Ga, hollow galvanized metal. 16 Ga. Galvanized metal frame. Weather stripping shall be of the screw-on type.

3. Interior: All interior doors shall be provided under Section 13-3430: Portable Buildings – Improvements.

K. Door Hardware:

1. Provide door hardware in accordance with Peralta Community College District Door Hardware Specification Guideline attached as an Appendix to this Project Manual and with the Door Hardware Schedule on drawings.

L. Interior Finish and Trim:

1. Interior wall finish: Continuous ½"x4"x9’ vinyl wrapped tackboard. Color as selected by Architect.

M. Ceiling System:

1. T-grid as manufactured by Donn Corporation or approved equal, DX ceiling grid, or “the hot dip galvanized suspension system” by Armstrong, color white.

2. Ceiling tile, 2’x4’ fiberglass, as manufactured by Armstrong, “Random Fissured” #2910 pattern, or approved equal.

3. Ceiling height 102”

N. Building Insulation:

1. Fiberglass, formaldehyde free and must be installed at a level (thickness) that will meet or exceed the climactic zone requirements.

O. Sealants:


2. Installation: All voids must be completely filled and result in a weather tight seal.

3. With respect to applications to the interior areas of buildings or classrooms. The Manufacturer shall only use adhesive materials, sealants, tapes, mastics and glues that do not identify on their labels or in their Material Safety Data Sheets formaldehyde (or formalin-its Chemical Abstract Service number being 50-00-0) as an ingredient in their formulations.

2.3 DECKS, RAMPS, STAIRS AND RAILINGS

A. General: Provide a complete, integrated system of decks, ramps, stairs and railings as shown on drawings.

B. Materials: As shown on drawings, hot-dip galvanized steel.
2.4 HVAC SYSTEM

A. General: HVAC units, quantity and locations, shall comply with standards as required by DSA Specifications.

B. Design/Diffuser Layout: Additional air diffusers shall be provided as required by individual portable floor plan configuration as shown on drawings.

C. Standard Components:
   1. All HVAC units will be BARD and provided with a CRV. Standard 24’ x 40’ classrooms will require a single 4-ton unit. All buildings will have the HVAC system designed to meet ASHRAE standards current to date of original stockpile manufacture with the CRV factory adjusted to setting “C”.
   2. For buildings larger than 24’x40’ supply air system should accommodate a variety of configurations, including double classroom and administrative offices.
   3. All units should be shipped with the necessary HVAC and thermostat operation information attached immediately adjacent to the thermostat.
   4. All HVAC units are to be single phase unless specifically requested otherwise.
   5. Where applicable, a minimum three collar plenum with three 12”-round flex supply ducts are to be provided for 960 square foot. In addition all buildings are required to have the proper quantity and size: plenum, ducting, dampers, registers and HVAC unit(s) to meet or exceed current ASHRAE standards for the occupancy group load of the building.
   6. For the standard three collar plenum two adjustable volume dampers one on each of the short supply ducts, at the plenum are required. These are to be factory adjusted to approximately equalize the CFM of air at each register.
   7. All supply registers shall meet or exceed the following: equal to a Shoemaker 104 series, 4 way, stamped, curved blade, diffuser, with a 16” x 16” square neck and a 16” x 16” x 12” round side outlet box. (A perforated face is not allowed.) Further, all registers must have a NC (noise coefficient) of <35, as installed in the building.
   8. A minimum of three registers per HVAC unit is required.
   9. All buildings must meet climate zones 1-15 unless specifically otherwise requested.
   10. White Rogers Programmable #1F92-371 5-day T-stat or equivalent.

2.5 ELECTRICAL SYSTEMS:

A. General: Panel boxes, circuits and outlets shall comply with standards as required by DSA Specifications.

B. Components/Design:
   1. Panel boxes should be mounted on the 12’ wall (where the HVAC is located if applicable).
   2. All circuits must be labeled and cross-overs must be identified per circuit.
   3. Additional power outlets shall be provided, at perimeter walls, as shown on drawings.

C. Lighting:
   1. 2’ x 4’ recessed fluorescent fixtures to provide appropriate lighting levels at desk
height, with plastic diffusers – Fixtures shall be A rated with electronic low harmonic ballast Triad Magnetek #B2321UNVHP-B or MMMC approved equivalent.

2. Exterior light is Fail-safe IB0-100-120 or approved equal.

3. Energy efficient occupancy sensor light switching: Leviton Dual relay occupancy sensor wall switch part #001-ODSOD-IDI or single relay 092-ODS15-IDW or approved equal.

2.6 RESTROOM PORTABLES

A. General: Restroom facilities shall comply with standards as required by DSA Specifications.

B. Design: Provide MEN/WOMEN/STAFF ROOMS as shown on drawings.

C. Interior Finish and Trim:

Restroom walls shall be FRP with matching trim. Color as selected by Architect.

D. Flooring:

Restrooms will require sheet goods as manufactured by Tarkell Coordinates Plus field color 77500 in 12’ goods or approved equal. No seams. Flooring should be self-coved as per DSA Specifications. Underlayment to be used in all sheet vinyl applications.

C. Basic Components:

1. Provide HVAC system as required for the climate zone.

2. Provide deck, ramp, stairs and railings as shown on drawings.

3. Floor drains, if required, cannot run into the waste system and should drain into the main plumbing tree.

4. Restrooms buildings should be built with a 9” chase wall, for access to plumbing components, complete with a removable rear wall access panel.

5. All restrooms receiving exhaust fans should have the fan strategically placed directly over the toilet area. The use of a wall mounted exhaust fan will only be allowed when it does not affect the width of the modular. Total exhaust must exceed 1.25 times the square feet of the area ventilated.

6. Fixtures are to be wall hung and supported with proper blocking.

7. Where “Staff” restrooms are supplied the restrooms should be equipped with “Staff” sign on door (not unisex). Staff restrooms should have push button locks on the inside so that when the push button is pushed in the door cannot be opened from the outside except by special master key.

8. Units that contain plumbing must have a factory fabricated plumbing tree that provides a single connection point at the building edge.

9. Slope of the prefabricated tree line is sufficient for proper flow

D. Fixtures/Accessories/Partitions:
1. Elongated toilet: ProFlo model PF1201 or Crane model 3-792 or equal
2. Handicapped elongated toilets: ProFlo model PF 1203 or Crane model 3-152 or equal
3. Urinals: ProFlo Model PF1800 or Crane model 7-120 or equal
4. Wall hung sinks: ProFlo model PF5404 or Crane model 1-320V or equal
5. Insinkerator: ISE Model #UW or equal
6. Water heater: American PROline M# E61-06U-015SV or equal
7. Continental Classic Roll Tissue Holder, #RT22 Chrome Single Roll Capacity or equal
8. Privacy partitions shall be medium gray

2.6 FABRICATION

A. Fabricate buildings completely in factory.
B. Preglaze windows and doors at factory.
C. Prewire buildings at factory, ready for connection to service at Project site.
D. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.
   1. Provide double jamb studs for openings 60 inches and less in width, and triple-jamb studs for wider openings. Provide headers of depth according to Table R502.5(1) or Table R502.5(2), as applicable, in ICC's International Residential Code for One and Two Family Dwellings.
E. Accessibility: Fabricate decks, ramps, stairs and railings complete, as shown on drawings. Contractor's responsibility to verify field conditions, prior to fabrication.

PART 3 -EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install buildings according to manufacturer's written instructions.
B. Set buildings plumb and aligned. Level baseplates true to plane with full bearing on concrete bases.
C.  Fasten buildings securely to cast-in anchor bolts.

D.  Connect electrical power service to power distribution system.

3.3 ADJUSTING

A.  Adjust doors, operable windows, and hardware to operate smoothly, easily, properly, and without binding.  Confirm that locks engage accurately and securely without forcing or binding.

B.  Lubricate hardware and other moving parts.

C.  After completing installation, inspect exposed finishes and repair damaged finishes.

END OF SECTION
PART 1 -GENERAL

1.1 SUMMARY

A. Contractor to provide and install exterior/interior improvements of leased portable buildings as shown on drawings and as specified herein.

B. Improvements include but are not limited to:

1. Interior partitions.
2. Interior Door/Windows
3. Flooring
4. Signage
5. Operable partitions
7. Backing plates/support
8. Casework
9. Installation of owner provided equipment/furniture.
10. Painting
11. Markerboards
12. Lockers
13. Projection Screens

C. Related work:

1. Section 22 4000: Plumbing Fixtures
2. Section 23 0500: Mechanical
3. Section 26 0923: Lighting Control Devices
4. Section 26 5600: Exterior Lighting
5. Section 27 0000: Communications
6. Section 27 0523: Television Signal Distribution Systems
7. Section 28 3100: Fire Detection & Alarm

1.2 SUBMITTALS

A. Comply with requirements of Section 01330: Submittals

B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

D. Samples for Initial Selection: For factory-applied colors and finishes.

E. Samples for Verification: For exposed finishes, in manufacturer’s standard sizes.

F. Welding certificates.

G. Warranty: Sample of special warranty.
1.3 QUALITY ASSURANCE

A. Comply with requirements of Section 04000: Quality Requirements

B. Welding Qualifications: Quality procedures and personnel according to the following:

C. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board’s ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

D. 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.

E. Safety Glazing Products: Category II materials complying with testing requirements in 16 CFR 1201.
   1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of SGCC or another certification agency acceptable to authorities having jurisdiction.

1.4 COORDINATION

A. Comply with requirements of Section 03100: Project Management and Coordination.

1.5 WARRANTIES

A. Comply with Requirements of Section 06000: Product Requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Concrete: In accordance to ACI 301, as follows:
   1. Minimum Compressive Strength: 3000 psi at 28 days.

B. Aluminum: Alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated, and as follows:
   1. Sheet: ASTM B 209 (ASTM B 209M)
   2. Extruded Shapes: ASTM B 221 (ASTM B 221M)

C. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, commercial quality, G90 (Z275) coating designation, mill phosphatized.
D. Tubing: ASTM A 500 (cold formed) or ASTM A 513.
E. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
F. Steel Structural Tubing: ASTM A 500, Grade B.
G. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
H. Steel Mechanical Tubing: ASTM A 513, welded steel mechanical tubing.
I. Zinc-Coated (Galvanized) Steel: Hot-dip galvanized according to ASTM A 123/A 123M.
J. Stainless-Steel Sheet: ASTM A 666, Type 304.
K. Lumber: DOC PS 20.
1 Framing: Construction or No. 2.
2 Blocking: Construction, Stud, or No. 3.
L. Plastic Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.
M. Plywood: DOC PS 1.
1 Plywood Wall Sheathing: Exterior, Structural I.
2 Plywood Roof Sheathing: Exterior, Structural I.
   a. Nominal Thickness: Not less than 5/8 inch.
N. Particleboard: ANSI A208.1, Grade M-2.
O. Plywood Siding: APA-rated siding in panel sizes indicated.
1 Thickness: 5/8 inch.
2 Face Species: Douglas fir, western red cedar, or redwood.
3 Pattern: Texture 1-11; grooves 8 inches o.c.
4 Surface: Rough sawn.
P. Clear Float Glass: ASTM C 1036, Type I, Class 1, Quality q3.
Q. Clear Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Class 1, and Quality q3.
R. Insulating Glass: Units complying with ASTM E 774 for Class CBA and consisting of two lites of 2.5-mm-thick clear float glass and dehydrated air space, with a total overall unit thickness of 7/16 inch (11 mm) and with manufacturer's standard dual seal.
S. Gypsum Board: ASTM C 1396/C 1396M, Type X, 5/8 inch thick.
1. Applying and Finishing Gypsum Board: In accordance with ASTM C 840.
   1. Manufacturers: One of the following:
      a. Kemlite Company Inc.
      b. Marlite.
      c. Nudo Products, Inc.

U. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

2.2 COMPONENTS

A. Pipe and Tube Railings:
   1. Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
   2. Hot-dip galvanize railings, including hardware, after fabrication.

B. Welded Steel Grating:
   3. Steel Finish: Hot-dip galvanized with a coating weight of not less than 1.8 oz./sq. ft. of coated surface.

C. Skylights:
   1. Provide and install skylights as shown on drawings.
   2. Manufacturer/Model as recommended by Portable Building Manufacturer.

D. Flush Wood Doors: WDMA I.S.1-A.
   1. Performance Grade: Extra Heavy Duty.
   2. Core: Particleboard.
   3. Construction: Five or seven plies.
   4. Veneer Facing: Transparent finished wood, species and cut as selected by Architect.

E. Windows: Extruded-aluminum sash frames glazed with clear insulating glass with low-e coating on #2 surface.
   1. Frame Finish: 2-coat fluoropolymer.
   2. Provide insect screens for each operable window.

F. Porcelain-Enamel Markerboards: Balanced, high-pressure, factory-laminated markerboard assembly of three-ply construction consisting of backing sheet, particleboard core material, and 0.021-inch-thick, porcelain-enamel face sheet with high-gloss finish.
   2. Style: Type A with full length anodized aluminum marker tray.

G. Operable Partitions: Manually operated, continuously hinged formed, welded steel panels.
STC Rating: 50.

Facing Material: As selected by Architect from manufacturer's standard offering.

H. Lockers: Standard Metal Lockers.
1. Material: Cold rolled steel sheet.
2. Door Hinges: Knuckle hinges.
3. Door Handle and Latch: Stainless-steel strike plate with integral pull; with steel padlock loop that projects through metal locker door.
4. Equipment: Equip each metal locker with identification plate, shelf, one double-prong ceiling hook, and two single-prong wall hooks.
5. Finish: Baked enamel or powder coat.
   a. Color: As selected by Architect.

I. Projection Screens: Manually operated, heavy duty spring roller in AV format.

J. Horizontal Louver Blinds: Aluminum.
2. Size: 1 inch wide slats.

1. Construction Type: Type A, Frameless.
2. Cabinet and Door Interface Style: Style 1, overlay.
3. Door and Drawer Front Style: Flush overlay.
5. Plastic Laminate:
   a. Horizontal Surfaces: Grade HGL.
   b. Vertical Surfaces: Grade VGS.

L. Plastic-Laminate Countertops:
1. High-Pressure Decorative Laminate Grade: HGS.
2. Core Material at Sinks: Particleboard made with exterior glue or exterior-grade plywood.
3. Core Material at Other Locations: Particleboard.

M. Cabinet Hardware:
1. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 135 degrees of opening, self-closing.
2. Wire Pulls: Back mounted, solid metal, 5 inches long, 2-1/2 inches deep, and 5/16 inch in diameter.
3. Drawer Slides: BHMA A156.9, B05091.
4. Catches: Roller catches, BHMA A156.9, B03071.
5. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
   a. Bright Chromium Plated: BHMA 625 for brass or bronze base; BHMA 651 for steel
N. Interior Finishes:

   b. Size: 12 inches by 12 inches.
   c. Color: R-1 51908 Pewter.

2. Resilient Base: ASTM F 1861, Type TS or Type TP.

3. Tile Carpeting:
   b. Size: 18 inches by 18 inches.

O. Painting: Basis-of-design coating systems by Sherwin Williams, unless otherwise indicated, as follows:

1. Interior Gypsum Board; Acrylic Latex:
   b. Intermediate coat: Same as top coat.

2. Interior Ferrous and Non Ferrous Metals Including: Exposed metal fabrications, steel doors, steel door frames, and other miscellaneous metal items indicated; Direct to Metal Acrylic, Semi-Gloss:
   b. Intermediate coat: None required.
   c. Top coat: Same as Primer.

3. Exterior Galvanized Metal: Hollow metal doors and frames, railings, exposed miscellaneous metal; Urethane, semi-gloss:
   a. Primer: Epoxy "Series 66," by Tnemec; 2.5 DFM.
   b. Intermediate coat: Not required.
   c. Top coat: High-build acrylic urethane; Tnemec Series 1081, "Endura-Shield WB"; 2 to 4 DFM.

4. Exterior Wood: Acrylic latex, Satin:
   b. Intermediate coat: Same as topcoat.
   c. Top coat: A-100 Exterior Latex, 2 DFM.

2.3 DOOR HARDWARE

A. Provide door hardware in accordance with Peralta Community College District Door Hardware Specification Guideline attached as an Appendix to this Project Manual and with the Door Hardware Schedule on drawings.

2.4 FABRICATION
PART 3 -EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ADJUSTING

A. Adjust doors, operable windows, and hardware to operate smoothly, easily, properly, and without binding. Confirm that locks engage accurately and securely without forcing or binding.

B. Lubricate hardware and other moving parts.

C. After completing installation, inspect exposed finishes and repair damaged finishes.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Flexible pipe connectors.
2. Expansion joints.
3. Expansion compensators.
4. Pipe alignment guides.
5. Swivel joints.
6. Pipe anchors.

B. Related Sections:

1. Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment: Product and installation requirements for piping hangers and supports.
2. Section 22 11 00 - Facility Water Distribution: Product and installation requirements for piping used in domestic water systems.

1.2 REFERENCES

A. American Society of Mechanical Engineers:

1. ASME B31.9 - Building Services Piping.
2. ASME Section IX - Boiler and Pressure Vessel Code - Welding and Brazing Qualifications.

B. American Welding Society:

1. AWS D1.1 - Structural Welding Code - Steel.

1.3 DESIGN REQUIREMENTS

A. Provide structural work and equipment required for expansion and contraction of piping. Verify anchors, guides, and expansion joints provide and adequately protect system.

B. Expansion Compensation Design Criteria:

1. Installation Temperature: 50 degrees F.
2. Domestic Hot Water: 110 degrees F.
3. Safety Factor: 30 percent.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures
B. Shop Drawings: Indicate layout of piping systems, including flexible connectors, expansion joints, expansion compensators, loops, offsets and swing joints. Submit shop drawings sealed by a registered professional engineer. Include shop drawing information for piping expansion compensation in shop drawings for piping system.

C. Product Data:
   1. Flexible Pipe Connectors: Indicate maximum temperature and pressure rating, face-to-face length, live length, hose wall thickness, hose convolutions per foot and per assembly, fundamental frequency of assembly, braid structure, and total number of wires in braid.
   2. Expansion Joints: Indicate maximum temperature and pressure rating, and maximum expansion compensation.

D. Samples: Submit two low-pressure compensators 3/4 inch in size.

E. Design Data: Indicate criteria and show calculations. Submit sizing methods calculations sealed by a registered professional engineer.

F. Manufacturer's Installation Instructions: Submit special procedures.

G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

H. Welders' Certificate: Include welders' certification of compliance with ASME Section IX.

I. Manufacturer's Field Reports: Indicate results of inspection by manufacturer's representative.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 77 00 - Closeout procedures

B. Project Record Documents: Record actual locations of flexible pipe connectors, expansion joints, anchors, and guides.

C. Operation and Maintenance Data: Submit adjustment instructions.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.

B. Perform Work in accordance with State of California standard.

C. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section
with minimum three years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three years documented experience approved by manufacturer.

C. Design expansion compensating system under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of California.

1.8 PRE-INSTALLATION MEETINGS

A. Section 01 31 00 – Project Management and Coordination

B. Convene minimum one week prior to commencing work of this section.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements and Substitutions

B. Accept expansion joints on site in factory packing with shipping bars and positioning devices intact. Inspect for damage.

C. Protect equipment from exposure by leaving factory coverings, pipe end protection, and packaging in place until installation.

1.10 WARRANTY

A. Section 01 78 36 – Warranties

B. Furnish five year manufacturer warranty for leak free performance of packed expansion joints.

1.11 EXTRA MATERIALS

A. Section 01 77 00 – Closeout Procedures

B. Supply two containers of packing lubricant and cartridge style grease gun.

PART 2 - PRODUCTS

2.1 FLEXIBLE PIPE CONNECTORS

A. Furnish materials in accordance with State of California standards.

B. Steel Piping:

1. Inner Hose: Stainless Steel.
2. Exterior Sleeve: Double braided, stainless steel bronze.
3. Pressure Rating: 125 psig WSP and 450 degrees F.
4. Joint: Threaded with Union.
5. Size: Use pipe-sized units.
6. Maximum offset: 1 inch on each side of installed center line.

C. Copper Piping:

1. Inner Hose: Bronze.
2. Exterior Sleeve: Braided bronze.
3. Pressure Rating: 125 psig and 450 degrees F.
4. Joint: Soldered as specified for pipe joints.
5. Size: Use pipe sized units.
6. Maximum offset: 1 inch on each side of installed center line.

2.2 ACCESSORIES

A. Furnish materials in accordance with State of California standards.

B. Pipe Alignment Guides: Two piece welded steel with enamel paint, bolted, with spider
to fit standard pipe, frame with four mounting holes, clearance for minimum 1 inch (25
mm) thick insulation, minimum 3 inch travel.

C. Swivel Joints: Fabricated steel body, double ball bearing race, field lubricated, with
Buna-N o-ring seals.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install Work in accordance with ASME B31.9.

B. Install flexible pipe connectors on pipes connected to equipment supported by vibration
isolation. Refer to Section 22 05 48. Provide line size flexible connectors.

C. Install flexible connectors at right angles to displacement. Install one end immediately
adjacent to isolated equipment and anchor other end. Install in horizontal plane unless
indicated otherwise.

D. Rigidly anchor pipe to building structure. Provide pipe guides to direct movement only
along axis of pipe. Erect piping so strain and weight is not on cast connections or
apparatus.

E. Provide support and anchors for controlling expansion and contraction of piping.
Provide loops, pipe offsets, and swing joints, or expansion joints. Refer to Section
22 05 29 for pipe hanger installation requirements.

F. Provide grooved piping systems with minimum one joint per inch pipe diameter instead
of flexible connector supported by vibration isolation. Grooved piping systems need not
be anchored.
G. Provide expansion loops as indicated on Drawings.

3.2 MANUFACTURER’S FIELD SERVICES

A. Section 01 40 00 - Quality Requirements

B. Furnish inspection services by flexible pipe manufacturer's representative for final installation and certify installation is in accordance with manufacturer's recommendations and connectors are performing satisfactorily.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipe hangers and supports.
2. Hanger rods.
3. Inserts.
4. Flashing.
5. Sleeves.

B. Related Sections:

1. Section 07 84 00 - Firestopping: Product requirements for firestopping for placement by this section.
2. Section 07 92 00 Joint Sealers: For sealant materials for placement by this section.
3. Section 09 90 00 - Painting and Coating: Product and execution requirements for painting specified by this section.
4. Section 22 05 48 - Vibration and Seismic Controls for Plumbing Piping and Equipment: Product and execution requirements for vibration isolators.
5. Section 22 11 00 - Facility Water Distribution: Execution requirements for placement of hangers and supports specified by this section.
6. Section 22 13 00 - Facility Sanitary Sewerage: Execution requirements for placement of hangers and supports specified by this section.

1.2 REFERENCES

A. American Society of Mechanical Engineers:

1. ASME B31.1 - Power Piping.
2. ASME B31.9 - Building Services Piping.

B. ASTM International:


C. American Welding Society:

1. AWS D1.1 - Structural Welding Code - Steel.
D. Manufacturers Standardization Society of the Valve and Fittings Industry:
   1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
   2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
   3. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.

E. Underwriters Laboratories Inc.:
   3. UL 1479 - Fire Tests of Through-Penetration Firestops.
   5. UL - Fire Resistance Directory.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures

B. Shop Drawings: Indicate system layout with location including critical dimensions, sizes, and pipe hanger and support locations and detail of trapeze hangers.

C. Product Data:
   1. Hangers and Supports: Submit manufacturers catalog data including load capacity.
   2. Firestopping: Submit data on product characteristics, performance and limitation criteria.

D. Firestopping Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.

E. Design Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers. Indicate calculations used to determine load carrying capacity of trapeze, multiple pipe, and riser support hangers. Submit sizing methods, calculations sealed by a registered professional engineer.

F. Manufacturer's Installation Instructions:
   1. Hangers and Supports: Submit special procedures and assembly of components.
   2. Firestopping: Submit preparation and installation instructions.

G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

H. Engineering Judgements: For conditions not covered by UL or WH listed designs, submit judgements by licensed professional engineer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.
1.4 QUALITY ASSURANCE

A. Through Penetration Firestopping of Fire Rated Assemblies: ASTM E814 with 0.10 inch water gage minimum positive pressure differential to achieve fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.

1. Wall Penetrations: Fire F-Ratings as indicated on Drawings, but not less than 1-hour.
2. Floor Penetrations: Fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.

a. Floor Penetrations within Wall Cavities: T-Rating is not required.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three years documented experience approved by manufacturer.

1.6 PRE-INSTALLATION MEETINGS

A. Section 01 31 00 – Project Management and Coordination

B. Convene minimum one week prior to commencing work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements and Substitutions

B. Accept materials on site in original factory packaging, labeled with manufacturer’s identification.

C. Protect from weather and construction traffic, dirt, water, chemical, and damage, by storing in original packaging.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements and Substitutions

B. Do not apply firestopping materials when temperature of substrate material and ambient air is below 60 degrees F.

C. Maintain this minimum temperature before, during, and for minimum 3 days after installation of firestopping materials.

D. Provide ventilation in areas to receive solvent cured materials.
1.9 FIELD MEASUREMENTS
   A. Verify field measurements prior to fabrication.

1.10 WARRANTY
   A. Section 01 78 36 – Warranties
   B. Furnish five year manufacturer warranty for pipe hangers and supports.

PART 2 - PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS
   A. Manufacturers:
      1. Carpenter & Paterson Inc.
      2. Creative Systems Inc.
      3. Flex-Weld, Inc.
      4. Glope Pipe Hanger Products Inc.
      5. Michigan Hanger Co.

   B. Plumbing Piping - DWV:
      1. Conform to ASME B31.9, MSS SP58, MSS SP69, MSS SP89.
      2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, Carbon steel, adjustable swivel, split ring.
      3. Hangers for Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
      4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
      5. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
      8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
      9. Copper Pipe Support: Copper-plated, carbon-steel adjustable, ring.

   C. Plumbing Piping - Water:
      1. Conform to ASME B31.9, ASTM F708, MSS SP58, MSS SP69, MSS SP89.
      2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, Carbon steel, adjustable swivel, split ring.
      3. Hangers for Cold Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
      5. Hangers for Hot Pipe Sizes 6 inches and Larger: Adjustable steel yoke, cast iron roll, double hanger.
6. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
7. Multiple or Trapeze Hangers for Hot Pipe Sizes 6 inches and Larger: Steel channels with welded spacers and hanger rods, cast iron roll.
8. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
10. Wall Support for Hot Pipe Sizes 6 inches and Larger: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
12. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
13. Floor Support for Hot Pipe Sizes 4 inches and Smaller: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
14. Floor Support for Hot Pipe Sizes 6 inches and Larger: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
15. Copper Pipe Support: Copper-plated, Carbon-steel ring.

2.2 ACCESSORIES

A. Hanger Rods: Mild steel threaded both ends, threaded on one end, or continuous threaded.

2.3 INSERTS

A. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.4 FLASHING

A. Metal Flashing: 26 gage thick galvanized steel.
B. Metal Counterflashng: 22 gage thick galvanized steel.
C. Lead Flashing:
   1. Waterproofing: 5 lb./sq. ft sheet lead.
   2. Soundproofing: 1 lb./sq. ft sheet lead.
D. Flexible Flashing: 47 mil thick sheet compatible with roofing.
E. Caps: Steel, 22 gage minimum; 16 gage at fire resistant elements.

2.5 SLEEVES

A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage thick galvanized steel.
B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet
Floors: Steel pipe or 18 gage thick galvanized steel.

C. Sealant: Refer to Section 07 92 00.

### 2.6 FORMED STEEL CHANNEL

A. Manufacturers:

1. Allied Tube & Conduit Corp.
4. Unistrut Corp.
5. Substitutions: Section 01 60 00 - Product Requirements and Substitutions

B. Product Description: Galvanized 12 gage thick steel. With holes 1-1/2 inches on center.

### 2.7 FIRESTOPPING

A. Manufacturers:

1. Dow Corning Corp.
2. Fire Trak Corp.
3. Hilti Corp.
4. International Protective Coating Corp.
5. 3M fire Protection Products.

B. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.

1. Silicone Firestopping Elastomeric Firestopping: Single component silicone elastomeric compound and compatible silicone sealant.
2. Foam Firestopping Compounds: Single component foam compound.
3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
4. Fiber Stuffing and Sealant Firestopping: Composite of mineral fiber stuffing insulation with silicone elastomer for smoke stopping.
5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
7. Firestop Pillows: Formed mineral fiber pillows.

### 2.8 FIRESTOPPING ACCESSORIES

A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 31 00 – Project Management and Coordination

B. Verify openings are ready to receive sleeves.

C. Verify openings are ready to receive firestopping.

3.2 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.

B. Remove incompatible materials affecting bond.

C. Install backing damming materials to arrest liquid material leakage.

D. Obtain permission from Architect/Engineer before using powder-actuated anchors.

E. Do not drill or cut structural members.
3.3 INSTALLATION - INSERTS

A. Install inserts for placement in concrete forms.

B. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe 4 inches and larger.

D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

E. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

3.4 INSTALLATION - PIPE HANGERS AND SUPPORTS

A. Install in accordance with ASME B31.1, ASME B31.5, ASME 31.9, ASTM F708, MSS SP 58, MSS SP 69 and MSS SP 89.

B. Support horizontal piping as scheduled.

C. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.

D. Place hangers within 12 inches of each horizontal elbow.

E. Use hangers with 1-1/2 inch minimum vertical adjustment.

F. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.

G. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.

H. Where piping is installed in parallel and at same elevation, provide multiple pipe or trapeze hangers.

I. Support riser piping independently of connected horizontal piping.

J. Provide copper plated hangers and supports for copper piping.

K. Design hangers for pipe movement without disengagement of supported pipe.

L. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

M. Provide clearance in hangers and from structure and other equipment for installation of insulation. Refer to Section 22 07 00.
3.5 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

A. Provide housekeeping pads of concrete, minimum 3-1/2 inches thick and extending 6 inches beyond supported equipment. Refer to Section 03 30 00.

B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.

C. Construct supports of steel members formed steel channel steel pipe and fittings. Brace and fasten with flanges bolted to structure.

D. Provide rigid anchors for pipes after vibration isolation components are installed. Refer to Section 22 05 48.

3.6 INSTALLATION - FLASHING

A. Provide flexible flashing and metal counterflashing where piping penetrates weather or waterproofed walls, floors, and roofs.

B. Flash vent and soil pipes projecting 3 inches minimum above finished roof surface with lead worked 1 inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counter-flash, and seal.

C. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inch sheet size. Fasten flashing to drain clamp device.

D. Seal floor, shower, and mop sink drains watertight to adjacent materials.

E. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

3.7 INSTALLATION - SLEEVES

A. Exterior watertight entries: Seal with mechanical sleeve seals.

B. Set sleeves in position in forms. Provide reinforcing around sleeves.

C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

D. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.

E. Where piping penetrates floor, ceiling, or wall, close off space between pipe and adjacent work with stuffing firestopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
3.8 INSTALLATION - FIRESTOPPING

A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping and other items, requiring firestopping.

B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.

C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating.

D. Fire Rated Surface:
   1. Seal opening at floor, wall, partition, ceiling, and roof as follows:
      a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
      b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
      c. Pack void with backing material.
      d. Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.

   2. Where cable tray, conduit, wireway, trough, and penetrates fire rated surface, install firestopping product in accordance with manufacturer's instructions.

E. Non-Rated Surfaces:
   1. Seal opening through non-fire rated wall, partition, floor, ceiling, and roof opening as follows:
      a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
      b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
      c. Install type of firestopping material recommended by manufacturer.

   2. Install escutcheons, floor plates or ceiling plates where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces include rooms with finished ceilings and where penetration occurs below finished ceiling.

   3. Exterior wall openings below grade: Assemble rubber links of mechanical sealing device to size of piping and tighten in place, in accordance with manufacturer's instructions.

3.9 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements
B. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.10 CLEANING

A. Section 01 77 00 – Closeout Procedures

B. Clean adjacent surfaces of firestopping materials.

3.11 PROTECTION OF FINISHED WORK

A. Section 01 77 00 – Closeout Procedures

B. Protect adjacent surfaces from damage by material installation.

3.12 SCHEDULES

<table>
<thead>
<tr>
<th>PIPE MATERIAL</th>
<th>MAXIMUM HANGER SPACING FEET</th>
<th>HANGER ROD DIAMETER INCHES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS (ALL SIZES)</td>
<td>4</td>
<td>3/8</td>
</tr>
<tr>
<td>ALUMINUM (ALL SIZES)</td>
<td>10</td>
<td>1/2</td>
</tr>
<tr>
<td>BRASS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAST IRON (ALL SIZES)</td>
<td>5</td>
<td>5/8</td>
</tr>
<tr>
<td>CAST IRON (ALL SIZES) WITH 10 FOOT LENGTH OF PIPE</td>
<td>10</td>
<td>5/8</td>
</tr>
<tr>
<td>COPPER TUBE, 1-1/4 INCHES AND SMALLER</td>
<td>6</td>
<td>1/2</td>
</tr>
<tr>
<td>COPPER TUBE, 1-1/2 INCHES AND LARGER</td>
<td>10</td>
<td>1/2</td>
</tr>
<tr>
<td>STEEL, 3 INCHES AND SMALLER</td>
<td>12</td>
<td>1/2</td>
</tr>
<tr>
<td>STEEL, 4 INCHES AND LARGER</td>
<td>12</td>
<td>5/8</td>
</tr>
</tbody>
</table>
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Nameplates.
2. Tags.
3. Stencils.
4. Pipe markers.
5. Ceiling tacks.
7. Lockout devices.

B. Related Sections:

1. Section 09 90 00 - Painting and Coating: Execution requirements for painting specified by this section.

1.2 REFERENCES

A. American Society of Mechanical Engineers:


1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures

B. Product Data: Submit manufacturers catalog literature for each product required.

C. Shop Drawings: Submit list of wording, symbols, letter size, and color coding for mechanical identification and valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

D. Samples: Submit two labels, pipe markers and size used on project.

E. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.

F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 77 00 - Closeout procedures

B. Project Record Documents: Record actual locations of tagged valves; include valve tag numbers.
1.5 QUALITY ASSURANCE
   A. Conform to ASME A13.1 for color scheme for identification of piping systems and accessories.
   B. Maintain one copy of each document on site.

1.6 QUALIFICATIONS
   A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
   B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.7 PRE-INSTALLATION MEETINGS
   A. Section 01 31 00 – Project Management and Coordination
   B. Convene minimum one week prior to commencing work of this section.

1.8 FIELD MEASUREMENTS
   A. Verify field measurements prior to fabrication.

1.9 EXTRA MATERIALS
   A. Section 01 77 00 – Closeout Procedures
   B. Furnish two containers of spray-on adhesive.

PART 2 - PRODUCTS

2.1 NAMEPLATES
   A. Manufacturers:
      2. Safety Sign Co.
      4. Substitutions: Section 01 60 00 - Product Requirements and Substitutions

   B. Product Description: Laminated three-layer plastic with engraved black letters on light contrasting background color.

2.2 TAGS
   A. Plastic Tags:
1. Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inches diameter.

B. Metal Tags:
1. Brass or Aluminum with stamped letters; tag size minimum 1-1/2 inches diameter with finished edges.

C. Information Tags:

D. Tag Chart: Typewritten letter size list of applied tags and location in anodized aluminum frame.

2.3 STENCILS
A. Furnish materials in accordance with State of California standards.

B. Stencils: With clean cut symbols and letters of following size:

1. Up to 2 inches Outside Diameter of Insulation or Pipe: 1/2 inch high letters.
2. 2-1/2 to 6 inches Outside Diameter of Insulation or Pipe: 1-inch high letters.

C. Stencil Paint: As specified in Section 09 90 00, semi-gloss enamel, colors and lettering size conforming to ASME A13.1.

2.4 PIPE MARKERS

B. Plastic Pipe Markers:
1. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.

PART 3 - EXECUTION

3.1 PREPARATION
A. Degrease and clean surfaces to receive adhesive for identification materials.

B. Prepare surfaces in accordance with Section 09 90 00 for stencil painting.
3.2 INSTALLATION

A. Apply stencil painting in accordance with Section 09 90 00.

B. Install identifying devices after completion of coverings and painting.

C. Install metal nameplates with corrosive-resistant mechanical fasteners, or adhesive.

D. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer. For unfinished canvas covering, apply paint primer before applying labels.

E. Install tags using corrosion resistant chain. Number tags consecutively by location.

F. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.

G. Identify water heaters, pumps, tanks, and water treatment devices with plastic nameplates. Identify in-line pumps and other small devices with tags.

H. Identify control panels and major control components outside panels with plastic nameplates.

I. Identify valves in main and branch piping with tags.

J. Identify piping, concealed or exposed, with plastic pipe markers. Use tags on piping 3/4 inch diameter and smaller. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.

K. Provide ceiling tacks to locate valves above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

3.3 SCHEDULES

A. Identification:

1. Domestic Cold Water Piping.
   a. Background Color: Black
   b. Lettering Size: 1 ½"
   c. Lettering Color: White

2. Domestic Hot Water.
   a. Background Color: Black
   b. Lettering Size: 1 ½"
   c. Lettering Color: White
3. Sanitary and Storm Water Piping.
   a. Background Color: White
   b. Lettering Color: Black

B. Valve Tags:

1. Natural Gas.
   a. Tag Material: Metal Name Plate
   b. Tag Size: 1 ½"
   c. Tag Shape: Round
   d. Tag Color: White

2. Domestic Cold Water and Hot Water.
   a. Tag Material: Metal Name Plate
   b. Tag Shape: Round
   c. Tag Color: White

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plumbing piping insulation, jackets and accessories.
2. Plumbing equipment insulation, jackets and accessories.

B. Related Sections:

1. Section 07 84 00 - Firestopping: Product requirements for firestopping for placement by this section.
2. Section 09 90 00 - Painting and Coating: Execution requirements for painting insulation jackets and covering specified by this section.

1.2 REFERENCES

A. ASTM International:

6. ASTM C450 - Standard Practice for Prefabrication and Field Fabrication of Thermal Insulating Fitting Covers for NPS Piping, Vessel Lagging, and Dished Head Segments.
Insulation.

B. National Fire Protection Association:

C. Underwriters Laboratories Inc.:

1.3 SUBMITTALS
A. Section 01 33 00 - Submittal Procedures
B. Product Data: Submit product description, thermal characteristics and list of materials and thickness for each service, and location.
C. Samples: Submit two samples of representative size illustrating each insulation type.
D. Manufacturer’s Installation Instructions: Submit manufacturers published literature indicating proper installation procedures.
E. Manufacturer’s Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE
A. Test pipe insulation for maximum flame spread index of 25 and maximum smoke developed index of not exceeding 50 in accordance with UL 723 and NFPA 255.
B. Pipe insulation manufactured in accordance with ASTM C585 for inner and outer diameters.
C. Factory fabricated fitting covers manufactured in accordance with ASTM C450.
D. Perform Work in accordance with State of California.
E. Maintain one copy of each document on site.

1.5 QUALIFICATIONS
A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
B. Applicator: Company specializing in performing Work of this section with minimum
three years documented experience approved by manufacturer.

1.6 PRE-INSTALLATION MEETINGS

A. Section 01 31 00 – Project Management and Coordination

B. Convene minimum one week prior to commencing work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 – Product Requirements and Substitutions

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

C. Protect insulation from weather and construction traffic, dirt, water, chemical, and damage, by storing in original wrapping.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements and Substitutions

B. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.

C. Maintain temperature before, during, and after installation for minimum period of 24 hours.

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.10 WARRANTY

A. Section 01 78 36 Warranties

B. Furnish five year manufacturer warranty for man made fiber.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturers for Glass Fiber and Mineral Fiber Insulation Products:

1. CertainTeed.
2. Knauf.
4. Owens-Corning.
5. Substitutions: Section 01 60 00 - Product Requirements and Substitutions
B. Manufacturers for Closed Cell Elastomeric Insulation Products:
   2. Armacell, LLC. Armadex.

2.2 PIPE INSULATION

A. TYPE P-5: ASTM C534, Type I, flexible, closed cell elastomeric insulation, tubular.
   1. Thermal Conductivity: 0.27 at 75 degrees F.
   2. Operating Temperature Range: Range: Minus 70 to 180 degrees F.

B. TYPE P-7: ASTM C534, Type I, flexible, nonhalogen, closed cell elastomeric insulation, tubular.
   1. Thermal Conductivity: 0.27 at 75 degrees F.
   2. Maximum Service Temperature: 250 degrees F.
   3. Operating Temperature Range: Range: Minus 58 to 250 degrees F.

2.3 PIPE INSULATION JACKETS

A. Vapor Retarder Jacket:
   1. ASTM C921, white Kraft paper with glass fiber yarn, bonded to aluminized film.
   2. Moisture vapor transmission: ASTM E96; 0.02 perm-inches.

B. PVC Plastic Pipe Jacket:
   1. Product Description: ASTM D1784, One piece molded type fitting covers and sheet material, off-white color.
   2. Thickness: 30 mil.

2.4 PIPE INSULATION ACCESSORIES

A. Vapor Retarder Lap Adhesive: Compatible with insulation.

B. Covering Adhesive Mastic: Compatible with insulation.

C. Piping 1-1/2 inches diameter and smaller: Galvanized steel insulation protection shield. MSS SP-69, Type 40. Length: Based on pipe size and insulation thickness.

D. Piping 2 inches diameter and larger: Wood insulation saddle, hard maple. Inserts length: not less than 6 inches long, matching thickness and contour of adjoining insulation.

E. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.
F. Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement: ASTM C449/C449M.

G. Insulating Cement: ASTM C195; hydraulic setting on mineral wool.

H. Adhesives: Compatible with insulation.

2.5 EQUIPMENT INSULATION

A. TYPE E-1: ASTM C553; glass fiber, flexible or semi-rigid, noncombustible.

1. Thermal Conductivity: 0.24 at 75 degrees F.
2. Operating Temperature Range: 0 to 450 degrees F.
3. Density: 1.65 pound per cubic foot.

B. TYPE E-2: ASTM C612; glass fiber, rigid board, noncombustible with factory applied aluminum foil jacket.

1. Thermal Conductivity: 0.24 at 75 degrees F.
2. Operating Temperature Range: 0 to 450 degrees F.
3. Density: 4.2 pound per cubic foot.
4. Jacket Temperature Limit: minus 20 to 150 degrees F.

2.6 EQUIPMENT INSULATION ACCESSORIES

A. Vapor Retarder Lap Adhesive: Compatible with insulation.

B. Covering Adhesive Mastic: Compatible with insulation.

C. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.

D. Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement: ASTM C449/C449M.

E. Adhesives: Compatible with insulation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 31 00 – Project Management and Coordination

B. Verify piping and equipment has been tested before applying insulation materials.

C. Verify surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION - PIPING SYSTEMS

A. Piping Exposed to View in Finished Spaces: Locate insulation and cover seams in
least visible locations.

B. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one hour or less. Provide intumescent firestopping when continuing insulation through assembly. Finish at supports, protrusions, and interruptions. Refer to Section 07 84 00 for penetrations of assemblies with fire resistance rating greater than one hour.

C. Inserts and Shields:

1. Piping ½ inches Diameter and Smaller: Install steel shield between pipe hanger and insulation.

2. Piping 2 inches Diameter and Larger: Install insert between support shield and piping and under finish jacket.
   a. Insert Configuration: Minimum 6 inches long, of thickness and contour matching adjoining insulation; may be factory fabricated.
   b. Insert Material: Compression resistant insulating material suitable for planned temperature range and service.

D. Insulation Terminating Points:

1. Coil Branch Piping 1 inch and Smaller: Terminate hot water piping at union upstream of the coil control valve.

2. Chilled Water Coil Branch Piping: Insulate chilled water piping and associated components up to coil connection.

3. Condensate Piping: Insulate entire piping system and components to prevent condensation.

E. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces less than 10 feet above finished floor: Finish with PVC jacket and fitting covers.

F. Piping Exterior to Building: Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor retarder cement. Cover with aluminum jacket with seams located at 3 or 9 o'clock position on side of horizontal piping with overlap facing down to shed water or on bottom side of horizontal piping.

G. Prepare pipe insulation for finish painting. Refer to Section 09 90 00.

3.3 INSTALLATION - EQUIPMENT

A. Factory Insulated Equipment: Do not insulate.

B. Exposed Equipment: Locate insulation and cover seams in least visible locations.

C. Fill joints, cracks, seams, and depressions with bedding compound to form smooth
surface. On cold equipment, use vapor retarder cement.

3.4 SCHEDULES

A. Water Supply Services Piping Insulation Schedule:

<table>
<thead>
<tr>
<th>PIPING SYSTEM</th>
<th>INSULATION TYPE</th>
<th>PIPE SIZE</th>
<th>INSULATION THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOMESTIC HOT WATER SUPPLY AND RECIRCULATION</td>
<td>P-1</td>
<td>1-1/4 INCHES AND SMALLER</td>
<td>0.5 INCHES</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-1/2 INCHES AND LARGER</td>
<td>1.0 INCHES</td>
</tr>
<tr>
<td></td>
<td>P-1 OR P-5</td>
<td>1-1/4 INCHES AND SMALLER</td>
<td>0.5 INCHES</td>
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<tr>
<td></td>
<td></td>
<td>1-1/2 INCHES AND LARGER</td>
<td>1.0 INCHES</td>
</tr>
</tbody>
</table>

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Domestic water piping, within 5 feet of building.
2. Domestic water piping, above grade.
3. Unions and flanges.
4. Valves.
5. Pipe hangers and supports.
6. Pressure gage taps.
7. Flow control valves.
8. Relief valves.
11. Hydrants.
12. Recessed valve box.
14. Thermostatic mixing valves.
15. Pressure balanced mixing valves.
16. In-line circulator pumps.
17. Bedding and cover materials.

B. Related Sections:

1. Section 07 84 00 - Firestopping: Product requirements for firestopping for placement by this section.
2. Section 08 31 00 - Access Doors and Frames: Product requirements for access doors for placement by this section.
3. Section 09 90 00 - Painting and Coating: Product and execution requirements for painting specified by this section.
4. Section 22 05 16 - Expansion Fittings and Loops for Plumbing Piping: Execution requirements for pipe expansion devices for placement by this section.
5. Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment: Product requirements for pipe hangers and supports and firestopping for placement by this section.
6. Section 22 05 48 - Vibration and Seismic Controls for Plumbing Piping and Equipment: Product requirements for vibration isolators for placement by this section.
7. Section 22 05 53 - Identification for Plumbing Piping and Equipment: Product requirements for pipe identification and valve tags for placement by this section.
8. Section 22 07 00 - Plumbing Insulation: Product and execution requirements for pipe insulation.
1.2 REFERENCES

A. American National Standards Institute:


B. American Society of Mechanical Engineers:

1. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
2. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
3. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes.
4. ASME B31.9 - Building Services Piping.
5. ASME B40.1 - Gauges - Pressure Indicating Dial Type - Elastic Element.
6. ASME Section VIII - Boiler and Pressure Vessel Code - Pressure Vessels.
7. ASME Section IX - Boiler and Pressure Vessel Code - Welding and Brazing Qualifications.

C. ASTM International:


D. Plumbing and Drainage Institute:


E. Underwriters Laboratories Inc.:

1. UL 393 - Indicating Pressure Gauges for Fire-Protection Service.
2. UL 404 - Gauges, Indicating Pressure, for Compressed Gas Service.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures

B. Product Data:

1. Piping: Submit data on pipe materials, fittings, and accessories. Submit manufacturer's catalog information.
2. Valves: Submit manufacturers catalog information with valve data and ratings for
3. **Hangers and Supports:** Submit manufacturers catalog information including load capacity.

4. **Domestic Water Specialties:** Submit manufacturers catalog information, component sizes, rough-in requirements, service sizes, and finishes.

5. **Pumps:** Submit pump type, capacity, certified pump curves showing pump performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable. Include electrical characteristics and connection requirements.

C. **Manufacturer's Installation Instructions:** Submit installation instructions for pumps, valves and accessories.

D. **Manufacturer's Certificate:** Certify products meet or exceed specified requirements.

E. **Submit water cleaning samples report to Construction Manager for Architect's approval and include in Operation and Maintenance Manual.**

### 1.4 CLOSEOUT SUBMITTALS

A. **Section 01 77 00 - Execution Requirements**

B. **Project Record Documents:** Record actual locations of valves and equipment.

C. **Operation and Maintenance Data:** Submit spare parts list, exploded assembly views and recommended maintenance intervals.

### 1.5 QUALITY ASSURANCE

A. **Perform Work in accordance with State of California standard.**

B. **Maintain one copy of each document on site.**

### 1.6 QUALIFICATIONS

A. **Manufacturer:** Company specializing in manufacturing products specified in this section with minimum three years documented experience and with service facilities within 100 miles of Project.

B. **Installer:** Company specializing in performing Work of this section with minimum three years documented experience approved by manufacturer.

### 1.7 PRE-INSTALLATION MEETINGS

A. **Section 01 31 00 – Project Management and Coordination**

B. **Convene minimum one week prior to commencing work of this section.**
1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements and Substitutions

B. Accept valves and equipment on site in shipping containers with labeling in place. Inspect for damage.

C. Provide temporary protective coating on cast iron and steel valves.

D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

E. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements and Substitutions

B. Do not install underground piping when bedding is wet.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.11 WARRANTY

A. Section 01 78 36 Warranties

B. Furnish five year manufacturer warranty for domestic water piping.

1.12 EXTRA MATERIALS

A. Section 01 77 00 – Closeout Procedures

B. Furnish two packing kits for each size valve, two loose keys for outside hose bibs

PART 2 - PRODUCTS

2.1 DOMESTIC WATER PIPING, BURIED BEYOND 5 FEET OF BUILDING

A. PVC Pipe: AWWA C900 Class 100, polyvinyl chloride (PVC) material.
   1. Fittings: AWWA C110, ductile iron, standard thickness.

B. Polyethylene Pipe: AWWA C901 ASTM D3035, for 130 psig pressure rating.
   1. Fittings: AWWA C901, molded or fabricated.
2. Joints: Compression.

C. Copper Tubing: ASTM B42, hard drawn.
   1. Fittings: ASME B16.18 cast copper alloy or ASME B16.22 wrought copper and bronze.
   2. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony, or tin and silver, with melting range 430 to 535 degrees F. Braze, AWS A5.8 BCuP silver/phosphorus/copper alloy with melting range 1190 to 1480 degrees F.

D. Copper Tubing: ASTM B42, annealed.

E. Polyethylene Pipe: ASTM D2239, or ASTM D2447 Schedule 40.
   1. Fittings: ASTM D2609, Polyethylene.
   2. Joints: Mechanical with stainless steel clamp.

F. Polyethylene/Aluminum Composition Tubing: ASTM F1281 or ASTM F1282.
   1. Fittings and Joints: Brass compression type.

2.2 DOMESTIC WATER PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Copper Tubing: ASTM B88, Type K.
   2. Joints: Compression connection or Brazed, AWS A5.8 BCuP silver/phosphorus/copper alloy with melting range 1190 to 1480 degrees F.

B. Copper Tubing: ASTM B42, annealed.

2.3 DOMESTIC WATER PIPING, ABOVE GRADE

A. Copper Tubing: ASTM B88, Type ‘L’ hard drawn.
   1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
   2. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony, or tin and silver, with melting range 430 to 535 degrees F.

B. CPVC Pipe: ASTM D2846/D2846M, ASTM F441/F441M, or ASTM F442/F442M, chlorinated polyvinyl chloride (CPVC) material. (Verify with city for approval to use.)

2.4 UNIONS AND FLANGES

A. Unions for Pipe 2 inches and Smaller:
   1. Ferrous Piping: Class 150, malleable iron, threaded.
   2. Copper Piping: Class 150, bronze unions with soldered or brazed joints.
   3. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

B. Flanges for Pipe 2-1/2 inches and Larger:
   1. Ferrous Piping: Class 150, forged steel, slip-on flanges.

2.5 GATE VALVES

A. Manufacturers:
   1. Crane Valve, North America
   2. Hammond Valve
   3. Milwaukee Valve Company
   4. NIBCO, Inc.
   5. Stockham Valves & Fittings

B. Furnish materials in accordance with State of California standards.

C. 2 inches and Smaller: MSS SP 80, Class 125, bronze body, bronze trim, threaded wedge disc, alloy seat rings, threaded ends.

D. 2-1/2 inches and Larger: MSS SP 70, Class 125, cast iron body, bronze trim, bolted bonnet, non-rising stem, hand-wheel, outside screw and yoke, solid wedge disc with bronze seat rings, flanged ends.

2.6 GLOBE VALVES

A. Manufacturers:
   1. Crane Valve, North America
   2. Hammond Valve
   3. Milwaukee Valve Company
   4. NIBCO, Inc.
   5. Stockham Valves & Fittings

B. Furnish materials in accordance with State of California standards.

C. 2 inches and Smaller: MSS SP 80, Class 125 bronze body, bronze trim, threaded
bonnet, hand wheel, Buna-N composition disc, threaded ends.

D. 2-1/2 inches and Larger: MSS SP 85, Class 125, cast iron body, bronze trim, hand wheel, outside screw and yoke, flanged ends. Furnish chain-wheel operators for valves 6 inches and larger mounted over 8 feet above floor.

2.7 BALL VALVES

A. Manufacturers:

1. Crane Valve, North America
2. Hammond Valve
3. Milwaukee Valve Company
4. NIBCO, Inc.
5. Stockham Valves & Fittings

B. Furnish materials in accordance with State of California standards.

C. 2 inches and Smaller: MSS SP 110, two piece bronze body, chrome plated brass ball, full port, teflon seats, blow-out proof stem, threaded ends wing or tee handle.

2.8 PLUG VALVES

A. Manufacturers:

1. DeZURIK, Unit of SPX Corp.
2. Flow Control Equipment, Inc.
3. Homestead Valve

B. Furnish materials in accordance with State of California standards.

C. 2 inches and Smaller: MSS SP 78, Class 150, semi-steel construction, round port, full pipe area regular opening, pressure lubricated, teflon packing, threaded ends. Furnish one plug valve wrench for every ten plug-valves with minimum of one wrench.

D. 2-1/2 inches and Larger: MSS SP 78, Class 150, semi-steel construction, round port, full pipe area.

2.9 CHECK VALVES

A. Horizontal Swing Check Valves:

1. Manufacturers:

   a. Crane Valve, North America
   b. Hammond Valve
   c. Milwaukee Valve Company
   d. NIBCO, Inc.
   e. Stockham Valves & Fittings
2. Furnish materials in accordance with State of California standards.
3. 2 inches and Smaller: MSS SP 80, Class 150, bronze body and cap, bronze seat, Buna-N disc, threaded ends.
4. 2-1/2 inches and Larger: MSS SP 71, Class 125 cast iron body, bolted cap, bronze or cast iron disc, renewable disc seal and seat, flanged ends.

2.10 PIPE HANGERS AND SUPPORTS

A. Manufacturers:
   1. Carpenter & Paterson Inc.
   2. Creative Systems Inc.
   3. Flex-Weld, Inc.
   4. Glope Pipe Hanger Products Inc.
   5. Michigan Hanger Co.

B. Furnish materials in accordance with State of California standards.

C. Plumbing Piping: Conform to ASME B31.9  MSS SP 58.

D. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron Carbon steel, adjustable swivel, split ring.

E. Hangers for Cold Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.

F. Hangers for Hot Pipe, Sizes 2 to 4 inches: Carbon steel, adjustable, clevis.

G. Hangers for Hot Pipe, Sizes 6 inches and Larger: Adjustable steel yoke, cast iron pipe roll and double hanger.

H. Multiple or Trapeze Hangers: Steel channels with welded supports or spacers and hanger rods.

I. Multiple or Trapeze Hangers for Hot Pipe Sizes 6 inches and Larger: Steel channels with welded supports or spacers and hanger rods, cast iron roll.

J. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hooks.

K. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamps.

L. Wall Support for Hot Pipe Sizes 6 inches and Larger: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron pipe roll.

M. Vertical Support: Steel riser clamp.

N. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
O. Floor Support for Hot Pipe Sizes 4 inches and Smaller: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

P. Floor Support for Hot Pipe Sizes 6 inches and Larger: Adjustable cast iron pipe roll and stand, steel screws, and concrete pier or steel support.

Q. Copper Pipe Support: Carbon steel ring, adjustable, copper plate.

2.11 PRESSURE GAGE TAPS
A. Furnish materials in accordance with State of California standards.

2.12 STEM TYPE THERMOMETERS
A. Furnish materials in accordance with State of California standards.

2.13 HOSE BIBS
A. Furnish materials in accordance with State of California standards. See Plumbing drawing P0010 under fixture schedule.

2.14 RECESSED VALVE BOX
A. Washing Machine: Plastic preformed rough-in box with brass valves with single lever handle, socket for 2 inch waste, slip in finishing cover.
B. Refrigerator: Plastic preformed rough-in box with brass valves with wheel handle slip in finishing cover.

2.15 WATER HAMMER ARRESTORS
A. Pre-charged suitable for operation in temperature range -100 to 300 degrees F and maximum 150 psi working pressure.

2.16 SYSTEM LUBRICATED CIRCULATORS
A. See drawing P0010 for make and model number.
B. Type: Horizontal shaft, single stage, direct connected with multiple speed wet rotor motor for in-line mounting, for 140 psig maximum working pressure, 230 degrees F maximum water temperature.
C. Casing: Bronze with flanged pump connections.
D. Impeller, Shaft, Rotor: Stainless Steel.
E. Bearings: Metal Impregnated carbon (graphite) and ceramic.
F. Motor: Impedance protected, single speed.
G. Electrical Characteristics: In accordance with Section 26 05 03.
   1. See drawing P0010 for make, model number, and power requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 31 00 – Project Management and Coordination

B. Verify excavations are to required grade, dry, and not over-excavated.

3.2 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt, on inside and outside, before assembly.

3.3 INSTALLATION - THERMOMETERS AND GAGES

A. Install one pressure gage for each pump, locate taps before strainers and on suction and discharge of pump; pipe to gage.

B. Install gage taps in piping.

C. Install pressure gages with pulsation dampers. Provide needle valve or ball valve to isolate each gage.

D. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inches for installation of thermometer sockets. Allow clearance from insulation.

E. Provide instruments with scale ranges selected according to service with largest appropriate scale.

F. Install gages and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.

G. Adjust gages and thermometers to final angle, clean windows and lenses, and calibrate to zero.

3.4 INSTALLATION - HANGERS AND SUPPORTS

A. Inserts:
   1. Provide inserts for placement in concrete forms.
   2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe 4 inches and larger.
4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above flush with top of slab.

B. Pipe Hangers and Supports:
   1. Install in accordance with ASME B31.9, ASTM F708, and MSS SP 89.
   2. Support horizontal piping as schedule.
   3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
   4. Place hangers within 12 inches of each horizontal elbow.
   5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
   7. Where piping is installed in parallel and at same elevation, provide multiple pipe or trapeze hangers.
   8. Provide copper plated hangers and supports for copper piping sheet lead packing between hanger or support and piping.
   9. Prime coat exposed steel hangers and supports. Refer to Section 09 90 00. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
   10. Provide hangers adjacent to motor driven equipment with vibration isolation; refer to Section 22 05 48.

3.5 INSTALLATION - ABOVE GROUND PIPING

A. Install non-conducting dielectric connections wherever jointing dissimilar metals.
B. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
C. Install piping to maintain headroom without interfering with use of space or taking more space than necessary.
D. Group piping whenever practical at common elevations.
E. Slope piping and arrange systems to drain at low points.
F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 22 05 48.
G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 22 07 00.
H. Provide access where valves and fittings are not accessible. Coordinate size and location of access doors with Section 08 31 00.

I. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

J. Provide support for utility meters in accordance with requirements of utility companies.

K. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Section 09 90 00.

L. Install domestic water piping in accordance with ASME B31.9.

M. Sleeve pipes passing through partitions, walls and floors. Refer to Section 22 05 29.

N. Install firestopping at fire rated construction perimeters and openings containing penetrating sleeves and piping.

O. Install unions downstream of valves and at equipment or apparatus connections.

P. Install valves with stems upright or horizontal, not inverted.

Q. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

R. Install ball or butterfly valves for shut-off and to isolate equipment, part of systems, or vertical risers.

S. Install globe, ball, or butterfly valves for throttling, bypass, or manual flow control services.

T. Provide lug end butterfly valves adjacent to equipment when functioning to isolate equipment.

U. Provide spring loaded check valves on discharge of water pumps.

V. Provide flow controls in water circulating systems as indicated on Drawings.

W. Install potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibs.

X. Pipe relief from valves, back-flow preventers and drains to nearest floor drain.

Y. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to lavatories sinks washing machine outlets and flush valves toilets.
3.6 INSTALLATION - SERVICE CONNECTIONS

A. Provide new water service complete with approved reduced pressure back-flow preventer and with by-pass valves.

B. Provide sleeve in wall for service main and support at wall with reinforced-concrete bridge. Caulk enlarged sleeve and make watertight with pliable material. Anchor service main inside to concrete wall.

3.7 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements

B. Section 01 77 00 – Closeout Procedures

C. Test domestic water piping system in accordance with applicable code local authority having jurisdiction.

3.8 CLEANING

A. Section 01 77 00 – Closeout Procedures

B. Prior to starting work, verify system is complete, flushed and clean.

C. Verify pH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash).

D. Inject disinfectant, free chlorine in liquid, powder and tablet or gas form, throughout system to obtain residual from 50 to 80 mg/L.

E. Bleed water from outlets to obtain distribution and test for disinfectant residual at minimum 15 percent of outlets.

F. Maintain disinfectant in system for 24 hours.

G. When final disinfectant residual tests less than 25 mg/L, repeat treatment.

H. Flush disinfectant from system until residual concentration is equal to incoming water or 1.0 mg/L.

I. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.9 SCHEDULES

A. Pipe Hanger Spacing:
### PART 2 - PIPE MATERIAL

| PART 9 - COPPER TUBE, 1-1/4 INCHES AND SMALLER | PART 10 - 6 | PART 11 - 1/2 |
| PART 12 - COPPER TUBE, 1-1/2 INCHES AND LARGER | PART 13 - 10 | PART 14 - 1/2 |
| PART 15 - PVC (ALL SIZES) | PART 16 - 4 | PART 17 - 3/8 |
| PART 18 - STEEL, 3 INCHES AND SMALLER | PART 19 - 12 | PART 20 - 1/2 |
| PART 21 - STEEL, 4 INCHES AND LARGER | PART 22 - 12 | PART 23 - 5/8 |

### 3.10 DEMONSTRATION AND TRAINING AND MAINTENANCE

A. Submit manufacturer’s operation and maintenance data.

B. Include written maintenance data on components of system, servicing requirements, and Record Drawings.

C. Include maintenance, and inspection data, replacement and part numbers and availability, location and numbers of service depot.

D. Provide demonstration and training and manuals for attendees.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Sanitary sewer piping buried within 5 feet of building.
   2. Sanitary sewer piping above grade.
   3. Unions and flanges.
   4. Valves.
   5. Pipe hangers and supports.
   6. Floor drains.
   7. Floor sinks.
   8. Cleanouts.

B. Related Sections:
   1. Section 07 84 00 - Firestopping: Product requirements for firestopping for placement by this section.
   2. Section 09 90 00 - Painting and Coating: Product and execution requirements for painting specified by this section.
   3. Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment: Product requirements for pipe hangers and supports and firestopping for placement by this section.
   4. Section 31 00 01 - Earthwork:

1.2 REFERENCES

A. American Society of Mechanical Engineers:
   2. ASME A112.21.1 - Floor Drains.
   3. ASME B16.3 - Malleable Iron Threaded Fittings.

B. ASTM International:

C. Cast Iron Soil Pipe Institute:
   2. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures

B. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes for sewage-ejectors, and manholes.

C. Product Data:
   1. Piping: Submit data on pipe materials, fittings, and accessories. Submit manufacturers catalog information.
   2. Hangers and Supports: Submit manufacturers catalog information including load capacity.
   3. Sanitary Drainage Specialties: Submit manufacturers catalog information, component sizes, rough-in requirements, service sizes, and finishes.

D. Manufacturer's Installation Instructions: Submit installation instructions for material and equipment.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 77 00 - Closeout procedures

B. Project Record Documents: Record actual locations of equipment and clean-outs.

C. Operation and Maintenance Data: Submit frequency of treatment required for interceptors. Include, spare parts lists, exploded assembly views for pumps and equipment.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with State of California standards.

B. Maintain one copy of each document on site.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three years documented experience approved by manufacturer.
1.7 PRE-INSTALLATION MEETINGS
   A. Section 01 31 00 – Project Management and Coordination
   B. Convene minimum one week prior to commencing work of this section.

1.8 DELIVERY, STORAGE, AND HANDLING
   A. Section 01 60 00 – Product Requirements and Substitutions
   B. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

1.9 ENVIRONMENTAL REQUIREMENTS
   A. Section 01 60 00 - Product Requirements and Substitutions
   B. Do not install underground piping when bedding is wet or frozen.

1.10 FIELD MEASUREMENTS
   A. Verify field measurements prior to fabrication.

1.11 WARRANTY
   A. Section 01 78 36 – Warranties
   B. Furnish five year manufacturer warranty.

1.12 EXTRA MATERIALS
   A. Section 01 77 00 – Closeout Procedures

PART 2 - PRODUCTS

2.1 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET OF BUILDING
   A. Cast Iron Pipe: CISPI 301, hub-less.
      1. Fittings: Cast iron, CISPI 301.
      2. Joints: CISPI 310, neoprene gasket and stainless steel clamp and shield assemblies.

2.2 SANITARY SEWER PIPING, ABOVE GRADE
   A. Cast Iron Pipe: CISPI 301, hub-less, service weight.
      1. Fittings: Cast iron, CISPI 301.

2.3 PIPE HANGERS AND SUPPORTS

A. Manufacturers:
   1. Carpenter & Paterson Inc.
   2. Creative Systems Inc.
   3. Flex-Weld, Inc.
   4. Glope Pipe Hanger Products Inc.
   5. Michigan Hanger Co
   7. Substitutions: Section 01 60 00 - Product Requirements and Substitutions

B. Drain, Waste, and Vent: Conform to ASME B31.9, ASTM F708, and MSS SP 58.

C. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Carbon steel, adjustable swivel, split ring.

D. Hangers for Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.

E. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.

F. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hooks.

G. Wall Support for Pipe Sizes 3 inches and Larger: Welded steel bracket and wrought steel clamp.

H. Vertical Support: Steel riser clamp.

I. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

2.4 FLOOR DRAINS

A. Manufacturers:
   1. J.R. Smith
   2. Wade
   3. Zurn
   4. Mifab
   5. See Drawing P0010 under fixture schedule

B. Floor Drain (FD-1): ASME A112.21.1; lacquered galvanized cast iron two piece body with double drainage flange, weep holes, reversible clamping collar, and round, adjustable nickel-bronze strainer.
2.5 FLOOR SINKS

A. Manufacturers:
   1. J.R. Smith
   2. Wade
   3. Zurn
   4. Mifab
   5. Substitutions: Section 01 60 00 - Product Requirements and Substitutions

B. Furnish materials in accordance with State of California Plumbing Code.

C. Floor Sink (FS-1): Cast iron body with dome strainer and seepage flange.

D. See drawing P002 for make and model number.

2.6 CLEANOUTS

A. Manufacturers:
   1. J.R. Smith
   2. Wade
   3. Zurn
   4. Mifab
   5. Substitutions: Section 01 60 00 - Product Requirements and Substitutions

B. Furnish materials in accordance with State of California standards.

C. Exterior Surfaced Areas: Round Square cast nickel bronze access frame and non-skid cover.

D. Exterior Unsurfaced Areas: Line type with lacquered cast iron body and round epoxy coated cover with gasket.

E. Interior Finished Floor Areas: Galvanized cast iron body with anchor flange, threaded top assembly, and round scored cover with gasket in service areas and round depressed cover with gasket to accept floor finish in finished floor areas.

F. Interior Finished Wall Areas: Line type with lacquered cast iron body and round epoxy coated cover with gasket, and round stainless steel access cover secured with machine screw.

G. Interior Unfinished Accessible Areas: Calked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 31 00 – Project Management and Coordination

B. Verify excavations are to required grade, dry, and not over-excavated.

3.2 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.3 INSTALLATION - HANGERS AND SUPPORTS

A. Inserts:

1. Provide inserts for placement in concrete forms.
2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe 4 inches and larger.
4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above flush with top of slab.

B. Pipe Hangers and Supports:

1. Install in accordance with ASME B31.9 and MSS SP 89.
2. Support horizontal piping as scheduled.
3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
4. Place hangers within 12 inches of each horizontal elbow.
5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
7. Where installing several pipes in parallel and at same elevation, provide multiple pipe hangers or trapeze hangers.
8. Provide copper plated hangers and supports for copper piping
9. Prime coat exposed steel hangers and supports. Refer to Section 09 90 00. Hangers and supports located in crawl spaces, pipe shafts, and suspended
ceiling spaces are not considered exposed.
10. Install hangers adjacent to motor driven equipment with vibration isolation; refer to Section 22 05 48.

3.4 INSTALLATION - ABOVE GROUND PIPING

A. Establish invert elevations, slopes for drainage to 1/8", per foot.
B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Provide clearances at cleanout for snaking drainage system.
C. Encase exterior cleanouts in concrete flush with grade.
D. Install floor cleanouts at elevation to accommodate finished floor.
E. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
F. Install piping to maintain headroom. Do not spread piping, conserve space.
G. Group piping whenever practical at common elevations.
H. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 21 05 00.
I. Provide clearance in hangers and from structure and other equipment for installation of insulation. Refer to Section 22 07 00.
J. Install piping penetrating roofed areas to maintain integrity of roof assembly.
K. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Section 09 90 00.
L. Sleeve pipes passing through partitions, walls and floors.
M. Install firestopping at fire rated construction perimeters and openings containing penetrating sleeves and piping.
N. Support cast iron drainage piping at every joint.
O. Provide access where valves and fittings are not accessible.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 – Quality Requirements

Test sanitary waste and vent piping system in accordance with applicable code local authority having jurisdiction and California Plumbing Code.
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Note for Cast Iron Pipe: Provide close to joint on barrel. Also provide hanger at each change of direction and each branch connection.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Water closets.
2. Urinals.
3. Lavatories.
4. Sinks.
5. Service sinks.
6. Drinking fountains.

B. Related Sections:

1. Section 07 90 00 - Joint Protection: Product requirements for calking between fixtures and building components for placement by this section.
2. Section 22 11 00 - Facility Water Distribution: Supply connections to plumbing fixtures.
3. Section 22 13 00 - Facility Sanitary Sewerage: Waste connections to plumbing fixtures.

1.2 REFERENCES

A. American National Standards Institute:


B. American Society of Mechanical Engineers:

1. ASME A112.6.1 - Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use.
2. ASME A112.18.1 - Plumbing Fixture Fittings.
4. ASME A112.19.2M - Vitreous China Plumbing Fixtures.
5. ASME A112.19.3 - Stainless Steel Plumbing Fixtures.
6. ASME A112.19.5 - Trim for Water-Closet Bowls, Tanks and Urinals.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures

B. Product Data: Submit catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.

C. Samples: Submit two lavatory supply fittings.
D. Manufacturer's Installation Instructions: Submit installation methods and procedures.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 77 00 - Closeout Procedures

B. Operation and Maintenance Data: Submit fixture, trim, exploded view and replacement parts lists.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with State of California standard.

B. Provide products requiring electrical connections listed and classified by Underwriters Laboratories Inc. testing firm acceptable to authority having jurisdiction as suitable for purpose specified and indicated.

C. Maintain one copy of each document on site.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three years experience.

1.7 PRE-INSTALLATION MEETINGS

A. Section 01 31 00 - Project Management and Coordination

B. Convene minimum one week prior to commencing work of this section.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements and Substitutions

B. Accept fixtures on site in factory packaging. Inspect for damage.

C. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.9 WARRANTY

A. Section 01 78 36 – Warranties

B. Furnish five year manufacturer warranty for plumbing fixtures.
1.10 EXTRA MATERIALS

A. Section 01 70 00 - Execution Requirements

B. Furnish two sets of faucet washers, flush valve service kits, lavatory supply fittings, shower heads and toilet seats.

PART 2 - PRODUCTS

2.1 Acceptance or no exceptions taken by the engineer on any substitution proposed by the contractor shall not be construed as relieving the contractor from compliance with the project’s specifications and performance requirements nor departure there from. The contractor remains responsible for details and accuracy for confirming and correlating quantities and dimensions and for the selection of fabrication processes, techniques and assembly, coordination of his work with that of all other trades and making any needed modifications consequent to the substitution at his own cost and for performing the work in a safe manner.

2.2 Accessible plumbing fixture shall comply with all of the requirements of CBC Section 1115B. Heights and location of all fixtures shall be according to CBC Table 1115B-1. Fixture controls shall comply with CBC Section 1118B.

2.3 All products shall comply with AB1953 Lead Free Requirement.

2.4 FLUSH VALVE WATER CLOSETS.

A. Manufacturers:

1. Toto or District approved equal.

B. Bowl: ASME A112.19.2M; wall hung, siphon jet vitreous china closet bowl, with elongated rim, 1-1/2 inch top spud, china bolt caps.

C. Flush Valve: Toto or District approved. ASME A112.18.1; concealed rough brass, diaphragm type, chrome plated plate, wheel handle stop and vacuum breaker; (1.28 gph).

D. Seat: Solid white plastic, open front, extended back, self-sustaining hinge, brass bolts, without cover.

E. Wall Mounted Carrier: ASME A112.6.1; adjustable cast iron frame, integral drain hub and vent, adjustable spud, lugs for floor and wall attachment, threaded fixture studs with nuts and washers.

2.5 WALL HUNG URINALS.

A. Manufacturers:

B. Urinal: ASME A112.19.2M; vitreous china, wall hung waterless.

2.6 LAVATORIES.

A. Manufacturers:
   1. Toto or District approved equal.

B. Vitreous China Wall Hung Basin: ASME A112.19.2M; vitreous china wall hung lavatory minimum, with 4 inch high back, drillings on 4 inch, rectangular basin with splash lip, front overflow, and soap depression.

C. Supply Fitting: ASME A112.18.1; chrome plated combination supply fitting with open grid strainer, water economy with maximum 0.5 gpm flow, indexed handles.

D. Faucet: ASME A112.18.1; chrome plated with mixing valve faucet, aerator and cover plate, open grid strainer. Floor mounted fixture carrier. Vandal proof.

E. Accessories:
   1. Chrome plated 17 gage brass P-trap with clean-out plug and arm with escutcheon.
   2. Offset waste with perforated open strainer.
   3. Screwdriver stops.
   4. Flexible supplies.
   5. Trap and waste insulated and offset to meet ADA compliance.

F. Wall Mounted Carrier: ASME A112.6.1; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, concealed arm supports, bearing plate and studs.

2.7 SINKS.

A. Manufacturers:
   1. Just
   2. Elkay

B. Single Compartment Bowl: ASME A112.19.3; 18 gage thick, 5 ½” depth for ADA compliant. Type stainless steel. Self-rimming and undercoated, with 1-1/2 inch stainless steel drain, 3-1/2 inch crumb cup and tailpiece, ledge back drilled for trim.

C. Trim: ASME A112.18.1; chrome plated brass supply with high rise swing spout, vandal proof water economy aerator with maximum 2.2 gpm single lever handle.

D. Accessories: Chrome plated 17 gage brass P-trap with clean-out plug and arm with escutcheon, screwdriver stop, flexible supplies.
2.8 DRINKING FOUNTAINS.

A. Manufacturers:
   1. Haws.
   2. Sunroc or District approved equal

B. Fountain: Haws model 1117L or 1011MS, dual height, 18 gauge accessible 304 stainless steel No. 4 satin finish wall mounted.

2.9 LAVATORY INSULATION KIT

A. Furnish materials in accordance with State of California Plumbing Code standards.

B. Product Description: Where Lavatories are noted to be insulated for access compliance, furnish the following: Safety Covers conforming to ANSI A177.1 and consisting of insulation kit of molded closed cell vinyl construction, 3/16 inch thick, white color, for insulating tailpiece, P-trap, valves, and supply piping. Furnish with weep hole and angle valve access covers.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 31 00 – Project Management and Coordination

B. Verify walls and floor finishes are prepared and ready for installation of fixtures.

C. Verify electric power is available and of correct characteristics.

D. Confirm millwork is constructed with adequate provision for installation of counter top lavatories and sinks.

3.2 PREPARATION

A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.3 INSTALLATION

A. Install Work in accordance with State of California standards.

B. Install each fixture with trap, easily removable for servicing and cleaning.

C. Provide chrome plated rigid or flexible supplies to fixtures with loose key screwdriver stops, reducers, and escutcheons.

D. Install components level and plumb.
E. Install and secure fixtures in place with wall supports, wall carriers and bolts.

F. Seal fixtures to wall and floor surfaces with sealant as specified in Section 07 92 00, color to match fixture.

G. Solidly attach water closets to floor with lag screws. Lead flashing is not intended hold fixture in place.

H. For ADA accessible water closets, install flush valve with handle to wide side of stall.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Review millwork shop-drawings. Confirm location and size of fixtures and openings before rough in and installation.

3.5 ADJUSTING

A. Section 01 70 00 - Execution Requirements

B. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.6 CLEANING

A. Section 01 70 00 - Execution Requirements

B. Clean plumbing fixtures and equipment.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01 70 00 - Execution Requirements

B. Do not permit use of fixtures before final acceptance.

3.8 SCHEDULES

A. Fixture Mounting Heights:

1. Water Closet:
   a. Standard: 15 inches to top of bowl rim.
   b. Accessible: 18 inches to top of seat.

2. Water Closet Flush Valves:
   a. Standard: 11 inches min. above bowl rim.
   b. Recessed: 10 inches. above bowl rim.

3. Urinal:
a. Standard: 22 inches to top of bowl rim.
b. Accessible: 17 inches to top of bowl rim.

4. Lavatory:
   a. Accessible: 34 inches to top of basin rim.

5. Drinking Fountain:
   a. Standard Adult: 40 inches to top of basin rim.
   b. Accessible: 36 inches to top of spout.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Common Work Requirement for Mechanical is specifically applicable to Division 23 Sections.

1.2 DESCRIPTION

A. Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified and as required to complete the work of this section, except as otherwise herein specifically excluded.

B. General provision:
   1. Comply with all the specification sections of the project.
   2. This Division is an integrated whole comprising interrelated and interdependent Sections and shall be considered in its entirety in determining requirements.
   3. Applies to all Work and requirements of Division 23.

C. Provide a complete and operable installation, including all labor, supervision, materials, equipment, tools, apparatus, transportation, warehousing, rigging and other equipment and services necessary to accomplish the work in accordance with the intent and meaning of these drawings and specifications.

1.3 WORK INCLUDED

A. The complete Heating, Ventilating and Air Conditioning (HVAC) including but not limited to these major items.
   1. Coordinate work of this Section with related trades.
   2. Verify applicable dimensions at the jobsite.
   4. Duct systems; supply, return and exhaust complete with fire dampers, combination fire-smoke dampers, and manual dampers.
   5. Diffusers, registers, terminal mixing and VAV boxes.
   6. Mechanical equipment bases and roof curbs.
   7. Exhaust, supply and return fans.
   8. Furnishing and installation of miscellaneous hangers, supports, sleeves, inserts, anchors and other auxiliary equipment for systems under this Division.
   9. Duct lining and insulation.
   10. Heating, hot water, condensate drain, refrigeration piping, fittings, valves and specialties, and insulation.
   11. Installation and connection of Owner furnished equipment.
   12. Temperature and Energy Management systems. (Delta control which is acceptable)
13. Shop drawings.
15. Equipment and systems adjustments and balancing.
16. Air and water systems testing, adjusting and balancing.
17. Written operating and maintenance instructions.
18. Record drawings.
19. Guarantee
20. The installation of condensate drain piping as detailed herein including valves, fitting, and piping specialties.
21. The preparation and submission of complete Written Operating and Maintenance Instructions for all equipment and accessories installed in the scope of this Project for each discipline under Division 23.
22. The Scope of Work for Division 23 shall be coordinated with the scope of work with all other Divisions included in the Project Contract Documents and Specifications.
23. All existing conditions and dimensions shall be verified in the field prior to the fabrication and installation of any new work for Division 23.
24. Coordinate work of this Section with related trades.
25. Complete water heating systems, including water heating equipment, circulating pumps, connections.
27. Complete coordination with all other trades related to mechanical systems installation.
28. Contractor to submit and pay all fees to all regulatory agencies having jurisdiction on this project for all necessary plan check and permit approvals. Contractor to obtain all necessary approvals for plan checking, installation and operating permits from all the regulatory agencies applicable to this project and pay all the fees.
29. Contractor to obtain all necessary utility companies connections approvals, and pay all utilities connection and extension fees, costs, etc.

B. Furnish all labor, materials, tools, equipment, and services for all mechanical Work as specified and indicated, in accord with provisions of Contract Documents. Completely coordinate with Work of all other trades. Although such Work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.

C. Drawings, Use and Interpretation:

1. Drawings are only diagrammatic and indicate general arrangement of systems and equipment, except when specifically dimensioned or detailed. Contractor shall be fully responsible to prepare to the scale final fabrication drawings, shop drawings, conduct all systems fully coordinated and make all mechanical and plumbing system space coordination efforts.
2. For exact locations of building elements, refer to dimensioned architectural and structural drawings.
3. Field measurements take precedence over dimensioned drawings.
4. Piping and ductwork plans are intended to show size, capacity, approximate location, direction and general relationship of one work phase to another, but not the exact detail or arrangement.

5. Field verify locations and arrangement of all existing systems and equipment.

6. For any conflict in the Drawings and/or Specifications the more stringent requirements shall apply. Any such conflict shall be brought to the attention of the Architect/Engineer for resolution prior to construction of such items.

D. Installation of all systems and equipment is subject to clarification as indicated in reviewed Shop Drawings with field coordination.

1. Generally, layout pipelines requiring gravity drainage first; followed by large pipe mains, ductwork and electrical conduit.

2. This procedure is intended to promote orderly installation, but not to establish trade precedence.

3. Dimensions indicated are limiting dimensions.

4. Do not use equipment exceeding dimensions indicated on detail drawings or arrangements that reduce required clearances or exceed all of the specified maximum dimensions.

E. Description of systems: Furnish and install all materials resulting, upon completion, in functioning systems in compliance with performance requirements specified, and any modifications resulting from reviewed Shop Drawings with field coordination.

F. Access: Provide access panels in ceilings, partitions, enclosures, etc. as required to permit proper access to mechanical equipment and devices. Avoid the need for access panels by installing Work in accessible areas when possible. Means to secure such access shall be provided whenever such access is located within a secured area per the security plans.

G. The Contractor shall prepare color coded multi-disciplinary overlay drawings including mechanical, plumbing, electrical, structural, architectural, security systems, all communication systems, fire suppression systems and all other building systems and coordinate with all trades for complete installation and operation of mechanical and plumbing systems. Contractor to submit fully coordinated overlay drawings to Architect for review and approval, prior to starting of any installation and fabrication. Contractor to provide all necessary labor and material to modify, reroute, relocate, rearrange, and redesign, all necessary MEP and Fire Sprinkler systems and HS components to make it fit and install them in the available attics, shafts, wall, etc. spaces at no additional cost to owner. Contractor to coordinated, relocate and adjust all necessary divisions, inlets and outlets, lighting, sprinklers, lighting access panels, etc. in at the ceiling surfaces to make it fit at no additional cost to the owner.

H. This project’s bid documents includes mechanical and plumbing design based on a particular specified equipment vendors, brand and systems as indicated on the drawings and specifications. However, if contractor elects to substitute with alternate vendors equipments and systems other than used as basis of design, then contractor shall be
solely and completely responsible for feasibility of substituted equipments related redesign, rechecking and coordination of mechanical systems and complete coordination with all other building systems including architectural, structural, electrical, etc. and shall pay all related redesign cost, impact cost on other trades, additional installation cost, obtain building department approvals, pay inspection fees and shall be fully responsible to pay all other associated cost. Architect will review substituted equipment submittal only one time. If subsequent reviews are requested by the Contractor, they will be reviewed at $150/hour review cost.

I. All the exposed mechanical systems inside the building and outside the building other than concealed shall be primed and oil-painted. Color and finish as selected by the Architect. For the purpose of this section: “Concealed” means hidden from sight in chases, furred spaces, shaft, hung ceiling or embedded in construction; “Exposed" means not installed underground or concealed as defined.

J. The scope of work for Division 23 shall include everything necessary and incidental to completing the Heating, Ventilating, and Air Conditioning (HVAC), work indicated on the project Contract Documents, including but not limited to the followings:

1. The installation of Air handling systems with fans, coils, filters, and air terminal controllers.
2. The installation of all required air filters for all HVAC systems included in the scope of this Project.
3. The installation of roof mounted, in-line, ceiling and utility set Exhaust Fans for general or special system exhaust requirements.
4. The installation of HVAC system ceiling Diffusers and Ceiling Registers including volume dampers and mounting frames to match the ceiling types on the Project.
5. The installation of all supply, return, exhaust and fresh air ductwork for the entire project including manual volume dampers, combination fire/smoke dampers, duct hanger and supports, sleeves, inserts and anchors and all other required appurtenances for all new HVAC systems installed of all duct and pipe installation under the scope of work for this Division.
6. The installation of all duct and pipe insulation including all rigid inserts, weather covers and water sealing.
7. The installation of condensate drain piping as detailed herein including calves, fitting, and piping specialties.
8. The preparation and submission of complete Shop Drawings for all equipment and material installed under the scope of work for all disciplines specified under Division 23.
9. The installation of all Equipment Identification as specified herein.
10. The complete Air test and Balancing for all HVAC systems installed in the scope of the Project by an Independent Test and Balance Contractor.
11. The complete air pressure and soap testing of all natural gas piping installed in the scope of this project.
12. The preparation and submission of complete Written Operating and Maintenance Instruction for all equipment and accessories installed in the scope of this project for each discipline under Division 23.
13. The preparation and submission of complete Record Drawings for all work installed under Division 23.
14. The preparation and submission of One (1) Year Written Guarantee in a form as stipulated in General Requirements.
15. The Scope of Work for Division 23 shall be coordinated with the scope of work with all other divisions included in the Project Contract Documents and Specifications.
16. Provide all necessary labor and material to provide fully functional Mechanical & Plumbing systems.

1.4 DEFINITIONS (AS USED ON DIVISION 23 DRAWINGS AND HEREIN)

A. “Provide” means furnish, install and connect unless otherwise described in specific instances.

B. “Piping” means pipes, fittings, valves and all like pipe accessories connected thereto.

C. “Ductwork” means ducts, plenums, compartments, or casings including the building structure, which are used to convey or contain air.

D. “Extend”, “Submit”, “Repair” and similar words mean that the Contractor (or his designated subcontractor) shall accomplish the action described.

E. “Products”, “Materials” and “Equipment” are used interchangeably and mean materials, fixtures, equipment, accessories, etc.

F. “Utility Areas” are defined as mechanical, electrical, janitorial, and similar rooms or spaces which are normally used or occupied only by custodial or maintenance personnel. “Public Areas” are defined as the rooms or spaces which are not included in the utility areas definition.

G. “Building Boundary” includes concrete walkways immediately adjacent to the building structure.

H. “Below Grade” means buried in the ground.

I. “Substantial Mechanical Completion” means all components of all systems are functioning but lacking in final adjustment.

J. “Pressure Rating Specified” (such as for valves and the like) mean design working pressure for and with references to the fluid which the device will serve.

1.5 WORK SPECIFIED ELSEWHERE

A. Concrete, Architectural Sheet Metal, Door and Exterior Wall Louvers, Painting and Electrical.

B. Related work specified elsewhere:
1. Motor starters and disconnect switches, wiring and conduit, except as otherwise specified: Division 26 - Electrical.
2. Outside air intake, exhaust louvers and screens.
3. Installation of access doors and plaster frames for registers and grilles.
4. Temperature control wiring, which is part of the mechanical contractor responsibility.
5. Testing, adjusting and balancing of air/water systems, Section 23 05 93.

C. This Section includes general administrative and procedural requirements for mechanical installations.

1. Submittals
2. Coordination drawings
3. Record Documents
4. Maintenance manuals
5. Rough-ins
6. Mechanical installations
7. Cutting and Patching

1.6 SITE INSPECTION

A. Contractor shall familiarize himself with the conditions at the site. No allowance will be made subsequently for any error through negligence in observing the site conditions. Contractor shall observe and make cost allowance for any mechanical and/or electrical items that must be relocated to accommodate the installation or servicing of any item covered under this contract.

1.7 ORDINANCES, REGULATIONS AND CODES

A. References to Technical Societies, Trade Organizations, Governmental Agencies is made in Division 23 in accordance with the following abbreviations.

AFI - Air Filter Institute
AMCA - Air Moving & Conditioning Association
ARI - Air Conditioning & Refrigeration Institute
ASHRAE - American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME - American Society of Mechanical Engineers
ASTM - American Society of Testing Materials
AWSC - American Welding Society Code
ANSI - American National Standards Institute
CBC - California Building Code
CCR - California Code of Regulations
CEC - California Electrical Code
CFC - California Fire Codes
CMC - California Mechanical Code
CPC - California Plumbing Code
DSA - Division of the State Architect
FIA - Factory Insurance Association
NAFM - National Association of Fan Manufacturers  
NEMA - National Electrical Manufacturer's Association  
NFPA - National Fire Protection Association  
ORS - Office of Regulatory Services  
OSHPD - Office of Statewide Health, Planning and Development  
SCAQMD - South Coast Air Quality Management District  
SMACNA - Sheet Metal and Air Conditioning Contractors National Association  
UFC - Uniform Fire Code  
UL - Underwriter's Laboratories  
UPC - Uniform Plumbing Code

B. Requirements of Regulatory Agencies: Materials and installation shall comply with applicable local, state, and national codes and ordinances. Rulings and interpretations of the enforcing agencies shall be considered as part of the local codes. No extras will be permitted for furnishing items required by the local codes but not specified or shown on the drawings.

C. Codes and Standards:

1. UBC and California Amendments (California Building Code - Part 2, Title 24, CCR).  
2. UMC and California Amendments (California Mechanical Code - Part 4, Title 24 CCR).  
3. UPC and California Amendments (California Plumbing Code - Part 5, Title 24 CCR).  
4. Uniform Fire Code with State Amendments (California Fire Code - Part 9, Title 24 CCR).  

D. Nothing in these drawings and specifications is to be construed to permit work in violation thereof. Ordinances, regulations and codes are to be construed as minimum requirements.

E. The responsibility of the Architect to conduct construction reviews of the Contractor's performance is not intended to include the adequacy of the Contractor's safety measures in, on, or near the construction site.

F. Ventilating, refrigeration and electrical equipment and appliances are required to be approved by the Underwriters' Laboratories, Inc., or other nationally recognized testing agency and installed per the testing agency's specifications.

1.8 PERMITS, FEES AND INSPECTIONS

A. Obtain and pay for all necessary permits, fees, assessments, complimentary drawings, required by any legally constituted public authorities having jurisdiction.

B. Afford the owner's representative every facility for evaluating the skill and competence of the mechanics and to examine the materials. Concealed work shall be reopened when so directed during the periodic visits.
1.9 PROJECT CONDITIONS

A. Verifying Job Conditions: Examine all Drawings and Specifications in a manner to be fully cognizant to all work required under this Division. Adjoining work of other trades shall be examined for interferences and conditions affecting the work of this Division.

B. Visit site prior to bidding and investigate the existing conditions which affects and will be affected by the work of this Division. Become familiar with the working conditions and take into account any special or unusual features peculiar to these jobs. By the act of submitting the bid, the contractor will be deemed to have complied with the foregoing, to have accepted such conditions, and to have made allowance therefore in preparing his bid.

C. The location of existing utility lines are shown in accordance with reference data received by the Architect. The points of connection are therefore approximate and the Bidder shall include in his bid adequate funds to cover cost of connection regardless of their exact location.

1.10 DRAWINGS AND SPECIFICATIONS

A. The Architect's decision will be final on interpretation of the Drawings and Specifications.

B. The Drawings and Specifications are complimentary. Any work called for on the Drawings and not mentioned in the Specifications, or vice versa, shall be performed as though fully set forth in both.

C. Piping, ductwork and other equipment shown as existing has been taken from the Owner's drawings. Contractor shall verify exact location in field before proceeding with the work.

D. Where codes, standards, drawings or specifications conflict, the most stringent shall prevail, unless prior approval for variance is obtained. Specific details on the drawings shall supersede the specification in the event of a conflict.

E. Alternate support or seismic detail shall have prior approval by the Architect; and the Contractor shall obtain agency approval without any additional cost or time to the contract and without any time penalty on the work schedule.

F. The Contract Drawings indicate the general arrangement of piping, ductwork and equipment.

1. For the purpose of clarity and legibility, drawings are essentially diagrammatic to the extent that many offsets, bends and special fittings and exact locations of items are not specifically dimensioned. Diagrammatic drawings shall be understood as schemes of required systems.

2. Drawings and specifications are intended to complement each other. Where conflicts exist between the drawings and/or specifications, request clarification.
3. “The Architect” and/or, “The Engineer” shall interpret the drawings and the specifications, as to the true intent and meaning thereof and the quality, quantity, and sufficiency of the materials and workmanship furnished thereunder.

4. In case of conflicts not clarified prior to bidding deadline, use the better quality, greater quantity or larger size in preparing bids. After the contract is awarded should the conflict require changes to the scope of work, a credit for the greater quantity will be required.

5. Certain runs of piping or ductwork may be shown distorted to avoid confusion. However, systems shall be grouped into orderly function and relationship, consistent with code requirements and working space.

6. Exact routing of systems, locations of fixtures, grilles, thermostats and devices shall be governed by structural conditions and obstructions. Ceiling installed devices shall be located symmetrically with respect to room centerline, lighting fixtures and type of ceiling system. Architectural restraints shall be verified before roughing-in.

7. Building and room dimensions, location of doors, partitions and similar physical features shall be taken from the Architectural Drawings at the approximate location shown on the Mechanical Drawings.

8. Manufacturers' drawings and instructions shall be followed in all cases and will become the basis for inspecting and accepting or rejecting actual installation procedures utilized in the performance of the work. Where manufacturer's instructions are in conflict with local codes or governing ordinances, the architect shall be notified for determination.

9. Mechanical drawings are generally diagrammatic, and do not indicate necessary offsets, obstructions, or structural conditions required for coordination with other trades. The contractor shall be responsible for the correct placing of his work and the proper location and connection of his work in relation with work of other trades.

10. It is the responsibility of the Contractor to install the work in such a manner that it will conform to the structure, avoid obstructions, and maintain headroom.

11. Above items to be performed at no additional cost to the Owner.

12. Manufacturer's drawings and instructions, when not in conflict with governing codes, shall be followed in all cases where the makers of devices and equipment furnish directions or details not shown on the Drawings or described in the Specifications.

13. Drawings are not intended to be scaled, but shall be followed with sufficient accuracy to coordinate with other work and structural limitations.

14. Work installed in a manner contrary to that shown on the drawings shall be removed and reinstated when so directed by the Architect. Discrepancies and questionable points shall be immediately reported to the Architect for clarification.

G. Modification of Contract Drawings:

1. In the event that substitute materials or equipment will require, for proper installation, changes to the design as indicated on the Contract Drawings, appropriate proposed revision drawings in an approved format shall be submitted for review.
Such drawings shall be sufficiently complete for the proper installation of the proposed substitute materials or equipment and for construction by all interested trades of the proposed revisions to the Contract Documents.

2. The cost of the drawings, cost of drawing checking, and approval by all legally constituted authorities having jurisdiction shall be borne by the Contractor.

H. All provisions shall be deemed mandatory except as expressly indicated as optional by the work “may” or “option”.

I. Contractor shall verify, at the site, the location of all existing equipment, ductwork, piping, utilities, panel boards and partitions affecting the installation of new work.

1.11 INSTALLATION OF THE WORK

A. Installation of mechanical work shall be coordinated with the Project Construction Schedule. The contractor shall be totally responsible for coordinating the layout of all building elements to avoid conflict of the work of the structural, mechanical, electrical systems, and architectural features of the building. The cost of any extra work of any kind caused by a conflict due to this lack of coordination, shall be borne by the Contractor.

1. Before proceeding with the work, the Contractor shall examine all Contract Documents, check and verify all dimensions and sizes that may affect the fitting of his materials and equipment to other parts of the equipment, structure and work of other Divisions.

2. Work installed, which interferes with the work of other trades, shall be removed and reinstalled at the Contractor’s expense when so directed by the Architect.

3. It shall be understood that no extras to the Contract will be permitted to accomplish the above results.

4. Notify the Architect of points of conflict between the work and that of other trades so that the conflict may be properly adjusted.

5. Coordinate mechanical systems, equipment, and materials installation with other building components.

6. Verify all dimensions by field measurements.

7. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.

8. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.

9. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.

10. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.

11. Coordinate connection of mechanical system with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide
required connection for each service.

12. Install systems, materials, and equipment to conform to approved submittal data, including coordination drawings, to greatest extend possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.

13. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.

14. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components, where installed exposed in finished spaces.

15. Install access panel or doors where units are concealed behind finished surfaces.

16. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specific slope.

B. Coordinate field details with other trades to avoid construction delays and maintain required clearances.

1. Equipment bases and supports: Furnish certified details and drawings for approval before fabrication. Furnish all parts necessary for each base, sub-base and support.

2. Roof, wall and floor openings: Furnish shop drawings showing exact locations and sizes of openings through roofs, walls and floors.

3. When changes in size of equipment bases and pads result in additional design and construction costs, such costs shall be borne by Contractor.

4. Moving of equipment: Investigate each space through which equipment must be moved. Where necessary, equipment shall be shipped from manufacturer in crated sections of size suitable for moving through restricted spaces available.

C. Prepare and provide coordination drawings in accordance with Division 1 to a scale of ¼" = 1'-0" or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination for the installations are of importance to the efficient flow of the work, including but not necessarily limited to the following:

1. Indicate the proposed locations of piping, ductwork, equipment, and materials. Include the following:
   a. Clearances for installing and maintaining insulation.
   b. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
   c. Equipment for connections and support details.
   d. Fire-rated wall and floor penetrations.
2. Prepare reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication systems components, sprinklers, and other ceiling-mounted items.

3. No extras will be allowed for changes made necessary by interference with work of other trades. Areas of limited clearance shall be laid out to 1/4" = 1'-0" scale with all ducts, pipes, conduits, beams, etc., shown and shall be signed by the General Contractor’s superintendent on the job.

D. Examine other Divisions for work related to the work of this Division, especially Division 26 Electrical and Direct Digital Control (ISAC Control) for HVAC.

E. Rough-In

1. Verify final locations of rough-ins with field measurements and with the requirements of the actual equipment to be connected.

2. Refer to equipment specifications in Divisions 2 through 16 for rough-in requirements.

F. Delivery and Storage:

1. All material shall be delivered to the site with all labels intact and identified to permit check against approved material lists and for shop drawings. Lost or damaged materials and equipment will be replaced by new at no increase in contract cost. Damaged factory applied finishes supplied with final finish under this division shall be refinished as approved by the Architect, employing workmen skilled in the work involved. Finishing materials shall be obtained from the equipment or materials manufacturer.

2. Protect materials against dirt, water, chemical and mechanical damage both while storage and during construction.

G. Substitution of materials and equipment:

1. Where no specific make of material or equipment is mentioned, appropriate products of approved manufacturers may be used, providing they conform to the requirements of the system.

2. Materials and equipment may be followed by phrases "similar to", "equal to", "as approved equal". In the cases, if the Contractor desires to use any other brand or manufacturer of the same quality, appearance and utility to that specified, the Contractor shall comply with the general conditions Section 01 60 00 requirements and other sections of specifications as applicable.

3. Complete technical data including drawings, performance specifications, cost data and tests of the article proposed for substitution, including the reason for substitution.

4. Complete breakdown of costs, indicating the cost differential to the Contract if the proposed substitution is accepted.

5. Statement by the Contractor that the proposed substitution is in full compliance with the Contract Documents and applicable codes.
6. List of other trades which may be affected by the substitution.

7. The Contractor shall be responsible for any effect upon related work of any substitution and shall bear any additional costs generated by any substitutions, including the costs of the Architect/Engineers' additional services thereby made necessary.

8. Acceptance of no exceptions taken by the engineer on any substitution proposed by the contractor shall not be construed as relieving the contractor from compliance with the project's specifications and performance requirements nor departure therefrom. The contractor remains responsible for details and accuracy for confirming and correlating quantities and dimensions and for the selection of fabrication processes, techniques and assembly, coordination of his work with that of all other trades and making any needed modifications consequent to the substitution at his own cost and for performing the work in a safe manner. There will be no temperature control substitution. The Building standard is ISAC Control.

1.12 OPENINGS, CUTTING AND PATCHING

A. Openings have been indicated on the Architectural Drawings, additional openings or holes required for the Work of this Division and cost of same is an obligation to this Division.

1. Openings, cutting and patching to be in accordance with that specified under Architectural specifications.

2. At a time in advance of the work, verify the openings indicated on Architectural and Structural Drawings. If the work of this Division requires such, furnish new instructions as to requirements for these openings, subject to approval by the Architect.

B. Additional cutting and patching and reinforcement of construction of building, required under the work of this Division, subject to approval by the Architect, to be performed under the Division of the Specification covering the particular materials, and the cost of same shall be an obligation to this Division.

C. Core drilling of floor slabs and concrete walls for passage of pipes, where authorized by the Architect, shall be per building standard specifications.

1.13 SUBMITTALS

A. Before starting work, the Contractor shall furnish for the approval of the Architect, shop drawings and itemized equipment lists, complete in all details that he proposes to install. All items shall be submitted at the same time. Conform to Division 01.

B. Submittals must be specific to this project with respect to model number, capacities, performance, etc., generic submittals will not be accepted.

C. Submittals shall include, but not necessarily be limited to the following which are
mandatory:

1. Draw Equipment Layouts to ¼" scale, including equipment, piping accessories, and showing clearances for operating and servicing.
2. Schedule of pipe, fittings, valves, with manufacturer and catalog number.
3. Specialties, valves, gauges and thermometers of all types.
5. Earthquake supports and calculations.
6. Insulation.
7. Ventilation and air conditioning equipment, specialties and the air control systems.
8. Fans, fan characteristic curves, fan tests.
10. Shop fabrication drawings and installation drawings of ductwork and piping layouts. Submit for approval prior to fabrication. Drawings shall indicate dimensions from bottom of piping and ductwork to finish floor level.
11. Wiring diagrams, control panel board, motor starters and controls for electrically operated equipment furnished by mechanical trades.
12. Automatic control system diagrams.
13. Exhaust, supply and return fans.
15. Hangers, inserts, supports, anchors.
16. Pipe, fittings and specialties.
17. Pipe isolators.
18. Roof flashing.
20. Shop fabrications drawings and calculations.
21. Approved seismic drawings and calculations for applicable piping equipment, or as required by ORS/DSA.
22. Special and miscellaneous products furnished under this section and not listed herein.

1.14 RECORD DRAWINGS AND MANUALS

A. Record Set During the Work: At site, maintain at least one set of Drawings as a Field Record Set. Also maintain at least one copy of all Addenda, Modifications, approved submittals, correspondence, and transmittals at site. Keep Drawings and data in good order and readily available to Architect and Owner.

B. Changes: Clearly and correctly mark Record Drawings to show changes made during the construction process at the time the changed work is installed. No such changes shall be made in the work unless authorized by the Architect.

C. Final Record Drawings: Conform to Division 01 requirements.

D. Preparation of Final Record Drawings: Contractor shall transfer recorded changes in the work indicated on the Field Record Set to the record set. Changes shall be neatly and clearly drawn and noted by skilled draftsmen, and shown technically correct.
E. Approval: Prior to Architect's inspection for Substantial Completion, submit the Final Record Drawings to the Architect for review, and make such revisions as may be necessary for Final Record Drawings to be a true, complete, and accurate record of the work.

F. Manuals: Obtain data from the various manufacturers and submit instruction, operation, and maintenance manuals as required and to the extent required under other Sections.

G. Contents: Each manual shall have an index listing the contents. Information in the manuals shall include not less than:

1. General introductions and overall equipment description, purpose, functions and simplified theory of operation.
2. Specifications
3. Installation instructions, procedures, sequences, and precautions, including tolerances for level, horizontal and vertical alignment.
4. Grouting requirements.
5. List showing lubricants for each item of mechanical equipment and recommended lubrication intervals.
6. Start-up and beginning operation procedures.
7. Operational procedures.
8. Shutdown procedures.
9. Maintenance and calibration procedures
10. Parts lists
11. Name, address and telephone number of each manufacturer's local representative.

H. Manual Submittals: Unless otherwise specified, each submittal shall include two copies of each manual, one of which will be returned to the Contractor, marked to show the required review. When approved, deliver four copies to Architect unless otherwise specified.

I. "As-Built" drawings of ductwork and piping, including all elbows, transitions, damper and valve locations shall be provided prior to commencement of air and water balance.

1.15 STANDARDS

A. Compliance shall be in conformance with the requirements of Architectural Specifications. Submit proof of material and equipment conformance to the requirements of Regulations and Standards. The label or listing of the specified agency will be acceptable evidence. In lieu of the label or listing, the Contractor may submit a written certificate from an approved, nationally recognized testing organization, adequately equipped and competent to perform such services, verifying that the items have been tested and that the work conforms to the Regulations and Standards, including the methods of testing utilized by the testing agency.

1.16 QUALITY OF EQUIPMENT, MATERIALS AND WORKMANSHIP
A. Unless otherwise specified, equipment and materials used in the installation shall be new and in perfect condition when installed. Articles provided for the same general purpose or use shall be of the same make. Workmanship shall be of the best quality and none but competent mechanics skilled in their trades shall be employed. Furnish the services of an experienced superintendent, who shall be constantly in charge of the work, together with all necessary journeymen, helpers and laborers required.

1.17 MATERIALS AND EQUIPMENT

A. Provide products by manufacturers regularly engaged in the manufacture of similar items with an acceptable history of successful production and ability to render competent and thorough technical services and spare parts through local organizations.

1. Provide the names and addresses of the nearest service and maintenance organization and spare parts supplier.
2. Discontinued models will not be accepted by the owner even if that model was specified. The architect must be immediately notified if there is a conflict in this matter.

B. Materials and equipment shall be guaranteed by the manufacturer to equal or exceed specified, submitted and published ratings. Equipment specified by manufacturer's number shall include all accessories, controls and devices listed in manufacturers catalog as standard with the equipment.

C. Provide a complete working installation with all equipment called for in proper operating conditions. Drawings and Specifications do not undertake to list every item or device of equipment to be installed. When an item or device is necessary for the operation of the equipment shown or specified, the items or devices shall be provided with the equipment which will allow the system to function properly.

1.18 SEISMIC DESIGN

A. Contractor shall be responsible for anchors and connections of mechanical work to the building structure including calculations for approval by ORS/DSA, as applies, for items or work, where approval by ORS/DSA is deferred or where alternate support or anchorage detail is proposed to prevent damage as a result of an earthquake, including manufactured equipment, the connection and integrity of shop fabricated and field fabricated materials and equipment. The anchorage of all pipes, ducts, conduits, fixtures, equipment, etc. shall withstand the lateral forces and shall accommodate calculated building displacement as required by the California Building Code, and local city/county codes. (Building equipment and connections therefore shall be designed to resist lateral seismic forces equal to 1.0 of equipment weight to working allowable stress. Cantilever posts supporting equipment shall be designed to resist lateral seismic forces equal to 0.5 of equipment weight to allowable working stress. Conform to the following:

1. In accordance with Title 24, 2007 CBC Section 1632A and Table No. 16A-O, details
shall be provided for the seismic anchorage of all mechanical and electrical equipment, anchorage details shall be based upon appropriate design calculations.

2. For equipment weighing 400 pounds or more anchorage details and appropriate design calculations shall be submitted as part of the mechanical and electrical drawings. “Deferred Approval” items will not be permitted unless specifically approved by the plan check supervisor.

3. **Exception:** Attachments of equipment weighting less than 400 pounds and supported directly on the floor or roof structure, furniture, or temporary or movable equipment and equipment weighing less than 20 pounds that is supported by vibration isolation devices suspended from the roof, wall or floor, need not be detailed on the plans provided the following notes are included on the mechanical and electrical plans.

4. The seismic anchorage of mechanical and electrical equipment shall conform to C.C.R. Title 24, 1998 CBC Section 1632A and Table 16A-O. Anchorage details for roof/floor-mounted equipment shall be shown on plans.

### 1.19 SHOP DRAWINGS, MATERIAL LISTS AND SUBMITTAL DATA

**A. Comply with the requirements:**

1. Material list: 8 copies of a complete list of material and equipment, tabbed and according to main areas of work, shall be submitted to the Architect within 30 days after award of Contract. Submission shall include manufacturers’ names, catalog numbers and other data necessary for identification. 5 copies will be returned to the Contractor. If corrections are required, 6 additional copies shall be resubmitted within 15 days. No material or equipment is to be delivered to the job site until material lists have been reviewed by the Architect. Contractor shall note all items that replaced discontinued models or items.

2. Submittal data: Printed catalog material and brochures covering equipment and material shall be submitted as follows: 8 copies shall be submitted for review; 5 copy shall be returned to the Contractor, who shall review the corrections, if so noted, and resubmit 8 copies for final review. Assemble each brochure with tabbed separators for each Specification Section where products are noted to be submitted, with separate tabs for each product label.

3. Three copies of final submittal data will be returned to the Contractor. The Contractor may submit additional copies deemed necessary to correlate the work of other trades.

   a. Submittal data to include complete brochures containing only items specified, indicating names of manufacturers, catalog figure numbers, technical data and requested information on each item.

   b. Submittal data to be referenced to Section number and paragraph numbers of the Specifications, and to fixture and equipment indicated. Brochure not to contain extraneous material not specified.

**B. Shop Drawings:**
1. Submission of shop drawings shall consist of 6 complete sets, one of blue line prints and the other of sepia transparency, indicating the required technical information. One complete set of the sepia transparency will be returned to the Contractor.

2. Shop drawings shall use the same nomenclature indicated on the Drawings and must indicate locations where material or equipment is to be installed.

3. Shop drawings shall be submitted covering equipment, piping and ductwork in each equipment room.

4. Shop drawings shall be coordinated with all other trades covered by Contract Drawings before submission to the Architect.

5. Submit following material with all equipment room shop drawings:
   a. Manufacturer's specifications, including materials, type, performance characteristics and capacity ratings.
   b. Certified dimension drawings, indicating size, component parts and installation details.
   c. Electrical wiring diagram and controls where applicable.
   d. Complete automatic control and wiring diagrams.
   e. Equipment supports.
   f. For items such as valves, hangers and accessories, indicate specific items and where they are to be used.
   g. Supplementary framing including calculations.

6. Equipment and/or materials installed without the Contractor receiving written approval from the Architect are subject to removal and replacement by the Contractor with approved materials, at no additional cost to the Owner, or delay of job progress.

C. Submittals: Unless otherwise specified, specific items for which the following requirements apply and for which submittals are required shall be as specified in each section of Division 15.

1. Manufacturer's Data: Submittals for manufactured items shall comprise manufacturer's descriptive literature, drawings, diagrams, performance and characteristic curves, and catalog cuts. These shall be identified by manufacturer's name, trade name, model or catalog number, name-plate data, size, layout dimensions, capacity, project specification reference, applicable Federal, Military, industry, and technical society publication references, and any other additional information necessary to establish contract compliance. Photographs of existing installation and similar data submitted in lieu of manufacturer's catalog data are not acceptable and will be returned without approval.

2. Shop Drawings: Submit required shop drawings in one complete package. Drawings shall be drawn to a minimum scale of 1/4"; shall be a minimum of 30 x 42 in size; and shall include wiring diagrams, plans, elevations, and sections of equipment and control spaces identifying and indicating proposed and existing locations, layouts, and arrangement of items of equipment, control panels,
accessories, piping, ductwork, and any other items that must be shown to assure
a coordinated installation. Wiring diagrams shall identify circuit terminals, and
indicate the internal wiring for each item of equipment and the interconnection
between each item of equipment. Indicate adequate clearances for operation,
maintenance, and replacement of operating equipment and devices. If any
equipment is disapproved, revise drawings to show acceptable equipment
resubmitted.

3. Standard Compliance: Where equipment or materials are specified to conform with
requirements of standards of recognized technical or industrial organizations
such as Notional Electrical Manufacturers Association, American Society for
Mechanical Engineers (ASME), Underwriters' Laboratories (UL), American Gas
Association (AGA), or American Refrigeration Institute (ARI), that use a label or
published listing as a method of indicating compliance, proof of such
conformance shall be submitted and approved. The label or listing of the
specified organization will be acceptable evidence. In lieu of the label or listing,
submit a certificate from an independent testing organization of suitable
competence, stating that the item has been tested and found to conform to the
specified standard.

4. Certificates of Conformance of Compliance: Certifications shall be in the original
and not pre-printed. The certification shall not contain statements that could be
interpreted to imply that the project does not meet all requirements specified,
such as "as good as"; "achieve the same end use and results as materials
formulated in accordance with the referenced publications"; "equal or exceed the
service and performance of the specified material". The certification shall simply
state that the product conforms to the requirements specified.

5. Certified Test Reports: Certified Test Reports are reports of tests conducted on
previously manufactured materials or equipment identical to that proposed for
use. Before delivery of materials and equipment proposed for use, results of the
tests shall be submitted in accordance with the requirements for laboratory test
results of this Contract.

6. Factory Tests: Factory tests are tests required to be performed on the actual
materials or equipment proposed for use. Submit results of the tests in
accordance with the requirements for laboratory test results of this Contract.

7. Permits and Certificates of Inspection: Furnish the originals.

8. Testing procedures and test results required in this and other sections.

9. Other data required by other sections of this Division.

D. Submit for review only the specific items required in this section or other Sections of
Division 23.

E. Submittal materials will be reviewed for substantial conformity with the intent of the
contract plans and specifications only. Such review does not indicate approval of
dimensions, quantities, coordination with other trades, or work methods of the
contractor, which are indicated thereon.

F. Additional copies may be required by individual sections of these specifications.
G. Within thirty (30) days after the award of Contract and prior to executing any fabrication or installation, the Contractor shall prepare and submit to the Mechanical Engineer for review and approval, complete Division 15 Shop Drawings and Submittals for the Project. This shall include HVAC and Plumbing disciplines under the scope of Division 15.

H. All submittals shall be bound in a neat ring type binder form and shall contain a complete list, in index form for all equipment and materials proposed for use on the Project. All submittals shall be complete as one package and submitted at one time. Partial or incomplete submittals will not be reviewed and will be returned to the Contractor rejected for re-submittal.

I. All information contained in the Submittals and Shop Drawings shall be properly identified by reference number to the item number of paragraphs in the Contract Specifications and Drawing Equipment Schedules. Any deviation or substitution shall be clearly identified on the submittal page and noted as such.

J. All Equipment or materials fabricated or installed prior to obtaining the Mechanical Engineers Shop Drawing and Submittal review and approval are at the Contractors own risk. The Contractor, at his own expense, shall be responsible for correcting and / or removing all work installed or fabricated prior to obtaining Shop Drawing and Submittal approvals.

K. In the event the Contractor obtains the Mechanical Engineers approval for equipment other than that described herein, the Contractor shall, at his own expense, make all required changes in the supporting structures, buildings, related trade costs, and piping necessary to accommodate the substituted equipment. Complete Record Drawings shall be furnished to the Mechanical Engineer indicated all details of the installation.

L. The following list is the minimum Shop Drawing and Submittal package that the Contractor shall prepare and submit to the Mechanical Engineer for review and approval. The Project Shop Drawings and Submittals shall be complete in every aspect as described in the paragraphs above. Partial or incomplete submittals will not be reviewed and will be returned to the Contractor rejected for re-submittal.

1. The installing Contractor shall prepare and submit for approval the following Shop Drawing and Submittal package as part of the Scope of Work for Division 26, HVAC:
   a. Prepare prior to fabrication and installation, complete field coordinated installation Shop Drawings for each discipline included in Division 15 Scope of Work in this Project.
   b. All Shop Drawings shall be prepared using the manual drafting method or using the latest release of AutoCAD 2008. Contractor submitted hand sketches are not acceptable and will be returned to the installing Contractor rejected.
   c. All Shop Drawings prepared by the Contractor shall be prepared in ¼ -
inch. No exceptions.

d. Submission of shop drawings shall consist of 6 complete sets, one of blue line prints and the others of sepia transparency, indicating the required technical information. One complete set of the sepia transparency will be returned to the contractor.

e. The Contractors Shop Drawings shall detail all equipment and piping systems including installed dimensions and elevations. All Shop Drawings shall be complete in every respect prior to submittal to the Mechanical Engineer.

f. The re-use of the Mechanical Engineers construction drawings for the preparation of the installing Contractors Field Shop Drawing Submittal is not acceptable.

g. It shall be the responsibility of the Contractor to submit copies of the final approved and coordinated Field Shop Drawings to all other trades for coordination with their work so that grouped pipes, ducts, and conduit will not interfere with each other.

2. Submit complete HVAC equipment and accessory submittals for each and every piece of equipment installed on the Project including:

a. Air Conditioning Units – supply fan data, economizer data, dimensioned arrangement drawings, air aide performance data, refrigeration system tonnage and performance data, motor horsepower(s), voltage, and factory supplied accessories.

b. Exhaust Fans Systems – complete manufacturer computer selections, dimensioned arrangement drawings, fan curves and motor horsepower, voltage, and factory supplied accessories.

3. Submit complete HVAC ductwork and accessory submittals for all systems installed on the Project including:

a. Supply, return, exhaust, and fresh air ductwork including rectangular duct gauges and joint methods, round duct type, duct gauge, and joint methods, duct fittings – rectangular and round, duct joint sealing method, supports and seismic bracing details.

b. Duct system appurtenances including fire damper assemblies, fire / smoke damper assemblies, manual volume dampers – round and rectangular ducts, flexible ductwork, register boxes, turning vanes, housings and plenums, roof flashing, and duct instrument test ports.

c. Air distribution products including supply diffusers, return / exhaust registers, mounting frames, and manual dampers.

d. Duct insulation and duct liner including proposed thickness, R-Value for each type, manufacturer & model and installation methods.

e. Ductwork vibration isolation including fabric connections at each unit or where passing through building seismic separations where specified herein.
4. Submit complete HVAC, and accessory submittals for all systems installed on the Project including:

   a. Complete piping submittals including piping material – schedule & type and ASTM grade, pipe fittings - type and ASTM grade, joint methods, supports and seismic bracing details.
   b. Piping system appurtenances and accessories including each type of valve(s), – grade, rating, catalog number and manufacturer.
   c. Piping system specialties including thermometers with separable wells, pressure gauges, automatic air vents, Pete’s Plugs, circuit balancing valves, strainers, check valves, plug cocks, and butterfly valves.
   d. Pipe insulation including proposed thickness, R-Value for each type, rigid inserts, manufacturer & model and installation methods.
   e. Piping vibration isolation including flex connections at each unit or where passing through building seismic separations where specified herein.
   f. Piping installation appurtenances including sleeves, fireproofing, caulking, waterproofing, roof flashing and escutcheons.

1.20 CLOSING-IN OF UNINSPECTED WORK

A. Contractor shall not allow or cause any of the work to be covered up or enclosed until it has been inspected, tested and approved by the Architect and proper inspector. Should any of his work be covered up or enclosed before such inspection and test, he shall, at his own expense, uncover the work and after it has been inspected, tested and approved, make all repairs with such materials as may be necessary to restore all his work and that of other trades to its original and proper condition.

1.21 EQUIPMENT SUPPORTS

A. Furnish and install necessary steel supports and seismic restraints for fans, coils, receivers, tanks, piping and other equipment for a complete installation and as approved by the Architect. Supports shall be painted with one coat of rust-preventative paint after installation under work of this Division.

1.22 SUBSTITUTIONS AND CHANGES

A. The design has been based on data from certain manufacturers, suitable for each application. Recommendations for alternative manufacturers are made for each product, except when "no substitutions permitted" is indicated.

B. It is the intent of the Owner to have this project constructed with materials, products and system originally designed and specified into the project.

C. Alternatives that may require the modification, realignment and/or adjustment of other associated components, including impact on other trades, shall be accomplished at no additional cost or time to the contract and shall have the approval of the Architect.
D. Substitutions shall be submitted addressing all features listed in the specifications. Features that deviate from the plans and specifications shall be clearly identified including justification for deviations. TTG Engineers will review initial submittal on substitutes only. Subsequent submittals made to correct deficiencies in original submittals will be reviewed at Contractor's expense based on TTG Engineer's hourly rate for engineering services.

E. Should the Contractor elect to propose substitutions for the Owner's interest, the substitutions shall be in compliance with the Architectural Division.

F. Acceptance or no exceptions taken by the engineer on any substitution proposed by the contractor shall not be construed as relieving the contractor from compliance with the project's specifications and performance requirements nor departure there from. The contractor remains responsible for details and accuracy for confirming and correlating quantities and dimensions and for the selection of fabrication processes, techniques and assembly, coordination of his work with that of all other trades and making any needed modifications consequent to the substitution at his own cost and for performing the work in a safe manner.

1.23 APPROVALS

A. The Architect will have the right to accept or reject equipment, materials, workmanship, tests and determine when the Contractor has complied with the requirements herein specified.

1.24 SELECTION AND ORDERING OF EQUIPMENT AND MATERIALS

A. Immediately after award of the Contract and after the approval of submittals by the Architect, the Contractor shall arrange for the purchase and delivery of equipment and materials required, in ample quantities and at the proper time. He shall deliver to the Architect a complete list of equipment and materials ordered, giving descriptions, plate numbers, brochures, name of the wholesalers, date of the orders and approximate delivery dates.

1.25 LOCATIONS AND ACCESSIBILITY

A. Drawings show pipe and ductwork diagrammatically. Conform to Drawings as closely as possible in layout work. Vary run of piping, run and shape of ductwork and make offsets during progress of work as required to meet structural and other interferences as approved by Architect. Install piping and ductwork to best suit field conditions after coordinating with other trades. Run exposed piping and ductwork parallel to, or at right angle to, building walls. Keep horizontal lines as close to bottom of structures as possible. Conform to ceiling heights established on Drawings.

B. Install equipment in such a manner as to be readily accessible for maintenance and repairs. Install piping, ducts and conduit in such a manner as to preserve headroom, avoid obstructions and keep openings and passageways clear.
C. Installation at valves, thermometers, gauges, cleanouts, dampers, controls, and water specialties, duct access doors or any other indicating equipment or specialties requiring reading, adjustment, inspection, maintenance shall be conveniently and accessibly located with reference to the finished building.

D. Where wall and ceiling access doors are required but not shown, such doors shall be furnished under other sections and as directed by the Architect. Coordinate this requirement with appropriate trade.

E. If changes in the indicated locations or arrangements are required, they shall be made without additional charges.

F. In an existing area, where required, remove, reinstall, reconnect or replace, etc., any existing work to accommodate new work without any additional cost to the Owner. Material shall match existing, unless otherwise specified or approved in writing by the Architect.

G. Provide sheaves and belts if required, to Test, Adjust and Balance Agency, to allow air moving equipment to meet flow requirements specified at no additional cost to the Owner.

1.26 COORDINATION OF TRADES

A. Contractor shall coordinate all trades in the interest of obtaining the most practical overall arrangement of equipment, piping, conduit, and ducts and to maintain maximum headroom and accessibility.

B. No extras will be allowed for changes made necessary by interference between trades.

C. Submit Composite Drawings in accordance with Special Conditions. Include dimensioned plans, elevations, sections and details and give complete information particularly as to the kinds and types of materials and equipment, size and location of sleeves, inserts, attachments, chases, openings, conduits, ducts, boxes, lighting, structural interferences. Coordinate these Composite Drawings and field layouts in the field for proper relationship to work of applicable trades based on field conditions. Contractor shall have competent personnel readily available for coordinating, checking, and supervision of field layouts. The procedures for submittals and resubmittals, and final distribution shall be as specified in Division 01. Do not start installation of work involved under Composite Drawings until the Architect reviews applicable submittal. Discrepancies between the Drawings and Composite Drawings shall be specifically noted and identified on the Composite Drawings. Drawings for the various trades involved shall be submitted as required and reviewed prior to preparation of Composite Drawings.

1. Equipment Foundations and Bases: Furnish certified details and drawings for approval before fabrication. Furnish parts necessary for each foundation subbase and support.
2. **Pipe Sleeves and Inserts:** Furnish and install pipe sleeves and pipe support inserts before concrete is poured.

3. **Roof, Wall and Floor Openings:** Furnish Shop Drawings showing exact locations and sizes of openings through roofs, walls and floors.

4. **Concrete:** Conform to Concrete Section of the Specifications.

### 1.27 GUARANTEES

**A.** Contractor shall guarantee workmanship, equipment and materials installed under his contract for a period of not less than one (1) year from the date of Substantial Completion. Should any defects occur during this period, the Contractor shall promptly repair or replace the defective item and any other damage caused to the building free of charge to the Owner, including cost of labor and materials.

**B.** Guarantee included in this section to cover:

1. Faulty or inadequate design of equipment or material installed.
2. Improper assembly or erection.
3. Defective workmanship or material.
4. Incorrect or inadequate operation or other failure.

**C.** He shall guarantee the complete and perfect operation of the entire system and that equipment will be supported in such a way as to be free of objectionable vibration and noise.

**D.** Furnish the parts and labor to replace any items found to be defective in the refrigeration equipment within the guarantee period.

**E.** In addition to other guarantees, furnish free maintenance for the refrigeration equipment, including replacement of refrigerant and oil, for a period of one (1) year. This shall include regular monthly maintenance and "On Call" service if required.

**F.** For equipment bearing a manufacturer's warranty in excess of one year, furnish a copy of the warranty to the Owner, who shall be named as beneficiary.

### 1.28 PROTECTION OF EQUIPMENT AND MATERIALS

**A.** Provide adequate storage facilities for equipment and materials on the site and shall make provisions to protect such materials and equipment from damage.

### 1.29 CLOSING-IN OF UNINSPECTED WORK

**A.** Contractor shall not allow or cause any of the work, specifically ductwork and piping, to be covered up or enclosed until it has been inspected, tested, and approved by the Architect. Should any of work be covered up or enclosed before such inspection and test, he shall at his own expense, uncover the work and after it has been inspected,
tested, and approved, make repairs with such materials as may be necessary to restore work to its original and proper condition.

1.30 EQUIPMENT LABELS

A. Equipment provided under this Section shall be provided with the manufacturer's metal identification labels attached to each individual piece of equipment showing complete performance characteristics, size, model and serial number.

1.31 PRELIMINARY OPERATION

A. Should the Owner request that any portion of the plant, apparatus, or equipment be operated for the Owner's beneficial use prior to the final completion and acceptance of the work, the Contractor shall conform to Beneficial Occupancy Provisions of the General Conditions. Such operation shall be under the supervision and direction of the Contractor. Such preliminary operation shall not be construed as an acceptance of any of the work.

1.32 ELECTRICAL WORK

A. Coordinate with Division 26 in making the line and low voltage electrical connections and be responsible for the operation of the equipment furnished under this section.

B. Voltage for electrical work will be included in Division 26. However, any control wiring which is required that is not shown on the control diagram shall be as described under this Section. In the event that the Contractor chooses to provide equipment that requires extra expense in the power or control wiring, he shall pay additional electrical costs.

C. Safety switches, starters, circuit breakers, unless provided as a portion of package equipment, and the electrical connections of mechanical equipment to the electrical power service shall be provided under Division 26.

D. Interconnecting wiring, safety switches, relays, controllers and motor starters which are integral components of packaged equipment shall be provided as an integral part of that equipment.

E. All interconnecting power wiring and conduits shall be provided by Division 26.

F. Control wiring shall be provided by Division 23, unless otherwise indicated on the drawings.

G. Conduit for control wiring shall be provided by Division 26.

H. All motors, power driven equipment and automatic control equipment, except motor starters as hereinafter set forth required and connected with the work of this section of the specifications are to be furnished and installed under Division 26.
I. All control low (24V) wiring conduits, CAC furnished by Division 26. Line (120V) voltage wiring, conduit and related switches and relays required for the automatic control and/or interlock of motors and equipment including final connection, are to be furnished and installed Division 15. Materials and installation to conform to Class 1 or 2, CCR Title 24, Article E725, and as restricted under the Division 26 Electrical of these specifications.

J. Power wiring, conduit, outlets, disconnect switches and motor-rated contractors, and making of final connections, except as hereinafter specified, are to be furnished and installed under the Division 26 Electrical of the specification.

K. Identify circuits and equipment as outlined in the Electrical section of these specifications.

L. Coordinate requirements for underground conduit only between buildings for control interlocks shown on the drawings. This conduit to be furnished and installed under Division 26 of these specifications.

M. Starters and disconnects will be provided under Division 26, unless otherwise noted.

N. All line voltage control wiring and conduits shall be provided under Division 26 – Electrical.

O. All control wiring and installation shall be the responsibility of Division 23.

1.33 SUPPLEMENTARY FRAMING

A. Provide supplementary framing required for attachment of hanger, supports and anchors. Fasten supplementary framing to structure in an approved manner. Supplementary framing of structural angle iron, channels and "I" beams properly designed to carry the weight of piping and its contents and to withstand any thrust exerted by the expansion or contraction of the piping.

B. Submit details of hangers, anchors, supplementary framing including the proposed method of fastening of supplementary framing to the base building structure and calculations used in determining the proposed fastening method.

C. Structural work shall conform to applicable building codes.

D. Paint supplementary framing with one coat of rust-preventive paint after installation under work of this Division.

1.34 ADDITIONAL BALANCING DEVICES

A. Provide any additional apparatus, devices or equipment that may be required to completely balance all the air and hydronic systems. Such apparatus, devices or equipment shall be included in the work at no additional cost to the Owner.

1.35 DELIVERY, HANDLING, STORAGE OF MATERIALS, PROTECTION OF WORK
A. Properly store, adequately protect, and carefully handle equipment and materials to prevent damage before and during installation as recommended by the manufacturer and as approved by the Architect. Items determined to be damaged or defective shall be replaced at no cost to the Owner. Determinations of the Architect shall be final.

B. Cover materials in such a manner that no finished surfaces will be damaged, marred or splattered with plaster or paint, and all moving parts will be kept clean and dry.

C. Replace or refinish any damaged materials including fronts of control panels, ductwork fittings, and shop-fabricated ductwork.

D. Keep cabinets and other openings closed to prevent entry of foreign matter.

E. Refer to other sections of this Division for additional requirements.

1.36 STANDARD PRODUCTS

A. Materials and equipment shall be essentially the standard catalogued products of manufacturers regularly engaged in production of such materials or equipment, and shall be their latest standard designs that comply with the Specification requirements. Materials and equipment shall duplicate items that have been in satisfactory commercial or industrial use at least two years prior to bid opening. Where two units of the same class of equipment are required, these units shall be products of a single manufacturer. The components thereof, however, are not required to be exclusively of the same manufacturer. Each major component of equipment shall have manufacturer's name, address, model and serial number on a nameplate securely affixed in a conspicuous place. The nameplate of the distributing agent will not be acceptable.

1.37 SAFETY REQUIREMENTS

A. Belts, pulleys, chains, gears, couplings, projecting setscrews, keys, and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded. High temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of a type specified herein. Provide items such as catwalks, ladders, and guard rails where required for safe operation and maintenance of equipment.

1.38 MANUFACTURER'S RECOMMENDATIONS

A. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material or equipment being installed, furnish printed copies of these recommendations to the Architect prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

1.39 OPERATION AND MAINTENANCE MANUAL
A. Furnish an operation and maintenance manual covering the stipulated mechanical systems and equipment as follows. Seven copies of the manual, bound in the hardback binders or an approved equivalent, shall be provided to the Owner and one copy to the Architect. Furnish one complete manual prior to the time that system or equipment tests are performed. Furnish the remaining manuals before the contract is completed. The following identification shall be inscribed on the cover:

1. Operation and Maintenance Manual
2. Building Number
3. Contractor
4. Contract Number

B. Provide a table of contents. Insert tab sheets to identify discrete subjects. Instruction sheets shall be legible and easily understood, with large sheets of drawings folded in. The manual shall be complete in all respects for all equipment, controls, accessories and appurtenances stipulated. Include as a minimum the following:

1. System layout showing piping, valves and controls.
2. Wiring and control diagrams with data to explain detailed operation and control of each component.
3. A control sequence describing start-up, operation and shutdown.
4. Detailed description of the function of each principal component of the system.
5. Procedure for starting.
6. Procedure for operating.
7. Shutdown instructions.
8. Installation instructions.
10. Lubrication schedule including type grade, temperature range and frequency.
11. Safety precautions, diagrams and illustration.
12. Test procedures.
13. Performance data.
14. Parts lists, with manufacturer's names and catalog numbers.
15. Preventive maintenance schedule.
16. Service organization with name, address and telephone number.
17. Valve identification chart and schedule.
18. ASME certificates.
19. Air balance report.

C. Provide operation and maintenance manuals for all mechanical and electrical equipment. Product videotaped instructions during the training period for operating personnel at the time of final inspection using factory startup engineers to show adjusting, calibrating, testing, operating and servicing procedures for all systems.

1. Furnish four (4) complete sets of videotaped cassettes or compact discs (CD) for each system and the equipment requiring the instructions.
2. Contractor shall use the videotaped instructions during the training period for the
1.40 POSTED OPERATING INSTRUCTIONS

A. For each designated system or equipment item, provide instructions for guidance of operating and maintenance personnel. Following approval of content, prepare these instructions in a form and scale that will be readily legible when displayed in appropriate locations, to be designated by the Owner. Meet the following requirements:

B. For each system, include diagrams of equipment, piping, ductwork, wiring and controls. Define control sequences.

C. For each equipment item, include starting, adjustment, operation, lubrication, safety precautions and shutdown. Identify procedures to be performed in event of equipment failure. Provide other instructions recommended by the manufacturer.

D. Make final copies impervious to deterioration from exposure to sunlight. Physically protect such copies by mounting them in glazed frames, by plastic lamination, or by engraving in metal or laminated plastic. For outside locations, protection shall be weatherproof. Attach to structure or equipment as directed.

1.41 INSTRUCTIONS TO OWNER PERSONNEL

A. When specified in other sections or herein, the Contractor shall furnish, without additional expense to the Owner, the services of competent instructors who will give full instruction to the designated personnel in the adjustments, operation, and maintenance, including pertinent safety requirements, of the equipment or system specified. Each instructor shall be thoroughly familiar with all parts of the installation, and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Owner for regular operation. The number of man-days of instruction are specified, approximately half of the time shall be for classroom instruction. All other time shall be used for instruction with the equipment or system. When significant changes or modifications in the equipment or system are made under the terms of the contract, provide additional instruction to acquaint the operating personnel with the changes or modifications.

B. The following systems and equipment shall be required to be furnished with operating instructions videocassette and number of hours training:

1. Air conditioning system, man-day (8 hours).
2. Direct-Digital Control System per HVAC Drawings (minimum 16 hours).

1.42 SPARE PARTS AND TOOLS

A. Contractor shall furnish difficult-to-obtain manufacturer unique spare parts upon contract completion.
B. Contractor shall furnish any special tools required to service equipment with the equipment. Provide a lockable metal toolbox to secure tools.

1.43 WARRANTY

A. In addition to requirements of the Conditions of the Contract, warrant all equipment, ratings, capacities, motor HP, etc., to produce the specified and indicated performance at an elevation of the project site above sea level.

1. Refer to Division 01 for procedures and submittal requirements for warranties. Refer to individual equipment specifications for warranty requirements.

2. Contractor shall guarantee all workmanship, equipment and materials installed under his contract for a period of not less than one year from the date of acceptance of the installation. Should any defects occur during this period, the Contractor shall promptly repair or replace the defective item and any other damage caused to the building free of charge to the Owner, including cost of labor and materials.

3. Where periods more than one year are specified in the specifications, such longer periods shall govern. However, when any component fails at any time during this period, the warranty period for such component and all other components which are inactive because of said failure shall be suspended. The warranty period for such components shall resume to run for the remaining portion of this warranty period when failed components are completely repaired and in operation; however, in no case shall the resumed portion of the warranty period be less than 3 months in duration.

4. Neither payment for work, nor total or partial occupancy of work by the Owner, within or prior to the warranty period specified, shall be construed as acceptance of faulty work or shall condone any negligence or omission of Contractor in doing the work.

5. Compile and assemble the warranties specified in Division 26, into a separated set of vinyl covered, three ring binders, tabulated and indexed for easy reference.

6. Provide complete warranty information for each item to include product or equipment to include date of beginning of warranty or bond; duration of warranty or bond; and names and addresses, and telephone numbers and procedures for filing a claim and obtaining warranty services.

7. The Contractor shall require that the manufacturer of the chiller shall furnish the parts and the labor to replace any item found to be defective in the refrigeration equipment, within the guarantee period.

8. In addition to other guarantees, the Contractor shall furnish free maintenance for the refrigeration equipment, including replacement of refrigerant and oil, for a period of one year. This shall include regular monthly maintenance and “On Call” service for a period of one year.

B. Warranty start on date of acceptance by the Owner.

1.44 QUALITY OF EQUIPMENT, MATERIALS AND WORKMANSHIP
A. Unless otherwise specified, equipment and materials used in the installation shall be new and in perfect condition when installed. Articles provided for the same general purpose or use shall be of the same make. Workmanship shall be of the best quality and none but competent mechanics skilled in their trades shall be employed. Furnish the services of an experienced superintendent, who shall be constantly in charge of the work, and who will remain on the project through completion together with all necessary journeymen, helpers and laborers required.

1.45 GENERAL REQUIREMENTS

A. Minimum head room for service access aisles shall be 6-feet, 8-inches. Keep the following areas clear:

B. NEC required service areas for electrical equipment,

C. Tube and coil pull areas for,

1. Fire damper and smoke damper access.
2. Accessibility to valves.

D. Provide any code required or service required clearances over equipment.

E. Particular attention shall be paid to noise and vibration control. The extent of sound and vibration control efforts shall be a function of the sensitivity of spaces adjacent to the equipment rooms, whether above, below, or on the same level. For critical applications, AHUs and return fans shall have a maximum noise control (NC) level specified for both breakout sound level and for sound radiated to the space.

F. All mechanical equipment needs to be isolated from the structure with Neoprene pads and/or seismic restraint spring isolators. All piping that is served by rotating equipment of any type should be isolated from the building and suspended. The suspension shall be done with spring hangers selected for size and a static deflection of at least 1 inch.

G. The contractor shall maintain record drawings during course of project and give to Engineer for recording on CADD.

H. Painting is as specified elsewhere.

I. Structural steel used for supporting equipment in fan plenums or outside shall be galvanized.

J. The mechanical contractor shall furnish wall and ceiling access panels to the general contractor for installation. Show final locations of panels on as-built drawings.

1.46 INSTALLATION

A. Workmanship shall be in the best standard practice of the trade.
B. Install equipment in accordance with the manufacturer’s instructions and recommendations unless otherwise noted or specified.

C. Sequence, coordinate and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:

1. Coordinate mechanical systems, equipment, and materials installation with other building components.
2. Verify all dimensions by field measurements.
3. Arrange for chases, slots and openings in other building components during progress of construction, to allow for mechanical installation.
4. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
5. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.
6. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
7. Install mechanical equipment to facilitate servicing, maintenance and repair or replacement of equipment components, where installed exposed in finished spaces.
8. Install access panel or doors where units are concealed behind finished surfaces.
9. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specific slope.

D. All valves, VAV boxes and dampers shall be installed to be accessible by maintenance personnel.

1.47 CUTTING AND PATCHING

A. Perform cutting and patching in accordance with Division 01.

B. In addition to the requirements specified in Division 01, the following requirements apply:

1. Protection of Installed Work: During cutting and patching of operations, protect adjacent installations.

C. Perform cutting, fitting, and patching of mechanical equipment and materials required to:
1. Remove and replace defective work.
2. Remove and replace work not conforming to requirements of the contract documents.
3. Install equipment and materials in existing structures.
4. Upon written instructions from the Architect, uncover and restore work to provide for Architect/Engineer observation of concealed work.

D. Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of mechanical piping, heating units, plumbing fixtures and trim, and other mechanical items made obsolete by the new work.

E. Protect the structure, furnishings, finishes and adjacent materials not indicated or scheduled to be removed.

F. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

G. Patch existing finished surfaces and building components using new materials matching existing materials and experienced installers. Installer’s qualifications refer to the materials and methods required for the surface and building components being patched. Refer to Division 1, for definition of “Experienced Installer”.

1.48 SYSTEM OPERATIONAL TESTS

A. The Contractor shall inform the Owner one week prior to starting this testing in order that the Owner’s Representative may be present.

B. After balancing and prior to final inspection, the contractor shall operate all systems continuously trouble free and stable for a minimum period of fourteen consecutive days including Saturday and Sunday. Each day shall be a minimum of an 8 hour day. Should a problem arise, the 14 day period shall be restarted and repeated until successfully operated for a full 14 days. A written report certified by the Owner’s Representative shall indicate the successful completion of a stable and trouble free 14 day period.

1.49 CLEANING

A. Cleaning shall be done as the work proceeds. Periodically remove waste and debris to keep the site as clean as is practical.

B. Refer to Division 1 for general requirements for final cleaning.

C. Leave exposed parts of the mechanical work in a neat, clean and usable condition, with painted surfaces unblemished and plated metal surfaces polished.

D. Thoroughly clean all materials, equipment and appliances. Clean and prepare all surfaces to be painted. Clean the entire premises of unused materials, debris, spots.
and marks to the satisfaction of the Architect.

E. Remove, thoroughly clean and replace all strainers and automatic valves after the system has been put in operation until system is clear of all foreign matter and repeat this operation after 10 days and again after the system has been in operation 30 days. Submit certification that this operation has been completed.

1.50 TESTING

A. General: Provide labor and test equipment including test pumps, gages, instruments and other equipment required. Use test quality pressure gages, instruments and other equipment required. Use test quality pressure gages with range of approximately twice test pressure. Use calibrated gages and instruments. Coordinate with provisions of Section 15992.

B. Hangers and Supports: With systems in normal operation, test hangers, supports and rods to insure they are plumb and supporting proper share of load. Additionally support systems and equipment that sway, crawl, or vibrate.

C. Ductwork:

1. Ductwork Design Pressure Classification: As specified in Section 15890, "Ductwork".

2. SMACNA 4-inch and 3-inch Ducts and Plenums:
   a. Capping and testing in sections is permitted.
   b. Perform leak test in accordance with procedures contained in SMACNA "HVAC Air Duct Leakage Test Manual." Measure total leakage with calibrated orifice plate.

      1) Test pressure shall equal duct design pressure of +4-inch or +3-inch as applicable. Total leakage shall not exceed 1% of design airflow capacity in cfm.

   c. Under test pressure, no audible leaks shall be evident.

3. For ductwork and plenums other than those listed above:
   a. Demonstrate leakage amount in air balance report. Compare air flow rate of fan to that of sum of air outlets.
   b. Maximum leakage 2% of system design air flow rate.

D. Ductwork Specialties:

1. Verify fire dampers, fire/smoke dampers, and smoke dampers are 100% open, unless damper is indicated to be closed during normal operation.

2. Test airflow measuring units for accurate indication.
1.51 ADJUSTING AND CLEANING

A. Inspect all equipment and put in good working order.

B. Clean all exposed and concealed items:
   1. Clean air surfaces of all coils, fans (including fan wheels and motors), air handler plenums and air filter frames.
   2. Clean floor drains, cleanouts, and plumbing fixtures.
   3. Clean specialties such as traps and strainers.

C. Ductwork: Blow-out ducts with fans before connecting terminal units. Clean ducts before installing air outlets.

D. Equipment and Materials: Remove foreign materials including dirt, grease, splashed paint, and plaster, etc. Restore damaged finishes to original condition.

E. Adjusting: Adjust equipment and system components as indicated or as otherwise required to result in intended system operation. Thereafter, as a result of system operation, or as directed, make readjustments as necessary to refine performance and to effect complete system tune-up.

1.52 SPECIAL TOOLS

A. Furnish to Owner not later than when Owner takes possession of equipment.

B. Definition of Special Tools: Identified in or otherwise implied by, the manufacturer's operation and maintenance manuals for the furnished equipment, or which are otherwise required for the operation, with the manufacturer's recommended procedures for operation, adjustment and maintenance. Special tools do not include those required for major repairs normally done by factory trained or otherwise specialized service personnel, nor do they include those normally found in the possession of Owner's on site maintenance personnel.

1.53 MANUFACTURER'S START-UP ASSISTANCE

A. Where the services of a factory authorized service representative are specified for the start-up of certain pieces of equipment, arrange to have the manufacturer of such equipment perform start-up and check-out service. Manufacturer shall provide a letter which shall be on the manufacturer's letterhead, shall list the equipment, shall certify that the equipment has been examined, that it has been installed in accordance with the manufacturer's installation instructions, started up, adjusted, and checked out in accordance with the manufacturer's instructions, and is operating properly. The letter shall be addressed to the Owner and shall be signed by an authorized representative of the manufacturer. Coordinate with provisions of Section 15992.

1.54 PUTTING SYSTEMS IN OPERATION - START UP
A. Prior to final acceptance, at time agreed to by Owner and Architect, put all systems into satisfactory operation.

B. At first heating or cooling season following final acceptance, start up systems not started due to lack of seasonal design load or operation of the central system.

C. Operate all systems in good working order for period of fourteen (14) working days.

D. Perform services in accordance with manufacturer's written start-up instructions. Test control and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.

E. Maintenance and Operation Training:
   
   1. As a part of the maintenance and operating instructions, review data in operating and maintenance manual, including preventative maintenance schedule and procedures, and procedures for obtaining repair parts and technical assistance. Demonstrate all phases of operation including start-up and shut-down.

   2. Schedule minimum of 8 hours training with Owner, provide at least seven (7)-day notice to Architect/Engineer.

1.55 COORDINATION WITH COMMISSIONING ACTIVITIES

A. Submit start-up checklist form and procedure for review and approval. Approval shall be given prior to initial equipment start-up.

B. Upon completion of start-up procedure, submit report including:

   1. Start-up checklist.
   2. List of personnel performing start-up.
   3. Equipment identification.
   4. Date of start-up.
   5. Description of equipment start-up problems or successful operation.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Testing, adjusting, and balancing of air systems.
   2. Measurement of final operating condition of HVAC systems.
   3. Sound measurement of equipment operating conditions.
   4. Vibration measurement of equipment operating conditions.

1.2 REFERENCES

A. Associated Air Balance Council:

B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:

C. Natural Environmental Balancing Bureau:
   1. NEBB - Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.

1.3 DESCRIPTION OF WORK

A. Extent of testing, adjusting, and balancing (TAB) work required by this Section is indicated on Drawings and Schedules, and by requirements of this Section; and is defined to include, but is not necessarily limited to, air distribution systems, hydronic and steam distribution systems, and associated equipment and apparatus of mechanical work. The Work consists of setting speed and volume (flow) adjusting facilities provided for systems, recording data, conducting tests, preparing and submitting reports, and recommending modifications to work as required by Contract Documents. TAB Contractor to be contracted with General Contractor.

B. Component types of testing, adjusting, and balancing specified in this Section includes the following as applied to mechanical equipment:

1. Fans and Air Conditioning Units.
2. Exhaust Fans
3. Air Distribution Systems.
4. Heat Pump units and All Other Mechanical and Plumbing Equipments.

C. Refer to Division-26 Sections for electrical hook-up and wiring of equipment to be tested, adjusted, and balanced; not Work of this Section.
1.4 QUALITY ASSURANCE

A. Tester's qualifications: Member of AABC or NEBB with at least 5-years of successful testing, adjusting, and balancing experience on projects with testing and balancing requirements similar to those required for this Project, who is not Installer of system to be tested, and is otherwise independent of the Project.

B. Codes and Standards:

1. Standards Compliance: Comply with latest edition of "AABC National Standards" or NEBB Standards as applicable to mechanical air and hydronic distribution systems, and associated equipment and apparatus.

2. Industry Standards: Comply with ASHRAE recommendations pertaining to measurements, instruments, and testing, adjusting, and balancing, except as otherwise indicated.

1.5 SUBMITTALS

A. Submittal Procedures: Section 23 05 00

B. Prior to commencing Work, submit proof of latest calibration date of each instrument.

C. Test Reports: Indicate data on AABC MN-1 National Standards for Total System Balance forms.

D. Field Reports: Indicate deficiencies preventing proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.

E. Prior to commencing Work, submit report forms or outlines indicating adjusting, balancing, and equipment data required. Include detailed procedures, agenda, sample report forms and copy of AABC National Project Performance Guaranty and Copy of NEBB Certificate of Conformance Certification.

F. Submit draft copies of report for review prior to final acceptance of Project.

G. Furnish reports in soft cover, letter size, 3-ring binder manuals, complete with table of contents page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.

H. Within 60 calendar days after commencement of Division-26 Work, submit the following for approval:

1. Name of testing, adjusting, and balancing (TAB) company.
2. Certificate of AABC or NEBB membership.
3. Copy of applicable AABC or NEBB standards.
4. Proof of satisfactory balancing Work with list of at least three (3) projects of comparable type and size, including following information:
a. Project name and location.
b. Gross floor area.
c. Number of terminal units.
d. Name of the engineering firm, name of the project engineer and telephone number.
e. Name of the Owner, name of the chief operating engineer and telephone number.

5. Sample blank forms to be used for TAB data recording and reports.
6. List of TAB instruments and data sheets.
7. Biographical data on engineer who is to directly supervise TAB work of this Project.

I. Within 30 calendar days after Architect's approval of TAB company, TAB company shall review Contract Documents. Advise Architect if any additional balancing devices (such as dampers, balancing valves, "Pete's Plugs" Etc.) are required by TAB company to properly perform specified and required TAB functions.

J. At least fifteen days prior to Contractor's request for final inspection, submit three copies of final reports.

1. Form of Final Reports:
   a. Each individual final reporting form must bear:
      1) Signature of person who recorded data.
      2) Signature of TAB supervisor of reporting organization.
   b. Format per AABC. Bound 8-1/2" x 11".

2. Schedule testing and balancing of parts of systems which is delayed due to seasonal, climatic, occupancy, or other conditions beyond control of Contractor, as early as proper conditions will allow, after consultation with the Owner.
3. Submit reports of delayed testing promptly after execution of those services.

K. Maintenance data: Include in maintenance manuals, copies of certified test reports, identification of instruments, and data on Engineer; in accordance with requirements of Division 1.

L. Report Content:
1. Air Balance:
   a. Fans:
      1) Number, service, model, and size.
      2) Delivery in CFM.
      3) Static pressure: Suction, discharge, and total.
      4) Voltage: Rated and actual.
5) Motor Amperage: Rated and actual.
6) Motor Sheave Diameter: Adjustable or solid.
7) Fan sheave diameter.
8) Motor RPM.
9) Fan RPM.

b. Fans Graphic Plot: For each fan, on its actual fan curve, plot intersections of following lines:
   1) CFM from traverse (or from airflow measuring stations where installed).
   2) Static pressure (or total pressure for fans so rated).
   3) Brake horsepower from amperes.
   4) RPM
   5) Position of fans variable adjustment (Blade pitch, inlet vanes, and related information).

c. Filter banks, and outside air, return air, and exhaust air CFM's.
d. Supply, exhaust, and return air outlets; arrange following in columns:
   1) Outlet location by room number or other suitable means.
   2) Include key plans if necessary to identify location.
   3) Supply outlet size.
   4) Supply outlet deflection setting.
   5) Supply outlet design CFM.
   6) Supply outlet actual CFM.
   7) Return or exhaust outlet size.
   8) Return or exhaust outlet design CFM.
   9) Return or exhaust outlet actual CFM.
 10) Difference between supply and return/exhaust CFM's.

e. Airflow Measuring Stations:
   1) CFM
   2) static pressure.

f. CV and VAV Terminal Units:
   1) Design maximum CFM
   2) Actual maximum CFM.
   3) Design minimum CFM
   4) Actual minimum CFM.
   5) CV and VAV Box Gain Factors Report and Calculations.

g. Duct Air Quantities: Mains, Branches, Outside Air and Exhausts (Maximum and Minimum):
   1) Duct sizes.
2) Number of pressure readings.
3) Sum of velocity measurements.
4) Average velocity.
5) Duct recorded airflow rate.
6) Duct design air flow rates.

h. Building Pressurization Data:
1) Outside air temperatures and humidities.
2) Outside wind velocity.
3) Building pressures plotted with respect to systems.
4) Supply air, return air and exhaust airflow rates for varying damper positions.
5) Locations of pressure measuring points, inside and outside building.

2. Water Balance:
a. Each Flow Measuring Device and Balancing Device:
1) Device type, model and size.
2) Pressure differential.
3) GPM.

b. Each Heat Transfer Device: (Coil, heat exchanger, and associated items):
1) Number, service, model and size.
2) GPM.
3) Entering water temperature.
4) Leaving water temperature.
5) Pressures: Inlet and outlet.

c. Heating Equipment Design Data:
1) Heat transfer rate.
2) Flow rates and pressure drops.
3) Entering and leaving water temperature.

d. Heating Equipment Recorded Data:
1) Element type and identification (location and designation).
2) Entering and leaving temperatures.
3) Flow rates and pressure drops.

e. Air Heating and Cooling Equipment Design Data:
1) Heat transfer rate.
2) Water pressure drop across coil.
3) Air static pressure drop.
4) Entering and leaving water temperatures.
5) Entering and leaving air dry and wet bulb temperatures.

f. Air Heating and Cooling Equipment Recorded Data:

1) Element type and identification.
2) Entering and leaving air dry and wet bulb temperatures.
3) Entering and leaving water temperatures.
4) Water pressure drop across coil.
5) Water pressure drop across bypass valve.
6) Air static pressure drop.
7) Air and water flow rates.
8) Adjusted temperature rise or drop.

3. Vibration Test:

a. Location of Points:

1) Fan bearing, drive end.
2) Fan bearing, opposite end.
3) Motor bearing, center (if applicable).
4) Motor bearing, drive end.
5) Motor bearing, opposite end.
6) Casing (bottom or top).
7) Casing (side).

b. Test Readings:

1) Horizontal, velocity and displacement.
2) Vertical, velocity and displacement.
3) Axial, velocity and displacement.

b. Test Readings:

1) Horizontal, velocity and displacement.
2) Vertical, velocity and displacement.
3) Axial, velocity and displacement.

b. Test Readings:

1) Horizontal, velocity and displacement.
2) Vertical, velocity and displacement.
3) Axial, velocity and displacement.

c. Normally acceptable readings, velocity and acceleration.
d. Unusual conditions at time of test.
e. Vibration source (if non-complying).

4. This procedure and results for carrying out steps a-f above are to be retained by the Mechanical Contractor for delivery to the owner/design consultant on request.

5. TAB contractor shall compile an Excel spreadsheet for all terminal boxes, listing each box by its unique identification number, the inlet flow area established by the box manufacturer, the manufacturer’s gain factor for the box, final TAB calibrated gain factor for the box if field calibrated, and the ratio of the calibrated gain factor to the manufacturer’s gain factor.

6. TAB shall show in their report all the individual velocity measurements from duct or AHU traverses in grid format.
1.6 GENERAL

A. The Test and Balance Agency shall be provided with:

1. Within 30 days after selection -
   a. Construction Drawings
   b. Equipment Specifications
   c. Written Contract
   d. Equipment Submittals

2. As issued or received:
   a. Change Orders
   b. Equipment Manufacturer's Submittal Data
   c. Mechanical/Air Conditioning Contractor's Shop Drawings
   d. Temperature Control Drawings
   e. Reasonable Time
   f. Completely Operable System

3. Before testing or balancing is started, the Contractor shall adjust belts and sheaves, align all parts, oil and grease bearings in accordance with manufacturer's instructions, clean exterior surfaces of coil tubes and fins, flush interior of coil tubes until clean and check mixing damper operation to insure free operation and activation by the correct thermostat.

4. The contractor shall be responsible for certifying in writing that the system, as scheduled for balancing, is operational and complete. Completeness shall include not only the physical installation, but the Contractor's certification that the prime movers, fans, pumps, refrigeration machines, boilers, are installed in good working order, and that full load performance has been preliminarily tested under the certification of the Contractor. Before any testing and balancing is started, a complete report shall be sent to the Test and Balance Agency.

5. The Contractor shall be responsible for making all modifications to rectify discrepancies reported by the Balancing Agency as indicating non-compliance with the contract documents.

1.7 PROJECT RECORD DOCUMENTS

A. Submit record documents under provisions of Special Conditions section.

1.8 SEQUENCING AND SCHEDULING

A. Sequence work to commence after completion of systems and schedule completion of work before Beneficial Occupancy of Project.

B. Schedule and provide assistance in final adjustment and test of system with Fire Authority.

C. This project will be completed in phases. Provide a phasing plan and schedule for work
to be performed.

1.9 PRE-INSTALLATION CONFERENCE

A. A conference 2 weeks prior to commencing work of this Section.

1.10 REPORT FORMS

A. Within 60 calendar days after commencement of Division-15 Work, submit the following for approval:
   1. Name of testing, adjusting, and balancing (TAB) company.
   2. Certificate of AABC or NEBB membership.
   3. Copy of applicable AABC or NEBB standards.
   4. Proof of satisfactory balancing Work with list of at least three (3) projects of comparable type and size, including following information:
      a. Project name and location.
      b. Gross floor area.
      c. Number of terminal units.
      d. Name of the engineering firm, name of the project engineer and telephone number.
      e. Name of the Owner, name of the chief operating engineer and telephone number.
   5. Sample blank forms to be used for TAB data recording and reports.
   6. List of TAB instruments and data sheets.
   7. Biographical data on engineer who is to directly supervise TAB work of this Project.

B. Within 30 calendar days after Architect's approval of TAB company, TAB company shall review Contract Documents. Advise Architect if any additional balancing devices (such as dampers, balancing valves, "Pete's Plugs" Etc.) are required by TAB company to properly perform specified and required TAB functions.

C. At least fifteen days prior to Contractor's request for final inspection, submit three copies of final reports, on applicable reporting forms.
   1. Form of Final Reports:
      a. Each individual final reporting form must bear:
         1) Signature of person who recorded data.
         2) Signature of TAB supervisor of reporting organization.
      b. Format per AABC. Bound 8-1/2" x 11".
   2. Schedule testing and balancing of parts of systems which is delayed due to
seasonal, climatic, occupancy, or other conditions beyond control of Contractor, as early as proper conditions will allow, after consultation with the Owner.

3. Submit reports of delayed testing promptly after execution of those services.

D. Maintenance Data: Include in maintenance manuals, copies of certified test reports, identification of instruments, and data on Engineer; in accordance with requirements of Division 1.

E. Submit reports on AABC National Standards for Total System Balance.

F. Forms shall include the following information:

1. Title Page:
   a. Company name
   b. Company address
   c. Company telephone number
   d. Project name
   e. Project location
   f. Project Architect
   g. Project Engineer
   h. Project Contractor
   i. Project altitude

2. Instrument List:
   a. Instrument
   b. Manufacturer
   c. Model
   d. Serial number
   e. Range
   f. Calibration date

3. Air Moving Equipment:
   a. Location
   b. Manufacturer
   c. Model
   d. Air flow, specified and actual
   e. Return air flow, specified and actual
   f. Outside air flow, specified and actual
   g. Total static pressure and total external, specified and actual
   h. Inlet pressure
   i. Discharge pressure
   j. Fan RPM

4. Exhaust Fan Data:
a. Location  
b. Manufacturer  
c. Model  
d. Air flow, specified and actual  
e. Total static pressure and total external, specified and actual  
f. Inlet pressure  
g. Discharge pressure  
h. Fan RPM  

5. Electric Motors:  
a. Manufacturer  
b. HP/BHP  
c. Phase, voltage, amperage; nameplate, actual, no load.  
d. RPM  
e. Service factor  
f. Starter size, rating, heater elements  

6. V-Belt Drive:  
a. Identification/location  
b. Required driven RPM  
c. Driven sheave, diameter and RPM  
d. Belt, size and quantity  
e. Motor sheave, diameter and RPM  
f. Center to center distance, maximum, minimum, and actual  

7. Cooling Coil Data:  
a. Identification/number  
b. Location  
c. Service  
d. Manufacturer  
e. Air flow, design and actual  
f. Entering air DB temperature, design and actual  
g. Entering air WB temperature, design and actual  
h. Leaving air DB temperature, design and actual  
i. Leaving air WB temperature, design and actual  
j. Water flow, design and actual  
k. Water pressure drop, design and actual  
l. Entering water temperature, design and actual  
m. Leaving water temperature, design and actual  
n. Air pressure drop, design and actual  

8. Heating Coil Data:  
a. Identification/number  
b. Location
c. Service

d. Manufacturer

e. Air flow, design and actual

f. Water flow, design and actual

g. Water pressure drop, design and actual

h. Entering water temperature, design and actual

i. Leaving water temperature, design and actual

j. Entering air temperature, design and actual

k. Leaving air temperature, design and actual

l. Air pressure drop, design and actual

m. Test readings:

1) Horizontal, velocity and displacement

2) Vertical, velocity and displacement

3) Axial, velocity and displacement

n. Normally acceptable readings, velocity and acceleration

o. Unusual conditions at time of test

p. Vibration source (if non-complying)

9. Duct Leak Test:

a. Description of ductwork under test

b. Duct design operating pressure

c. Duct design test static pressure

d. Duct capacity, air flow

e. Maximum allowable leakage duct capacity times leak factor

f. Test apparatus

1) Blower

2) Orifice, tube size

3) Orifice size

4) Calibrated

g. Test static pressure

h. Test orifice differential pressure

i. Leakage

10. Fans Graphic Plot: For each fan, on its actual fan curve, plot intersections of following lines:

a. CFM from traverse (or from airflow measuring stations where installed).

b. Static pressure (or total pressure for fans so rated).

c. Brake horsepower from amperes.

d. RPM

e. Position of fans variable adjustment (Blade pitch, inlet vanes, and related information).
11. Filter banks, and outside air, return air, and exhaust air CFM's.
12. Supply, exhaust, and return air outlets; arrange following in columns:
   a. Outlet location by room number or other suitable means.
   b. Include key plans if necessary to identify location.
   c. Supply outlet size.
   d. Supply outlet deflection setting.
   e. Supply outlet design CFM.
   f. Supply outlet actual CFM.
   g. Return or exhaust outlet size.
   h. Return or exhaust outlet design CFM.
   i. Return or exhaust outlet actual CFM.
   j. Difference between supply and return/exhaust CFM's.
13. Duct Air Quantities: Mains, Branches, Outside Air and Exhausts (Maximum and Minimum):
   a. Duct sizes.
   b. Number of pressure readings.
   c. Sum of velocity measurements.
   d. Average velocity.
   e. Duct recorded air flow rate.
   f. Duct design air flow rates.
14. Building Pressurization Data:
   a. Outside air temperatures and humidities.
   b. Outside wind velocity.
   c. Building pressures plotted with respect to systems.
   d. Supply air, return air and exhaust air flow rates for varying damper positions.
   e. Locations of pressure measuring points, inside and outside building.
15. The TAB contractor shall compare the sum of the CAV box diffuser readings with the flow indicated by the box’s controller prior to calibrating the box’s controller. If the two readings agree within +/- 5%, the factory calibration factors shall not be changed. If the readings are not within +/- 5%, a documented trouble shooting procedure consisting of checking and resolving the following shall be conducted prior to calibrating the controller to verify:
   a. box size is per the approved submittal,
   b. manufacturer’s gain/flow factor has been correctly entered into the controller,
   c. low pressure duct/connections are tight,
   d. velocity pressure connections at the box inlet and controller are tight and undamaged,
   e. static pressure at the box’s inlet exceeds the minimum required, and
   f. box flow measuring device is undamaged.
16. This procedure and results for carrying out steps a-f above are to be retained by the Mechanical Contractor for delivery to the owner/design consultant on request.

17. TAB contractor shall compile an Excel spreadsheet for all terminal boxes, listing each box by its unique identification number, the inlet flow area established by the box manufacturer, the manufacturer’s gain factor for the box, final TAB calibrated gain factor for the box if field calibrated, and the ratio of the calibrated gain factor to the manufacturer’s gain factor.

18. Require the TAB contractor to measure AHU supply and return flow at the dirty differential pressure drop across the pre-filter and final filter.

19. TAB shall show in their report all the individual velocity measurements from duct or AHU traverses in grid format.

1.11 PROCEDURES

A. General: Prior to commencement of balancing, review proposed schedule, methods and instruments to be used in balancing with the Engineer. Include descriptive data, procedure data and sample forms.

B. Descriptive Data: Review contract documents, shop drawings released for construction, design concepts and general function of each system including associated equipment and operation cycles. Confirm listing of flow and terminal measurements to be performed; selection points for proposed sound measurements.

C. Procedure Data: Outline procedures for taking test measurements to establish compliance with requirements. Specify type of instruments to be used, method of instrument application (by sketch) and correction factors. Verify access to valves, dampers and equipment for testing and balancing.

D. Sample Forms: Submit forms showing application of procedures to typical systems. Forms shall be of AABC format.

E. AABC test sheets required are as follows:

1. Air Moving Equipment Test Sheet.
2. Exhaust Fan Test Sheet (Supply, Return, Relief Fans).
3. Air Inlet and Outlet Test Sheet.
5. Duct Traverse Zone Totals Sheet.

1.12 JOB CONDITIONS

A. Do not proceed with testing, adjusting, and balancing Work until Work has been completed and is operable. Ensure that there is no latent residual Work still to be completed.

B. Do not proceed until Work scheduled for testing, adjusting, and balancing are clean and free from debris, dirt, and discarded building materials.
1.13 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of flow measuring stations, balancing valves and rough setting.

B. Operation and Maintenance Data: Furnish final copy of testing, adjusting, and balancing report inclusion in operating and maintenance manuals.

1.14 QUALITY ASSURANCE


B. Maintain one copy of each document on site.

C. Prior to commencing Work, calibrate each instrument to be used. Upon completing Work, recalibrate each instrument to assure reliability.

1.15 QUALIFICATIONS

A. Agency: Company specializing in testing, adjusting, and balancing of systems specified in this section with minimum three years documented experience certified by AABC or Certified by NEBB.

B. Perform Work under supervision of AABC Certified Test and Balance Engineer NEBB Certified Testing, Balancing and Adjusting Supervisor registered professional engineer experienced in performance of this Work and licensed is in State of California.

1.16 PRE-INSTALLATION MEETINGS

A. Convene minimum one week prior to commencing work of this section.

1.17 SCHEDULING

A. Administrative Requirements: Coordination and project conditions.

B. Schedule and provide assistance in final adjustment and test of life safety system with Fire Authority.

PART 2 - PRODUCTS

2.1 PATCHING MATERIALS

A. Except as otherwise indicated, use same products as used by original Installer for patching holes in insulation, ductwork and housings which have been cut or drilled for test purposes, including access for test instruments, attaching jigs, and similar purposes.
B. At Tester's option, plastic plugs with retainers may be used to patch drilled holes in ductwork and housings.

2.2 TEST INSTRUMENTS

A. Utilize test instruments and equipment for TAB work required, of type, precision, and capacity as recommended in AABC standards.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify systems are complete and operable before commencing work. Verify the following:

1. Systems are started and operating in safe and normal condition.
2. Temperature control systems are installed complete and operable.
3. Final filters are clean and in place. If required, install temporary media in addition to final filters.
4. Duct systems are clean of debris.
5. Fans are rotating correctly.
6. Fire and volume dampers are in place and open.
7. Air coil fins are cleaned and combed.
8. Access doors are closed and duct end caps are in place.
9. Air outlets are installed and connected.
10. Duct system leakage is minimized.
11. Hydronic systems are flushed, filled, and vented.
12. Proper strainer baskets are clean and in place or in normal position.

3.2 TEST PROCEDURES

A. Examine installed Work and conditions under which testing is to be done to ensure that Work has been completed, cleaned, and is operable. Do not proceed with TAB work until unsatisfactory conditions have been corrected in manner acceptable to Tester.

B. Test, adjust and balance environmental systems and components, as indicated, in accordance with procedures outlined in applicable standards of subparagraph "Codes and Standards" above.

C. Test, adjust and balance system during summer season for air conditioning systems and during winter season for heating systems, including period of operation at outside conditions within 5 degrees F wet bulb temperature of maximum summer design condition, and within 10 degrees F dry bulb temperature of minimum winter design condition. When seasonal operation does not permit complete measurements, then take final readings when seasonal operation does permit.

D. Prepare report of test results, including instrumentation calibration reports, in format
recommended by applicable standards.

E. Patch holes in insulation, ductwork and housings, which have been cut or drilled for test purposes, in manner recommended by original Installer.

F. Mark equipment settings, including damper control positions, valve indicators, fan speed control levers, and similar controls and devices, to show final settings at completion of TAB work. Provide markings with paint or other suitable permanent identification materials.

G. Retest, adjust, and balance systems subsequent to significant system modifications, and resubmit test results.

H. Mark all damper and valve balancing device settings. The owner reserves the right to require rebalancing of all balancing devices not marked.

3.3 PREPARATION

A. Furnish instruments required for testing, adjusting, and balancing operations.

B. Make instruments available to Architect/Engineer to facilitate spot checks during testing.

3.4 INSTALLATION TOLERANCES

A. Air Handling Systems: Adjust to within plus or minus 10 percent of design.

B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

C. Hydronic Systems: Adjust to within plus or minus 10 percent of design.

3.5 ADJUSTING

A. Verify recorded data represents actual measured or observed conditions.

B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.

C. After adjustment, take measurements to verify balance has not been disrupted. If disrupted, verify correcting adjustments have been made.

D. Report defects and deficiencies noted during performance of services, preventing system balance.

E. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

F. At final inspection, recheck random selections of data recorded in report. Recheck points
G. Check and adjust systems approximately six months after final acceptance and submit report.

3.6 AIR SYSTEM PROCEDURE

A. Adjust air handling and distribution systems to obtain required or design supply, return, and exhaust air quantities at site altitude.

B. Make air quantity measurements in main ducts by Pitot tube traverse of entire cross sectional area of duct.

C. Measure air quantities at air inlets and outlets.

D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts.

E. Use volume control devices to regulate air quantities only to extent adjustments do not create objectionable air motion or sound levels. Effect volume control by using volume dampers located in ducts.

F. Vary total system air quantities by adjustment of fan speeds. Provide sheave drive changes to vary fan speed. Vary branch air quantities by damper regulation.

G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across fan. Make allowances for 50 percent loading of filters.

I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.

J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.

K. At modulating damper locations, take measurements and balance at extreme conditions. Balance variable volume systems at maximum airflow rate, full cooling, and at minimum airflow rate, full heating.

L. Measure building static pressure and adjust supply, return, and exhaust air systems to obtain required relationship between each to maintain approximately 0.05 inches positive static pressure near building entries.

M. For variable air volume system powered units set volume controller to airflow setting indicated. Confirm connections properly made and confirm proper operation for automatic variable-air-volume temperature control.
N. Execute air systems balancing for each air system in accordance with AABC specifications and as described herein.

O. Make tests with supply, return and exhaust systems operating and doors, windows, closed or in their normal operating condition.

P. Test and adjust fan or blower speed to design requirements.

Q. Test and record motor full load amps. Record each installed motor manufacturer.

R. Traverse main supply air ducts, using a pitot tube and manometer. Calibrate the manometer to read two significant figures in velocity pressure ranges. Take a minimum 16 readings per traverse. The intent of this operation is to measure by traverse the total air quantity supplied by the fan and to verify the distribution of air to zones. A main duct is defined as any of the following:

1. A duct serving 5 or more outlets.
2. A duct serving 3 or more branch ducts.
3. A duct serving a hydronic coil.
4. A duct emanating from a fan discharge or plenum and terminating at one or more outlets.

S. Submit data in support of supply fans deliveries by the following four methods. For return, relief and exhaust fans, methods 1 and 4 are sufficient:

1. By summation of the air quantity readings at inlets or outlets.
2. By duct traverses of main supply ducts.
3. By rotating vane traverse across the filter or coil bank.
4. By plotting revolutions per minute and static pressure readings on the fan curve. Air density corrections must be indicated.

T. Test and record required and measured system static pressures; filter differential, coil differential and fan total static pressure.

U. Test and adjust systems for design recirculated airflow rates.

V. Test and adjust system for design outside airflow rates.

W. Test and record entering and leaving air temperatures.

X. Install one-inch roll media filters upstream of air filters to impose 90 percent of the manufacturers recommended final filter air pressure drop.

Y. Adjust main supply and return ducts to proper design flow rates.

Z. Inspect and confirm all fire dampers are open, all smoke dampers and fire/smoke dampers are in their correct position, all duct access doors are closed and fire damper fusible links are accessible.
AA. Adjust zones to proper design, supply and return flow rates.

BB. Test and adjust each air inlet and air outlet and transfer duct to within 10 percent of design requirements.

CC. Identify each air inlet, air outlet, transfer duct and transfer wall opening as to location and area.

DD. Identify and list size, type and manufacturer of diffusers, grilles, registers and testing equipment. Use manufacturer's rating on equipment to make required calculations.

EE. In readings and tests of diffusers, grilles and registers, report the required face and neck velocity, test face and neck velocity, and required air pressure drop and flow rate. Test after adjustments.

FF. Building Management System contractor shall set adjustments of automatically operated inlet vanes, cones, plugs and all dampers to operate as indicated in cooperation with balancing contractor.

GG. Adjust diffusers, grilles and registers to minimize drafts, dumping, and to prevent "short circuiting" between supply and return outlets.

HH. Use volume control devices to regulate air quantities only to extent that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters. Remove air slots on return air troffers to achieve adequate relief and minimize pressure drop into the ceiling plenum.

II. Vary total system air flow rates by adjustment of fan speeds or fan volume-varying devices. Vary branch air quantities by damper regulation.

JJ. Record installed fan drive assemblies; fan sheaves, motor sheaves, belts and motors.

KK. For fans with two-speed motors, execute the entire Air Systems procedure at both speeds.

LL. The final balanced condition of each area shall include testing and adjusting of pressure conditions. Test and record building pressurization levels in variable volume systems throughout full range of fan delivery rates, under both heating and cooling conditions. For multi-story buildings, test pressure conditions at ground, intermediate and upper levels. Front doors, stair and vestibule doors, exits and elevator shafts shall be checked for airflow so that leakage does not cause excessive or abnormal pressure conditions. Document abnormal building leakage conditions noted.

MM. Complete balancing to achieve positive building pressure unless otherwise instructed. A positive pressure relative to outside of 0.05 inch water gauge minimum and 0.10 inch water gauge maximum shall be achieved, measure with negligible, outside wind velocity.

NN. Provide a complete spreadsheet for all CAV boxes gain factor calculation and analysis.
3.7 AIR BALANCING

A. General:

1. Balance so that outside airflow does not go below minimum value at any time.
2. Verify proper automatic operation of automatic outside, return, and exhaust air dampers throughout entire range of operation.
3. Balance with filter pressure drop at midpoint between clean and dirty filters. Artificially create required pressure drop, if necessary, by blanking off coils.
4. Balance with doors and windows in their normal, closed position.
5. Balance air in stairs and stair vestibules to maintain pressure differentials required by code.
6. Balance main exhaust systems to maintain building indoor pressure at approximately 0.05 inch WC positive relative to outside ambient pressure. This may require different return/exhaust air quantities than scheduled.

B. Balance air to following tolerances:

1. Each outlet and each inlet: Plus 10% to minus 10% of CFM indicated on Drawings.
2. Each room with multiple supply outlets: 0% to plus 10% of CFM indicated on Drawings.
3. Each Room: As inlet and outlet CFM's are balanced for tolerance 1 above, balance the difference between SCFM and ECFM as follows:
   a. Equal air balance for a room where SCFM is equal to ECFM: The difference between SCFM and ECFM is to be no more than 5% of SCFM (or ECFM); except for corridors (As listed in Criterion "d").
   b. Positive air balance for a room where SCFM is larger than ECFM: ECFM is to be 80 to 85% of SCFM.
   c. Negative air balance for a room where ECFM is larger than SCFM: ECFM is to be 110 to 115% of SCFM.
   d. Corridor shall be balanced for equal air balance for tolerance "2a" above, adding to SCFM the air coming out of adjacent rooms of positive air balance, and adding to ECFM the air going into adjacent rooms of negative air balance.
   e. NOTE: SCFM = room supply CFM which is the sum of air in CFM supplied to the room as indicated on Drawings.
   f. ECFM = room exhaust CFM which is the sum of air in CFM exhausted and/or returned from the room as indicated on Drawings.
4. Each Airflow Measuring Station: 0% to plus 10% of air monitor CFM.
5. Each Fan: 0% to plus 10% of system CFM.

C. Adjust throw patterns of supply air outlets including slot diffusers and air handling light troffers.
1. Adjust for draft free room air distribution.
2. Adjust as indicated. Where not indicated, adjust as directed by Architect. Request such direction prior to balancing.
3. Unless otherwise indicated or directed, adjust air outlets to distribute air horizontally along ceiling and adjust perimeter slot diffusers to blow away from building perimeter.

D. System design static pressures are approximations. Make changes in sheaves and belts as required for specified air balance. Final adjustment of sheaves to result in sheave with additional possible adjustment in both directions.

E. Inspect all rooms for room temperatures, drafts, and noise. Make adjustments to correct any problems.

F. Operate each room thermostat to verify correct system response to raising and lowering thermostat set points.

3.8 WORK BY MECHANICAL SUBCONTRACTOR

A. Preparation: Before any testing or balancing operations are started, the Mechanical Subcontractor shall adjust belts and sheaves, align parts, oil and grease bearings in accordance with manufacturer's instructions, clean exterior surfaces of coil tubes and fins, flush interior of coil tubes until clean, and check mixing damper operation to insure free operation and activation by correct thermostat. Install filters and start up equipment.

B. Certification: Mechanical Subcontractor shall certify in writing that the system, as scheduled for balancing, is operational and complete. Completeness shall include not only the physical installation, but Mechanical Subcontractor's certification that prime movers, fans, pumps, refrigeration machines, boilers, etc., are installed in good working order, and full load performance has been preliminarily tested under certification of Mechanical Subcontractors. Before any testing and balancing is started a complete report shall be sent to Agency.

3.9 ON-GOING INSPECTION

A. Agency shall visit the job site a minimum of three times during the early stages of fabrication to inspect duct installations, and shall submit a report listing any deficiencies found and making recommendations for Work to be performed or devices to be added to allow for proper balancing.

3.10 TOTAL SYSTEM BALANCE

A. Each piece of equipment and the entire HVAC system shall be adjusted to ensure proper function of all controls, proper distribution of air, maintenance of temperatures, elimination of drafts and vibration, and left in first class operating condition.

B. Air System: System shall be adjusted to obtain the air volumes as indicated, but shall be readjusted if required to obtain design temperature in each room. The Mechanical
Subcontractor shall make drive changes, install additional dampers, vanes, grille baffles, etc., as may be required on the job, at no extra cost to Owner.

C. Noise: Wherever use of multi-louvers (in supply, exhaust, or return air grilles) creates objectionable noise determined by the engineer, 2" thick, 6 pcf density fiberglass board, foiled faced, shall be installed in grille opening, slotted for the proper air quantity, by Mechanical Subcontractor at no extra cost to the Owner. (Not allowed in sensitive areas).

D. Method: Balance supply and return air systems (with AC units operating) by first arriving at fan total air quantity, reading air velocities at cooling coils at 55 degrees F, return air and outside air openings; and a duct traverse. Fan RPM shall then be adjusted for indicated or specified air quantities allowing for a maximum of 2% for duct leakage. The quantity of air to each outlet shall not be less than that indicated and not in excess of 10% of that amount. If so instructed by the Architect, further balancing of temperatures shall be made and indicated by thermometer or by temperature recorder.

E. Pilot Tube Traverse: Perform pivot tube traverse of all supply, return, and exhaust systems. Except as otherwise specified herein, pivot tube traverse shall be taken in branch ducts to assure specified flow to all zones. Pivot tubes, associated instruments, traversing and testing techniques shall conform to the ASHRAE "Handbook of Fundamentals." Pivot tube traverse may be omitted:

1. Where duct serves only a single room or space and the design volume is less than 2000 CFM.
2. Where the duct design velocity and air quantity may be determined by measurements of terminals served.

F. Test Holes: The test holes shall be provided in a straight duct as far as possible downstream of elbows, bends, take-offs, and other turbulence generating devices, to optimize reliability of flow measurements.

G. Wherever the use of multi-louvers (in supply, exhaust, or return air grilles) creates objectionable noise, 2 inches thick, 6 pound fiberglass board shall be installed in the grille opening, slotted for the proper air quantity.

H. Balance the supply and return air systems (with the chillers operating) by first arriving at the fan total air quantity, reading air velocities at cooling coils at 55 degrees F, return air and outside air openings; and a duct traverse. The fan RPM shall then be adjusted for the specified air quantities allowing for a maximum of 2 percent for duct leakage. The quantity of air to each outlet shall not be less than that shown on the drawings and not in excess of 10 percent of that amount. If so instructed by the Architect, further balancing of temperatures shall be made and indicated by thermometer or by temperature recorder.

I. Perform Pitot Tube Traverse of all supply, return and exhaust systems.
1. Except as specifically indicated herein, Pitot tube traverse shall be taken in branch ducts to assure specified flow to all zones. Pitot tubes, associated instruments, traversing, and testing techniques shall conform to the ASHRAE Handbook of Fundamentals.

2. Pitot tube traverse may be omitted:
   a. Where the duct serves only a single room or space and its design volume is less than 2000 CFM.
   b. Where duct’s design velocity and air quantity may be determined by measurements of terminals served.

3. Test holes shall be in a straight duct, as far as possible downstream from elbows, bends, take-offs and other turbulence generating devices, to optimize reliability of flow measurements.

J. Furnished typewritten data for all supply fans tabulating:
   1. Quantity of air in CFM at each air outlet or inlet.
   2. Dry and wet bulb temperatures at each thermostat to the nearest 1/10 of 1 degree.
   3. Outdoor dry and wet bulb temperature, wind direction and velocity, and barometric pressure at the time tests are conducted.
   4. RPM of fan or blower.
   5. RPM of motor.
   6. Ampere input of each motor (one reading on each phase leg).
   7. No lead Amperage and Brake Horsepower calculations on all motors 1/2 horsepower or larger.
   8. Static pressure in inches water gauge at inlet of fan or blower.
   9. Duct Traverse data.

K. Duct Pressure Testing:
   1. Test apparatus shall be a high pressure portable blower with an orifice flow measuring device. Each orifice assembly is accurately calibrated with its own calibration curve.
   2. Contractor to close off and seal all openings in the duct section to be tested.
   3. Each section shall be tested at 2" W.G. Total allowable leakage should not exceed 1 percent of the total CFM design for that section being tested.
   4. After all tests are complete, the test information will be presented to the Architect for his approval.

L. The Contractor shall require that the Air Balance Agency prepare a complete set of full scale drawings showing actual duct runs and outlet/inlet locations. Drawings shall be keyed to and furnished with the Air Balance Report. The mechanical plans are not acceptable for this purpose.

M. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05 inches positive static pressure.
N. Check multi-zone units for motorized damper leakage. Adjust air quantities with mixing dampers set first for cooling, then heating, then modulating.

O. For variable air volume system powered units, set volume controller to air flow setting indicated. Confirm connections properly made and confirm proper operation for automatic variable air volume temperature control.

P. On fan powered VAV boxes, adjust air flow switches for proper operation.

Q. Ductwork Tests: All medium pressure ductwork and plenums shall be tested in accordance with AABC National Standards for field measurement and instrumentation volume one No. 81266 Bulletin Section, 21 June 1968. The procedure shall include testing ductwork for 1 minute at 12 inches S.P., then reducing pressure to 7 inches S.P. and surveying all ductwork for audible leaks. After leaks have been sealed, operate ductwork at 7 inches S.P. and re-check in the presence of the Architect. In no case will total air leakage in excess of 4 percent be allowed.

R. Ductwork and sheet metal fabrication drawings: Contractor shall submit to the Architect for approval, 1/2 inch to 1 foot scaled plan drawings of all parts of the building showing all duct systems. Plans shall show all duct details, offset, transitions, after coordination all other sections and existing conditions. Drawings shall also include mechanical rooms with ductwork and plenums complete. PARTIAL OR INCOMPLETE DRAWINGS WILL NOT BE ACCEPTABLE.

3.11 DUCT PRESSURE AND LEAK TESTING

A. General
1. High, medium, and low pressure ductwork systems tested during construction prior to insulation. Test ducts lengths a maximum of 100 feet at time for risers and 150 feet for horizontal ducts. All ductwork tested and approved prior to installation of insulation.
2. Riser branches shall be isolated with seals, plugs, or caps. Riser installed in shafts shall be tested in sections to allow erection of shaft wall and duct insulation as approved by Architect.
3. Tests shall be performed in presence of the Architect who must verify recorded test data for test pressure and air leakage for tested duct length.
4. Test equipment: Rotary blower, calibrated orifice section, and gauge board.
5. Pressure test procedure:
   a. Check and alert the Mechanical Contractor Division 15 of any required seals of all openings in duct and plenum section to be tested.
   b. Connect the test apparatus to test section using a flexible duct connection or hose.
   c. Close damper on blower suction side, to prevent excessive build-up of pressure.
   d. Start blower and gradually open damper on suction side of blower.
   e. Build-up pressure on test section to required limit.
   f. Determine amount of air leakage by make-up air flow measurements and make repairs as required.
g. Total allowable leakage shall not exceed 1% per minute based upon the total operating CFM of the system being tested. Total leakage is determined by summation of leakage for each section of system tested.

h. All negative pressure ducts, including return and exhaust system, shall be tested by same procedure as positive pressure supply ducts.

i. Report final results of duct testing.

6. All ductwork pressure and leak testing shall also comply with section 15890.

B. Main Supply Ductwork Systems: Extending from the discharge of supply fans to the inlet of air terminal units.
   1. Test pressures: 5" WG.
   2. The allowable leak measured in CFM varies depending upon the length of duct tested and as follows:
      a. Main duct maximum 1/2% of 1% of the designed CFM on the total length and proportioned to the duct being tested.
      b. Branch duct or risers maximum 1/2% of 1% of the designed CFM on the total length and proportioned to the duct being tested.

C. Branch Ductwork Systems: Extending from the air terminal to diffuser, if required, also return and exhaust air ducts.
   1. Test pressures: 2" WG.
   2. The allowable leak measured in CFM varies depending upon the length of duct tested and as follows:
      a. Main duct maximum 1/2% of the designed CFM on the total length and proportioned to the duct being tested.
      b. Branch duct or risers maximum 1/2% of the designed CFM on the total length and proportioned to the duct being tested.
   3. The allowable leakage shall not exceed 2% per minute based upon the total peak operating CFM of system being tested. Total leakage is determined by summation of leakage for each section of the system tested.

D. Leak tests shall be performed and recorded separately for each system for:
   1. Main duct.
   2. Branch duct or risers.
   3. Complete system.

E. Test Failures: Notify General Contractor to repair duct system if test pressure and leakage is not attained. Repairs and sealings to be done with sheet metal and sealant by Mechanical Contractor Division 15.

3.12 FINAL DRAWINGS

A. The Agency shall prepare a complete set of full scale drawings showing actual duct runs
and outlet/inlet locations. Drawings shall be keyed to and submitted with Air Balance Report; the Contract Mechanical Drawings are not acceptable for this purpose.

3.13 TOTAL SYSTEM PERFORMANCE VERIFICATION

A. Immediately on completion of the system testing and balancing, the Agency shall conduct a 7-day continuous total system performance and capacity test; the Contractor shall supply all energy and consumables and/or materials required for the test.

B. General: Outdoor DB and WB air temperatures, and actual operating data for this test shall be taken simultaneously and hourly on all energy consuming equipment of cooling and heating plants and on any air and/or water distribution equipment which deviates more than 10% from design specifications.

C. Date Conversion and Reports: The data collected during this test shall be converted to KWH per ton for cooling equipment and KWH per MBH for the heating equipment and shall cover a minimum of four points on the equipment operating curve. These points shall be at 25%, 50%, 75% and 100% of full load test. Reports shall be prepared and submitted for all data and conversion.

3.14 GENERAL PROCEDURE

A. Adjust air moving systems to 0 to plus 5 percent for supply systems and plus or minus 5 percent for return and exhaust systems from figures indicated as long as pressure relationships are being maintained with adjacent spaces per OSHPD requirements.

B. Adjust hydronic systems to 0 to 10 percent plus of design conditions indicated.

C. Permanently mark settings on valves, splitters, dampers and other adjustment devices.

D. Take measurements to verify balance has not been disrupted or that such disruption has been rectified.

E. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Engineer.

F. At the completion of balancing procedures, allow for a minimum of two days for the Engineer to witness test procedures and conduct operational tests.

3.15 SITE VISITS

A. A review of the installation shall be made prior to commencing balancing work and any additional dampers or valves required for proper balance shall be reviewed with the Engineer and the Contractor.

B. The Test and Balance Contractor shall visit the job site a minimum of two times during the ductwork, equipment and piping installations. Site Visit Reports shall be submitted to the Engineer listing any deficiencies found. Identify in the report any additional balancing valves or dampers required.
3.16 ACCEPTANCE

A. Mechanical systems shall not be considered ready for final inspection until balancing results acceptable to the Engineer are obtained.

B. If it is found that the specified airflows cannot be achieved on portions of the system, the actual conditions shall be reported to the Engineer for consideration of corrective action before continuing the balancing procedure.

C. If measured flow at final inspection shows deviation of \(\pm 5\) percent or more, the report shall be rejected.

D. If report is rejected, systems shall be rebalanced and a new certified report submitted.

3.17 BALANCING REPORT

A. Submit a draft copy of reports prior to final acceptance of project. Provide copies of final report for inclusion in Operating and Maintenance Manuals.

B. Provide reports in durable soft cover, 3-ring binder manuals, complete with table of contents, indexing tabs and cover identification at front and side.

C. Include types, serial number and dates of calibration of instruments.

D. Record test data on a sepia made from the latest available revised set of mechanical shop drawings and submit copies upon completion of the balancing contract.

E. Install at each piece of mechanical equipment a "Data Register" showing significant operating temperatures, pressures, amperes, voltage, brake horsepower. "Data Register" shall be enclosed in a hard, clear plastic holder securely attached to the equipment or to a wall in the adjacent area.

F. Submit with report, fan and pump curves with operating conditions plotted. Submit grille and diffuser shop drawings and diffusion factors.

G. Report shall be indexed as follows:

| Air Summary | Fan Sheets |
| Procedure | Fan Curves |
| Instrumentation | Fan Profile Data |
| Drawings | Static Data |
| Equipment Summary | Outlet Data Summary and Schematics (per system) |
Building Pressurization Data

Smoke Exhaust Mode Data

Vibration

Fire/Smoke Damper Certification
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. HVAC equipment insulation, jackets and accessories.
   2. HVAC ductwork insulation, jackets, and accessories.

B. Related Sections:
   1. Firestopping: Product requirements for firestopping for placement by this section.
   2. Painting and Coating: Execution requirements for painting insulation jackets and covering specified by this section.

1.2 REFERENCES

A. ASTM International:
   6. ASTM C450 - Standard Practice for Prefabrication and Field Fabrication of Thermal Insulating Fitting Covers for NPS Piping, Vessel Lagging, and Dished Head Segments.

B. Sheet Metal and Air Conditioning Contractors’:
   1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

C. National Fire Protection Association:

D. Underwriters Laboratories Inc.:

1.3 SUBMITTALS

A. Submittal Procedures: Architectural Specifications

B. Product Data: Submit product description, thermal characteristics and list of materials and thickness for each service, and location.
C. Samples: Submit two samples of representative size illustrating each insulation type.

D. Manufacturer’s Installation Instructions: Submit manufacturers published literature indicating proper installation procedures.

E. Manufacturer’s Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Test pipe insulation for maximum flame spread index of 25 and maximum smoke developed index of not exceeding 50 in accordance with ASTM E84, UL 723, and NFPA 255.

B. Pipe insulation manufactured in accordance with ASTM C585 for inner and outer diameters.

C. Factory fabricated fitting covers manufactured in accordance with ASTM C450.

D. Maintain one copy of each document on site.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Applicator: Company specializing in performing Work of this section with minimum three years experience approved by manufacturer.

1.6 PRE-INSTALLATION MEETINGS

A. Convene minimum one week prior to commencing work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Product Requirements: Requirements for transporting, handling, storing, and protecting products.
B. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

C. Protect insulation from weather and construction traffic, dirt, water, chemical, and damage, by storing in original wrapping.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Product Requirements: Environmental conditions affecting products on site.

B. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.

C. Maintain temperature before, during, and after installation for minimum period of 24 hours.

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.10 WARRANTY

A. Execution and Closeout Requirements: Product warranties and product bonds.

B. Furnish five year manufacturer warranty for manmade fiber.

C. Architectural Specifications – Warranties.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturers for Glass Fiber and Mineral Fiber Insulation Products:

   1. CertainTeed.
   2. Knauf.
   4. Owens-Corning.
5. Substitutions: Not Permitted.

B. Manufacturers for Closed Cell Elastomeric Insulation Products:

2. Armacell, LLC. Armaflex.

2.2 DUCTWORK INSULATION

A. TYPE D-2: ASTM C612, Type IA or IB, rigid glass fiber, with factory applied reinforced aluminum foil facing meeting ASTM C1136, Type II.

1. Thermal Conductivity: 0.22 at 75 degrees F.
2. Density: 3.0 pound per cubic foot.

B. TYPE D-4: ASTM C1071, Type I, flexible, glass fiber duct liner with coated air side.

1. Thermal Conductivity: 0.24 at 75 degrees F.
2. Density: 1.5 pound per cubic foot.
3. Maximum Operating Temperature: 250 degrees F.
4. Maximum Air Velocity: 6,000 feet per minute.

C. TYPE D-5: ASTM C1071, Type II, rigid, glass fiber duct liner with coated air side.

1. Thermal Conductivity: 0.23 at 75 degrees F.
2. Density: 3.0 pound per cubic foot.
3. Maximum Operating Temperature: 250 degrees F.
4. Maximum Air Velocity: 4,000 feet per minute.

D. TYPE D-7: ASTM C534, Type II, flexible, closed cell elastomeric insulation, sheet laminated with white thermoplastic rubber membrane.

1. Thermal Conductivity: 0.27 at 75 degrees F.
2. Service Temperature Range: Range: Minus 58 to 180 degrees F.

E. TYPE D-8: Inorganic blanket encapsulated with scrim reinforced foil meeting UL 1978.

1. Thermal Conductivity: 0.42 at 500 degrees F.
2. Weight: 1.4 pound per square foot.
3. Flame spread rating of 0 and smoke developed rating of 0 in accordance with ASTM E84.
2.3 DUCTWORK INSULATION JACKETS

A. Aluminum Duct Jacket:
   1. ASTM B209.
   2. Thickness: 0.020 inch thick sheet.
   3. Finish: Embossed.
   5. Fittings: 0.02 inch thick die shaped fitting covers with factory attached protective liner.
   6. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.

2.4 DUCTWORK INSULATION ACCESSORIES

A. Vapor Retarder Tape:
   1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.

B. Vapor Retarder Lap Adhesive: Compatible with insulation.

C. Adhesive: Waterproof, ASTM E162 fire-retardant type.

D. Liner Fasteners: Galvanized steel, self-adhesive pad head.

E. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.


G. Impale Anchors: Galvanized steel, 12 gage self-adhesive pad.

H. Adhesives: Compatible with insulation.

I. Membrane Adhesives: As recommended by membrane manufacturer.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify piping, equipment and ductwork has been tested before applying insulation materials.

B. Verify surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION - DUCTWORK SYSTEMS

A. Duct dimensions indicated on Drawings are finished inside dimensions.

B. Insulated ductwork conveying air below ambient temperature:
   1. Provide insulation with vapor retarder jackets.
   2. Finish with tape and vapor retarder jacket.
   3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
   4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.

C. Insulated ductwork conveying air above ambient temperature:
   1. Provide with or without standard vapor retarder jacket.
   2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.

D. Ductwork Exposed in Mechanical Equipment Rooms or Finished Spaces below 10 feet above finished floor: Finish with aluminum jacket.

E. External Glass Fiber Duct Insulation:
   1. Secure insulation with vapor retarder with wires and seal jacket joints with vapor retarder adhesive or tape to match jacket.
   2. Secure insulation without vapor retarder with staples, tape, or wires.
   3. Install without sag on underside of ductwork. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift ductwork off trapeze hangers and insert spacers.
   4. Seal vapor retarder penetrations by mechanical fasteners with vapor retarder adhesive.
5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

F. External Elastomeric Duct Insulation:
   1. Adhere to clean oil-free surfaces with full coverage of adhesive.
   2. Seal seams and butt joints with manufacturer's recommended adhesive.
   3. When application requires multiple layers, apply with joints staggered.
   4. Insulate standing metal duct seams with insulation of like material and thickness as adjacent duct surface. Apply adhesive at joints with flat duct surfaces.
   5. Lift ductwork off trapeze hangers and insert spacers.

G. Duct Liner:
   1. Adhere insulation with adhesive for 100 percent coverage.
   4. Seal liner surface penetrations with adhesive.
   5. Cut insulation for tight overlapped corner joints. Support top pieces of liner at edges with side pieces.

H. Ducts Exterior to Building:
   1. Install insulation according to external duct insulation paragraph above.
   2. Provide external insulation with vapor retarder jacket. Cover with outdoor jacket finished as specified with caulked aluminum jacket with seams located on bottom side of horizontal duct section.
   3. Finish with aluminum duct jacket.
   4. Calk seams at flanges and joints. Located major longitudinal seams on bottom side of horizontal duct sections.

I. Prepare duct insulation for finish painting. Refer to Section 09 90 00.

3.3 SCHEDULES

A. Cooling Services Piping Insulation Schedule:
### Piping Insulation Schedule:

<table>
<thead>
<tr>
<th>PIPING SYSTEM</th>
<th>INSULATION TYPE</th>
<th>PIPE SIZE</th>
<th>INSULATION THICKNESS INCHES</th>
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<tr>
<td>Condensate Piping from Cooling Coils</td>
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<tr>
<td>Refrigerant Suction</td>
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<td>All sizes</td>
<td>0.5</td>
</tr>
<tr>
<td>Refrigerant Hot Gas</td>
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### Heating Services Piping Insulation Schedule:

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<th>PIPE SIZE</th>
<th>INSULATION THICKNESS INCHES</th>
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</thead>
</table>

### Ductwork Insulation Schedule:

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<th>DUCTWORK SYSTEM</th>
<th>INSULATION TYPE</th>
<th>INSULATION THICKNESS INCHES</th>
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<tr>
<td>Supply Ducts (externally insulated)</td>
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<tr>
<td>Return Ducts (externally insulated)</td>
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<td>1.5</td>
</tr>
<tr>
<td>Supply Air (exterior to building on roof)</td>
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<td>Return Air (exterior to building on roof)</td>
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<td>Rectangular Supply Ducts Downstream of Variable Air Volume Boxes (externally insulated)</td>
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<td>Round Supply Ducts Downstream of Variable Air Volume Boxes (externally insulated)</td>
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<td>1.5</td>
</tr>
<tr>
<td>Transfer Air Ducts (internally insulated)</td>
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</tr>
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</table>
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Duct Materials.
2. Insulated flexible ducts.
4. Transverse duct connection system.
5. Casings.
6. Ductwork fabrication.
7. Duct cleaning.

B. Related Sections:

1. Cast-In-Place Concrete: Product requirements for concrete for placement by this section.
2. Painting and Coating: Execution requirements for Weld priming, weather resistant, paint or coating specified by this section.
3. Hangers and Supports for HVAC Piping and Equipment: Product requirements for hangers, supports and sleeves for placement by this section.
4. Air Duct Accessories: Product requirements for duct accessories for placement by this section.

1.2 REFERENCES

A. ASTM International:

2. ASTM A90/A90M - Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
5. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
6. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

B. National Fire Protection Association:
   2. NFPA 90B - Standard for the Installation of Warm Air Heating and Air Conditioning Systems.

C. Sheet Metal and Air Conditioning Contractors:
   2. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

D. Underwriters Laboratories Inc.:
   1. UL 181 - Factory-Made Air Ducts and Connectors.

1.3 PERFORMANCE REQUIREMENTS

A. Variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is not permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.4 SUBMITTALS


B. Shop Drawings: Submit duct fabrication drawings, drawn to scale not smaller than ¼ inch equals 1 foot, on drawing sheets same size as Contract Documents, indicating:
   1. Fabrication, assembly, and installation details, including plans, elevations, sections, details of components, and attachments to other work.
   2. Duct layout, indicating pressure classifications and sizes in plan view. For exhaust duct systems, indicate classification of materials handled as defined in this section.
   3. Fittings.
   4. Reinforcing details and spacing.
   5. Seam and joint construction details.
   6. Penetrations through fire rated and other walls.
7. Terminal unit, coil, and humidifier installations.
8. Hangers and supports, including methods for building attachment, vibration isolation, and duct attachment.

C. Product Data: Submit data for duct materials, duct liner, duct connectors.

D. Samples: Submit two samples of typical shop fabricated duct fittings.

E. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.

1.5 CLOSEOUT SUBMITTALS

A. Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards - Metal and flexible.

B. Construct ductwork to NFPA 90A and NFPA 96 standards.

C. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Installer: Company specializing in performing Work of this section with minimum three years experience approved by manufacturer.

1.8 PRE-INSTALLATION MEETINGS

A. Convene minimum one week prior to commencing work of this section.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Do not install duct sealant when temperatures are less than those recommended by sealant manufacturers.

B. Maintain temperatures during and after installation of duct sealant.

1.10 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.
1.11 WARRANTY

A. Execution and Closeout Requirements: Product warranties and product bonds.
B. Furnish five year manufacturer warranty for ducts.
C. Architectural Specifications – Warranties.

PART 2 - PRODUCTS

2.1 DUCT MATERIALS

A. Galvanized Steel Ducts: ASTM A653/A653M galvanized steel sheet, lock-forming quality, having G90 zinc coating of in conformance with ASTM A90/A90M.
B. Steel Ducts: ASTM A1008/A1008M, ASTM A1011/A1011M, ASTM A568/A568M.
D. Fasteners: Rivets, bolts, or sheet metal screws.
E. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.2 INSULATED FLEXIBLE DUCTS

A. Manufacturers:
   1. Clevaflex.
   2. Thermaflex.
B. Product Description: Two ply vinyl film supported by helical wound spring steel wire; fiberglass insulation; aluminized vapor barrier film.
   1. Pressure Rating: 10 inches wg positive and 1.0 inches wg negative.
   3. Temperature Range: -10 degrees F to 160 degrees F.
   4. Thermal Resistance: 4.2 square feet-hour-degree F per BTU.

2.3 SINGLE WALL SPIRAL ROUND DUCTS

A. Manufacturers:
   2. Semco Incorporated.
   3. Tangent Air Corp.
5. Substitutions: Not Permitted.

B. Product Description: UL 181, Class 1, round spiral lockseam duct constructed of galvanized steel.

C. Construct duct with the following minimum gages:

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Gauge</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 inches to 14 inches</td>
<td>26</td>
</tr>
<tr>
<td>15 inches to 26 inches</td>
<td>24</td>
</tr>
<tr>
<td>28 inches to 36 inches</td>
<td>22</td>
</tr>
<tr>
<td>38 inches to 50 inches</td>
<td>20</td>
</tr>
<tr>
<td>52 inches to 84 inches</td>
<td>18</td>
</tr>
</tbody>
</table>

D. Construct fittings with the following minimum gages:

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Gauge</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 inches to 14 inches</td>
<td>24</td>
</tr>
<tr>
<td>15 inches to 26 inches</td>
<td>22</td>
</tr>
<tr>
<td>28 inches to 36 inches</td>
<td>20</td>
</tr>
<tr>
<td>38 inches to 50 inches</td>
<td>20</td>
</tr>
<tr>
<td>52 inches to 60 inches</td>
<td>18</td>
</tr>
<tr>
<td>62 inches to 84 inches</td>
<td>16</td>
</tr>
</tbody>
</table>

2.4 TRANSVERSE DUCT CONNECTION SYSTEM

A. Manufacturers:

2. Semco Incorporated.

B. Product Description: SMACNA "E" rated, SMACNA "F" rated, or SMACNA "J" rated rigidity class connection, interlocking angle and duct edge connection system with sealant, gasket, cleats, and corner clips.

2.5 CASINGS

A. Fabricate casings in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and construct for operating pressures indicated.
B. Reinforce access door frames with steel angles tied to horizontal and vertical plenum supporting angles. Furnish hinged access doors where indicated or required for access to equipment for cleaning and inspection. Furnish clear wire glass observation ports, minimum 6 x 6 inch size.

C. Fabricate acoustic casings with reinforcing turned inward. Furnish 16 gage back facing and 22 gage perforated front facing with 3/32 inch diameter holes on 5/32 inch centers. Construct panels 3 inches thick packed with 4.5 lb./cu ft minimum glass fiber media, on inverted channels of 16 gage.

2.6 DUCTWORK FABRICATION

A. Fabricate and support rectangular ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and as indicated on Drawings. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

B. Fabricate and support round ducts with longitudinal seams in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible (Round Duct Construction Standards), and as indicated on Drawings. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

C. Construct T's, bends, and elbows with minimum radius 1-1/2 times centerline duct width. Where not possible and where rectangular elbows are used, provide airfoil turning vanes. Where acoustical lining is indicated, furnish turning vanes of perforated metal with glass fiber insulation.

D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.

E. Fabricate continuously welded round and oval duct fittings two gages heavier than duct gages indicated in SMACNA Standard. Minimum 4 inch cemented slip joint, brazed or electric welded. Prime coat welded joints.

F. Provide standard 45-degree lateral wye takeoffs. When space does not allow 45-degree lateral wye takeoff, use 90-degree conical tee connections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify sizes of equipment connections before fabricating transitions.

3.2 INSTALLATION

A. Install and seal ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
B. During construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

C. Use crimp joints with or without bead or beaded sleeve couplings for joining round duct sizes 8 inch and smaller.

D. Install duct hangers and supports in accordance with Section 23 05 29.

E. Use double nuts and lock washers on threaded rod supports.

F. Connect flexible ducts to metal ducts with liquid adhesive plus tape and draw bands.

G. Set plenum doors 6 to 12 inches above floor. Arrange door swing so fan static pressure holds door in closed position.

H. Casings: Install floor mounted casings on 4 inch high concrete curbs. Refer to Section 03 30 00. At floor, rivet panels on 8 inch centers to angles. Where floors are acoustically insulated, furnish liner of 18 gage galvanized expanded metal mesh supported at 12 inch centers, turned up 12 inches at sides with sheet metal shields.

3.3 INTERFACE WITH OTHER PRODUCTS

A. Install openings in ductwork where required to accommodate thermometers and controllers. Install pitot tube openings for testing of systems. Install pitot tube complete with metal can with spring device or screw to prevent air leakage. Where openings are provided in insulated ductwork, install insulation material inside metal ring.

B. Connect diffusers or light troffer boots to low pressure ducts directly or with 5 feet maximum length of flexible duct held in place with strap or clamp.

C. Connect air outlets and inlets to supply ducts directly or with five foot maximum length of flexible duct. Do not use flexible duct to change direction.

3.4 CLEANING

A. Execution and Closeout Requirements: Final cleaning.

B. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air flow, clean one half of system completely before proceeding to other half. Protect equipment with potential to be harmed by excessive dirt with temporary filters, or bypass during cleaning.

C. Clean duct systems with high power vacuum machines. Protect equipment with potential to be harmed by excessive dirt with filters, or bypass during cleaning. Install access openings into ductwork for cleaning purposes.

3.5 SCHEDULES

A. Ductwork Material Schedule:
3.6 DUCT TESTING

A. All supply air ductwork and plenums downstream of the supply fans and upstream of the terminal boxes shall be leak tested to shown leaker is less than 1% of the design air flow.

B. All return air ducts and plenum upstream of the return fan shall be leak tested to show leakage is less than 2% of the design air flow.

C. Provide results to the Construction Manager.

End of Section
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

2. Combination fire-and-smoke dampers.
3. Duct access doors.
4. Volume control dampers.
5. Flexible duct connections.
6. Duct test holes.
7. Static pressure gages.

B. Related Sections:

1. Instrumentation and Control for HVAC: Execution and Product requirements for connection and control of Combination Smoke and Fire Dampers for placement by this section.
2. Direct-Digital Control System for HVAC
3. HVAC Ducts and Casings: Requirements for duct construction and pressure classifications.
4. Section 26 05 03 - Equipment Wiring Connections: Execution requirements for connection of electrical Combination Smoke and Fire Dampers specified by this section.

1.2 REFERENCES

A. Air Movement and Control Association International, Inc.:

1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.

B. ASTM International:


C. National Fire Protection Association:

2. NFPA 92A - Recommended Practice for Smoke-Control Systems.

D. Sheet Metal and Air Conditioning Contractors:

1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.
E. Underwriters Laboratories Inc.:

1. UL 555 - Standard for Safety for Fire Dampers.
2. UL 555C - Standard for Safety for Ceiling Dampers.

1.3 SUBMITTALS


B. Shop Drawings: Indicate for shop fabricated assemblies including volume control dampers duct access doors and duct test holes.

C. Product Data: Submit data for shop fabricated assemblies and hardware used.

D. Product Data: Submit for the following. Include where applicable electrical characteristics and connection requirements.

1. Combination Fire/Smoke dampers including locations and ratings.
2. Smoke dampers including locations and ratings.
4. Flexible duct connections.
5. Volume control dampers.
6. Duct access doors.
7. Duct test holes.

E. Product Data: For fire dampers and combination fire and smoke dampers submit the following:

1. Include UL ratings, dynamic ratings, leakage, pressure drop and maximum pressure data.
2. Indicate materials, construction, dimensions, and installation details.
3. Damper pressure drop ratings based on tests and procedures performed in accordance with AMCA 500.

F. Manufacturer's Installation Instructions: Submit for Fire and Combination Smoke and Fire Dampers.

G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents: Record actual locations of access doors and test holes.

C. Operation and Maintenance Data: Submit for Combination Smoke and Fire Dampers and for all accessories.
1.5 QUALITY ASSURANCE

A. Dampers tested, rated and labeled in accordance with the latest UL requirements.
B. Damper pressure drop ratings based on tests and procedures performed in accordance with AMCA 500.
C. Maintain one copy of each document on site.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum one week prior to commencing work of this section.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Product Requirements: Product storage and handling requirements.
B. Protect dampers from damage to operating linkages and blades.
C. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.
D. Storage: Store materials in a dry area indoor, protected from damage.
E. Handling: Handle and lift dampers in accordance with manufacturer's instructions. Protect materials and finishes during handling and installation to prevent damage.

1.9 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.10 COORDINATION

A. Coordinate Work where appropriate with building control Work.

1.11 WARRANTY

A. Execution and Closeout Requirements: Product warranties and product bonds.
B. Furnish five year manufacturer warranty for duct accessories.
C. Architectural Specifications – Warranties.
1.12 EXTRA MATERIALS

A. Execution and Closeout Requirements: Spare parts and maintenance products.

B. Furnish two of each size and type of fusible link.

C. Furnish two of every type of filter and cleaning tool.

PART 2 - PRODUCTS

2.1 BACK-DRAFT DAMPERS

A. Manufacturers:
   1. California Aire.
   2. Ruskin.
   3. Pottorff.

B. Product Description: Multi-Blade, back-draft dampers: Parallel-action, gravity-balanced, Galvanized 16 gage thick steel, or extruded aluminum. Blades, maximum 6 inch width, center pivoted, with felt or flexible vinyl sealed edges. Blades linked together in rattle-free manner with 90-degree stop, steel ball bearings, and plated steel pivot pin. Furnish dampers with adjustment device to permit setting for varying differential static pressure.

2.2 COMBINATION FIRE AND SMOKE DAMPERS

A. Manufacturers:
   1. California Aire.
   2. Ruskin.
   3. Pottorff.

B. Fabricate in accordance with NFPA 90A, UL 555, and UL 555S.

C. Fire Resistance: 1-1/2 hours

D. Leakage Rating: Class I, maximum of 8 cfm at 4 inches wg differential pressure.

E. Damper Temperature Rating: 250 degrees F.

F. Frame: 16 gage, galvanized steel.

G. Blades:
   1. Style: Single skin with 3 longitudinal grooves.
3. Orientation: Horizontal.
5. Width: Maximum 6 inches.

H. Bearings: Stainless steel pressed into frame.

I. Seals: Silicone blade edge seals and flexible stainless steel jamb seals.

J. Linkage: Concealed in frame.

K. Release Device: Close in controlled manner and lock damper through actuator closure spring.

L. Actuator:
   1. Type: Electric 24 volt, 60 hertz, two-position, fail close.
   2. Mounting: External or Internal.

M. Fusible Link Release Temperature: 165 degrees F.

N. Finish: Mill galvanized.

O. Factory installed sleeve and mounting angles. Furnish silicone caulk factory applied to sleeve at damper frame to comply with leakage rating requirements.

2.3 DUCT ACCESS DOORS

A. Manufacturers:
   1. California Aire.
   2. Ruskin.
   3. Pottorff.

B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.

C. Fabrication: Rigid and close fitting of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, furnish minimum 1 inch thick insulation with sheet metal cover.
   1. Less than 12 inches square, secure with sash locks.
   2. Up to 18 inches Square: Furnish two hinges and two sash locks.
   3. Up to 24 x 48 inches: Three hinges and two compression latches with outside and inside handles.
   4. Larger Sizes: Furnish additional hinge.
   5. Sash Lock.
   6. Compression Latch.
8. Access panels with sheet metal screw fasteners are not acceptable.

2.4 VOLUME CONTROL DAMPERS

A. Manufacturers:

1. California Aire.
2. Ruskin.
3. Pottorff.

B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated on Drawings.

C. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 x 72 inch. Assemble center and edge crimped blades in prime coated or galvanized frame channel with suitable hardware.

D. End Bearings: Except in round ductwork 12 inches and smaller, furnish end bearings. On multiple blade dampers, furnish oil-impregnated nylon or sintered bronze bearings. Furnish closed end bearings on ducts having pressure classification over 2 inches wg.

E. Quadrants:

1. Furnish locking, indicating quadrant regulators on single and multi-blade dampers.
2. On insulated ducts mount quadrant regulators on standoff mounting brackets, bases, or adapters.
3. Where rod lengths exceed 30 inches furnish regulator at both ends.

2.5 FLEXIBLE DUCT CONNECTIONS

A. Manufacturers:

1. Duro-Dyne.
2. Elgin.

B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated on Drawings.

C. Connector: Fabric crimped into metal edging strip.

1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric conforming to NFPA 90A, minimum density 30 oz per sq yd.
3. Metal: 3 inch wide, 24 gage galvanized steel.

D. Leaded Vinyl Sheet: Minimum 0.55 inch thick, 0.87 lbs. per sq ft, 10 dB attenuation in 10
2.6 DUCT TEST HOLES

A. Manufacturers:

1. Elgin.
2. California Aire.

B. Permanent Test Holes: Factory fabricated, air tight flanged fittings with screw cap. Furnish extended neck fittings to clear insulation.

2.7 STATIC PRESSURE GAGES

A. Manufacturers:

1. Dwyer Instruments Inc.
2. Weiss Instruments Inc.
3. Precision Instruments Inc.

B. Dial Gages: 3-1/2 inch diameter dial in metal case, diaphragm actuated, black figures on white background, front calibration adjustment, 2 percent of full scale accuracy.

C. Inclined Manometer: Plastic with red liquid on white background with black figures, front calibration adjustment, 3 percent of full scale accuracy.

D. Accessories: Static pressure tips with compression fittings for bulkhead mounting, 1/4 inch diameter tubing.

2.8 BOWDEN CABLE CONTROL SYSTEMS AND VOLUME DAMPERS

A. Manual volume dampers, round or rectangular, with cable control or manual quadrant.

B. General: All volume dampers above inaccessible ceilings shall be provided with Bowden remote cable controls as manufactured by Young Regulator Company, no known equal. Dampers mounted in diffuser inlets or requiring ceiling access panels for adjustment are not acceptable.

C. Construction:

1. Round dampers shall be butterfly design with heavy-duty spiral shell, 20 ga. “V” style blade, ½” round steel shaft and oil impregnated bronze bearings requiring no lubrication. Round dampers shall be Young Regulator Model 5020 or equal.

2. Rectangular dampers shall be opposed blade design. Dampers up to 12” in height shall be constructed of .050 extruded aluminum double channel frame with stainless steel hardware including the damper slide. Blades shall be .050 extruded aluminum with longitudinal reinforcing beads. Blades shall be installed...
in individual Teflon blade bushings in the damper frame. Dampers shall be used in branch ducts with velocities under 750 fpm and maximum pressures of 2" w.g. Rectangular dampers shall be Young Regulator Model 820/830 or equal.

3. For volume dampers above 12" in height, refer to control damper specification.
4. Cable control manufacturer shall supply all necessary hardware for simple installation of remote cable control system including the Bowden aluminum angle bracket and the Bowden control hub to accommodate the cable control system mounted on the damper.

D. Cable Control System: Cable control system shall consist of Bowden cable .054" stainless steel control wire encapsulated in 1/16" flexible galvanized spiral wire sheath to insure positive operation. Control kit shall be designed for use with internally or externally controlled round or rectangular dampers and shall consist of 14 ga. Steel rack and pinion gear drive to convert rotary motion to push-pull motion. Control shaft shall be D-style flattened ½" diameter with 265 degree rotation providing graduations for positive locking control and 1-1/2" linear travel. Cable shall terminate in a 1" or 3" inconspicuous access port, as indicated on plans. Twisting or rotating cable controls are not acceptable.

E. Manual Quadrant: Manual quadrant shall be commercial quality, locking type for 3/8" square or ½" round shaft and shall be available on an extended base for externally insulated ductwork.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify rated walls are ready for fire damper installation.
B. Verify ducts and equipment installation are ready for accessories.
C. Check location of air outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

3.2 INSTALLATION.

A. Install in accordance with NFPA 90A, and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 23 31 00 for duct construction and pressure class.
B. Install back-draft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated on Drawings.
C. Access Doors: Install access doors at the following locations and as indicated on Drawings:
   1. Spaced every 50 feet of straight duct.
   2. Upstream of each elbow.
3. Upstream of each reheat coil.
4. Before and after each duct mounted filter.
5. Before and after each duct mounted coil.
6. Before and after each duct mounted fan.
7. Before and after each automatic control damper.
8. Before and after each combination fire and smoke damper.
9. Install at locations for cleaning kitchen exhaust ductwork in accordance with NFPA 96.

D. Access Door Sizes: Install minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, and as indicated on Drawings. Install 4 x 4 inch for balancing dampers only. Review locations prior to fabrication.

E. Install temporary duct test holes required for testing and balancing purposes. Cut or drill in ducts. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

F. Install combination fire and smoke dampers at locations as indicated on Drawings. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.

1. Install smoke dampers and combination smoke and fire dampers in accordance with NFPA 92A.
2. Install dampers square and free from racking with blades running horizontally.
3. Do not compress or stretch damper frame into duct or opening.
4. Handle damper using sleeve or frame. Do not lift damper using blades, actuator, or jack shaft.
5. Install bracing for multiple section assemblies to support assembly weight and to hold against system pressure. Install bracing as needed.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Diffusers.
   2. Registers
   4. Door grilles.

B. Related Sections:
   1. Section 23 33 00 - Air Duct Accessories: Volume dampers for inlets and outlets.

1.2 REFERENCES

A. Air Movement and Control Association International, Inc.:
   1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.

B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
   1. ASHRAE 70 - Method of Testing for Rating the Performance of Air Outlets and Inlets.

C. Sheet Metal and Air Conditioning Contractors:
   1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

1.3 SUBMITTALS


B. Product Data: Submit sizes, finish, and type of mounting. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

C. Samples: Submit two of each required air outlet and inlet type.

D. Test Reports: Rating of air outlet and inlet performance.

E. Manufacturer’s Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Execution and Closeout Requirements: Closeout procedures.
B. Project Record Documents: Record actual locations of air outlets and inlets.

1.5 QUALITY ASSURANCE

A. Test and rate diffuser, register, and grille performance in accordance with ASHRAE 70.
B. Test and rate louver performance in accordance with AMCA 500.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience, and with service facilities within 100 miles of Project.

1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum one week prior to commencing work of this section.

1.8 WARRANTY

A. Execution and Closeout Requirements: Product warranties and product bonds.
B. Furnish five year manufacturer warranty for air outlets and inlets.
C. Architectural Specifications – Warranties.

1.9 EXTRA MATERIALS

A. Execution and Closeout Requirements: Spare parts and maintenance products.

PART 2 - PRODUCTS

2.1 PERFORATED FACE CEILING DIFFUSERS

A. Manufacturers:
   1. Titus.
   2. Price Company.
   5. Tuttle and Bailey.
B. Type: Square perforated face with adjustable pattern, stamped, multicore diffuser to discharge air in one-way, two-way, three-way, four-way pattern with sector baffles where indicated.
C. Frame: Surface mount, Snap-in, Inverted T-bar, Spline type. In plaster ceilings, furnish plaster frame and ceiling frame.
D. Fabrication: Steel with steel or aluminum frame and baked enamel off-white finish.

2.2 CEILING EXHAUST AND RETURN REGISTERS/GRILLES

A. Manufacturers:

1. Titus.
2. Price Company.
5. Tuttle and Bailey.

B. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with blades set at 45 degrees, vertical or horizontal face as indicated on the drawings.

C. Frame: 1 inch margin with countersunk screw mounting.

D. Fabrication: Steel with 20 gage minimum frames and 22 gage minimum blades, steel and aluminum with 20 gage minimum frame, or aluminum extrusions, with factory baked enamel finish.

E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.

2.3 WALL SUPPLY REGISTERS/GRILLES

A. Manufacturers:

1. Titus.
2. Price Company.
5. Tuttle and Bailey.

B. Type: Streamlined and individually adjustable blades, 3/4 inch minimum depth, 3/4 inch maximum spacing with spring or other device to set blades, vertical or horizontal face, single or double deflection.

C. Frame: 1 inch margin with countersunk screw mounting and gasket.

D. Fabrication: Steel with 20 gage minimum frames and 22 gage minimum blades, steel and aluminum with 20 gage minimum frame, or aluminum extrusions, with factory off-white baked enamel finish.

E. Damper: Integral, gang-operated opposed blade type with removable key operator, operable from face.
2.4 WALL EXHAUST AND RETURN REGISTERS/GRILLES

A. Manufacturers:

1. Titus.
2. Price Company.
5. Tuttle and Bailey.

B. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with spring or other device to set blades, vertical or horizontal face.

C. Frame: 1 inch margin with countersunk screw mounting.

D. Fabrication: Steel with 20 gage minimum frames and 22 gage minimum blades, with factory off-white enamel finish.

E. Damper: Integral, gang-operated, opposed-blade type with removable key operator, operable from face.

2.5 DOOR GRILLES

A. Manufacturers:

1. Titus.
2. Price Company.
5. Tuttle and Bailey.

B. Type: V-shaped louvers of 20 gage thick steel, 1 inch deep on 1/2 inch centers.

C. Frame: 20 gage steel with auxiliary frame to give finished appearance on both sides of door, with factory prime coat finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify inlet and outlet locations.

B. Verify ceiling systems are ready for installation.

3.2 INSTALLATION

A. Install diffusers to ductwork with airtight connection.
B. Install balancing dampers on duct take-off to diffusers, grilles, and registers, whether or not dampers are furnished as part of diffuser, grille, and register assembly. Refer to Section 23 33 00.

C. Paint visible portion of ductwork behind air outlets and inlets matte black.

END OF SECTION
PART 1 – GENERAL

1.1 SUMMARY

Furnish and install a self-contained, vertical, exterior wall mount, through-the-wall heat pump to be manufactured by Bard Manufacturing Company, Inc. The unit shall be approved and listed by Intertek ETL Listed (ETL US/C). Unit shall be factory assembled, pre-charged, pre-wired, tested and ready to operate. Unit performance shall be certified in accordance with the Air Conditioning Heating and Refrigeration Institute (AHRI) Standard 390-2003 for Single Package Vertical Units. Unit efficiency shall be specified by EER and COP.

Manufacturers: Capacities shall be as indicated on drawings and units shall be manufactured by Bard Manufacturing Company, Inc. or prior approved equal.

PART 2 - CONSTRUCTION FEATURES

2.1 CABINET

Construction shall be a single, enclosed, weatherproof casing constructed of 20-gauge galvanized steel. Unit base is constructed of 16-gauge galvanized steel. Each exterior casing panel to be bonderized and finished with baked-on exterior polyester enamel paint prior to assembly. The baked-on cured paint finish shall pass the industry rub test with a minimum of 72 rubs MEK (Methyl Ethyl Ketone) or standard rub test of a minimum of 100 rubs using Tolulene. Cooling section shall be fully insulated with 1-inch fiberglass to prevent sweating and to muffle sounds. Openings shall be provided for power connections. Access openings appropriate for outside structure to all fan motors and compressor for making repairs and for removing internal components without removing unit from its permanent installation. Fresh air intake and outdoor coil shall be protected from intrusions by a sturdy metal grating with less than 1/4 inch openings.

Colors (Select One)
Beige (standard)
White
Gray
Desert Brown
Dark Bronze

2.2 DRAIN PAN

Drain pan shall be constructed of 20-gauge galvanized steel, bonderized and finished with baked-on exterior polyester enamel paint.

2.3 INSULATION
SECTION 23 8143
AIR-TO-AIR HEAT PUMP

Insulation shall be foil faced for ease of cleaning.

2.4 MOUNTING BRACKETS

Full-length side mounting brackets shall be an integral part of the cabinet. Bottom mounting bracket shall be provided.

2.5 REFRIGERATION SYSTEM

All models shall use a high efficiency scroll or compressor. The compressor shall be covered by a 5-year parts warranty. The refrigeration circuit shall be equipped with factory installed high and low pressure controls and liquid line filter dryer. The refrigeration control shall be a factory installed capillary tube. Compressor shall be mounted rubber grommets. Unit shall be provided with R-410A (HFC) non-ozone depleting refrigerant.

2.6 CONDENSER FAN MOTOR

The condenser fan, motor and shroud shall be of slide out configuration for easy access.

2.7 INDOOR BLOWER MOTOR

The indoor blower motor shall be twin wheels with forward curve blades. Motor shall be high efficiency PSC type.

2.8 ELECTRICAL COMPONENTS

Electrical components are easily accessible for routine inspection and maintenance through front service panels. Circuit breaker is standard on all 208/230-volt models and rotary disconnect standard on all 460-volt models. Circuit breaker/rotary disconnect access is through lockable access panel.

2.9 CONTROL CIRCUIT

The internal control circuit shall consist of a current limiting 24VAC type 50VA transformer. The defrost circuit shall consist of a solid-state electronic heat pump control. A 30-minute timer shall inflate a defrost cycle if the outdoor coil temperature indicates the possibility of an iced condition. The thermistor sensor, speed-up terminal for service, and a ten-minute defrost override shall be standard on the electronic heat pump control. To prevent rapid compressor short cycling, a five-minute time delay circuit shall be factory installed. A low-pressure bypass shall be factory installed to prevent nuisance tripping during low temperature start-up.

All units with 3-phase power shall include factory mounted phase rotation monitor. This device shall protect scroll compressor from reverse rotation and also protect unit from phase failure. If 3-phase power is incorrectly connected at the field power connections, the phase monitor shall lock out the unit and a red light will illuminate indicating incorrect phase. Also if a power leg is lost, the phase monitor will lockout the unit due to phase
imbalance. Once the condition is corrected, turning the power off at the circuit breaker or disconnect will reset the phase monitor.

PART 3 - HEAT OPTIONS

3.1 Electric Heat

The heat pump shall have a factory installed electric resistance heater available that is designed specifically for application in the WH Series heat pump. Heater shall include automatic limit safety controls.

PART 4 - VENTILATION OPTIONS (SELECT ONE)

WH models to meet all the ventilation and indoor air quality requirements. All ventilation packages are factory or field installed, and easily removable for service.

4.1 COMMERCIAL ROOM VENTILATOR

The built-in commercial room ventilator is internally mounted and allows outside ventilation air, up to 50% of the total air flow rating of the unit, to be introduced through the air inlet openings. It includes a built-in exhaust air damper. The damper can be easily adjusted to control the amount of fresh air supplied into the building. Automatic control shall be provided to maintain desired ventilation rate during the different supply airflows of fan only, Stage 1 and Stage 2 modes of operation. The CRV can be controlled by indoor blower operation or field controlled based on room occupancy using CO2 controller. Unit complies with ANSI/ASHRAE Standard 62.1 Ventilation for Acceptable Air Quality.

PART 5 - FILTER OPTIONS –

5.1 2” Fiberglass – Pleated – MERV 6

PART 6 - UNIT CONTROL OPTIONS

6.1 Low ambient control
6.2 High pressure control
6.3 Outdoor air thermostat

PART 7 - OPERATING CONTROLS (FIELD INSTALLED)

7.1 None
PART 8 - INSTALLATION

8.1 Installation shall be done in strict adherence to Bard’s Installation Instructions.

PART 9 - HOT GAS REHEAT

9.1 The dehumidification circuit incorporates an independent heat exchanger coil in the supply air stream in addition to the standard evaporator coil. This coil reheats the supply air after it passes over the cooling coil, and is sized to nominally match the sensible cooling capacity of the evaporator coil. Extended run times in dehumidification mode can be achieved using waste heat from the refrigeration cycle to achieve the reheat process, while at the same time large amounts of moisture can be extracted from the passing air stream. Models that also have electric heaters installed have the electric heat inhibited during dehumidification mode, although it remains available for additional reheat during certain conditions. The dehumidification cycle shall be energized by a rise in relative humidity above set point. The unit shall energize in the cooling mode and also a two position valve will energize, allowing hot refrigerant gas to pass thru the reheat coil, reheating the cold air leaving the evaporator coil. The dehumidification cycle shall have on/off capability. If the thermostat calls for cooling or heating during the dehumidification cycle, the unit shall drop out of dehumidification to satisfy the call from the thermostat. A solid state circuit board shall control the dehumidification function. The dehumidification option shall be factory installed.

PART 10 – WARRANTY

10.1 The Bard product specified shall be free from defects in materials and workmanship for a period of 5 years for compressor, and for a period of 5 years for all parts. Warranty period shall start from date of installation as stated on warranty card; or from date of shipment if no warranty card is returned to Bard Manufacturing. Equipment must be used under normal conditions and warranty is subject to Bard Manufacturing’s standard limited warranty statement.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers general work of all Sections under Division 26.

B. Provide a complete working electrical installation with all equipment called for in proper operating condition. Documents do not undertake to show or list every item to be provided. When an item not shown or listed is clearly necessary for proper operation of equipment which is shown or listed, provide the item which will allow the system to function properly at no increase in Contract Price.

1.2 REFERENCES

A. The General Conditions, Supplementary Conditions, and applicable portions of Divisions 01 and 26 apply to the work of this Section as if printed herein.

1.3 SUBMITTALS

A. Forward all submittals in related groups. Individual or incomplete submittals are not acceptable.

B. Identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and check materials and equipment.

C. Identify each submittal item by reference to Specification Section paragraph in which item is specified or Drawing and Detail number.

D. Organize submittals in same sequence as they appear in Specification Sections, articles or paragraphs.

E. Shop Drawings shall show physical arrangement, construction details and finishes.

1. Drawings shall be drawn to scale and dimensioned where applicable.

2. Catalog cuts and published material may be included to supplement scale drawings.

F. Internal wiring diagrams of equipment shall show wiring as actually furnished for this project with all optional items clearly identified as included or excluded. Clearly identify external wiring connections. Identify and obliterate superfluous material.

G. Binders: Prepare submittal material in accordance with the following:
1. Insert all literature in standard 3-ring binders for 8-1/2 inch by 11 inch pages with individual tabs. Do not staple literature on different products together.

2. Number all binders on the outside of the cover and indicate the Specification Section. Mark Binder No. 1 Architect's copy and No. 2 Engineer's copy. Both of these binders shall contain original manufacturer's literature.

3. Provide an index with binder. This index shall follow the same sequence as the Specifications.

H. Submittal literature, drawings and wiring diagrams shall be specifically applicable to this Project and shall not contain extraneous material or optional choices. Clearly mark literature to indicate the proposed item. Submittals shall include, but not be limited to those items listed in individual Sections.

1. Include all physical and performance data, including materials, manufacturer's names, model numbers, weights, sizes, capacities, performance curves, finishes, colors, accessories and all other data required to completely describe equipment and to indicate complete compliance with Specifications and Drawings.

2. Include with complete submittals above, complete, large scale, dimensioned Shop Drawings, certified by manufacturer, of all major equipment and other equipment as directed by Architect.

I. Resubmittals will be reviewed for compliance with comment made on the original submittal only and should be marked with a resubmittal number and dated.

J. Operating & Maintenance Instructions and Manuals:

1. Subsequent to final completions and testing operations, this Division is responsible for instructing the Owner's authorized representatives in operation, adjustment and maintenance of electrical plant.

2. Submit three (3) copies of certificate, signed by Owner's Representatives, attesting to their having been instructed.


4. Provide two (2) full size prints of Record Drawing One-Line Diagram, in metal frame with glass front. Obtain record drawing prints from Architect at Contractor's cost and have prints framed in location as directed.

K. Submit as-built drawings showing actual constructed conditions, in accordance with the provisions of Section 01720.
1.4 QUALITY ASSURANCE

A. Materials and Systems:

1. Labels: Provide materials listed and labeled by Underwriters' Laboratories or testing firm acceptable to authority having jurisdiction, where listing service is normally provided for product.
2. Materials: Provide new and ship to jobsite in original manufacturer's containers or bundles.

B. Workmanship: Arrange work to obtain coordinated installation.

C. Code Compliance: Comply with applicable codes, laws, rules, regulations, and standards of applicable code-enforcing authorities.

D. References and Standards: All materials and equipment shall comply with all applicable standards and requirements of the standards listed below. Nothing in the Drawings or Specifications shall be construed to permit Work not conforming to applicable laws, ordinances, rules and regulations. It is not the intent of Drawings or Specifications to repeat requirements of codes except where necessary for completeness or clarity.

2. Association of Edison Illuminating Companies (AEIC).
3. Insulated Cable Engineers Association (ICEA).
4. Institute of Electrical and Electronics Engineers (IEEE).
5. National Electrical Manufacturer's Association (NEMA).
6. Underwriters' Laboratories, Inc. (UL).

E. Codes and regulations noted in other Sections in Division 26, applicable State and Local Codes and Ordinances. If any of the requirements of the above are in conflict with one another, or with the requirements of these specifications, the most stringent requirement shall govern.
1.5 DELIVERY, STORAGE AND HANDLING

A. Protect from loss or damage. Replace lost or damaged materials and equipment with new at no increase in Contract Sum.

1.6 DRAWINGS AND COORDINATION WITH OTHER WORK

A. Drawings:

1. For purposes of clarity, legibility, Drawings are essentially diagrammatic.
2. Exact routing of wiring and locations of outlets, panels, etc., shall be governed by structural conditions, obstructions and existing conditions. Architect reserves right, at no increase in price, to make any reasonable change in locations of electrical items, exposed at ceiling and/or on walls, to group them into orderly relationships and/or increase their utility. Contractor shall verify Architect’s requirements in this regard prior to rough-in.
3. Dimensions, location of doors, partitions, and similar physical features shall be taken from Architectural Drawings for exact location of outlets to center with Architectural features, panels, etc., at the approximate location shown on Electrical Drawings.
4. Mounting heights of brackets, outlets, etc., shall be as required to suit equipment served.
5. Drawings indicate, generally, routes of all branch circuits. All runs to panels are indicated as starting from nearest outlet, pointing in direction of panel. Continue all such circuits to panel as though routes were indicated in their entirety.

B. Coordination:

1. Work out all "tight" conditions involving Work under this Division and Work in other Divisions in advance of installation. If necessary, and before Work proceeds in these areas, prepare supplementary Drawings under this Division for review, showing all Work in "tight" area. Provide supplementary Drawings and additional Work necessary to overcome "tight" conditions.
2. Differences or disputes concerning coordination, interference or extent of Work between Divisions shall be decided by Contractor. His decision, if consistent with Contract Documents requirements, shall be final.
3. Coordinate electrical power and control wiring requirements of mechanical equipment with Division 23.
4. Where conflict exists between rough-in shown on drawings and that shown or required by equipment to be installed, obtain clarification from Architect and provide rough-in as directed.
5. Provide templates, information and instructions to other Divisions to properly locate holes and openings to be cut or provided for Electrical Work.

6. Coordinate chases, slots, inserts, sleeves, and openings for electrical supports, raceways, and cable with general construction work.

7. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment that requires positioning before closing in the building.

8. Coordinate location of access panels and doors for electrical items that are concealed by finished surfaces.

9. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.

C. Large Scale Layout Drawings: In accordance with requirements of Section 017700, prepare large scale detailed layout Drawings showing locations of equipment, conduit runs, panels, and all other elements of electrical systems where required by other Sections of this Division, plus sections of all congested areas to show relative position and spacing of affected elements. All symbols and designations used in preparing record Drawings shall match those used in Contract Drawings.

D. Equipment Rough-In:

1. Rough-in locations shown on Electrical Drawings for equipment furnished by Owner and for equipment furnished under other Divisions are approximate only.

   a. Obtain exact rough-in locations from following sources:
      1) From shop drawings for Contractor-furnished and installed equipment.
      2) From Architect for Owner-furnished Contractor-installed equipment.

2. Verify electrical characteristics of equipment before starting rough-in. Where conflict exists between equipment and rough-in shown on Drawings obtain clarification from Architect and provide as directed.

3. Unless otherwise shown or specified, provide direct raceway and conductor connections from building wiring system to equipment terminals for direct connected equipment which is Contractor furnished and Contractor installed, Owner furnished and Contractor installed.

4. Provide plug-in receptacle cap for cord connected equipment which is Contractor furnished and Contractor installed, Owner furnished and Contractor installed. Provide new cord and cap if required on Owner furnished and Contractor installed equipment.
5. Provide disconnect switches, flush type in finished spaces, where shown or required by code for direct connected equipment.

PART 2 - PRODUCTS

2.1 MATERIALS FURNISHED

A. New, bearing label of Underwriter's Laboratories, or other testing laboratory acceptable to authority having jurisdiction, where labeling exists for the class of equipment.

B. Provide equipment of one manufacturer, alike in appearance and function.

C. For equipment specified by manufacturer's number, include all accessories, controls, etc., listed in catalogue as standard with equipment. Furnish optional or additional accessories as specified.

D. Where no specific make of material or equipment is mentioned, use any product of reputable manufacturer which conforms to requirements of system and other applicable specification sections.

E. Equipment and material damaged during transportation, installation, or operation is considered as totally damaged. Replace with new. Variance from this permitted only with written approval.

F. Provide an authorized representative to constantly supervise Work of this Division, check all materials prior to installation for conformance with Drawings, Specifications, and reviewed Shop Drawings.

2.2 SUPPORTING DEVICES

A. Material: Cold-formed steel, with corrosion-resistant coating.

B. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel.

C. Slotted-Steel Channel: Flange edges turned toward web, and 9/16-inch-diameter slotted holes at a maximum of 2 inches o.c., in webs. Strength rating to suit structural loading.

D. Slotted Channel Fittings and Accessories: Recommended by the manufacturer for use with the type and size of channel with which used.

1. Materials: Same as channels and angles, except metal items may be stainless steel.
E. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.

F. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.

G. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for nonarmored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.

H. Expansion Anchors: Carbon-steel wedge or sleeve type.

I. Toggle Bolts: All-steel springhead type.


2.3 ELECTRICAL IDENTIFICATION

A. Colored Adhesive Marking Tape for Raceways, Wires, and Cables: Self-adhesive vinyl tape, not less than 1 inch wide by 3 mils thick.

B. Tape Markers for Conductors: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

C. Color-Coding Cable Ties: Type 6/6 nylon, self-locking type. Colors to suit coding scheme.

D. Underground Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape compounded for permanent direct-burial service, and with the following features:
   1. Not less than 6 inches wide by 4 mils thick.
   2. Embedded continuous metallic strip or core.
   3. Printed legend that indicates type of underground line.

E. Engraved-Plastic Labels, Signs, and Instruction Plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch minimum thickness for signs up to 20 sq. in. and 1/8-inch minimum thickness for larger sizes. Engraved legend in black letters on white background.

F. Warning and Caution Signs: Preprinted; comply with 29 CFR 1910.145, Chapter XVII. Colors, legend, and size appropriate to each application.
1. Interior Units: Aluminum, baked-enamel-finish, punched or drilled for mechanical fasteners.
2. Exterior Units: Weather-resistant, non-fading, preprinted, cellulose-acetate butyrate with 0.0396-inch, galvanized-steel backing. 1/4-inch grommets in corners for mounting.

G. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

H. Electrical Outlets: Dymo labels, self adhesive.

2.4 CONCRETE BASES

A. Concrete Forms and Reinforcement Materials: As specified in Section 033000“Cast-in-Place Concrete.”

B. Concrete: 3000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Manufacturer's Directions: Follow in all cases where manufacturers of articles used furnish directions covering points not specified or shown.

B. Equipment: Accurately set and leveled with supports neatly placed and properly fastened as shown and specified. Provide means of bringing in and installing equipment into position inside building. Install to facilitate service, maintenance and repair or replacement of components. Connect for ease of disconnecting with minimum interference with other installations.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom.

D. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.

E. Right of Way: Give to raceways and piping systems installed at a required slope.

F. Conduit Systems:

1. Worked into complete, integrated arrangement with like elements to make Work neat appearing, finished.
2. Run concealed, except as shown or noted otherwise. Where exposed, install parallel with walls or structural elements: vertical runs plumb; horizontal runs level or parallel with structure as appropriate: groups racked together neatly with straight runs and bends both parallel and uniformly spaced.

3. Install as high as practicable to maintain adequate headroom shown or required. Coordinate with Work of other Divisions to achieve proper headroom.

4. Flash and counter-flash all conduits through roof in accordance with requirements of Section 076200.

5. Clearance: Do not obstruct spaces required by code in front of electrical equipment, access doors, etc.

G. Penetrations:

1. Pack space between conduit, sleeve in walls with non-combustible materials.

2. Make penetrations through floors water-tight with non-hardening sealant even though concealed within wall or furred space.

3. Make penetrations through any damp-proofed/water-proofed surfaces damp-proof/waterproof by appropriate means to maintain integrity of system penetrated.

4. Seal around penetrations with fireproofing material to maintain integrity of fire rating where occurs.

H. Provide shrouds at light fixtures, electrical panelboards and like items to maintain integrity of rated wall or ceiling construction.

I. Hangers, Supports, Anchors and Chases:

1. Provide complete as required for installation of Electrical Work.

2. Equipment to be of metal only: no wood or combustible material will be permitted including supports for outlet boxes.

3. Hangers, anchors and supports for conduit runs: As specified.

4. Provide concrete insets for attachment of hangers; subject to structural engineer's review.

5. Provide anchors for floor and wall mounted equipment.

6. Provide supports for wall mounted equipment.

3.2 ELECTRICAL SUPPORTING DEVICE APPLICATION

A. Damp Locations and Outdoors: Hot-dip galvanized materials or nonmetallic, slotted channel system components.

B. Dry Locations: Steel materials.
C. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four with, 200-lb minimum design load for each support element.

3.3 SUPPORT INSTALLATION

A. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

B. Size supports for multiple raceway or cable runs so capacity can be increased by a 25 percent minimum in the future.

C. Support individual horizontal single raceways with separate, malleable-iron pipe hangers or clamps except use spring-steel fasteners for 1-1/2-inch and smaller single raceways above suspended ceilings and for fastening raceways to slotted channel and angle supports.

D. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.

E. Secure electrical items and their supports to building structure, using the following methods unless other fastening methods are indicated:

1. Wood: Wood screws or screw-type nails.
2. Gypsum Board: Toggle bolts. Seal around sleeves with joint compound, both sides of wall.
3. Masonry: Toggle bolts on hollow block and expansion bolts on solid block. Seal around sleeves with mortar, both sides of wall.
4. New Concrete: Concrete inserts with machine screws and bolts.
5. Existing Concrete: Expansion bolts.
   a. Comply with AWS D1.1 for field welding.
7. Light Steel Framing: Sheet metal screws.
10. Fasteners: Select so load applied to each fastener does not exceed 25 percent of its proof-test load.

3.4 IDENTIFICATION MATERIALS AND DEVICES

A. Install at locations for most convenient viewing without interference with operation and maintenance of equipment.
B. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.

C. Self-Adhesive Identification Products: Clean surfaces before applying.

D. Tag and label circuits designated to be extended in the future. Identify source and circuit numbers in each cabinet, pull and junction box, and outlet box. Color-coding may be used for voltage and phase identification.

E. Install continuous underground plastic markers during trench backfilling, for exterior underground power, control, signal, and communication lines located directly above power and communication lines. Locate 6 to 8 inches below finished grade. If width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches, overall, use a single line marker.

F. Install warning, caution, and instruction signs where required to comply with 29 CFR 1910.145, Chapter XVII, and where needed to ensure safe operation and maintenance of electrical systems and of items to which they connect. Indoors install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

G. Install -engraved-laminated emergency-operating signs with white letters on red background with minimum 3/8-inch- high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.

3.5 FIRESTOPPING

A. Apply firestopping to cable and raceway sleeves and other penetrations of fire-rated floor and wall assemblies to restore original undisturbed fire-resistance ratings of assemblies. Firestopping installation is specified in Section 078413 “Penetration Firestopping”.

3.6 CONCRETE BASES

A. Construct concrete bases of dimensions indicated, but not less than 4 inches larger, in both directions, than supported unit. Follow supported equipment manufacturer's anchorage recommendations and setting templates for anchor-bolt and tie locations, unless otherwise indicated.

3.7 DEMOLITION
A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.

B. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.

C. Abandoned Work: Cut and remove buried raceway and wiring, indicated to be abandoned in place, 2 inches below the surface of adjacent construction. Cap raceways and patch surface to match existing finish.

D. Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.

3.8 CUTTING AND PATCHING

A. Do all cutting, repairing, including structural reinforcing, necessary for Work under this Division. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.

B. Do not do any cutting or patching without approval. Repair, refinish and touch up disturbed finish materials and other surfaces to match adjacent undisturbed surfaces equal to original condition in Architect’s opinion.

3.9 EXCAVATING & BACKFILLING

A. Provide as required for installation of work under this Division in accordance with requirements of Section 0327010.

B. Provide all necessary shoring, pumping as part of Work of this Division.

C. In any asphalt or concrete paved areas, backfill only to sub grade level.

3.10 TESTING AND ADJUSTING

A. Furnish all labor and test equipment required under this Division.

B. Test panels and branch circuits for grounds or shorts. Repair defective wiring as required.

C. Test each individual circuit at panel for proper operation.
D. Upon completion of Work, make final inspection; operate equipment under normal conditions, to satisfaction of Architect.

E. At completion of Work, provide written certification that all systems are functioning properly without defects.

F. Test all feeders for line-to-ground and line-to-line resistance with a 500 VDC motor driven "Megger". Minimum acceptable resistance is 100 meg-ohms. Schedule all feeders and indicate line-to-ground and line-to-line resistances. Have all tests witnessed by Architect or his authorized representative.

G. Perform testing at a time suitable to the Architect and Owner. Advise the Architect a minimum of two weeks prior to testing so that he can arrange to be present if he desires.

H. Provide for Grounding System: Test for ground currents with all equipment energized. Include ground impedance test by 2 or 3 point fall-of-potential method.

I. Submit six (6) sets of test reports for review.

3.11 CLEANING AND PAINTING

A. Properly prepare Work under this Division to be finish painted under Section 099113.

B. Refinish Work supplied with final finish under this Division if damaged under this Division to satisfaction of Architect.

C. After other Work is accomplished, clean exposed conduit, panels (interiors and exteriors), fixtures, equipment and leave in satisfactory condition.

3.12 VOLTAGE CHECK

A. At completion of job, check voltage at several points of utilization on the system which has been installed under this Contract. During test, energize all installed loads.

B. Adjust taps on transformers to give proper voltage, which is 118 to 122 volts for 120-volt nominal systems and proportionately equivalent for higher voltage systems. If proper voltage cannot be obtained, inform the Architect and the Owner.

END OF SECTION
PART 1 – GENERAL

1.1 SUMMARY

A. Section includes electrical connections to equipment.

B. Related Sections:

1. Section 260519 - Low-Voltage Electrical Power Conductors and Cable.
2. Section 260533 - Raceway and Boxes for Electrical Systems.

1.2 REFERENCES

A. National Electrical Manufacturers Association:

1. NEMA WD 1 - General Requirements for Wiring Devices.
2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures.

B. Product Data: Submit wiring device manufacturer’s catalog information showing dimensions, configurations, and construction.

C. Manufacturer's installation instructions.

1.4 CLOSEOUT SUBMITTALS

A. Section 017300 and 017700 - Execution and Closeout Procedures.

B. Section 017839 - Project Record Documents: Record actual locations, sizes, and configurations of equipment connections.

1.5 COORDINATION

A. Obtain and review shop drawings, product data, manufacturer’s wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.

B. Determine connection locations and requirements.

C. Sequence rough-in of electrical connections to coordinate with installation of equipment.

D. Sequence electrical connections to coordinate with start-up of equipment.
PART 2 - PRODUCTS

2.1 CORD AND PLUGS

A. Manufacturers:
   1. Leviton.
   2. Arrow Hart.
   4. Eagle.

B. Attachment Plug Construction: Conform to NEMA WD 1.

C. Configuration: NEMA WD 6; match receptacle configuration at outlet furnished for equipment.

D. Cord Construction: Type SO multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.

E. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify equipment is ready for electrical connection, for wiring, and to be energized.

3.2 EXISTING WORK

A. Remove exposed abandoned equipment wiring connections, including abandoned connections above accessible ceiling finishes.

B. Disconnect abandoned utilization equipment and remove wiring connections. Remove abandoned components when connected raceway is abandoned and removed. Install blank cover for abandoned boxes and enclosures not removed.

C. Extend existing equipment connections using materials and methods compatible with existing electrical installations.

3.3 INSTALLATION

A. Make electrical connections.

B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

D. Install receptacle outlet to accommodate connection with attachment plug.

E. Install cord and cap for field-supplied attachment plug.

F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.

H. Install terminal block jumpers to complete equipment wiring requirements.

I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

J. Coolers and Freezers: Cut and seal conduit openings in freezer and cooler walls, floor, and ceilings.

3.4 ADJUSTING

A. Section 017300 and 017700 - Execution and Closeout Procedures.

B. Cooperate with utilization equipment installers and field service personnel during checkout and starting of equipment to allow testing and balancing and other startup operations. Provide personnel to operate electrical system and checkout wiring connection components and configurations.

END OF SECTION
PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.2 SUBMITTALS

A. Section 013300 – Submittal Procedures.

B. Field quality-control test reports.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 CONDUCTORS AND CABLES

A. Manufacturers:

2. General Cable Corporation.

B. Refer to Part 3 "Conductor and Insulation Applications" Article for insulation type, cable construction, and ratings.

C. Conductor Material: Copper complying with NEMA WC 5 or 7; solid conductor for No. 10 AWG and smaller, stranded for No. 8 AWG and larger.
D. Conductor Insulation Types: Type THW, THHN-THWN or XHHW complying with NEMA WC 5 or 7.

E. Multiconductor Cable: Metal-clad cable, Type MC with ground wire. Use shall be approved by the school district.

2.3 CONNECTORS AND SPLICES

A. Manufacturers:

1. AFC Cable Systems, Inc.
2. AMP Incorporated/Tyco International.
3. Hubbell/Anderson.
4. O-Z/Gedney; EGS Electrical Group LLC.
5. 3M Company; Electrical Products Division.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR AND INSULATION APPLICATIONS

A. Service Entrance: Type THHN-THWN, single conductors in raceway.

B. Exposed Feeders: Type THHN-THWN, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.

D. Feeders Concealed in Concrete, below Slabs-on-Grade, and in Crawlspaces: Type THHN-THWN, single conductors in raceway.

E. Exposed Branch Circuits, including in Crawlspaces: Type THHN-THWN, single conductors in raceway.

F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway. Metal-clad cable, Type MC shall not be used without notice of approval from the school district.

G. Branch Circuits Concealed in Concrete and below Slabs-on-Grade: Type THHN-THWN, single conductors in raceway.


I. Class 1 Control Circuits: Type THHN-THWN, in raceway.
J. Class 2 Control Circuits: Type THHN-THWN, in raceway.

3.2 INSTALLATION

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.

D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

E. Support cables according to Section 260500 "Common Work Results for Electrical."

F. Seal around cables penetrating fire-rated elements according to Section 078413 "Penetration Firestopping".

G. Identify and color-code conductors and cables according to Section 260500 “Common Work Results for Electrical.”

H. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

I. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.3 FIELD QUALITY CONTROL

A. Testing: Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.

B. Test Reports: Prepare a written report to record the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY
   
A. This Section includes grounding of electrical systems and equipment. Requirements specified in this Section may be supplemented by requirements of other Sections.

1.2 SUBMITTALS
   
A. Section 013300 – Submittal Procedures. Section xxxx – Concrete Reinforcement and Section xxxx – Cast-in_place Concrete.

B. Product Data: For ground rods.

1. Field quality-control test reports.

1.3 QUALITY ASSURANCE
   
A. Electrical Components, Devices, and Accessories: Listed and labeled under UL 467 as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.4 GROUNDING ELECTRODE SYSTEM
   
A. Metal underground water pipe.

B. Metal frame of the building.

C. Concrete-encased electrode.

D. Rod electrode.

1.5 PERFORMANCE REQUIREMENTS
   
A. Grounding System Resistance: 5 ohms.

1.6 SUBMITTALS
   
A. Section 013300 – Submittal Procedures.

B. Product Data: Provide data for grounding electrodes and connections.

C. Test Reports: Indicate all resistance to ground and resistance of each electrode.

D. Manufacturer’s Instructions: Include all instructions for storage, handling, protection, examination, preparation and installation of exothermic connectors.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cadweld.
2. Thermoweld.
3. Copperweld Corp.
4. Dossert Corp.
8. Hastings Fiber Glass Products, Inc.
9. ILSCO.
12. Lyncole XIT Grounding.
14. Burndy "Hyground" compression system
15. Thomas & Betts, compression system

2.2 GROUNDING CONDUCTORS

A. For insulated conductors, comply with Section 260519 "Low-Voltage Power Conductors and Cable."

B. Equipment Grounding Conductors: Insulated with green-colored insulation.

C. Isolated Ground Conductors: Insulated with green-colored insulation with yellow stripe. On feeders with isolated ground, use colored tape, alternating bands of green and yellow tape to provide a minimum of three bands of green and two bands of yellow.

D. Grounding Electrode Conductors: Stranded cable.

E. Underground Conductors: Bare, tinned, stranded, unless otherwise indicated.

F. Bare, Solid-Copper Conductors: ASTM B 3.

G. Assembly of Bare, Stranded-Copper Conductors: ASTM B 8.

H. Bare, Tinned-Copper Conductors: ASTM B 33.

I. Copper Bonding Conductor: No. 4 or No. 6 AWG, stranded copper conductor.
J. Copper Bonding Jumper: Bare copper tape, braided bare copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

K. Tinned-Copper Bonding Jumper: Tinned-copper tape, braided copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

L. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulated spacer.

M. Connectors: Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items. Exothermic-welded type, in kit form, selected per manufacturer’s written instructions.

N. Foundation Electrode: 4/0 AWG.

2.3 ROD ELECTRODES

A. Ground Rods: Copper-clad steel.
   1. Size: 3/4 inch diameter by 120 inches.
   2. Manufacturer: Blackburn; Eritech; Or equal.

2.4 GROUNDING WELL COMPONENTS

A. Well Pipe: 12 inch diameter by 24 inches long concrete pipe with belled end.

B. Well Cover: Cast iron with legend ‘GROUND” embossed cover.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use only copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone and similar materials.

B. In raceways, use insulated equipment grounding conductors.

C. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections.

D. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
   1. Use insulated spacer; space 1 inch from wall and support from wall 6 inches above finished floor, unless otherwise indicated.
E. Equipment Grounding Conductors: Comply with 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.

1. Install insulated equipment grounding conductors in feeders.
2. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate grounding conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.
3. Nonmetallic Raceways: Install an equipment grounding conductor in nonmetallic raceways unless they are designated for telephone or data cables.
4. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
   b. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

F. Ground Rods: Install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes.

1. Drive ground rods until tops are 2 inches below finished floor or final grade, unless otherwise indicated.
2. Interconnect ground rods with grounding electrode conductors. Use exothermic welds, except as otherwise indicated. Make connections without exposing steel or damaging copper coating.

G. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

H. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers or supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

I. Connections: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
6. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
7. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.
8. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conductor to a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.
9. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.
10. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.
11. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

J. Manholes and Handholes: Install a driven ground rod close to wall and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide a No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.

K. Connections to Manhole Components: Connect exposed-metal parts, such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper conductor. Align conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits.

3.2 FIELD QUALITY CONTROL
A. Testing: Perform the following field quality-control testing:

1. After installing grounding system but before permanent electrical circuitry has been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum ground-resistance level is indicated and at service disconnect enclosure grounding terminal. Measure ground resistance not less than two full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests, by the fall-of-potential method according to IEEE 81.
3. Provide drawings locating each ground rod, ground rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results. Nominal maximum values are as follows:
   a. Equipment Rated 500 kVA and Less: 10 ohms.
   b. Equipment Rated 500 to 1000 kVA: 5 ohms.
   c. Equipment Rated More Than 1000 kVA: 3 ohms.
   d. Manhole Grounds: 10 ohms.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Conduit supports.
2. Formed steel channel.
4. Sleeves.
5. Mechanical sleeve seals.
6. Firestopping relating to electrical work.
7. Firestopping accessories.
8. Equipment bases and supports.

1.2 REFERENCES

A. ASTM International:


B. FM Global:


C. National Fire Protection Association:

1. NFPA 70 - National Electrical Code.

D. Underwriters Laboratories Inc.:

3. UL 1479 - Fire Tests of Through-Penetration Firestops.
5. UL - Fire Resistance Directory.

E. Intertek Testing Services (Warnock Hersey Listed):
1. WH - Certification Listings.

1.3 DEFINITIONS

A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.4 SYSTEM DESCRIPTION

A. Firestopping Materials: ASTM E119 to achieve fire ratings as noted on Drawings for adjacent construction, but not less than 1 hour fire rating.

1. Ratings may be 3-hours for firestopping in through-penetrations of 4-hour fire rated assemblies unless otherwise required by applicable codes.

B. Surface Burning: ASTM E84 with maximum flame spread / smoke developed rating of 25/450.

C. Firestop interruptions to fire rated assemblies, materials, and components.

1.5 PERFORMANCE REQUIREMENTS

A. Firestopping: Conform to applicable code for fire resistance ratings and surface burning characteristics.

B. Firestopping: Provide certificate of compliance from authority having jurisdiction indicating approval of materials used.

1.6 SUBMITTALS

A. Section 013300 - Requirements for submittals.

B. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.

C. Product Data:

1. Hangers and Supports: Submit manufacturers catalog data including load capacity.

2. Firestopping: Submit data on product characteristics, performance and limitation criteria.

D. Firestopping Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.

E. Design Data: Indicate load carrying capacity of trapeze hangers, hangers and supports.
F. Manufacturer's Installation Instructions:
   1. Hangers and Supports: Submit special procedures and assembly of components.
   2. Firestopping: Submit preparation and installation instructions.

G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

H. Engineering Judgements: For conditions not covered by UL or WH listed designs, submit judgements by licensed professional engineer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.

1.7 QUALITY ASSURANCE

A. Through Penetration Firestopping of Fire Rated Assemblies: UL 1479 or ASTM E814 with 0.10 inch water gage minimum positive pressure differential to achieve fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
   1. Wall Penetrations: Fire F-Ratings as indicated on Drawings, but not less than 1-hour.
   2. Floor and Roof Penetrations: Fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
      a. Floor Penetrations within Wall Cavities: T-Rating is not required.

B. Through Penetration Firestopping of Non-Fire Rated Floor and Roof Assemblies: Materials to resist free passage of flame and products of combustion.
   2. Penetrating Items: Materials approved by authorities having jurisdiction for penetrating items connecting maximum of two stories.

C. Fire Resistant Joints in Fire Rated Floor, Roof, and Wall Assemblies: ASTM E1966 or UL 2079 to achieve fire resistant rating as indicated on Drawings for assembly in which joint is installed.

D. Fire Resistant Joints between Floor Slabs and Exterior Walls: ASTM E119 with 0.10 inch water gage minimum positive pressure differential to achieve fire resistant rating as indicated on Drawings for floor assembly.

E. Surface Burning Characteristics: 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

F. Perform Work in accordance with State Public Work's standard.

G. Maintain one copy of each document on site.
1.8 Qualifications

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section with minimum 5 years documented experience.

1.9 Delivery, Storage, and Handling

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

1.10 Environmental Requirements

A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.

B. Do not apply firestopping materials when temperature of substrate material and ambient air is below 60 degrees F.

C. Maintain this minimum temperature before, during, and for minimum 3 days after installation of firestopping materials.

D. Provide ventilation in areas to receive solvent cured materials.

Part 2 - Products

2.1 Conduit Supports

A. Manufacturers:

1. Allied Tube & Conduit Corp.
2. Electroline Manufacturing Company.
3. O-Z Gedney Co.

B. Furnish materials in accordance with State Public Work's standards.

C. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.
D. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.

E. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.

F. Conduit clamps - general purpose: One hole malleable iron for surface mounted conduits.

G. Cable Ties: High strength nylon temperature rated to 185 degrees F. Self locking.

2.2 FORMED STEEL CHANNEL

A. Manufacturers:

1. Allied Tube & Conduit Corp.
4. Unistrut Corp.

B. Furnish materials in accordance with State Public Work's standards.

C. Product Description: Galvanized 12 gage thick steel. With holes 1-1/2 inches on center.

D. Product Description: Mounting hole and screw closure.

2.3 SLEEVES

A. Furnish materials in accordance with State Public Work's standards.

B. Fire-stopping Insulation: Glass fiber type, non-combustible.

2.4 MECHANICAL SLEEVE SEALS

A. Manufacturers:

1. Thunderline Link-Seal, Inc.
2. NMP Corporation

B. Furnish materials in accordance with State Public Work's standards.

C. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.
2.5 FIRESTOPPING

A. Manufacturers:

1. Dow Corning Corp.
2. Fire Trak Corp.
3. Hilti Corp.
4. International Protective Coating Corp.
5. 3M fire Protection Products.

B. Furnish materials in accordance with State Public Work's standards.

C. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.

1. Silicone Firestopping Elastomeric Firestopping: Single component silicone elastomeric compound and compatible silicone sealant.
2. Foam Firestopping Compounds: Single component foam compound.
3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
4. Fiber Stuffing and Sealant Firestopping: Composite of mineral fiber stuffing insulation with silicone elastomer for smoke stopping.
5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
7. Firestop Pillows: Formed mineral fiber pillows.

D. Color: Dark gray

2.6 FIRESTOPPING ACCESSORIES

A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.

B. Dam Material: Permanent:

1. Mineral fiberboard.
3. Sheet metal.
4. Plywood or particle board.
5. Alumina silicate fire board.

C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.
D. General:
   1. Furnish UL listed products or products tested by independent testing laboratory.
   2. Select products with rating not less than rating of wall or floor being penetrated.

E. Non-Rated Surfaces:
   1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where conduit is exposed.
   2. For exterior wall openings below grade, furnish modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill annular space between conduit and cored opening or water-stop type wall sleeve.

PART 3 - EXECUTION

3.1 EXAMINATION

   A. Verify openings are ready to receive sleeves.
   B. Verify openings are ready to receive firestopping.

3.2 PREPARATION

   A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.
   B. Remove incompatible materials affecting bond.
   C. Install backing materials to arrest liquid material leakage.
   D. Obtain permission from Architect/Engineer before using powder-actuated anchors.
   E. Do not drill or cut structural members.

3.3 INSTALLATION - HANGERS AND SUPPORTS

   A. Anchors and Fasteners:
      1. Concrete Structural Elements: Provide precast inserts.
      2. Steel Structural Elements: Provide beam clamps.
      3. Concrete Surfaces: Provide self-drilling anchors and expansion anchors.
      5. Solid Masonry Walls: Provide expansion anchors and preset inserts.
      7. Wood Elements: Provide wood screws.
B. Inserts:

1. Install inserts for placement in concrete forms.
2. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above slab.

C. Install conduit and raceway support and spacing in accordance with NEC.

D. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.

E. Install multiple conduit runs on common hangers.

F. Supports:

1. Fabricate supports from structural steel or formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
2. Install surface mounted cabinets and panelboards with minimum of four anchors.
3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch off wall.
4. Support vertical conduit at every other floor.

3.4 INSTALLATION - FIRESTOPPING

A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.

B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.

C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating, to uniform density and texture.

D. Compress fibered material to maximum 40 percent of its uncompressed size.

E. Fire Rated Surface:

1. Seal opening at floor, wall, partition, ceiling, and roof as follows:
   a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
   b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
   c. Pack void with backing material.
d. Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.

2. Where conduit penetrates fire rated surface, install firestopping product in accordance with manufacturer's instructions.

F. Non-Rated Surfaces:

1. Seal opening through non-fire rated wall, partition, floor, ceiling, and roof opening as follows:
   a. Install sleeve through opening and extending beyond minimum of 1 inch on both sides of building element.
   b. Size sleeve allowing minimum of 1 inch void between sleeve and building element.
   c. Install type of firestopping material recommended by manufacturer.

2. Install escutcheons, floor plates or ceiling plates where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces include rooms with finished ceilings and where penetration occurs below finished ceiling.

3. Exterior wall openings below grade: Assemble rubber links of mechanical seal to size of conduit and tighten in place, in accordance with manufacturer's instructions.

4. Interior partitions: Seal pipe penetrations at clean rooms, laboratories, spaces, computer rooms, telecommunication rooms and data rooms. Apply sealant to both sides of penetration to completely fill annular space between sleeve and conduit.

3.5 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

A. Provide housekeeping pads of concrete, minimum 3-1/2 inches thick and extending 6 inches beyond supported equipment. Refer to Section 033000-Cast-In-Place Concrete.

B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.

C. Construct supports of steel members or formed steel channel. Brace and fasten with flanges bolted to structure.

3.6 INSTALLATION - SLEEVES

A. Exterior watertight entries: Seal with adjustable interlocking rubber links.

B. Conduit penetrations not required to be watertight: Sleeve and fill with silicon foam.

C. Set sleeves in position in forms. Provide reinforcing around sleeves.

D. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
E. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.

F. Where conduit or raceway penetrates floor, ceiling, or wall, close off space between conduit or raceway and adjacent work with fire stopping insulation and caulk. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

G. Install chrome plated steel stainless steel escutcheons at finished surfaces.

3.7 FIELD QUALITY CONTROL

A. Section 014100 - Quality Requirements. Field inspecting, testing, adjusting, and balancing.

B. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.8 CLEANING

A. Section 017300 and 017700 - Execution and Closeout Procedures.

B. Clean adjacent surfaces of firestopping materials.

3.9 PROTECTION OF FINISHED WORK

A. Section 017300 and 017700 - Execution and Closeout Procedures.

B. Protect adjacent surfaces from damage by material installation.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.2 SUBMITTALS

A. Section 013300 – Submittal Procedures.

B. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets indicated.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 METAL CONDUIT AND TUBING

A. Manufacturers:

1. AFC Cable Systems, Inc.
2. Alflex Inc.
3. Anamet Electrical, Inc.; Anaconda Metal Hose.
4. Electri-Flex Co.
5. Grinnell Co./Tyco International; Allied Tube and Conduit Div.
6. LTV Steel Tubular Products Company.
7. Manhattan/CDT/Coile-Flex.
8. O-Z Gedney; Unit of General Signal.
9. Wheatland Tube Co.
B. Rigid Steel Conduit: ANSI C80.1.

C. Aluminum Rigid Conduit: ANSI C80.5.

D. IMC: ANSI C80.6.

E. EMT and Fittings: ANSI C80.3.
   1. Fittings: Compression type.

F. FMC: Aluminum.

G. LFMC: Flexible steel conduit with PVC jacket.

H. Fittings: NEMA FB 1; compatible with conduit and tubing materials.

2.3 NONMETALLIC CONDUIT AND TUBING

A. Manufacturers:
   2. Anamet Electrical, Inc.; Anaconda Metal Hose.
   3. Arnco Corp.
   4. Cantex Inc.
   7. ElecSYS, Inc.
   8. Electri-Flex Co.
   9. Lamson & Sessions; Carlon Electrical Products.
  10. Manhattan/CDT/Cole-Flex.
  11. RACO; Division of Hubbell, Inc.
  12. Spiralduct, Inc./AFC Cable Systems, Inc.

B. RNC: NEMA TC 2, Schedule 40 and Schedule 80 PVC.

C. RNC Fittings: NEMA TC 3; match to conduit or tubing type and material.

2.4 SURFACE RACEWAYS

A. Surface Metal Raceways: Galvanized steel with snap-on covers. Finish with manufacturer's standard prime coating.
   1. Manufacturers:
      a. Airey-Thompson Sentinel Lighting; Wiremold Company (The).
      b. Thomas & Betts Corporation.
      d. Wiremold Company (The); Electrical Sales Division.
B. Types, sizes, and channels as indicated and required for each application, with fittings that match and mate with raceways.

2.5 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers:

1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. Emerson/General Signal; Appleton Electric Company.
3. Erickson Electrical Equipment Co.
6. O-Z/Gedney; Unit of General Signal.
7. RACO; Division of Hubbell, Inc.

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.
D. Nonmetallic Outlet and Device Boxes: NEMA OS 2.
E. Floor Boxes: Cast metal, fully adjustable, rectangular.
F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
G. Cast-Metal Pull and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.
H. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

I. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment.

2.6 FACTORY FINISHES

A. Finish: For raceway, enclosures, or cabinet components, provide manufacturer's standard prime-coat finish ready for field painting.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors:
1. Exposed: Rigid steel or IMC.
2. Concealed: Rigid steel or IMC.
3. Underground, Single Run: RNC.
4. Underground, Grouped: RNC.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
6. Boxes and Enclosures: NEMA 250, Type 3R.

B. Indoors:

1. Exposed: EMT.
2. Concealed: EMT.
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except use LFMC in damp or wet locations.
4. Damp or Wet Locations: Rigid steel conduit.
5. Boxes and Enclosures: NEMA 250, Type 1, except as follows:
   a. Damp or Wet Locations: NEMA 250, Type 4, stainless steel.

C. Minimum Raceway Size: 1/2-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings approved for use with that material. Patch all nicks and scrapes in PVC coating after installing conduits.

E. Do not install aluminum conduits embedded in or in contact with concrete.

3.2 INSTALLATION

A. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

B. Complete raceway installation before starting conductor installation.

C. Support raceways as specified in Section 260500 "Common Work Results For Electrical."

D. Install temporary closures to prevent foreign matter from entering raceways.

E. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above finished slab.

F. Make bends and offsets so ID is not reduced. Keep legs of bends in same plane and keep straight legs of offsets parallel, unless otherwise indicated.
G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
   1. Install concealed raceways with a minimum of bends in shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.

H. Raceways Embedded in Slabs: Install in middle 1/3 of slab thickness where practical and leave at least 2 inches of concrete cover.
   1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
   2. Space raceways laterally to prevent voids in concrete.
   3. Run conduit larger than 1-inch trade size parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
   4. Change from nonmetallic tubing to Schedule 80 nonmetallic conduit, rigid steel conduit, or IMC before rising above floor.

I. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
   1. Run parallel or banked raceways together on common supports.
   2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.

J. Join raceways with fittings designed and approved for that purpose and make joints tight.
   1. Use insulating bushings to protect conductors on all raceways 2” and larger.

K. Tighten set screws of threadless fittings with suitable tools.

L. Terminations:
   1. Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.
   2. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.

M. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
N. Telephone and Signal System Raceways, 2-Inch Trade Size and Smaller: In addition to above requirements, install raceways in maximum lengths of 150 feet and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements.

O. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.

P. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.

Q. Flexible Connections: Use maximum of 72 inches of flexible conduit for recessed and semi-recessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use LFMC in damp or wet locations. Install separate ground conductor across flexible connections.

R. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways to receptacle or fixture ground terminals.

S. Set floor boxes level and flush with finished floor surface.

T. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

3.3 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes underfloor raceway assemblies and associated junction boxes and fittings. Section also includes installation of wire and cable in raceways.

B. Related Sections:

1. Section 26 0526 - Grounding and Bonding for Electrical Systems.
2. Section 26 0533 - Raceway and Boxes for Electrical Systems.

1.2 SYSTEM DESCRIPTION

A. Underfloor Raceway System: Single level underfloor raceway, grouped in runs of 1 each for distributing power branch circuits, telephone circuits and data circuits; connected with header raceway.

B. Power Service Raceway: Standard width underfloor raceway with preset inserts for surface mounted single service outlet fittings.

C. Telephone and Data Service Raceway: Extra width underfloor raceway with preset inserts for surface mounted signal service outlet fittings.

D. Header Raceway: Extra width, flat top underfloor raceway, one for each service, with junction box connection at each distribution raceway.

E. Underfloor Raceway Assemblies: Cellular underfloor raceway assembly, with individual cells for power branch circuits, telephone circuits and data circuits; connected with header raceway.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures

B. Shop Drawings:

1. Indicate component details and assembly drawings.
2. Include floor plans, drawn to accurate scale, to show relationships between raceway and structural elements.
3. Raceway layout: Indicate components and accessories including expansion joint assemblies, inserts, outlets, and fittings.

C. Product Data: Submit underfloor raceway, fittings, and accessories; show components, dimensions, and finishes.

D. Samples: Submit two service fittings and flush outlet covers illustrating required finish.
1.4 CLOSEOUT SUBMITTALS
   A. Section 017300 and 017700 - Execution and Closeout Procedures.
   B. Project Record Documents: Record actual locations of underfloor raceway, junction boxes, inserts, and service outlet fittings. Indicate type and circuiting of outlets.
   C. Operation and Maintenance Data: Submit instructions for locating preset inserts, and installing outlets and after set inserts.

1.5 QUALIFICATIONS
   A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.6 PRE-INSTALLATION MEETINGS
   A. Convene minimum one week prior to commencing work of this section.

1.7 COORDINATION
   A. Coordinate Work with structural reinforcing.
   B. Coordinate fittings and trim with floor finishes.
   C. Coordinate component heights with concrete slab and floor fill thickness. Coordinate to obtain thickened slabs where required for underfloor raceway.

1.8 EXTRA MATERIALS
   A. Section 017300 and 017700 - Execution and Closeout Procedures.
   B. Furnish 5 after set inserts for each 200 feet of distribution raceway.
   C. Furnish 2 service fittings for each 100 feet of distribution raceway.
   D. Furnish 20 outlet blanking covers.
   E. Furnish 2 of each special tool needed to locate preset inserts.
   F. Furnish 2 of each special tool needed to install after set inserts.

PART 2 - PRODUCTS

2.1 FLAT-TOP UNDERFLOOR RACEWAY
   A. Manufacturers:
1. Wiremold.
2. B-Line
3. Panduit

B. Product Description: Steel underfloor raceway with corrosion-resistant finish.

C. Standard Size: 1.5 x 3 inches nominal.

D. Single Level Junction Boxes: Rectangular cover and trim, adjustable height. Furnish internal barriers, conduit and underfloor raceway entrances, and extension rings as indicated on Drawings.

E. Junction Box Cover Plate: Furnish tile trim plate flush with finished floor.

F. Supports: Adjustable before concrete topping placement.

G. Underfloor Raceway Markers: Corrosion resistant marker screws, with escutcheon.

H. Fittings and Accessories: Manufacturer's standard.

2.2 FLUSH-TYPE UNDERFLOOR RACEWAY

A. Manufacturers:

1. Wiremold.
2. B-Line
3. Panduit.

B. Product Description: Steel underfloor raceway with corrosion-resistant finish.

1. Standard Size: 1.5 x 3 inches nominal.
2. Inserts: Furnish precut 1-1/4 inch diameter holes on 24 inch centers. Close with flat metal screw plugs.
3. Junction Boxes: Rectangular cover and trim, adjustable height.
4. Junction Box Cover Plate: Furnish tile trim plate flush with finished floor.
6. Fittings and Accessories: Manufacturer's standard.

C. Housing: Satin aluminum.

D. Device Plate: Stainless steel.

E. Configuration: One duplex.
PART 3 - EXECUTION

3.1 EXISTING WORK

A. Disconnect abandoned underfloor duct circuits and remove service fittings. Remove abandoned service fittings when associated underfloor raceway is abandoned. Install blank covers for abandoned inserts, and patch finishes.

B. Maintain access to existing underfloor duct and other installations remaining active and requiring access. Modify installation or provide access panel.

C. Extend existing underfloor duct installations using materials and methods compatible with existing electrical installations, or as specified.

D. Clean and repair existing underfloor ducts to remain or to be reused.

3.2 INSTALLATION

A. Locate raceway in structural slab.

B. Install expansion fittings with bonding jumper where raceway crosses building expansion joints.

C. Securely hold junction boxes and raceways in place during installation to avoid floating or other movement.

D. Close unused raceway or conduit entrances to junction boxes. Seal raceway terminations at junction boxes.

E. Ground and bond raceway in accordance with Section 260526.

F. Special Techniques - Flat Top and Flush Type Raceway:

1. Install underfloor raceway with tops of preset inserts 1/8 inch below finished floor line. Locate raceways on centers.

2. Install top of flush-type raceway flush with finished floor.

3. Place schedule on inside of cover plate of each junction box indicating distance to first insert in each direction, measured from center of box. Install self-adhesive labels for schedule.

4. Install blank raceway in permanent corridors, vestibules, passages, lobbies, for connecting parallel raceways less than 6 feet apart, for feeder raceway from cabinet or panelboard to first junction box.

5. Support Couplers and Supports: Join raceway lengths using combination support couplers where practical. Install additional supports at intervals of not over 5 feet, within 30 inches each side of junction boxes, and as close as practical to elbows, bends, and terminations.

6. Install insert within 12 inches of edge of junction box. Align inserts on centers for services.
7. Do not extend inserts into special floor finishes, including terrazzo, marble, or wood.
8. Install raceway marker in each insert adjacent to junction box, at end of each raceway run, on both sides of permanent partitions, and on both sides of change of direction of raceway. Install markers flush with finished floor material. In carpeted areas, install marker screws level with carpet backing.
9. Install surface service fittings after installation of floor finishes. Cut floors in accordance with raceway manufacturer's recommendations. Replace damaged floor construction and finish with new.

G. Special Techniques - Wire and Cable Installation:

1. Clean raceways and fittings of debris and dust before installing wire and cable.
2. Pull wire and cable from outlet insert toward junction boxes.
3. Install branch circuit conductors continuous between junction box and farthest fitting. Do not cut conductor to make connections to receptacle devices.

END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. This section includes labor, materials, tools, equipment and components to form an underground electrical conduit (concrete encased ductbank) system to deliver electrical power, signal, and communications wiring to service points indicated on the Drawings.

B. All work must stay clear of Environmentally Sensitive Areas.

C. Manhole and handhole spacing shown on the Drawings is preliminary. Final manhole and handhole spacing shall be established by the Contractor based on maximum allowable cable pulling tension as designated by the cable manufacturer.

1.2 QUALITY ASSURANCE

A. Manufacturers: Firms regularly engaged in manufacture of underground utility structures, of types, sizes and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. NEC Compliance: Comply with NEC as applicable to construction and installation of underground electrical systems.

C. NESC Compliance: Comply with NESC as applicable to construction and installation of underground electrical systems.

D. Utility Companies: Comply with the requirements of the various utility companies.

1.3 SUBMITTALS

A. Submit complete dimensioned outline drawings with component details on fabricated manholes, handholes, and pullboxes, including cover details, structural bracing, accessory details such as cable racks, pulling irons, conduit knockouts, and erection and installation details and gross weights.

B. Shop Drawings: Submit dimensioned drawings of all raceways routing and cross-over details showing accurately scaled layouts and spatial relationships to associated equipment and connections. These drawings shall be fully coordinated with other trades prior to submittal. Show relationship to adjacent surrounding structure.

1.4 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, BOC technical design guidelines, and Division 01 Specification Sections, apply to this Section.

B. Related work specified elsewhere:
1. Trenching, backfilling and compacting: Division 2.
2. Raceways and Boxes for Electrical Systems: Section 26 0533.

PART 2 - PRODUCTS

2.1 CONDUIT AND FITTINGS

A. Conduit and fittings in duct banks shall be as described in Division 260533, Section “Raceways and Boxes for Electrical Systems”.

2.2 CONDUIT SPACERS

A. Spacers or separators shall be made of concrete, plastic or other suitable nonmetallic, non-decaying material. Spacers shall be interlocking and specifically formed for the conduit diameters used.

2.3 PRECAST MANHOLES AND HANDHOLES

A. Manholes and handholes precast with 28 day, 2,500 psi minimum compressive strength concrete and designed for AASHTO H-20 loading. Minimum internal dimensions are shown on the Drawings. Increase these as required by use of extension sections to accommodate the several raceway entrances at their required elevations.

B. Covers for manholes and handholes shall be identified as indicated on the Drawings. Provide covers with locking hold down bolts and gaskets for all manholes, handholes, and pull boxes. Use security type bolts for all covers.

C. Handholes shall be electrical type utility boxes as manufactured by Quickset, Brooks Products or equal. Provide hot dipped galvanized pull-in irons, sump pit, hole in floor near corner for ground rod, and knockout windows for entry of ductbanks.

D. Manholes shall have hot dipped galvanized pull-in irons, closed bottom sump pit with cover, hole in floor near corner for ground rod, and knockout windows for entry of ductbanks. Provide cable racks on each of the two longest sides with a 36 inch separation between racks. Provide racks as specified for manholes except spacing of signal racks shall be 30 inches. Refer to the Drawings for size. Prefabricated manhole shall be manufactured by Brooks Products or equal.

E. Cable racks shall be heavy duty, hot-dipped, galvanized, T-section steel.

2.4 DUCTBANK

A. For single or multiple conduit assemblies encase in concrete, provide details and sections of concrete encased underground duct banks indicating size of ducts, thickness of encasement, thickness of concrete between various ducts and burial depth required.
B. Underground duct sizes are as follows: Minimum size is 5” duct for general underground electric power distribution duct banks and minimum size is 4” duct for underground communication duct bank.

C. The minimum vertical or horizontal separation between ducts for power cables shall be 7.5” between adjacent centerlines.

D. An additional minimum of 25% spare ducts for all underground service shall be included for future expansion.

E. Install concrete encased underground duct banks at a minimum depth of 36” below final grade.

F. Where it is necessary to run communication ducts and/or low voltage ducts along with electric power distribution ducts, provide an isolated system for each in separate manhole compartments.

2.5 PRIMARY POWER DISTRIBUTION LOOP

A. No utility lines of any kind shall be routed under buildings, parking lots, paved terraces, sidewalks, and other paved areas. When electrical and communication lines must pass under paved roads, the concrete encased ducts shall be reinforced with #4 bars at 18” on center and a #6 wire hoop approximately 18”.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Conduits shall be thoroughly cleaned before laying. During construction and after completion, the conduit ends shall be kept plugged to prevent water from washing mud into the manholes, handholes, or pull boxes.

B. Provide a #4/0 bare copper conductor the length of each ductbank containing 12 KV feeder conductors.

C. Provide spacing between ducts for power cables in accordance with Details shown on the Drawings.

D. Conduit shall terminate in end bells in manholes, vaults, or handholes and shall enter at right angles to the wall.

E. Conduit bends within runs of less than 100 feet between pulling points, may have a radius of not less than 5 feet.

F. For conduit stub-ups manufactured bends may be used. Minimum radii of conduit under 3 inches shall be 18 inches. For 3 inch conduits and larger, minimum radii shall be 36 inches.
G. Install concrete encased underground duct banks at a minimum depth of 36 inches below final grade, unless indicated otherwise. Minimum depth shall be maintained below swales, ditches and other such features. Upon special request minimum depth may be reduced to no less than 24 inches to avoid underground conflicts.

H. Installation of underground raceways shall be coordinated with other site and building construction work.

I. Location of manholes and handholes shall be coordinated with Civil Engineering drawings for stationing.

J. Warning Tapes
   1. Bury warning tapes approximately 12 inches above all duct banks. Align parallel to and within three inches of the centerline of the conduit or duct bank. Where duct bank is wider than 36 inches, provide additional warning tapes at 36 inches centers, maximum, spaced uniformly over the duct bank.
   2. Plastic tape shall be yellow, six inch minimum width. Utilize tape made of material resistant to corrosive soil. Use tape with printed warning that an electric circuit is located below the tape. Manufacturers and types: ITT Blackburn Type YT, Griffolin Co., Terra-Tape or equal.

K. Use red concrete for medium voltage duct encasement.

L. Install ducts with minimum slope of 4" per 100 feet slope ducts away from buildings.

M. Mandrel
   1. Pull a mandrel of a diameter approximately 1/4 inch less than the raceways inside diameter, through each raceway to verify integrity and deburr conduit.
   2. Provide a 200 lb pull wire in all ducts.

N. Manholes and Handholes
   1. Set handholes on a pea gravel base or 20mm rock, six inches thick with horizontal dimensions same as bottom of handhole plus six inches all around.
   2. Set manholes on a pea gravel base or 20mm rock, 150 mm (six inches) thick with horizontal dimensions same as bottom of pull box plus 150 mm (six inches) all around.
   3. Cover shall be flush with finished surfaces. In unpaved areas, the top of manhole or pull box covers shall be one inch above finished grade or six inches above unfinished grade.
   4. At each manhole a ground rod shall be driven with 6 inches of rod exposed. A watertight seal shall be provided.
   5. Bond grounding conductors to ground rod.
   6. Excavation, backfilling and grading shall conform to requirements of section 312000.
7. Use box extension sections where necessary to raise cover to height required depending on grade finish and provide the required depth for conduit entrance.
8. Secure the cover frames to their handhole / manhole boxes.

O. Adjacent Utilities
1. Where other utility piping systems are encountered or being installed along a raceway route, maintain a 12 inch minimum vertical separation between raceways and other systems at crossings. Maintain a 12 inch minimum separation between raceways and other systems in parallel runs. Do not place raceways over valves or couplings in other piping systems.

P. Road Crossings
1. Where electric and communications lines must pass under paved roads, the concrete encased ducts shall be reinforced with 13mm (#4) bars at 18 inches on center and a #6 gauge wire hoop approximately 18 inches on center.

3.2 UNDERGROUND DISTRIBUTION SYSTEM GROUNDING
A. Manholes and Handholes: Install a driven grounding rod close to wall and set rod depth so 4 inches will extend above finished floor. Where necessary, install grounding rod before manhole is placed and provide a No. 1/0 AWG bare, copper conductor from grounding rod into manhole through a waterproof sleeve in manhole wall.

B. Connections to Manhole Components: Connect exposed metal parts, such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to grounding rod or grounding conductor. Make connections with minimum No. 4 AWG stranded, hard-drawn copper wire. Train conductors plumb or level around corners and fasten to manhole walls. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY
A. This Section includes seismic restraints and other earthquake-damage-reduction measures for electrical components. It applies to and complements optional seismic-restraint requirements in the various electrical component Sections of these Specifications.

1.2 DEFINITIONS
A. Seismic Restraint: A fixed device (a seismic brace, an anchor bolt or stud, or a fastening assembly) used to prevent vertical or horizontal movement, or both vertical and horizontal movement, of an electrical system component during an earthquake.
B. Mobile Structural Element: A part of the building structure such as a slab, floor structure, roof structure, or wall that may move independently of other structural elements during an earthquake.

1.3 SUBMITTALS
A. Section 013300 – Submittal Procedures.
B. Product Data: Illustrate and indicate types, styles, materials, strength, fastening provisions, and finish for each type and size of seismic-restraint component used. Include documentation of evaluation and approval of components by agencies acceptable to authorities having jurisdiction.
C. Shop Drawings: For components, physical arrangements, and installation details not defined by Drawings. Indicate materials and show calculations, design analysis, details, and layouts, signed and sealed by a professional engineer.
D. Pre-approval and Evaluation Documentation: By an agency approved by authorities having jurisdiction, showing maximum ratings of restraints.
E. Qualification data.
F. Field quality-control test reports.

1.4 QUALITY ASSURANCE
A. Comply with seismic-restraint requirements in California Building Code, unless requirements in this Section are more stringent.
B. Testing Agency Qualifications: An independent testing and inspection agency, acceptable to authorities having jurisdiction, with the experience and capability to conduct the inspection indicated.
1.5 PROJECT CONDITIONS

A. Project Seismic Zone and Zone Factor as Defined in CBC: Zone 4, Zone Factor 0.4.

B. Occupancy Category as Defined in CBC: III

C. Acceleration Factor as Defined in CBC, BOCA, or SBC: 0.75 G

1.6 COORDINATION

A. Coordinate layout and installation of seismic bracing with building structure, architectural features, and mechanical, fire-protection, electrical, and other building systems.

B. Coordinate concrete bases with building structural system.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Amber/Booth Company, Inc.
2. B-Line Systems, Inc.
3. Erico, Inc.
4. GS Metals Corp.
5. Loos & Company, Inc.
6. Mason Industries, Inc.
7. Powerstrut.
8. Thomas & Betts Corp.

2.2 MATERIALS

A. Use the following materials for restraints:

1. Indoor Dry Locations: Steel, zinc plated.
2. Outdoors and Damp Locations: Galvanized steel.

2.3 ANCHORAGE AND STRUCTURAL ATTACHMENT COMPONENTS

A. Strength: Defined in reports by ICC Evaluation Service or another agency acceptable to authorities having jurisdiction.
1. Structural Safety Factor: Strength in tension and shear of components shall be at least twice the maximum seismic forces for which they are required to be designed.

B. Concrete and Masonry Anchor Bolts and Studs: Steel-expansion wedge type.

C. Concrete Inserts: Steel-channel type.

D. Through Bolts: Structural type, hex head, high strength. Comply with ASTM A 325.

E. Welding Lugs: Comply with MSS SP-69, Type 57.

F. Beam Clamps for Steel Beams and Joists: Double sided. Single-sided type is not acceptable.

G. Bushings for Floor-Mounted Equipment Anchors: Neoprene units designed for seismically rated rigid equipment mountings, and matched to the type and size of anchor bolts and studs used.

1. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for seismically rated rigid equipment mountings, and matched to the type and size of attachment devices used.

2.4 SEISMIC-BRACING COMPONENTS

A. Slotted Steel Channel: 1-5/8-by-1-5/8-inch cross section, formed from 0.1046-inch-thick steel, with 9/16-by-7/8-inch slots at a maximum of 2 inches o.c. in webs, and flange edges turned toward web.

1. Materials for Channel: ASTM A 570, GR 33.
3. Fittings and Accessories: Products of the same manufacturer as channels and designed for use with that product.
4. Finish: Baked, rust-inhibiting, acrylic-enamel paint applied after cleaning and phosphate treatment, unless otherwise indicated.

B. Channel-Type Bracing Assemblies: Slotted steel channel, with adjustable hinged steel brackets and bolts.

C. Hanger Rod Stiffeners: Slotted steel channels, installed vertically, with internally bolted connections to hanger rod.

PART 3 - EXECUTION

3.1 INSTALLATION
A. Install seismic restraints according to applicable codes and regulations and as approved by authorities having jurisdiction, unless more stringent requirements are indicated.

B. Install structural attachments as follows:

1. Use bolted connections with steel brackets, slotted channel, and slotted-channel fittings to spread structural loads and reduce stresses.

2. Attachments to New Concrete: Bolt to channel-type concrete inserts or use expansion anchors.

3. Attachments to Existing Concrete: Use expansion anchors.

4. Holes for Expansion Anchors in Concrete: Drill at locations and to depths that avoid reinforcing bars.

5. Attachments to Solid Concrete Masonry Unit Walls: Use expansion anchors.

6. Attachments to Hollow Walls: Bolt to slotted steel channels fastened to wall with expansion anchors.

7. Attachments to Wood Structural Members: Install bolts through members.

8. Attachments to Steel: Bolt to clamps on flanges of beams or on upper truss chords of bar joists.

C. Install electrical equipment anchorage as follows:

1. Anchor panelboards, motor-control centers, motor controls, switchboards, transformers, fused power-circuit devices, control, and distribution units as follows:
   a. Anchor equipment rigidly to a single mobile structural element or to a concrete base that is structurally tied to a single mobile structural element.
   b. Size concrete bases so expansion anchors will be a minimum of 10 bolt diameters from the edge of the concrete base.
   c. Bushings for Floor-Mounted Equipment Anchors: Install to allow for resilient media between anchor bolt or stud and mounting hole in concrete.
   d. Anchor Bolt Bushing Assemblies for Wall-Mounted Equipment: Install to allow for resilient media where equipment or equipment-mounting channels are attached to wall.
   e. Torque bolts and nuts on studs to values recommended by equipment manufacturer.

D. Install seismic bracing as follows:

1. Install bracing according to spacing and strengths indicating by approved analysis.

2. Expansion and Contraction: Install to allow for thermal movement of braced components.
3. Attachment to Structure: If specific attachment is not indicated, anchor bracing to the structure at flanges of beams, upper truss chords of bar joists, or at concrete members.

E. Accommodation of Differential Seismic Motion: Make flexible connections in raceways, cables, wireway, cable trays, and busway where they cross expansion- and seismic-control joints, where adjacent sections or branches are supported by different structural elements, and where they terminate at electrical equipment anchored to a different mobile structural element from the one supporting them.

3.2 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing and inspection agency to inspect seismic-control installation for compliance with indicated requirements.

B. Testing Agency: Engage a qualified testing and inspection agency to inspect seismic-control installation for compliance with indicated requirements.

C. Re-inspection: Correct deficiencies and verify by re-inspection that work complies with requirements.

D. Provide written report of tests and inspections.

END OF SECTION
PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Nameplates.
   2. Labels.
   3. Wire markers.
   5. Stencils.
   7. Lockout Devices.

1.2 SUBMITTALS

A. Section 013300 - Submittal Procedures.

B. Product Data:
   1. Submit manufacturer’s catalog literature for each product required.
   2. Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function.

C. Samples:
   1. Submit two tags, actual size.
   2. Submit two labels, actual size.
   3. Submit two nameplates, 4 x 4 inch in size illustrating materials and engraving quality.

D. Manufacturer’s Installation Instructions: Indicate installation instructions, special procedures, and installation.

1.3 CLOSEOUT SUBMITTALS

A. Section 017300 and 017700 - Execution and Closeout Procedures.

B. Project Record Documents: Record actual locations of tagged devices; include tag numbers.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with State Public Work’s standard.
1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements.

B. Accept identification products on site in original containers. Inspect for damage.

C. Accept materials on site in original factory packaging, labeled with manufacturer’s identification, including product density and thickness.

D. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Section 016000 - Product Requirements.

B. Install labels and nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

1.8 EXTRA MATERIALS

A. Section 017300 and 017700 - Execution and Closeout Procedures.

B. Furnish two containers of spray-on adhesive.

PART 2 - PRODUCTS

2.1 NAMEPLATES

A. Furnish materials in accordance with State Public Work's standards.

B. Product Description: Laminated three-layer plastic with engraved black letters on white contrasting background color.

C. Letter Size:

1. 1/8 inch high letters for identifying individual equipment and loads.
2. 1/4 inch high letters for identifying grouped equipment and loads.

D. Minimum nameplate thickness: 1/8 inch.
2.2 LABELS
   A. Furnish materials in accordance with State Public Work's standards.
   B. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background.

2.3 WIRE MARKERS
   A. Description: Cloth tape, split sleeve, or tubing type wire markers.
   B. Legend:
      1. Power and Lighting Circuits: Branch circuit or feeder number as indicated on Drawings.
      2. Control Circuits: Control wire number as indicated on schematic and interconnection diagrams.

2.4 CONDUIT AND RACEWAY MARKERS
   A. Description: Nameplate fastened with adhesive.
   B. Color:
      1. 480 Volt System: Black lettering on white background.
      2. 208 Volt System: Black lettering on white background.

2.5 UNDERGROUND WARNING TAPE
   A. Description: 4 inch wide plastic tape, detectable type, colored with suitable warning legend describing buried electrical lines.

2.6 LOCKOUT DEVICES
   A. Lockout Hasps: Anodized aluminum hasp with erasable label surface; size minimum 7-1/4 x 3 inches.

PART 3 - EXECUTION

3.1 PREPARATION
   A. Degrease and clean surfaces to receive adhesive for identification materials. Prepare surfaces in accordance with Section 099113.

   B. INSTALLATION
      1. Install identifying devices after completion of painting.
      2. Nameplate Installation:
College of Alameda                SECTION 26 0553
Cougar Village Expansion                                 IDENTIFICATION FOR
Modular Bid Submittal FOR ELECTRICAL SYSTEM
16 January 2012

1. Install nameplate parallel to equipment lines.
2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.
3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners, or adhesive.
4. Secure nameplate to equipment front using screws, rivets, or adhesive.
5. Secure nameplate to inside surface of door on recessed panelboard in finished locations.

3. Install nameplates for the following:
   a. Switchboards.
   b. Panelboards.
   c. Service Disconnects.

4. Label Installation:
   a. Install label parallel to equipment lines.
   b. Install label for identification of individual control device stations.
   c. Install labels for permanent adhesion and seal with clear lacquer.

5. Wire Marker Installation:
   a. Install wire marker for each conductor at panelboard, gutters, pull boxes, outlet and junction boxes and each load connection.
   b. Mark data cabling at each end. Install additional marking at accessible locations along the cable run.
   c. Install labels at data outlets identifying patch panel and port designation as indicated.

6. Drawings.
   a. Stencil Installation: Apply stencil painting in accordance with Section 099113.

7. Underground Warning Tape Installation:
   a. Install underground warning tape along length of each underground conduit, raceway, or cable 6 to 8 inches below finished grade, directly above buried conduit, raceway, or cable.

END OF SECTION
PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

The lighting control system shall allow each relay to be controlled by the facilities management system. An interface assembly is provided in each relay panel to allow for one ON and one OFF momentary contact closure per relay. Each ON and OFF contact shall provide a 24VAC signal to the interface assembly. Local override switches may be connected to the relays as required.

1.2 QUALITY ASSURANCE

A. 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.

B. The manufacturer must be prepared to demonstrate the equipment he is proposing before the closing of tender.

C. Submit a one line diagram of the proposed system configuration for review.

D. Relay panel schedules indicating circuits connected, inputs assigned, area controlled, panel location and panel equipment details.

1.3 SUBMITTALS

A. Section 013300 – Submittal Procedures.

B. Supply manuals on system components to permit ease of installation, system operation and maintenance including, but not limited to the following:
   1. Lighting control system step by step operating instructions.
   2. Relay panel schedules indicating circuits connected, inputs assigned, area controlled, panel location and panel equipment details.

1.4 GENERAL

Provide a complete low voltage lighting control system for the building as shown on the plans and specified herein. All relays, transformers and interface devices shall be pre-assembled and pre-wired by the manufacturer on backpanels in the relay cabinets.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Low voltage control system shall be manufactured by one the following:
1. LC& D, WattStopper, Cooper Controls and Square D Controls or Approved equal.

All components including occupancy sensors and photocell are to be supplied by single manufacturer of this type of equipment.

B. Override Controller shall be manufactured by same manufacturer listed above or equal.

2.2 RELAYS

A. Lighting control relays mounted in relay panels shall be WR-6161 full load relays suitable for all types of lamp loads up to 20 Amperes at 347 VAC. Load contacts shall be able to sustain 1500 amp fault currents for up to 20 milliseconds. The relay shall be contained in a molded case containing both low and high voltage terminals and shall have a built-in operating lever marked on/off for manual switching at the relay panel.

B. It shall be impossible to continuously energize the relay coil by holding the low voltage switch in either the on or off position. Relays shall be complete with control diodes and internal control circuit eliminator contacts. Eliminator contacts shall automatically condition the input control circuit so as to reverse the coil polarity requirement immediately after an on/off control pulse is received.

C. Relays shall be CSA and UL listed.

D. Relays shall be Douglas WR-6161-82 or approved equal.

E. All Lighting Control Panel shall be installed with BMS Module compatible with the existing campus Delta BMS energy system.

2.3 RELAY PANELS

A. Where indicated on the drawings, provide a relay cabinet. The cabinet shall be for surface installation, with a lockable hinged door assembly as required.

2.4 OVERRIDE CONTROL

A. Control switch shall be capable of controlling different scheme (max of 8 scheme).

2.5 RELAY CABINETS

A. All relay cabinets must be UL/CSA approved for factory pre-assembly.
PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide #18 wire or larger as recommended by the manufacturer to switches.

B. Adhere to manufacturer’s recommendations as to maximum quantity of relays per switch.

END OF SECTION
PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes distribution panelboards and lighting and appliance branch-circuit panelboards.

1.2 SUBMITTALS

A. Product Data: For each type of panelboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:
   a. Enclosure types and details for types other than NEMA 250, Type 1.
   b. Bus configuration, current, and voltage ratings.
   c. Short-circuit current rating of panelboards and overcurrent protective devices.
   d. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

2. Wiring Diagrams: Power, signal, and control wiring.

3. Field quality-control test reports.

4. Operation and maintenance data.

C. Section 013300 – Submittal Procedures.

1.3 QUALITY ASSURANCE

A. 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.

B. Comply with NEMA PB 1.

C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:
   a. Eaton Corporation; Cutler-Hammer Products.
   c. Siemens Energy & Automation, Inc.
   d. Square D.

2.2 MANUFACTURED UNITS

A. Enclosures: Flush- and surface-mounted cabinets. NEMA PB 1, Type 1.
   1. Rated for environmental conditions at installed location.
      a. Outdoor Locations: NEMA 250, Type 3R.
      c. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
   2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.

B. Phase and Ground Buses: Hard-drawn copper, 98 percent conductivity.

C. Conductor Connectors: Suitable for use with conductor material.
   1. Ground Lugs and Bus Configured Terminators: Compression type.

D. Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect switches.

E. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices. Provide 20% space in all panelboards

F. Distribution and Panelboard Short-Circuit Rating:
   1. Fully rated to interrupt symmetrical short-circuit current available at terminals. Minimum rating as indicated on drawings.

2.3 DISTRIBUTION PANELBOARDS

A. Doors: Secured with vault-type latch with tumbler lock; keyed alike.

B. Main Overcurrent Protective Devices: Circuit breaker.

C. Branch Overcurrent Protective Devices:
   1. For Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.
   2. For Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.
2.4 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

B. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.5 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: UL 489, with interrupting capacity to meet available fault currents.


2. GFCI Circuit Breakers: Single- and two-pole configurations with 30-mA trip sensitivity.

3. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.
   a. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
   b. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
   c. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.

2.6 ACCESSORY COMPONENTS AND FEATURES

A. Furnish accessory set including tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

B. Fungus Proofing: Permanent fungicidal treatment for panelboard interior, including overcurrent protective devices and other components for all NEMA 3R panelboards.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install panelboards and accessories according to NEMA PB 1.1.

B. Comply with mounting and anchoring requirements specified in Section 260548 "Vibration and Seismic Controls for Electrical Systems."

C. Mount top of trim 74 inches above finished floor, unless otherwise indicated.
D. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.

E. Install overcurrent protective devices and controllers.
   1. Set field-adjustable switches and circuit-breaker trip ranges.

F. Install filler plates in unused spaces.

G. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future.

H. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Section 260500 "Common Work Results for Electrical"

I. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

J. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

K. Connect wiring according to Section 260519 "Low Voltage Electrical Power Conductors and Cables."

3.2 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:
   1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
   2. Test continuity of each circuit.

B. Perform the following field tests and inspections and prepare test reports:
   1. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
   2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION

A. Section 260500 applies to this section. Provide cabinets and enclosures, complete.

B. Work in This Section: Principal items include:
   1. Hinged cover enclosures.
   2. Cabinets.
   3. Terminal blocks and accessories.

1.2 QUALITY ASSURANCE

A. References:
   1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
   2. ANSI/NEMA ICS 1 - Industrial Control and Systems.
   3. ANSI/NEMA ICS 4 - Terminal Blocks for Industrial Control Equipment and Systems.
   4. ANSI/NEMA ICS 6 - Enclosures for Industrial Control Equipment and Systems.

1.3 SUBMITTALS

A. Section 013300 – Submittal Procedures.

B. Shop Drawings for Equipment Panels: Include wiring schematic diagram, wiring dia-
   gram, outline drawing and construction diagram as described in ANSI/NEMA ICS 1.

PART 2 – PRODUCTS

2.1 HINGED COVER ENCLOSURES

A. Construction: NEMA 250; Type 1, 3R, 4, steel.

B. Finish: Manufacturer's standard enamel finish.

C. Covers: Continuous hinge, held closed by flush latch operable by key. Locks shall be
   "keyed alike" with branch circuit panels.

D. Panel for Mounting Terminal Blocks or Electrical Components: 14 gage steel, white
   enamel finish.

2.2 CABINETS
A. Cabinet Boxes: Galvanized steel with removable endwalls. Provide 3/4 inch thick "CDX" plywood backboard painted matte white, for mounting terminal blocks.
B. Cabinet Fronts: Steel, flush surface type with concealed trim clamps, screw cover front, concealed hinge and flush lock keyed to match branch circuit panelboard; finish as directed by Contracting Agency.

2.3 TERMINAL BLOCKS AND ACCESSORIES

A. Terminal Blocks: ANSI/NEMA ICS 4; UL listed.
B. Power Terminals: Unit construction type, closed-back type, with tubular pressure screw connectors, rated 600 volts.
C. Signal and Control Terminals: Modular construction type, channel mounted; tubular pressure screw connectors, rated 300 volts.

2.4 FABRICATION

A. Shop Assembly: Shop assembles enclosures and cabinets housing terminal blocks or electrical components in accordance with ANSI/NEMA ICS 6.
B. Conduit Hubs Knockouts: Provide on enclosures.
C. Protective Pocket: Provide inside front cover with schematic diagram, connection diagram, and layout drawing of control wiring and components within enclosure.
D. Identification: Provide engraved nameplates on all cabinets as provided in Section 260553.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cabinets and enclosures plumb; anchor securely to wall and structural supports at each corner, minimum.
B. Provide accessory feet for free-standing equipment enclosures.
B. Install trim plumb.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Wall receptacles.
   2. Wall switches.
   3. Wall dimmer.
   4. Device wall plates and decorative box covers.

1.2 SUBMITTALS

A. Section 013300 – Submittal Procedures.

B. Product Data: For each type of product indicated submit manufacturer’s catalog information showing dimensions, colors and configurations.

C. Shop Drawings: List of legends and description of materials and process used for pre-marking wall plates.

D. Samples: One for each type of device and wall plate specified, in each color specified.

1.3 QUALITY ASSURANCE

A. 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.

B. Comply with NFPA 70.

C. NECA (National Electrical Contractors Association) – Standard of Installation.

D. NEMA WD 1 – General Requirements for Wiring Devices.

E. NEMA WD 6- Wiring Device – Dimensional Requirements.

PART 2 - PRODUCTS

2.1 RECEPTACLES

A. Description: NEMA WD 1, heavy duty general-use receptacle.

B. Device Body: White plastic or as selected by architect.

C. Configuration: NEMA WD 6, type as specified and indicated.
D. Convenience Receptacle: Type 5-20R

E. Ground Fault Interrupting GFCI Receptacle: with LED indicating light, test and reset buttons.

F. Construction: Nylon housing; one-piece yoke and ground (except isolation type) made of heavy gage brass; brass contacts; solid center rivet; back and side wired.

G. Manufacturers and Model Numbers:

1. Duplex convenience receptacle:
   a. Hubbell No. HBL5262
   b. Pass & Seymour/Legrand No. PS 5262
   c. Leviton No. 5262
   d. Cooper Wiring Devices No. 5262
   e. Or equal.

2. GFCI receptacle:
   a. Hubbell No. GF-20IL
   b. Pass & Seymour/Legrand No. 2095
   c. Leviton No. 8898
   d. Cooper Wiring Devices No. XGF20
   e. Or equal.

3. Special receptacles:
   a. Type as identified by NEMA standard number on drawings.

2.2 WALL SWITCHES

A. Description: NEMA WD 1, heavy duty AC only general-use, quiet type snap switch with fast make-slow break, silver-cadmium oxide alloy, side and back wired

B. Device Body: White plastic with matching toggle handle or as selected by architect.

C. Illuminated Handle Type Switch: Clear color handle.

D. Pilot Light: Lighted handle type switch, red color handle.

E. Voltage Rating: 120-277 volts, AC.

F. Current Rating: 20 amperes.

G. Manufacturers and Model Numbers:

1. Single-pole switch:
   a. Hubbell No. HBL-1221
   b. Pass & Seymour/Legrand No. PS20AC1
   c. Leviton No. 1221-2
   d. Cooper Wiring Devices No. 2221
   e. Or equal.
2. **Double-pole switch:**
   a. Hubbell No. HBL-1222
   b. Pass & Seymour/Legrand No. PS20AC2
   c. Leviton No. 1222-2
   d. Cooper Wiring Devices No. 2222
   e. Or equal.

3. **Three-Way switch:**
   a. Hubbell No. HBL-1223
   b. Pass & Seymour/Legrand No. PS20AC3
   c. Leviton No. 1223-2
   d. Cooper Wiring Devices No. 2223
   e. Or equal.

4. **Four-Way switch:**
   a. Hubbell No. HBL-1224
   b. Pass & Seymour/Legrand No. PS20AC4
   c. Leviton No. 1224-2
   d. Cooper Wiring Devices No. 2224
   e. Or equal.

5. **Pilot light handle indicator switch with red handle:**
   a. Hubbell No. HBL-1221-PL for 120V
   b. Pass & Seymour/Legrand No. PS20AC1-RPL for 120V
   c. Leviton No. 1221-PLR for 120V
   d. Cooper Wiring Devices No. 2221PL for 120V
   e. Or equal.

6. **Illuminated handle – Locator switch with clear handle:**
   a. Hubbell No. HBL-1221-ILC
   b. Pass & Seymour/Legrand No. PS20AC1-CSL
   c. Leviton No. 1221-2-LHC
   d. Cooper Wiring Devices No. 2221LTV
   e. Or equal.

7. **Up-down control switch:** 3-position, center off, momentary contact
   a. Hubbell No. HBL-1557
   b. Pass & Seymour/Legrand No. 1251
   c. Leviton No. 1257
   d. Cooper Wiring Devices No. 1995V
   e. Or equal.

### 2.3 INCANDESCENT WALL DIMMERS

A. **Description:** NEMA WD 1, semiconductor dimmer for incandescent lamps, type as indicated on drawings.

B. **Device Body:** White plastic with linear slide or as selected by architect.

C. **Voltage Rating:** 120 volts, AC.

D. **Power Rating:** Match load shown on drawings, 1,000 watts minimum.
E. Manufacturers: Lutron “Nova T” Series; Leviton “81000” series; Prescolite “Designer Line”.

F. Accessory Wall Switch: Match dimmer appearance.
   1. Lutron Model NT-1PS or NT-3PS.
   2. Or equal.

2.4 COMBINATION AND FLUORESCENT WALL DIMMER SWITCHES

A. Combination Switch and Receptacle: Both devices in a single gang unit with plaster ears and removable tab connector that permit separate or common feed connection.
   2. Receptacle: NEMA WD 6, Configuration 20-15R.
   3. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 20 percent of full brightness.

2.5 WALL PLATES

A. Decorative Cover Plate: Smooth nylon.
   1. Hubbell No. P Series
   2. Pass & Seymour/Legrand No. TP Series
   3. Leviton No. 80700 Series
   4. Cooper Wiring Devices No. PJ Series
   5. Or equal.

B. Weatherproof Cover Plate: Gasketed metal with hinged gasketed device cover.
   1. Hubbell No. WP26MH “while in use rated”
   2. Bell No. 245-AL
   3. Leviton NO. 4970
   4. Cooper Wiring Devices No. 989
   5. Or equal.

2.6 FINISHES

A. Color:
   1. Wiring Devices Connected to Normal Power System: As selected by Architect, unless otherwise indicated.

PART 3 - EXECUTION

3.1 INSTALLATION
A. Install devices and assemblies level, plumb, and square with building lines.

B. Install wall dimmers to achieve indicated rating after derating for ganging.

C. Install unshared neutral conductors on line and load side of dimmers.

D. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and with grounding terminal of receptacles on bottom. Group adjacent switches under single, multigang wall plates.

E. Remove wall plates and protect devices and assemblies during painting.

3.2 IDENTIFICATION

A. Comply with Section 260500 "Common Work Results for Electrical."
   1. Receptacles: Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.3 CONNECTIONS

A. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

B. Connect wiring according to Section 260519 "Low Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections:
   1. After installing wiring devices and after electrical circuitry has been energized, test for proper polarity, ground continuity, and compliance with requirements.
   2. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.

B. Remove malfunctioning units, replace with new units, and retest as specified above.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY
   A. Section includes fuses.

1.2 REFERENCES
   A. National Electrical Manufacturers Association:
      1. NEMA FU 1 - Low Voltage Cartridge Fuses.

1.3 DESIGN REQUIREMENTS
   A. Select fuses to provide appropriate levels of short circuit and overcurrent protection for the following components: wire, cable, bus structures, and other equipment. Design system to maintain component damage within acceptable levels during faults.

   B. Select fuses to coordinate with time current characteristics of other overcurrent protective elements, including other fuses, circuit breakers, and protective relays. Design system to maintain operation of device closest to fault operates.

1.4 FUSE PERFORMANCE REQUIREMENTS
   A. Motor Load Feeder Switches: Class RK1 (time delay).

   B. General Purpose Branch Circuits: Class RK1 (time delay).

   C. Motor Branch Circuits: Class RK1 (time delay).

1.5 SUBMITTALS
   A. Section 013300 - Submittal Procedures.

   B. Product Data: Submit data sheets showing electrical characteristics, including time-current curves.

1.6 CLOSEOUT SUBMITTALS
   A. Section 017300 and 017700 - Execution and Closeout Procedures.

   B. Project Record Documents: Record actual sizes, ratings, and locations of fuses.

1.7 QUALIFICATIONS
   A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years [documented] experience.
1.8 MAINTENANCE MATERIALS
   A. Section 0917300 and 017700 - Execution and Closeout Procedures.
   B. Furnish two fuse pullers.

1.9 EXTRA MATERIALS
   A. Section 017300 and 017700 - Execution and Closeout Procedures.
   B. Furnish three spare fuses of each Class, size, and rating installed.

PART 2 - PRODUCTS

2.1 FUSES
   A. Manufacturers:
      1. Bussmann.
      2. Eagle.
      3. G.E.
      4. Square D
   B. Dimensions and Performance: NEMA FU 1, Class as specified or as indicated on Drawings.
   C. Voltage: Rating suitable for circuit phase-to-phase voltage.

2.2 CLASS RK1 (TIME DELAY) FUSES
   A. Manufacturers:
      1. Bussmann.
      2. Eagle.
      3. G.E.
      4. Square D
   B. Dimensions and Performance: NEMA FU 1.
   C. Voltage: Rating suitable for circuit phase-to-phase voltage.

2.3 CLASS RK1 (NON-TIME-DELAY) FUSES
   A. Manufacturers:
      1. Bussmann.
      2. Eagle.
3. G.E.
4. Square D

B. Dimensions and Performance: NEMA FU 1.

C. Voltage: Rating suitable for circuit phase-to-phase voltage.

2.4 CLASS RK5 FUSES

A. Manufacturers:

1. Bussmann.
2. Eagle.
3. G.E.
4. Square D

B. Dimensions and Performance: NEMA FU 1.

C. Voltage: Rating suitable for circuit phase-to-phase voltage.

2.5 CLASS J (TIME DELAY) FUSES

A. Manufacturers:

1. Bussmann.
2. Eagle.
3. G.E.
4. Square D.

B. Dimensions and Performance: NEMA FU 1.

C. Voltage: Rating suitable for circuit phase-to-phase voltage.

D. Voltage: Rating suitable for circuit phase-to-phase voltage.

2.6 CLASS T FUSES

A. Manufacturers:

1. Bussmann.
2. Eagle.
3. G.E.
4. Square D.

B. Dimensions and Performance: NEMA FU 1.

C. Voltage: Rating suitable for circuit phase-to-phase voltage.
PART 3 - EXECUTION

3.1 EXISTING WORK

A. Remove fuses from abandoned circuits.

B. Maintain access to existing fuses and other installations remaining active and requiring access. Modify installation or provide access panel.

3.2 INSTALLATION

A. Install fuse with label oriented so manufacturer, type, and size are easily read.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following individually mounted, enclosed switches and circuit breakers:

1. Fusible switches.
2. Non fusible switches.
4. Enclosures.

1.2 SUBMITTALS

A. Section 013300 – Submittal Procedures.
B. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated.
C. Field quality-control test reports.
D. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. 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.
B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 FUSIBLE AND NONFUSIBLE SWITCHES

A. Manufacturers:

1. Eaton Corporation; Cutler-Hammer Products.
2. General Electric Co.; Electrical Distribution & Control Division.
4. Square D/Group Schneider.

B. Fusible Switch, 600 A and Smaller: NEMA KS 1, Type HD, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

C. Non-fusible Switch, 600 A and Smaller: NEMA KS 1, Type HD, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

D. Accessories:
   1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
   2. Neutral Kit: Internally mounted; insulated, capable of being grounded, and bonded; and labeled for copper and aluminum neutral conductors.
   3. Auxiliary Contact Kit: Auxiliary set of contacts arranged to open before switch blades open (required for all disconnects located downstream of Variable frequency Drives)

2.3 MOLDED-CASE CIRCUIT BREAKERS AND SWITCHES

A. Manufacturers:
   1. Eaton Corporation; Cutler-Hammer Products.
   2. General Electric Co.; Electrical Distribution & Control Division.
   4. Square D/Group Schneider.

B. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.
   3. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller and let-through ratings less than NEMA FU 1, RK-5.

C. Molded-Case Circuit-Breaker Features and Accessories:
   1. Standard frame sizes, trip ratings, and number of poles.
   2. Lugs: Mechanical style suitable for number, size, trip ratings, and conductor material.
3. Application Listing: Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.

4. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.

2.4 ENCLOSURES

A. NEMA AB 1 and NEMA KS 1 to meet environmental conditions of installed location.

1. Outdoor Locations: NEMA 250, Type 3R.
2. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Coordinate size and location of concrete bases. Verify structural requirements with structural engineer.

B. Concrete base is specified in Section 260500 "Common Work Results for Electrical," and concrete materials and installation requirements are specified in Division 03.

C. Comply with applicable portions of NECA 1, NEMA PB 1.1, and NEMA PB 2.1 for installation of enclosed switches and circuit breakers.

D. Mount individual wall-mounting switches and circuit breakers with tops at uniform height, unless otherwise indicated. Anchor floor-mounting switches to concrete base.

E. Comply with mounting and anchoring requirements specified in Section 260548 "Vibration and Seismic Controls for Electrical Systems."

F. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

G. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Section 260500 "Common Work Results for Electrical."

3.2 FIELD QUALITY CONTROL

A. Prepare for acceptance testing as follows:

1. Inspect mechanical and electrical connections.
2. Verify switch and relay type and labeling verification.
3. Verify rating of installed fuses.

B. Perform the following field tests and inspections and prepare test reports:
1. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.

2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION

A. Section 260500 applies to this section. Provide outdoor lighting, complete.

B. Work in This Section: Principal items include:
   1. Exterior luminaires and accessories.
   2. Poles, if required.

1.2 QUALITY ASSURANCE

A. Related Work:
   1. Section 312000 – Earth Moving.
   2. Section 260533 – Raceway and Boxes for Electrical Systems
   3. Section 260519 – Low-Voltage Power Conductors and Cable.

B. References: For all reference publications listed below, refer to editions currently adopted by federal, state, and local government agencies with jurisdiction over the project. For references that are not part of government codes, refer to most recent editions.
   1. IES Standards 1990 Applications.
   2. National Electrical Manufacturers Association - NEMA.
   3. National Electrical Code - NEC.
   4. Underwriters' Laboratories - UL.

1.3 SUBMITTALS

A. Section 013300 – Submittal Procedures.

B. Product Data: Submit indicating luminaire type, dimensions, wattage, voltage, ballast and lamp type, all provided accessories, pole type, pole dimensions, and pole structural information.

C. Manufacturer's Instructions: Submit covering Work of this Section.

D. Record Drawings: Submit under provisions of San Lorenzo County General Conditions. Accurately record installed location of poles, wiring configuration, and control devices and locations.

E. Operations and Maintenance Data: Submit under provisions of San Lorenzo County General Conditions.

F. Point-by-Point computer generated site plan indicating all lighting levels in maintained footcandles throughout the site, including all building block-outs. Plan shall be at same scale as working drawing Electrical Site Plan.
PART 2 - PRODUCTS

2.1 MATERIALS

A. All electrical materials shall be new and UL listed.

2.2 CONDUIT

A. Plastic Conduit: Shall be Schedule 40 PVC approved for use as nonmetallic raceway. Fittings shall be of the same manufacturer and installed with the manufacturer’s recommended solvent cement.

B. Rigid Steel Conduit: Shall be full weight, pipe size, hot-dip galvanized inside and out, wrapped with 20 mil pipe wrap with 50 percent overlap or PVC coated. Couplings shall be UL listed, threaded type, wrapped or PVC coated. Threadless couplings shall not be used.

C. Wire: All wire except fixture wire shall be THW or THWN, stranded copper.

D. Concrete: Class 1B, 3000 psi at 28 days or better.

2.3 EQUIPMENT

A. All electrical equipment shall be new and UL listed.

B. Pullboxes, if required: Shall be Christy N16 with N16-D lids in landscaped and pedestrian areas and N16-61J covers in traffic areas. Lids and covers shall be marked "LIGHTING".

C. Contactors: Shall be sized in accordance with load requirements but in no case smaller than NEMA size 1 (30 ampere). Enclosures shall be NEMA 1 for dry locations and NEMA 12 or 3R for manholes or damp locations. Control circuits shall be 120 volt only.

D. Circuit Breakers: NEMA 1 enclosures for dry locations and NEMA 12 or 3R for manholes or damp locations. Approved outdoor receptacles shall be provided.

E. Photocells: Plug-in type designed for outdoor use. Approved outdoor receptacles shall be provided.

F. Ballasts: Shall be constant wattage, high power factor type.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Locations of luminaires and electrical wiring indicated on the drawings are generally diagrammatic. Specific locations of all fixtures will be established
by Architect in the presence of the Contractor's representative after award of the Contract.

B. Conduit Installation:
1. Underground conduits in landscaped areas shall be PVC, Schedule 40, 1-1/4 inch minimum size with solvent weld couplings, except conduits from concrete pullboxes to lighting fixture bases shall be minimum 1 inch and stubbed up 6 inches from bottom of pullbox.
2. Conduits under roadways, parking lots, and other areas subject to vehicular traffic shall be galvanized rigid steel, wrapped or PVC coated.
3. Minimum depth of bury shall be 18 inches in landscaped areas and 24 inches in traffic areas. Trench shall be cleared of rocks and loose dirt and backfilled with smooth sand to depth of 3 inches under and 6 inches over conduit.
4. Field-cut ends of rigid steel conduits shall be reamed smooth. Running threads shall not be used.
5. Insulated throat grounding bushings shall be installed at each end of all metallic conduit runs. Terminations of PVC conduits at pullboxes shall be provided with endbells or suitable bushings and stubbed up 6 inches from bottom of pullbox.
6. Before any cables are pulled, a mandrel 1/4 inch smaller than the conduit I.D. shall be pulled through all conduits. If the mandrel will not go through, the duct will be considered unusable and must be repaired. Next, a wire brush the same diameter as the conduit I.D. shall be pulled through all conduits. This purging operation shall be done in the presence of the Project Manager's representative.
7. Pullboxes shall be installed firmly on a bedding of gravel and shall be set at grade in pavement and two inches above grade in unpaved areas.

C. Wiring:
1. Wire shall be sized in accordance with the drawings, but in no case smaller than No. 10 AWG, except fixture wire shall not be smaller than No. 16 AWG. Color coding shall be phase A- black, B- red, C- blue, for 120/208 volts and A- brown, B- orange, C- yellow for 277/480 volts; neutral - white, and ground - green. Color coding shall be orange, orange, green for 480 volt, single-phase systems.
2. Identification of Conductors in Pullboxes, Fixtures, and Panels: Branch circuits shall be securely tagged with vinyl wrap-around markers. Each circuit conductor shall be marked with corresponding circuit number.
3. Splices in wires No. 8 and smaller shall be made with twist-on, expandable, spring-type, solderless connectors with insulated metal shell, Scotchlok or approved equal. Splices in moist locations shall be epoxy encapsulated with Scotchcast or approved equal material.
4. Splices in wires No. 6 and larger shall be made with copper split copper bolt solderless gutter tap connectors, enveloped in insulating putty (Scotchfil or approved equal), taped, and painted with Scotchcoat or approved equal.
5. Splices in equipment grounding conductors shall be made with uninsulated copper split bolt connectors.

6. Metal poles shall be grounded.
   a. Ground wires shall be connected to grounding studs, where provided, using compression lugs.
   b. Ground wires shall be secured to fixture anchor bolts by means of ground clamps inside the poles.
   c. Ground rods shall be driven in pullboxes where required so that no luminaire is more than 400 feet from a ground rod.
   d. An equipment ground conductor shall be run with phase and neutral wires in each conduit and shall interconnect all ground rods and fixtures. Grounding conductors shall be sized in accordance with the NEC, except minimum size shall be No. 10 AWG, copper.

D. Fixture Installation: All luminaires and poles installed shall be secured in a truly plumb position and grouted.
   1. After installation of new luminaires and poles, all areas of damaged paint shall be repaired using equivalent and matching paint.
   2. All luminaires installed but not put into service shall be covered with burlap sack or equal until they are put into service.
   3. Luminaire foundations shall be constructed as shown on the drawings.

3.2 FIELD QUALITY CONTROL

A. General: Contractor shall arrange for locating of underground utilities through the Underground Service Alert locating service. Damage to marked utilities shall be repaired at Contractor's expense. Contractor shall repair all damage to sprinkler systems (whether marked or not) and shall restore all landscaping and pavement to its original condition.

B. Testing: Contractor shall test each completed system and verify that it is fully operational.

END OF SECTION
PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes general administrative and procedural requirements for Sections 270000 through 271300 and is intended to supplement, not supersede, the requirements of Division 1.

B. Related Items

1. Consult other Sections, determine the extent and character of related work, and coordinate work specified herein and for Sections numbering Div 27 with that specified elsewhere to produce a complete and operable installation.
2. Section 27 0726 Grounding and Bonding for Communications Systems
3. Section 27 0529 Hangers and Supports for Communications Systems
4. Section 27 0533 Conduits and Backboxes for Communications Systems
5. Section 27 0553 Identification for Communications Systems
6. Section 27 1000 Structured Cabling
7. Section 27 1300 Communication Backbone Cabling
8. General and Supplementary Conditions: Drawings and general provisions of Contract and Division 1 of the Specifications apply to 167 xx series Sections.
9. Selective Demolition: Nondestructive removal of materials and equipment as indicated, for reuse or salvage. Also dismantling materials and equipment made obsolete by these installations. Refer to Division 2, Selective Demolition.
10. Concrete Work: Saw cutting of existing slabs, setting of new conduit and/or floor boxes in existing concrete slabs, and grouting of conduits in saw-cut. Refer to Division 3, Concrete.
11. Moisture Protection and Smoke Barrier Penetrations: Membrane clamps, sheet metal flashing, counter flashing, caulking and sealant as required for waterproofing of conduit penetrations and sealing penetrations in or through fire walls, floors, ceiling slabs and foundation walls. Tape and make vapor tight penetrations through vapor barriers at slabs on grade. Refer to Division 7, Thermal and Moisture Protection.
12. Painting: Include surface preparation, priming and finish coating as required for exposed conduit, pull boxes, junction boxes, etc. where indicated on Drawings. Refer to Division 9, Painting.

1.2 REFERENCES

A. Reference to codes, standards, specifications and recommendations of technical societies, trade organizations and governmental agencies shall mean that latest edition of such publications adopted and published prior to submittal of the bid. Consider such codes or standards a part of this Specification as though fully repeated herein.
B. Codes: Perform Work and furnish materials and equipment under Sections 27 in accordance with applicable requirements of the latest edition of governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:

1. United States Department of Labor (DOL) Regulations (Standards - 29 CFR)
   a. Part 1910, "Occupational Safety and Health Standard. ••• "

2. National Fire Protection Agency (NFP A)
   a. NFP A 70, "National Electrical Code" (NEC).
   b. NFPA 75, "Protection Of Information Technology Equipment"


5. Uniform Fire Code (UFC).


7. National, State, Local and other binding building and fire codes.

8. FCC Regulations:
   b. Part 68 - Connection of Terminal Equipment to the Telephone Network

C. Standards: Perform Work and furnish materials and equipment under Sections l67xx in accordance with the latest editions of the following standards as applicable:

D. Underwriter's Laboratories (UL):

1. Applicable listing and ratings, including but not limited to the following standards:
   a. UL 444: Communications Cables
   b. UL 497: Protectors for Paired-Conductor Communication Circuits.
   c. UL 165]: Optical Fiber Cable
   d. UL1655: Community-Antenna Television Cables
   e. UL] 690: Data-Processing Cable
   f. UL ]963: Communications-Circuit Accessories
   g. g. UL 2024A: Optical Fiber Cable Routing Assemblies.

   a. Part 1: General Requirements
   b. Part 2: Balanced Twisted-Pair Cabling Component*)
   c. Part 2, Addendum 1: Transmission Performance Specifications For 4-Pair 100 Ohm Category 6 Cable
   d. Part 3: Optical Fiber Cabling Components Standard
3. ANSI/TIA/EIA -569-A Commercial Building Standard for Telecommunications Pathways and Spaces, including the following addenda:
   a. TIA/EIA-569-A-1 Perimeter Pathway Addendum
   b. TIA/EIA-569-A-2 Furniture Pathways Fill Addendum
   c. TIA/EIA-569-A-3 Access Floors
   d. TIA/EIA-569-A-4 Poke-Thru Devices
   e. TIA/EIA-569-A-6 Multi-Tenant Pathways and Spaces
   f. TIA/EIA-569-A-7 Cable Trays and Wireways
4. ANSI/TIA/EIA -B Optical Fiber Cable Color Coding.
6. ANSI/J-STD -607-A Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.
7. ANSI/TIA/EIA -758 Customer-Owner Outside Plant Telecommunications Cabling Standard. a. TIA/EIA-758-1 Addendum No. 1
8. EIA testing standards.
9. Insulated Cable Engineers Association (ICEA):
   a. ANSI/ICEA S-80-576-2002 Category 1 & 2 Individually Unshielded Twisted Pair Indoor Cables for Use in Communications Wiring Systems
   b. ANSI/ICEA 8-83-596-1994 Fiber Optic Premises Distribution Cable
   c. ANSI/ICEA 8-87-640-1999 Fiber Optic Outside Plant Communications Cable
   d. ANSI/ICEA S-90-661·2002 Category 3, 5, & 5e Individually Unshielded Twisted Pair Indoor Cable for Use In General Purpose and LAN Communication Wiring Systems
   e. ICEA S-104-696-2001 Standard For Indoor-Outdoor Optical Cable
    a. Telecommunications Distribution Methods Manual (TD:\IM)
    b. Customer-Owner Outside Plant Design Manual
    c. Wireless Design Reference Manual (WDRM)
    E. Make a copy of each document readily available during the course of construction for reference by field personnel.

1.3 DEFINITIONS

A. The Definitions of Division I shall apply to the Div 27 sections.

B. In addition to those Definitions of Division 1, the following list of terms as used in this specification defined as follows:
   1. "As directed": As directed or instructed by the Owner, or their authorized
1.4 SYSTEM DESCRIPTION

A. In circumstances where the Specifications and Drawings conflict, the Drawings shall govern quantity and the Specifications shall govern quality.

1.5 SUBMITTALS

A. Submit required submittals to the General Contractor in the quantities and formats as required under the general contract. In the absence of requirements, provide as described in the following with reference to quantity and format.

B. Product Data

1. Obtain written approval from the Engineer for the product data submittal prior to the release of materials and equipment purchase order and prior to installation.
2. Quantity: Submit product data submittals as described in Division 1. In the absence of requirements given, submit four product data submittals.
3. Format:
   a. Print product data on 8-1/2 x 11 inch paper either black & white or color.
   b. Package product data in either a folder or a 3-ring binder.
   c. Clearly label the submittal packaging - cover and spine (if applicable) - with the following information:

      1) Owner Name.
      2) Project Name and Project Address.
      3) Project Submittal Number.
      4) Submittal Name (e.g., "Product Data Submittal For Telecommunications Equipment Rooms").
      5) Specification Section Number (e.g., "Section 16705").
      6) Date of Submittal. Format: <month> <day>, <year> (e.g., "January 1, 2006").
      7) Contractor Name.

   d. Include a Table Of Contents at the beginning of the submittal that list materials (manufacturer and part number) by article and paragraph number (e.g., "2.02-A Equipment Racks").
   e. Include tabbed separators for improved navigation through the submittal.
4. Content:
   a. Cover Letter: Include a cover letter stating that the submittal is in full compliance with the requirements of the Contract Documents. Sign (and stamped, if applicable) cover letter and list items and data submitted. The person who prepared the submittal shall wet sign the cover letter. Failure to comply with this requirement shall constitute grounds for rejection of submittal.
   b. Product Information: Include catalog cuts, data sheets, product literature, manufacturer's technical data, specifications, block wiring diagrams, etc., which shall clearly describe the product's characteristics, physical and dimensional information, electrical performance data, materials used in fabrication, material color & finish, and other relevant information such as test data, typical usage examples, independent test agency information, and storage requirements. Clearly indicate by arrows or brackets precisely what is being submitted on and those optional accessories, which are included and those which are excluded. At a minimum, include products listed in the specifications numbering 167xx. Include relevant product, that will be installed, which are not listed in the specifications.
   c. Seismic Calculations: If required, include in the product data submittal the manufacturer's anchorage calculations for floor mounted fully loaded equipment racks/frames/cabinets such that it shall remain attached to the mounting surface after experiencing forces in conformance with CCR, Title 24, Table 23P, Part II and with Section 2312 "Earthquake Regulations" of the "Uniform Building Code" for Seismic Zone 4 Area, Importance Factor of 1.25. Specify proof loads for anchors. A Structural Engineer registered in the State of California shall prepare calculations and shall wet stamp and sign them. Forward calculations to the City of Alameda for review and approval.
   d. Resubmittals: Provide a cover letter with the resubmittal that lists the action taken and revisions made to each product submittal in response to Submittal Review Comments. No review shall take place for any resubmittal packages that is not accompanied by this cover letter. Failure to include this cover letter will constitute rejection of the resubmittal package.

C. Submittal Description: Shop Drawings
   1. Obtain written approval from the Engineer for the shop-drawings submittal prior to the release of materials and equipment purchase order and prior to installation.
   2. Quantity and Media: Submit shop drawing submittals as described in Division 1. In the absence of requirements given, submit four full-size sets of shop drawings on bond or "eco-bond".
   3. Format
      a. Prepare shop drawings using AutoCAD Release 2004 or later.
      b. Use the same size drawing sheet as the drawings of the Contract
Documents, and use the project title block.

c. Text: minimum of 3/32" high when plotted at full size.
d. Use identical symbols as those in the drawings.
e. Screen background information.
f. Plot system components (t<e; cable routes, etc.) and text at a sufficient line weight to stand out against background information.
g. Label each sheet in the shop drawings set with the Specification Section Number (e.g., "16710").
h. Scaling:

1) Scale floor plans at 1/8"=1 '-0"
2) Scale enlarged room plans at 1/4"=1 '-0"
3) Scale wall elevations at 112"= l'-0". 4) Scale rack elevations at 1 "= 1 '-0".

4. Content:

a. Submit detailed shop drawings if the proposed installation differs from the Contract Documents or the design intent.
b. Cover Letter: Accompany each shop drawing submittal with a cover letter stating that the shop drawings have been thoroughly reviewed by the Contractor and are in full compliance with the requirement~ of the Contract Documents. Have the person who prepared the submittal sign (and stamped, if applicable) the cover letter and include a drawing index. Failure to comply with this requirement shall constitute grounds for rejection of submittal.
c. Drawing Information: Shop drawing submittals shall consist of floor plans, enlarged room plans, wall and rack elevations, installation details, and other aspects of the system that differ from the Contract Documents or the design intent. Use the same scales as the Drawings (e.g., 1/4" == 1'-0" for enlarged room plans).
d. Seismic Calculations: Include anchorage calculations for floor mounted fully loaded equipment racks/frames/cabinets such that it shall remain attached to the mounting surface after experiencing forces in conformance with CCR, Title 24, Table 23P, Part II and with Section 2312 "Earthquake Regulations" of the "Uniform Building Code" for Seismic Zone 4 Area, Importance Factor of 1.25. Specify proof loads for anchors. A Structural Engineer registered in the State of California shall prepare Structural Calculations, and shall wet stamp and sign them. Forward calculations to the City of Alameda for review and approval.
e. Resubmittals: Accompany resubmittals with a cover letter that lists the revisions made to each drawing in response to Submittal Review Comments. Failure to include this cover letter will constitute rejection of the resubmittal package without review.

D. Submittal Description: Record / As-Built Drawings

1. Quantity & Media:
a. Submit four full-size sets of as-built drawings on bond or "eco-bond".
b. Submit one set of electronic files on CD-ROM.

2. Format:

a. Prepare as-built drawings using AutoCAD Release 2004 or later.
b. Use the sheet size as the drawings of the Contract Documents, and use the project title block.
c. Text: minimum of 3/32" high when plotted at full size.
d. Use symbols identical to the symbols shown on the Drawings.
e. Screen background information.
f. Plot system components (devices, cable routes, etc.) and text at a sufficient line weight to stand out against background information.

3. Content:

a. Provide Record Drawings that fully represent actual installed conditions and incorporate revisions made during the course of construction.
b. Floor plans shall show:
   1) Locations and identifiers of outlets.
   2) Size, quantity, location, and routes of pathways (such as cable trays, cable basket, conduits, cable hangers, and other cable support devices).
c. Enlarged room plans scaled at 112"=1'-0" showing exact placement of equipment cabinets/frames, rack bays, and overhead cable support devices (e.g., cable tray, cable basket, cable runway, conduit sleeves, etc.).
d. Wall elevations scaled at 1"=1 ' -0" showing exact placement of termination hardware (e.g., termination/crossconnect blocks).
e. Installation details.

E. Submittal Description: Operation and Maintenance (O&M) Manuals

1. Quantity: Submit quantity of O&M Manual~ as described in Division 1. In the absence of requirements given, submit four O&M Manuals.

2. Format:

a. Submit each O&M Manual in a white, 3-ring binder with front cover and spine clear pockets for insertion of the project information.
b. Clearly label the cover of each O&M Manual with the following information:
   1) Owner Name.
   2) Project Name and Project Address,
   3) Manual Name (e.g., "Operation And Maintenance Manual for Telecommunications Cabling System").
4) Date of Submittal. Format: <month> <day>, <year> (e.g., “July 11, 2011”), 5) Contractor Name.

c. Include a Table of Contents at the beginning that lists the contents,
d. Include tabbed separators for improved navigation through the manual.

3. Content:

a. 11 "x17" prints of As-Built Drawings. as described above.
b. Manufacturer’s original catalog information sheets for each component provided under
c. applicable Section.
d. Warranty certificate from the manufacturer and the Contractor.
e. Manufacturer’s instructions for system or component use.
f. Instructions for maintenance and warranty issues.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications

1. Five continuous years, minimum, design and manufacture of the materials and equipment specified herein.
2. Manufacturer(s) of products and equipment specified herein shall demonstrate that they have a quality assurance program in place to assure that the specifications are met. Include in the program minimum provisions for:

a. Incoming inspection of raw materials
b. In-process inspection and final inspection of the cable product
c. Calibration procedures of test equipment to be used in the qualifications of the product
d. Recall procedures in the event that out of calibration equipment is identified.

3. Conform to government standards on quality assurance for applications within these specifications.

B. Contractor Qualifications

1. A current, active, and valid and C7 or C1O California State Contractors License.
2. Five continuous years, minimum, experience
3. Five, minimum, completed projects similar to scope and cost.
4. Evidence of technicians qualified for the work.
5. IBEW / CWA union affiliation.
6. Panduit Certified Installer (PCI), certified by Panduit Corporation, and capable of providing an extended warranty in the Certification Plus system warranty program. Provide evidence as part of the bid submission of certification in the PCI program ("Certification Of Participation").
C. Materials

1. Provide new materials and equipment without defects.
2. Provide only specified products and equipment, or products and equipment that have been approved in writing.

D. Regulatory Requirements

1. Work and materials shall conform to the latest rules of National Board of Fire Underwriters wherever such standards have been established and shall conform to the regulations of the State Fire Marshal, OSHA and the codes of the governing local municipalities. Conform all Work under these specifications to the most stringent of the applicable codes.
2. Provide the quality identified within these specifications and drawings when codes, standards, regulations, etc. allow Work of lesser quality or extent. The Contract Documents address the minimum requirements for construction.

E. Project Management and Coordination Services

1. Provide a project manager for the duration of the project to coordinate this Work with other trades. Coordination services, procedures and documentation responsibility include. But are not limited to, the items listed in this section.
2. Review of Shop Drawings Prepared by Other Subcontractors:
   a. Obtain copies of shop drawings for equipment provided by others that require telecommunications service connections or interface with Work.
   b. Perform a thorough review of the shop drawings to confirm compliance with the service requirements contained in the Division 16 contract documents. Document discrepancies or deviations as follows:
      1) Prepare memo summarizing the discrepancy.
      2) Submit a copy of the specific shop drawing, indicating via cloud, the discrepancy.
   c. Prepare and maintain a shop drawing review log indicating the following information:
      1) Shop drawing number and brief description of the system/material.
      2) Date of the review.
      3) Name of the individual performing the review.
      4) Indication if follow-up coordination is required.

F. Drawings

1. Layout: Follow the general layout shown on the Drawings except where other Work may conflict with the Drawings.
2. Accuracy: Drawings for the Work within this Division are essentially diagrammatic within the constraints of the symbology applied.
3. The Drawings do not fully represent the entire installation for the Telecommunications Cabling System. Drawings indicate the general route for the cables and the location of devices/outlets. Primary pathways such as conduits, sleeves, cable basket, etc., are shown. However, secondary pathways such as hangers, etc. - for the most part - are not shown, but required.

4. Complete the details necessary for point-to-point design. This allows the Contractor to achieve desired results applying their own procedures and methods. Submit shop drawings for review prior to installation.

G. Role of the Engineer

1. During the construction phase of the project, the Engineer will work with the Contractor to provide interpretation and clarification of project contract documents, reply to (and 'process') relevant Requests Par Information (RPIs), and act as an interface between the Contractor and the Owner.

2. The Owner has retained the Engineer's services to observe the Work for general compliance with the Contract Documents and to ensure that the installation meets the design intent of the system.

3. In general, the Engineer will participate during the construction phase as follows;

   a. Review product data and shop drawings submittals for general compliance with the contract drawings and specifications.
   b. Review changes as they arise, and confirm that the proposed solutions maintain the intended functionality of the system.
   c. Interpret field problems for Owner, and translate between Owner and Construction Team.
   d. Review the testing procedures to confirm compliance with industry-accepted practices.

1.7 DELIVERY, STORAGE AND HANDLING

A. Delivery

1. Do not deliver products to the site until protected storage space is available.
2. Coordinate materials delivery with installation schedule to minimize storage time at jobsite.
3. Deliver materials in manufacturer's original, unopened, undamaged packaging and containers with identification labels (name of the manufacturer, product name and number, type, grade, UL classification, etc.) intact.
4. Immediately replace equipment damaged during shipping at no cost to the Owner, so as not to impact the construction schedule.

B. Storage and Protection

1. Store materials in clean, dry, ventilated space free from temperature and humidity conditions (as recommended by manufacturer) and protected from exposure to harmful weather conditions.
2. Comply with manufacturer's requirements for each product. Comply with
recommended procedures, precautions or remedies as described in the Material Safety Data Sheets (MSDS) as applicable.

3. Maintain factory wrapping or provide a heavy canvas/plastic cover to protect units from dirt, water, construction debris, and traffic.
4. Storage outdoors covered by rainproof material is not acceptable.
5. Provide heat where required to prevent condensation or temperature related damage.

C. Handling

1. Handle materials and equipment in accordance with manufacturer's written instructions.
2. Handle with care to prevent damage, breakage, denting, and scoring.
3. Do not install damaged materials and equipment. Replace damaged equipment at no cost to the Owner.

1.8 PERMITS AND INSPECTIONS

A. Obtain and pay for permits and inspections required for the Work.
B. Furnish materials and execute workmanship for this Work in conformance with applicable legal and code requirements.
C. Perform tests required herein, or as may be reasonably required to demonstrate conformance with the Specifications or with the requirements of legal authority having jurisdiction.
D. Arrange and pay [or review/inspection from compliance officials responsible for enforcement of applicable codes and regulations to establish that the work is in compliance with requirements of reference codes indicated herein.

1.9 SCHEDULING

A. Unless otherwise specified, the construction schedules of the 167xx series Sections may be combined,
B. Obtain written approval from the Owner or Owner's Representative for schedule of this Work.
C. Ensure schedule's coordination throughout trades related to Work.

1.10 WARRANTY

A. Render service within 24 hours of system failure notification. Note deviations or improvements to this service at the time of bid and obtain written acceptance from the Owner, or Owner's Representative.
B. Provide a Panduit Certification Plus system warranty for the cabling systems from the
date of acceptance, including a warranty certificate.  

C. Manufacturers of the major system components shall maintain a replacement parts department and provide testing equipment when needed. Provide complete replacement parts within a 24-hour period during the warranty period.

D. Warrant installed hardware, under normal use and service, to be free of defects and faulty workmanship during the warranty period. Keep the system in operating condition at no additional material or labor costs to the Owner during the warranty period.

E. The manufacturers shall demonstrate that a quality assurance program is in place to assure that the specifications are met. Include in the program, as a minimum, provisions for:

1. Incoming inspection of raw materials
2. In-process inspection and final inspection of the product
3. Calibration procedures of test equipment to be used in the qualifications of the product
4. Recall procedures in the event that out of calibration equipment is identified.

F. Conformance to certain government standards on quality assurance may be required for some applications outlined in these specifications.

PART 2 - PRODUCTS

2.1 GENERAL

A. Materials used shall present no environmental or toxicological hazards as defined by current industry standards and shall comply with OSHA and EPA standards, other applicable federal, state, and local laws.

B. Product numbers listed in the DIV 27 series sections in are subject to change by the manufacturer without notification. In the event a product number is invalid or conflicts with the written description, notify the Engineer in writing prior to ordering the material and performing installation work.

C. All new devices must be compatible with the districts existing system.

2.2 SUBSTITUTIONS

A. Conform to the general requirements and procedure outlined in Division 1 in the Request for Substitution.

B. Where products are noted as "or equal", a product of equivalent design, construction, and performance is considered. Include in the Product Data submittal: catalog cuts, product information, and pertinent test data required to substantiate that the product is in fact equivalent to that specified.
C. Only one substitution allowed for each product specified. Do not provide substituted material, processes, or equipment without written authorization from the Engineer. Assumptions on the acceptability of a proposed substitution, prior to acceptance by the Engineer, are at the sole risk of the Contractor.

D. The burden of proof rest with the Contractor that the substituted product is equivalent to the specified product. When the Engineer accepts a substitution in writing, it is with the understanding that the Contractor guarantees the substituted product, component, article, or material to be equivalent to the one specified and dimensioned to fit within the construction according to contract documents. Approved substitutions shall not relieve the Contractor of responsibilities for the proper execution of the Work, or from provisions of the Specifications.

E. Manufacturers' names and model numbers used in conjunction with materials, processes or equipment included in the Contract Documents are used to establish standards of quality, utility and appearance. Materials, processes or equipment that, in the opinion of the Engineer, are equivalent in quality, utility and appearance will be approved as substitutions to that specified when "or equal" follows the manufacturers' names or model number(s).

F. Whenever material, process or equipment is specified in accordance with a TIA/EIA specification, an ANSI specification, UL rating or other association standard. Present an affidavit from the manufacturer certifying that the product complies with the particular standard specification. When requested by the Engineer, submit supporting test data to substantiate compliance at no additional cost.

G. Pay expenses, without additional charge to the Owner, in connection with substitution materials, processes and equipment, including the effect of substitution on self, subcontractor's or other Contractor's work.

PART 3 - EXECUTION

3.1 General

A. Conditions: Verify existing conditions, stated under other sections, are acceptable for installation in accordance with manufacturer's instructions.

B. Pathways: Verify that pathways and supporting devices, provided under other sections, are properly installed, and that temporary supports, devices, etc., have been removed.

C. Field Measurements: Verify dimensions of pathways, including length. For example, "True Tape" the conduits.

3.2 FIELD QUALITY CONTROL

A. Staffing: Provide a qualified foreman who is in charge of the Work and who is present at the job site at times Work is being performed. Supervise the work force executing the
Work. Perform the installation within the restraints of the construction schedule.

B. Construction Meetings: Participate in construction coordination meetings throughout the course of construction to review the progress and to resolve issues and conflicts. Prepare and distribute meeting agenda for telecommunication issues prior to, and meeting notes after meetings, in a format acceptable to the Engineer. Provide the Engineer with the meeting notes within 3 business days following the meeting.

C. Scheduling: Keep the construction schedule current, based on the results of the construction meetings. Issue revised schedules to the General Contractor for approval. At minimum, schedule must cover critical due dates, tasks, and milestones. Prepare and issue the Engineer updated schedules, within 3 business day, whenever there are modifications.

D. Inspection: Perform inspection after installation. Keep areas of work accessible and notify code authorities, or designated inspectors, of work completion released for inspection. Document completion and inspection as required.

3.3 INSTALLATION

A. Complete work in a neat, high-quality manner, relative to common industry practices.

B. Conform to applicable federal, state and local codes, and telephone standards.

C. Coordinate the entire installation with the General Contractor, and their subcontractors, to meet the construction schedule.

D. Related Products Installation: Refer to other sections listed in Related Sections paragraph herein for related products installation.

E. Manufacturer's Instructions:

1. Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product carton instructions for installation.

2. Maintain jobsite file of Material Safety Data Sheets (MSDS) for each product delivered to jobsite packaged with an MSDS.

F. Adjusting:

1. Make changes and revisions to the system to optimize operation for final use.

2. Make changes to the system such that defects in workmanship are corrected and cables and the associated termination hardware pass the minimum test requirements.

G. Protection

1. Protect installed products and finish surfaces from damage during construction.
3.4 REPAIR RESTORATION

A. Replace or repair work completed by others that you deface or destroy. Pay the full cost of this repair/replacement.

B. Punch List:
   1. Inspect installed work in conjunction with the General Contractor and develop a punch list for
   2. Items needing correction.
   3. Provide punch list to Engineer for review prior to performing punch walk with the Engineer.

C. Re-Installation:
   1. Make changes to adjust the system to optimum operation for final use. Make changes to the system such that defects in workmanship are corrected and cables and the associated termination hardware passes the minimum test requirement.
   2. Repair defects prior to system acceptance.

3.5 CLEANING

A. Remove temporary coverings and protection of adjacent work areas. Remove unused products, debris, spills, or other excess materials. Remove installation equipment.

B. Leave finished work and adjacent surfaces in neat, clean condition with no evidence of damage.

C. Repair or replace damaged installed products,

D. Legally dispose of debris.

E. Clean installed products in accordance with manufacturer's instructions prior to Owner's, or Owner's Representative's acceptance.

3.6 DEMONSTRATION

A. On completion of the acceptance test, schedule a time convenient with the Owner, or Owner's Representative, for instruction in the configuration, operation, and maintenance of the system.

B. Provide 2 hours, minimum, of on-site training by a factory-trained representative. Document dates and times of training, and submit a "sign in" sheet for individuals trained, as part of the close out documentation.

C. Submit to Owner, or Owner's Representative, a written form of acceptance for signature. Complete corrections (punch list items) prior to issuing acceptance form.

END OF SECTION
PART 1 - GENERAL

1.1 SCOPE OF WORK

The work under this section includes all labor, materials, equipment, and accessories required to furnish and install a complete addition to the television signal distribution system as indicated on the drawings and as specified herein.

1.2 RELATED SECTIONS

A. Section 260533 – Raceway and Boxes for Electrical System

B. Section 260526 - Grounding and Bonding for Electrical System

1.3 RELATED WORK

Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 01 and 26 of these specifications.

A. The work described by this part includes the furnishing of all materials equipment, supplies, and labor and the performing of all operations necessary for the installation of complete and operating systems.

B. The contractor shall furnish and install all equipment, cables, devices, and other materials even though not specifically mentioned herein, which are necessary for the proper integration of the system so that the system shall perform the function listed herein in compliance with all specified requirements.

1.4 QUALIFICATION OF BIDDERS

A. To qualify as a bidder, the contractor shall hold a valid State of California C-7, C-61 or C-10 License, shall have been in business of furnishing and installing communication systems of this type for at least five years, and capable of being bonded to assure the owner of performance and satisfactory service during the guarantee period.

B. The contractor shall hold all other licenses required by the legally constituted authorities having jurisdiction over the work.

C. The contractor shall be a factory authorized distributor for the brand of equipment offered and shall maintain a fully equipped service organization capable of furnishing adequate repair service to the equipment. The contractor shall maintain a spare set of all major parts for the system at all times. All circuit boards, amplifiers and control sub systems shall be 100% backed up with stock at contractor’s shop.

1.5 EQUIPMENT QUALIFICATION

A. In order to establish quality and standards of performance of equipment required by the owner, the specified equipment for the communication systems is that of Blonder
Tongue Corporation. All mechanical, electrical and general information set forth on the respective data sheets for each specified item shall be considered as part of these specifications and binding herein. Any proposed equal item offered shall be substantiated fully to prove equality. The Architect reserves the right to require a complete sample of any proposed equal item and may, if necessary, request a sample tested by an independent testing laboratory to prove equality. The decision of the Architect regarding equality of proposed equal items will be final.

B. All equipment and wiring shall be furnished and installed by the authorized factory distributor of the equipment. The manufacturer's representative shall provide a letter with submittal from the manufacturer of all major equipment stating that he is the representative and that the manufacturer will have a service representative assigned to this area for the life of the equipment.

C. The contractor shall furnish a letter from the manufacturer of the equipment, which certifies that the equipment has been installed according to factory intended practice and that the system is operating satisfactorily. The contractor shall also furnish a written guarantee for a period of one year after final acceptance of the project by the owner.

1.6 SUBMITTALS

A. Submit under provisions of Section 013300.
B. Shop Drawings: Indicate installation details, cable routing, and system configuration.
C. Product Data: Submit for each component.
D. Submit manufacturer's installation instructions.

1.7 PROJECT RECORD DOCUMENTS

A. Submit record documents under provisions of Section 017839.
B. Accurately record actual locations of outlets, devices, and cable routing.

1.8 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 017823.
B. Operation Data: Include instructions for setting and tuning channels.
C. Maintenance Data: Include basic trouble-shooting procedures.

1.9 WARRANTY

A. The entire system shall be warrantee free of mechanical or electrical defects for a period of one year after final acceptance of the installation. Any material showing mechanical or electrical defects shall be replaced promptly at no expense to the purchaser.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Equal products by the following manufacturers will be considered providing all that features of the specified product.

1. Blonder-Tongue
2. Jerrold
3. C-Cor.
4. Belden.

B. Substitutions: Under provision of section: 260500

2.2 HEADEND EQUIPMENT

A. Amplifiers:

1. Broadband, high gain, solid state amplifiers shall be self-contained and designed specifically for use in television distribution system. Amplifiers shall have operation capacity (passive or active) and shall include following.

   a. Hybrid IC circuitry for high output with low distortion.
   b. Exceptional temperature stability range of -40 degree F to +140 degree F.
   c. Designed for critical applications requiring high gain.
   d. Front panel gain and slope controls for easy adjustments.
   e. Externally excessive test points to permit in-service testing.
   f. Aluminum chassis designed for heat dissipation to insure component reliability.
   g. External fuse for ease in replacement.
   h. LED pilot light.
   i. Line transient protection.
   j. Provide attenuator pads and equalizers as required for optimum signal throughout.
   k. High "Q" filters and rejection traps to minimize interference.

2. Frequency separator, if required.
3. Forward Amplifier: Forward bandpass shall be 54-450Mhz. Forward gain shall be 50dBmV. Forward gain control range shall be 10dBmV. Noise figure shall not exceed 6.5dBmV. Composite triple beat shall not exceed -59dBmV.
4. Reverse Amplifier: Reverse bandpass shall be 5-30Mhz. Reverse gain shall be 23dBmV. Reverse gain control range shall be 12dBmV. Reverse noise figure shall not exceed 6.0dBmV. Reverse composite triple beat shall not exceed -57dBmV.

2.3 REMOTE AMPLIFIERS
A. Provide remote amplifiers as required to extend signal and mount within equipment cabinet. Refer to specifications for headend amplifiers.

2.4 CABLES AND ACCESSORIES

A. Taps: Taps shall have the following features or characteristics:

1. Nickel-Plated housing with epoxy sealed bottom plate.
2. Brass connectors, nickel-plated.
3. dB radiation shielded.
4. Bandwidth: 5 – 600 MHz.
5. Tap to tap isolation: 10 – 450 MHz at 25 dB, minimum.
6. Return loss (tap): 10 – 600 MHz at 18 dB, minimum.
7. Return loss (in/out): 5 – 10 MHz at 17 dB, minimum; 10-450 MHz at 20 dB, minimum.
8. Hum modulation (5 amp, 60 volt square wave): -70dB below signal.
10. Tap shall have a swivel center conductor seizure mechanism.

B. Splitters and directional couplers: Shall be self-contained with “F” type screw-on receptacles for tap ports, 5/8 – 24 THD connector port for in/out ports, and mounting brackets. Units shall have the following features or characteristics:

1. Nickel plated center conductor posts and screws.
2. Corrosion-proof housing.
3. Acrylic based finish.
4. Entry connector sealing gaskets and counter bored entry ports.
5. Isolation between outputs: 20 dB, minimum.
8. Current capacity: 10 amperes, 60 volts, each leg.

C. Main distribution cable (.500): Shall be seamless tubular aluminum with polyethylene outer jacket. Cable used in underground applications shall have an outer jacket of self-sealing polyethylene type (flooding compound). Outer dimension shall be nominally of 0.560”. Center conductor shall be copper clad aluminum with outer dimension of 0.111”. Cable shall have the following characteristics:

1. Capacitance: 15.3 +/- 1.0 pf/ft.
2. Impedance: 75 +/- 2 ohms.
3. Velocity of propagation: 87%
4. Shielding efficiency: 120 dB down.
5. D.C. loop resistance: 1.68 ohms/1000 ft. @ 68 degree F, maximum.
6. Attenuation: 5 MHz, 0.16 dB/100 ft.; 211 MHz, 1.09 dB/100 ft.; 450 MHz, 1.65 dB/100 ft.; @ 68 degree F, maximum.
D. Branch distribution cable (RG 6/U): Shall have a polyvinylchloride jacket with a nominal outside diameter of 0.300”. Copper cover steel center conductor with a nominal diameter of 0.40”. Gas expanded polyethylene dielectric. Inner shield of aluminum-polypropylene-aluminum laminated tape with overlap bonded to dielectric. Outer shield of 34 AWG bare aluminum braid wire. Cable shall have following characteristics:

1. Capacitance: 16.2 +/- 1.0 pf/ft.
2. Impedance: 75 +/- 2 ohms.
3. Velocity of propagation: 82%
4. Attenuation: 5 MHz, 0.52dB/100 ft.; 211 MHz, 3.05 dB/100 ft.; 450 MHz, 4.40 dB/100 ft.; @ 68 degree F, maximum.

E. Connectors:

1. Main distribution cable:
   a. End connector: Shall be pin type, radiation-proof with integral compression sleeve for long-term radiation shielding. Conductor shall have chassis mounting for standard 5/8 – 24 THD equipment entries. Connector shall employ center conductor internal seizing and contain an integral sleeve in the nut assembly. Center pin shall have a nominal diameter of 0.67”. Connector shall be specifically designed for the cable size and type.
   b. Splice connectors: Shall be radiation-proof with integral compression sleeve for long-term radiation shielding. Connector shall utilize center conductor internal seizing and contain an integral sleeve in the nut assembly. Connector shall be specifically designed for cable size and type.
   c. Housing-to-housing connector: Shall be between devices using 5/8 -23 THD entry ports. Reduction to RG style connectors and is not acceptable. Connector shall be of the rotational type and employ center pins in both directions. Center pin shall have a nominal diameter of 0.080”.

2. Branch Distribution Cables: Shall have an integral ferrule (crimp ring) with a minimum of ½” length and shall require a hexagonal crimp tool to bind the connector to the cable. Connector shall have a brass body with annealed crimp ring and shall employ cadmium with chromate conversion coating.

F. Outlet Cover Plate: Cover plates shall have 1 or 2 mounting holes as indicated and provided with female connector(s). Provide terminator connected by chain to lower mounting screw. Installation shall utilize tamper resistance screws for cover plate attachment.

G. Terminators: Terminate all unused ports (taps and outlets) in characteristic impedance.

1. Tap and device terminators shall be 75 ohm, ¼ watt, brass body type with standard 7/16” hex.
2. Outlet terminator shall be 75 ohm, ¼ watt with brass body and chain. Chain shall have countersunk retainer for wall cover plate screws.
3. Distribution devices terminator shall be 75 ohm, designed to terminate 60 cycle and RF signals. Terminator shall have a 1.60” x 0.077” center pin and connect to a 5/8 -24 THD device Port.

2.5 TELEVISION SIGNAL DISTRIBUTION AND RETRIEVAL

A. The Contractor shall furnish all materials, equipment, labor and services required for the installation of a complete addition to the master antenna TV signal distribution system.

B. All work shall be performed under the supervision of a company accredited by the basic equipment manufactured and such accreditation must be presented.

C. All basic electronic equipment (not including cable) specified herein shall be produced by a single manufacturer of established reputation and experience who shall have produced similar apparatus for at least three or more years and who shall be able to refer to similar installations rendering satisfactory service.

D. System Functions and Capabilities:

1. The system shall provide for the reception of TV signals provided by a drop from the existing system.
2. The distribution system shall furnish signals to TV outlets shown on plans.
3. The distribution system shall be installed so that additional channels may be added to the installed system.
4. The system shall pass all channels without noticeable degradation of intelligence of color fidelity.
5. The system shall be suitable for the proper connection of standard EIA TV receivers.
6. The system shall deliver a minimum of 10dbmV signal strength to each receiver on every TV channel in the system; this condition shall be met when every outlet is connected to a lead. Zero dBmV equals 1,000 microvolts across 75ohms.
7. The system as installed shall be rated and capable of continuous 24 hour operation.
8. The system shall be designed to accept, process and distribute a simultaneous sub-channel inserted at any outlet in the system automatically.

E. Acceptance Test:

1. The installer shall, upon completion of the system adjust all controls, etc., to provide a system operating at maximum capability.
2. The installer shall, after the system is installed and adjusted, notify the Owner to arrange for an acceptance test at a mutually convenient time.
3. The installer shall prove the reception quality at an outlet by the Owner (or his authorized representative) is equal to or better than reception normally available in the area and that signal strength is as specified.
4. Submit block diagram and shop drawing of equipment.
PART 3 - EXECUTION

3.1 INSTALLATION.

A. Wiring:

1. The wiring of the system shall be executed in accordance with the drawings and the equipment manufacturer's wiring diagrams. Should any variations in these requirements occur, the contractor shall notify the architect before making any changes. It shall be the responsibility of the factory authorized distributor or dealer of the approved equipment to install the equipment and guarantee the system to operate as per plans and specifications.

2. Furnish all conductors, equipment plugs, terminal strips, etc., and labor to install a complete and operable system.

3. The cables within the rack or cabinets shall be carefully cabled and laced with No. 12 Cord waxed linen lacing twine or T&B model ty-rap series 500 cable straps. All cable conductors shall be color coded and numbered for identification.

4. Splices of conductors in underground pull boxes are not permitted.

B. Workmanship:

1. Labor employed by the contractor shall be regularly employed in the installation and repair of sound system and shall be acceptable to the owner and architect to engage in the installation and service of this system.

2. The contractor shall maintain a competent service organization and shall, if requested, submit a service maintenance agreement to the owner after the end of the guarantee period.

3. The contractor shall guarantee the system, including all components, loudspeakers, cords, wiring, and accessories for one year. Should any trouble develop within one year from the date of acceptance of the work, due to inferior or faulty material and/or workmanship, or should it develop that the work is not in accordance with the contract, the contractor shall make all required corrections without expense to the owner.

4. A typewritten notice shall be posted at the amplifier which, shall indicate the firm, address and telephone number to call when service is necessary. The notice shall be mounted in a neatly finished metal frame with a clear plastic window and securely attached to the inside of the door.

5. The contractor shall thoroughly clean all equipment and materials. All exposed parts of the amplifier, cabinets, speakers, microphone and other equipment shall be left in a clean condition, unblemished and free of all dirt, dust, smudges, spots, fingerprints, etc. The contractor shall remove all debris and rubbish occasioned by the electronic systems work from the site. The contractor shall thoroughly clean all buildings of any dirt, debris, rubbish, marks, etc., caused by the performance of this work.

C. Special System Tests:
1. Provide instruments for testing and demonstrating in the presence of the owner's inspector that the frequency response and distortion are at specified requirements. Check all circuits and wiring to verify they are free of shorts and grounds.

2. Furnish all labor, instruments, appliances, equipment, and materials necessary to demonstrate to the owner that the installations perform as required and are as specified herein.

3. The owner reserves the right to make independent tests of all equipment furnished to determine whether or not the equipment complies with the requirements specified herein and to accept or reject any or all of the equipment on the basis of the results thereby obtained.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wire.
2. Mechanical connectors.

B. Related Sections:

1. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

1.2 REFERENCES

A. Building Industry Consulting Service International, Inc.


B. California Electrical Code:

1. CEC - California Electrical Code.

C. Telecommunication Industry Association/Electronic Industries Alliance:

1. TIA/EIA 607 - Commercial Building Grounding and Bonding Requirements for Telecommunications.

1.3 SYSTEM DESCRIPTION

A. Communications grounding systems use the following elements as grounding electrodes:

1. Building grounding electrode.

B. Do not use the following elements as grounding electrodes:

1. Building plumbing system.
2. Building gas system.

1.4 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 25 ohms maximum.

1.5 SUBMITTALS

A. Section 01 30 00 - Administrative Requirements: Submittal Procedures.
B. Product Data: Submit data on grounding electrodes and connections.

C. Test Reports: Indicate overall resistance to ground.

D. Manufacturer's Installation Instructions: Submit for active electrodes.

E. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of components and grounding electrodes.

1.7 QUALITY ASSURANCE

A. Provide grounding and surge protection of telecommunications system in accordance with latest version of Grounding, Bonding and Electrical Protection chapter of the BICSI TDM Manual, TIA/EIA 607, and CEC.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section with minimum 3 years documented experience.

1.9 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

1.11 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.
1.12 PRE-INSTALLATION MEETINGS

1.13 DELIVERY, STORAGE, AND HANDLING

1.14 COORDINATION
   A. Section 01 30
   B. Complete grounding and bonding of building power system ground.

PART 2 - PRODUCTS

2.1 WIRE
   A. Material: Stranded copper.
   B. Grounding Conductor: Copper conductor bare.
   C. Bonding Conductor: Copper conductor bare.

2.2 MECHANICAL CONNECTORS
   A. Manufacturers:
      1. Apache Grounding/Erico Inc.
      2. Copperweld, Inc.
      3. Erico, Inc.
      4. ILSCO Corporation.
      5. O-Z Gedney Co.
      6. Thomas & Betts, Electrical.
      7. Substitutions: Section 01 60 00 - Product Requirements.
   B. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.

PART 3 - EXECUTION

2.3 PREPARATION
   A. Remove paint at connection points.

2.4 INSTALLATION
   A. Install in accordance with BICSI TDM Manual, TIA/EIA 607, and CEC.
   B. Install grounding and bonding conductors concealed from view.
C. Install grounding for each rack using 6 AWG THHN, rated for 90 degrees C, insulated, copper stranded conductor to copper communication grounding bus bar located in main telecommunications room.

D. Bond main telecommunications grounding system to building grounding electrode system at main electrical service entrance location with 6 AWG THHN, rated for 90 degrees C, insulated, copper stranded conductor.

E. Install routing for grounding conductor as short and direct as practical.

F. Install routing of bonding conductors with minimum number of bends and splices. Use sweeping bends.

G. Install bonding connections with listed bolts, crimp pressure connectors, clamps, or lugs.

H. Between each telecommunications/signal room, install multiple busbars directly bonded with 6 AWG copper conductor.

I. Position busbars near associated equipment and insulate from supports.

J. Construct busbars of copper, 4 inches x 8 inches by 1/4 inch thick with pilot holes for ground lug.

K. Bond backbone cabling at each sheath opening.

L. Ground data cabinets, racks, cable trays, and mounting hardware located in MDF Room and IDF Rooms.

M. Install ground from each piece of equipment to MDF Room grounding bar via an insulated cable no smaller than 6 AWG stranded copper wire. Install proper grounding lug on cable where connecting to racks and grounding bar.

N. Label grounding conductors and grounding bus bars in accordance with Section 27 05 53.

O. Permanently attach equipment and grounding conductors prior to energizing equipment.

2.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements and 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Visually inspect from each bus bar to main grounding electrode service location.

C. Test in accordance with BICSI TDM Manual, TIA/EIA 607, and CEC.

D. When improper grounding is found, check entire project and correct. Perform retest.
PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Conduit supports.
2. Formed steel channel.
3. Sleeves.
4. Mechanical sleeve seals.
5. Firestopping relating to electrical work.
6. Firestopping accessories.
7. Equipment bases and supports.

B. Related Sections:

1. Section 03 30 00 - Cast-In-Place Concrete: Product requirements for concrete for placement by this section.
2. Section 26 05 29 - Hangers and Supports for Electrical Systems.

1.2 REFERENCES

A. ASTM International:


B. FM Global:


C. California Electrical Code:

1. CEC - California Electrical Code.

D. Underwriters Laboratories Inc.:

3. UL 1479 - Fire Tests of Through-Penetration Firestops.
5. UL - Fire Resistance Directory.

E. Intertek Testing Services (Warnock Hersey Listed):

1. WH - Certification Listings.

1.3 DEFINITIONS

A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.4 SYSTEM DESCRIPTION

A. Firestopping Materials: ASTM E119, UL 1479 to achieve fire ratings as noted on Drawings for adjacent construction, but not less than 1 hour fire rating.

B. Firestop interruptions to fire rated assemblies, materials, and components.

1.5 PERFORMANCE REQUIREMENTS

A. Firestopping: Conform to FM and UL for fire resistance ratings and surface burning characteristics.

B. Firestopping: Provide certificate of compliance from authority having jurisdiction indicating approval of materials used.

1.6 SUBMITTALS

A. Section 01 30 00 - Administrative Requirements: Submittal Procedures.

B. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.

C. Product Data:

D. Hangers and Supports: Submit manufacturers catalog data including load capacity.

E. Firestopping: Submit data on product characteristics, performance and limitation criteria.

F. Firestopping Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.

G. Manufacturer's Installation Instructions:

H. Hangers and Supports: Submit special procedures and assembly of components.

I. Firestopping: Submit preparation and installation instructions.
J. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

K. Engineering Judgements: For conditions not covered by UL or WH listed designs, submit judgements by licensed professional engineer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.

1.7 QUALITY ASSURANCE

A. Through Penetration Firestopping of Fire Rated Assemblies: UL 1479 or ASTM E814 with 0.10 inch water gage minimum positive pressure differential to achieve fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.

1. Wall Penetrations: Fire F-Ratings as indicated on Drawings, but not less than 1-hour.
2. Floor and Roof Penetrations: Fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
   a. Floor Penetrations Within Wall Cavities: T-Rating is not required.

B. Through Penetration Firestopping of Non-Fire Rated Floor and Roof Assemblies: Materials to resist free passage of flame and products of combustion.

2. Penetrating Items: Materials approved by authorities having jurisdiction for penetrating items connecting maximum of two stories.

C. Fire Resistant Joints in Fire Rated Floor, Roof, and Wall Assemblies: ASTM E1966 or UL 2079 to achieve fire resistant rating as indicated on Drawings for assembly in which joint is installed.

D. Fire Resistant Joints Between Floor Slabs and Exterior Walls: ASTM E119 with 0.10 inch water gage minimum positive pressure differential to achieve fire resistant rating as indicated on Drawings for floor assembly.

E. Surface Burning Characteristics: 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section [with minimum 3 years documented experience.]
1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Do not apply firestopping materials when temperature of substrate material and ambient air is below 60 degrees F.

C. Maintain this minimum temperature before, during, and for minimum 3 days after installation of firestopping materials.

D. Provide ventilation in areas to receive solvent cured materials.

PART 2 - PRODUCTS

2.1 CONDUIT SUPPORTS

A. Manufacturers:

1. Allied Tube & Conduit Corp.
2. Electroline Manufacturing Company.
3. O-Z Gedney Co.
4. Substitutions: Section 01 60 00 - Product Requirements.

B. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.

C. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.

D. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.

E. Conduit clamps - general purpose: One hole malleable iron for surface mounted conduits.

F. Cable Ties: High strength nylon temperature rated to 185 degrees F. Self locking.
2.2 FORMED STEEL CHANNEL

A. Manufacturers:
   1. Allied Tube & Conduit Corp.
   4. Unistrut Corp.
   5. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: Galvanized 12 gage) thick steel. With holes 1-1/2 inches on center.

2.3 SLEEVES

A. Sleeves for Through Non-fire Rated Floors: 18 gage thick galvanized steel.

B. Sleeves for Through Fire Rated and Fire Resistive Floors and Walls, and Fire
   Proofing: Prefabricated fire rated sleeves including seals, UL listed.

C. Fire-stopping Insulation: Glass fiber type, non-combustible.

2.4 MECHANICAL SLEEVE SEALS

A. Manufacturers:
   1. Thunderline Link-Seal, Inc.
   2. NMP Corporation.
   3. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: Modular mechanical type, consisting of interlocking synthetic
   rubber links shaped to continuously fill annular space between object and sleeve,
   connected with bolts and pressure plates causing rubber sealing elements to expand
   when tightened, providing watertight seal and electrical insulation.

2.5 FIRESTOPPING

A. Manufacturers:
   1. Dow Corning Corp.
   2. Fire Trak Corp.
   3. Hilti Corp.
   4. International Protective Coating Corp.
   5. 3M fire Protection Products.
   7. Substitutions: Section 01 60 00 - Product Requirements.
2.6 FIRESTOPPING ACCESSORIES

A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.

B. Dam Material: Permanent:

   1. Sheet metal.

C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

D. General:

   1. Furnish UL listed products [or products tested by independent testing laboratory].
   2. Select products with rating not less than rating of wall or floor being penetrated.

E. Non-Rated Surfaces:

   1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where conduit is exposed.
   2. For exterior wall openings below grade, furnish modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill annular space between conduit and cored opening or water-stop type wall sleeve.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify openings are ready to receive sleeves.

C. Verify openings are ready to receive firestopping.

3.2 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.

B. Remove incompatible materials affecting bond.

C. Install backing materials to arrest liquid material leakage.

D. Do not drill or cut structural members.
3.3 INSTALLATION - HANGERS AND SUPPORTS

A. Anchors and Fasteners:

1. Concrete Structural Elements: Provide precast inserts, expansion anchors.
2. Steel Structural Elements: Provide beam clamps.
3. Concrete Surfaces: Provide self-drilling anchors and expansion anchors.

B. Inserts:

1. Install inserts for placement in concrete forms.
2. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

C. Install conduit and raceway support and spacing in accordance with CEC.

D. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.

E. Install multiple conduit runs on common hangers.

F. Supports:

1. Fabricate supports from structural steel or formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
2. Install surface mounted cabinets and panelboards with minimum of four anchors.
3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch off wall.

3.4 INSTALLATION - FIRESTOPPING

A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.

B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.

C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating, to uniform density and texture.

3.5 INSTALLATION - SLEEVES

A. Exterior watertight entries: Seal with adjustable interlocking rubber links.
B. Conduit penetrations not required to be watertight: Sleeve and fill with silicon foam.

C. Set sleeves in position in forms. Provide reinforcing around sleeves.

D. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

E. Extend sleeves through floors 1 inch above finished floor level. Caulk sleeves.

F. Where conduit or raceway penetrates floor, ceiling, or wall, close off space between conduit or raceway and adjacent work with fire stopping insulation and caulk. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

G. Install chrome plated steel escutcheons at finished surfaces.

3.6 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements and 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.7 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.

B. Clean adjacent surfaces of firestopping materials.

3.8 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Protect adjacent surfaces from damage by material installation.

END OF SECTION
PART 1 – GENERAL

1.1 SUMMARY

A. Section includes conduit and tubing, surface raceways, wireways, outlet boxes, pull and junction boxes, and handholes.

B. Related Sections:

1. Section 26 05 03 - Equipment Wiring Connections.
2. Section 26 05 33 - Raceway and Boxes for Electrical Systems.
3. Section 26 27 16 - Electrical Cabinets and Enclosures.
4. Section 26 27 26 - Wiring Devices.
5. Section 27 05 26 - Grounding and Bonding for Communications Systems.
6. Section 27 05 29 - Hangers and Supports for Communications Systems.
7. Section 27 05 53 - Identification for Communications Systems.

1.2 REFERENCES

A. American National Standards Institute:

1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
2. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.
3. ANSI C80.5 - Aluminum Rigid Conduit - (ARC).

B. National Electrical Manufacturers Association:

1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
2. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
3. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
4. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
5. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
6. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
7. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.3 SYSTEM DESCRIPTION

A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
B. Underground More than 5 feet outside Foundation Wall: Provide thickwall nonmetallic conduit. Provide cast metal boxes or nonmetallic handhole.

C. Underground Within 5 feet from Foundation Wall: Provide rigid steel conduit. Provide cast metal or nonmetallic boxes.

D. Outdoor Locations, Above Grade: Provide rigid conduit. Provide cast metal or nonmetallic boxes.

E. Wet and Damp Locations: Provide rigid steel. Provide cast metal or nonmetallic outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.


1.4 DESIGN REQUIREMENTS

A. Minimum Raceway Size: 3/4 inch unless otherwise specified.

1.5 SUBMITTALS

A. Section 01 30 00 - Administrative Requirements: Submittal Procedures.

B. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents:

1. Record actual routing of conduits larger than 2 inches.
2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

C. Protect PVC conduit from sunlight.

1.8 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate installation of outlet boxes for equipment connected under Section 26 05 03.

C. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.

PART 2 - PRODUCTS

2.1 METAL CONDUIT

A. Manufacturers:

1. Allied Tube.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Rigid Steel Conduit: ANSI C80.1.

C. Rigid Aluminum Conduit: ANSI C80.5.

D. Intermediate Metal Conduit (IMC): Rigid steel.

E. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit.

2.2 FLEXIBLE METAL CONDUIT

A. Manufacturers:

1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: Interlocked aluminum construction.
C. Fittings: NEMA FB 1.

2.3 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

A. Manufacturers:

1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: Interlocked aluminum construction with PVC jacket.

C. Fittings: NEMA FB 1.

2.4 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:

1. Allied Tube.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: ANSI C80.3; galvanized tubing.

C. Fittings and Conduit Bodies: NEMA FB 1; steel compression type.

2.5 NONMETALLIC CONDUIT

A. Manufacturers:

1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: NEMA TC 2; Schedule 80 PVC.

C. Fittings and Conduit Bodies: NEMA TC 3.
2.6 OUTLET BOXES

A. Manufacturers:

1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.

1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch male fixture studs where required.
2. Concrete Ceiling Boxes: Concrete type.

C. Nonmetallic Outlet Boxes: NEMA OS 2.

D. Cast Boxes: NEMA FB 1, Type FD, aluminum. Furnish gasketed cover by box manufacturer.

E. Wall Plates for Finished Areas: As specified in Section 26 27 26.

F. Wall Plates for Unfinished Areas: Furnish gasketed cover.

2.7 PULL AND JUNCTION BOXES

A. Manufacturers:

1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

C. Hinged Enclosures: As specified in Section 26 27 16.

D. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box:

1. Material: Galvanized cast iron.
2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.
E. In-Ground Cast Metal Box: NEMA 250, Type 6, outside flanged, recessed cover box for flush mounting:

1. Material: Galvanized cast iron.
2. Cover: Smooth cover with neoprene gasket and stainless steel cover screws.
3. Cover Legend: "COMMUNICATION".

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 INSTALLATION

A. Ground and bond raceway and boxes in accordance with Section 26 05 26.

B. Fasten raceway and box supports to structure and finishes in accordance with Section 26 05 29.

C. Identify raceway and boxes in accordance with Section 26 05 53.

D. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.3 INSTALLATION - RACEWAY

A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

B. Arrange raceway supports to prevent misalignment during wiring installation.

C. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

D. Group related raceway; support using conduit rack. Construct rack using steel channel specified in Section 26 05 29 provide space on each for 25 percent additional raceways.

E. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports

F. Do not attach raceway to ceiling support wires or other piping systems.

G. Construct wireway supports from steel channel specified in Section 26 05 29.
H. Route exposed raceway parallel and perpendicular to walls.
I. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
J. Route conduit in and under slab from point-to-point.
K. Maintain clearance between raceway and piping for maintenance purposes.
L. Maintain 12 inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
M. Cut conduit square using saw or pipe cutter; de-burr cut ends.
N. Bring conduit to shoulder of fittings; fasten securely.
O. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
P. Install conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations to cast boxes.
Q. Install no more than equivalent of three 90 degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2 inch size.
R. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
S. Install fittings to accommodate expansion and deflection where raceway crosses seismic and expansion joints.
T. Install suitable pull string or cord in each empty raceway except sleeves and nipples.
U. Install suitable caps to protect installed conduit against entrance of dirt and moisture.

3.4 INSTALLATION - BOXES

A. Install wall mounted boxes at elevations to accommodate mounting heights.
B. Adjust box location up to 10 feet prior to rough-in to accommodate intended purpose.
C. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26.
D. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
E. **In Accessible Ceiling Areas:** Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.

F. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

G. Do not install flush mounting box back-to-back in walls; install with minimum 6 inches separation. Install with minimum 24 inches separation in acoustic rated walls.

H. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

I. Install stamped steel bridges to fasten flush mounting outlet box between studs.

J. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

K. Install adjustable steel channel fasteners for hung ceiling outlet box.

L. Do not fasten boxes to ceiling support wires or other piping systems.

M. Support boxes independently of conduit.

N. Install gang box where more than one device is mounted together. Do not use sectional box.

O. Install gang box with plaster ring for single device outlets.

3.5 **INTERFACE WITH OTHER PRODUCTS**

A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods in accordance with Section 07 84 00.

B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket.

C. Locate outlet boxes to allow luminaires positioned as indicated on Drawings.

D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.6 **ADJUSTING**

A. Section 01 70 00 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

B. Adjust flush-mounting outlets to make front flush with finished wall material.

C. Install knockout closures in unused openings in boxes.
3.7 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.

B. Clean interior of boxes to remove dust, debris, and other material.

C. Clean exposed surfaces and restore finish.

END OF SECTION
PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Nameplates.
   2. Wire markers.
   3. Conduit markers.
   4. Stencils.
   5. Underground Warning Tape.

B. Related Sections:
   1. Section 09 90 00 - Painting and Coating: Execution requirements for painting specified by this section.
   2. Section 27 05 53 - Identification for Communications Systems.

1.2 SUBMITTALS

A. Section 01 30 00 - Administrative Requirements: Submittal Procedures.

B. Product Data:
   1. Submit manufacturer’s catalog literature for each product required.
   2. Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function.

C. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.

1.3 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of tagged devices; include tag numbers.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept identification products on site in original containers. Inspect for damage.
C. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

D. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Install nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

1.6 EXTRA MATERIALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for extra materials.

PART 2 - PRODUCT

2.1 NAMEPLATES

A. Product Description: Laminated three-layer plastic with engraved black letters on white contrasting background color.

B. Letter Size:
   1. 1/8 inch high letters for identifying individual equipment and loads.
   2. 1/4 inch high letters for identifying grouped equipment and loads.

C. Minimum nameplate thickness: 1/8 inch.

2.2 WIRE MARKERS

A. Description: Split sleeve type wire markers.

B. Legend:
   1. Power and Lighting Circuits: Branch circuit or feeder number [as indicated on Drawings].
   2. Low Voltage Circuits: Wire number as indicated on shop drawings.

2.3 UNDERGROUND WARNING TAPE

A. Description: 4 inch wide plastic tape, detectable type, colored yellow with suitable warning legend describing buried electrical lines.
PART 3 - EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

B. Prepare surfaces in accordance with Section 09 90 00 for stencil painting.

3.2 EXISTING WORK

A. Install identification on all equipment.

B. Replace lost nameplates.

3.3 INSTALLATION

A. Install identifying devices after completion of painting.

B. Nameplate Installation:

1. Install nameplate parallel to equipment lines.
2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.
3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners, or adhesive.
4. Secure nameplate to equipment front using [screws] [, rivets] [, or] [adhesive].
5. Secure nameplate to inside surface of door on recessed panelboard in finished locations.
6. Install nameplates for the following:
   a. Switchboards.
   b. Panelboards.
   c. Transformers.
   d. Service Disconnects.

C. Underground Warning Tape Installation: Install underground warning tape along length of each underground conduit, raceway, or cable 6 to 8 inches minimum below finished grade or as indicated on drawings, and directly above buried conduit, raceway, or cable.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes: Horizontal Cabling (subsystem of Telecommunications Cabling Infrastructure).

B. Related Sections

1. Comply with the Related Sections paragraph of Section 27 00 00 and latest PCCD Standard

C. Products Perused and Installed Under Another Section:

1. Pathways distribution system (conduit, tray, basket, hangers, etc.).
2. Conduit stubs & device (back) boxes for wall mounted outlets.
3. Sleeves.

1.2 REFERENCES

A. Comply with the References requirements of Section 27 00 00 and latest PCCD Standard.

1.3 DEFINITIONS

A. Refer to Section 27 00 00 for Definitions.

B. In addition, define the following list of terms as used in this specification as follows:

1. "CA T3": Category 3 [UTP]
2. "CA T6E": Category 6 Enhanced PTIP
3. "Channel": End to end transmission path; e.g., the entire portion of the horizontal cabling to each outlet consisting of the Permanent Link, line cord (at the workstation), patch cord, and, if a full crossconnection is implemented, the crossconnect termination/connecting apparatus and equipment cord.
4. "CMP": Communications Media Plenum, plenum rating; synonymous with "MPP"
5. "CMR": Communications Media Riser. non-plenum riser rating; synonymous with "MPR"
6. "FEP": Fluorinated Ethylene Propylene
7. "MM": Multimode [fiber type]
8. "Permanent Link": Test configuration for a horizontal cabling link excluding test cords, connections at the ends of the test cords, patch cords, equipment cords, line cords; e.g., the ‘permanent’ portion of the horizontal cabling to each outlet consisting of cable, consolidation point (if used), termination/connecting apparatus in the IDF and the connector at the outlet.
9. "PVC": PolyVinyl Chloride
10. "SM": Singlemode [fiber type]
1.4 SYSTEM DESCRIPTION

A. Work Covered Under Other Sections

1. Telecommunications Rooms: The buildout of the telecommunications rooms (rack bay, overhead cable support, exit sleeves/pathways, etc.) is covered under another section.

2. Telecommunications Pathways:
   a. The primary and secondary pathway system components (cable basket, cable tray, cable hangers, etc.) throughout the ceiling space to the device location (e.g. from the cable tray exiting the IDFs to the conduit stub) is covered under another section.
   b. The device pathways (conduit stub and device box) at the wall and in-floor outlets are covered under another section.
   c. Refer to the Drawings for size (capacity) and route information for pathway system components.

3. Testing: Refer to 16719 for testing requirements.

B. Base Bid Work

1. Provide engineering, labor, materials, apparatus, tools, equipment, and transportation required to make a complete working communications Horizontal Cabling System installation described in these specifications. Consider horizontal cabling as shown on Drawings as base bid work, unless otherwise noted. This includes terminations at both ends.

2. In general, the base bid work includes:

   a. Submittals.
   b. Horizontal cables, terminations, and outlets.
   c. Cable management.
   d. Patch cords and cross-connects.
   e. Cable identification tags and system labeling.
   f. Record Documents.
   g. Warranty.

1.5 SUBMITTALS

A. Comply with the Submittals article of Section 16700 for procedural, quantity, and format requirements.

B. Submittal Requirements at Start Of Construction:

1. Product Data Submittal, indicating conformance with NEC, UL, TIA/EIA listings, certifications and specifications.

2. Sample Submittal, consisting of the following components:
a. Type HA" Outlet Sample - A fully configured outlet including faceplate, modular jacks, and label.
b. Cable Label Sample per PCCD Standard

3. Schedule Submittal, consisting of proposed schedule of work. This schedule may be combined with the schedule developed for Div 27 series Sections.

4. Shop Drawings Submittal, consisting of proposed changes to cable routing, or termination locations/configurations.

C. Submittal Requirements at Closeout
   1. As-Built Drawings.
   2. Cross-connection records/cut sheets.
   3. O & M Manuals.

1.6 QUALITY ASSURANCE
   A. Comply with the Manufacturer Qualifications requirements of Section 27 00 00.
   B. Comply with the Contractor Qualifications requirements of Section 27 00 00.
   C. Contractor Qualifications
      1. Panduit Certified Installer (PCI), certified by Panduit Corporation, and capable of providing an extended warranty in the CertificationPlus system warranty program. Provide evidence as part of the hid submission of certification in the PCT program ("Certification Of Participation").

1.7 DELIVERY, STORAGE AND HANDLING
   A. Comply with the Delivery, Storage and Handling requirements of Section 27 00 00.

1.8 WARRANTY
   A. The telecommunications horizontal cabling system, as specified in this section, shall carry a 25-year warranty under the Panduit Certification Plus System Warranty Program. This extended warranty shall cover parts and labor. This extended warranty shall also guarantee electrical performance of cabling system to the specific category per A."ISJII'AIEIA-568-H performance criteria for Permanent Link (minimum).

PART 2 - PRODUCT

2.1 SUBSTITUTIONS
   A. Comply with the Substitutions requirements of Section 27 00 00.

2.2 HORIZONTAL CABLE
A. Application: Suitable for indoor installation, within cable basket, above ceiling.

B. Conductors:
   1. Insulated Conductors: 24 AWG solid copper, fully insulated with a flame retardant thermoplastic material (material: PVC or equivalent).
   2. Twisted Pairs: Two insulated conductors "twisted" into a "pair" (twisted pair) with individually color code-d twisted pairs to industry standards (ANSI/ICEA Publication S-80576-1994, and EIA-230). Cable Sheath:
      3. Provide unshielded cable with a seamless outer jacket (material = LS-PVC, or equivalent) applied to and completely cover the internal components (twisted pairs).
      4. Flame Rating: NEC (Article 800) rated as CMP, and UL listed as such.

C. Electrical Performance: Meet or exceed TIAfEIA-568-B requirements for CAT6 UTP cabling.

D. Manufacturer: Panduit
   1. PUP6004WH-U, TX600 Category 6 UTP CMP, White
   2. PUP6004BU-U, TX600 Category 6 UTP CMP, Blue
   3. PUP6004GR-U, TX600 Category 6 UTP CMP, Green

2.3 PATCH CORDS

A. Provide modular patch cords suitable for indoor installation within a telecom room or workstation environment.

B. Provide cords assembled from a single, continuous length of cordage, homogenous in nature, and terminated at both ends via 8 position modular plugs. Splices are not permitted anywhere.

C. Cordage
   1. Insulated Conductors: 24 A WG stranded copper, fully insulated with a flame retardant thermoplastic material (such as PVC. or equivalent).
   3. Unshielded sheath and flame-retardant polyvinyl chloride (PVC) jacketed.
   4. Flame Rating: NEC CM (or higher) rated, and UL listed as such.

D. Electrical Performance: Comply with TINEIA-568-B for CAT6 UTP patch cords and Channel requirements (minimum).

E. Manufacturer: Panduit
1. #UTPSP3; CAT6 modular patch cord, 3 feet
2. #UTPSP5; CAT6 modular patch cord, 5 feet
3. #UTPSP7; CAT6 modular patch cord, 7 feet
4. #UTPSP10; CAT6 modular patch cord, 10 feet
5. #UTPSP14; CAT6 modular patch cord, 14 feet

F. No allowance for furnishing or installing cords for use at the workstations (from the outlet to the end user equipment) will be required for this contract. The Owner will provide these cords.

2.4 CROSS-CONNECT WIRE

A. Application: Suitable for indoor installation within a 110-based crossconnect system.

B. Each and every crossconnect wire manufactured from a single, continuous length of insulated wire, homogenous in nature (splices are not permitted). Factory splices of insulated conductors are expressly prohibited.

C. Conductors:

1. Insulated Conductors: Conductors of 24 AWG solid copper and fully insulated with a flame retardant thermoplastic material (such as PVC, or equivalent).
2. Twisted Pairs: Two insulated conductors "twisted" into a "pair" (twisted pair), and individually color coded.

D. Manufacturer or equal: SYSTIMAX Inc.

1. CCW-F 1124 S1000 (105597 231) crossconnect wire, 1 pair, Whi-Red / Red-Whi
2. CCW-I 1/24 S1000 (105597 264) crossconnect wire, 1 pair, Whi-Blu / Blu-Whi

2.5 MODULAR PATCH PANEL - DISCRETE TYPE

A. Discrete patch panels suitable for installation within a telecommunication facility for the termination of the Horizontal cables.

B. Discrete patch panels horizontally oriented for a rack-mounted configuration.

C. Discrete patch panels capable of supporting, organizing, labeling and patching/crossconnecting between the horizontal termination field and the equipment and/or equipment field.

D. Discrete patch panel having either 48 ports each and fully compatible with the Connectors listed below.

E. Manufacturer: Panduit.

1. #CPPL4RWBL, Discrete patch panel, 48 ports, with labeling.
2.6  110 BLOCK - IDF TYPE

A. Termination apparatus shall be suitable for installation within a telecommunication facility for the termination of the backbone twisted pair cables, suitable for rack-mount configuration. Termination apparatus shall be "110 block" type.

B. 110 Blocks, with the management panels, shall be capable of supporting; organizing, labeling and patching/crossconnecting the backbone cables to successfully achieve the design intent.

C. Manufacturer: Panduit:
   1. #GPB484R4WJ; 110 Block kit (rack bracket, two 100-pair blocks, forty-eight 4-pair IDC connectors.)

2.7 MODULAR CONNECTORS

A. Mini-Com Series Modular Jacks
   1. Modular connectors for CAT6 UTP 4-pair cables, 8-position modular jacks, and compliant to TINIAI-568-B.2 Chapter 5, and CAT6 rated.
   2. Modular connectors shall be T568A wired. Manufacturer: Panduit.
      a. #CJ6H8TGBU; CAT6 8-position jack "Mini-Jack PowerSum+", Blue.
      b. #CJ688TYL; CAT6 8-position jack "Mini-Jack PowerSum+", Yellow.
      c. #CJ688TWH; CAT6 8-position jack "Mini-Jack PowerSum+", White.
      d. #CJ688TIG, CAT6 8-position jack "Mini-Jack PowerSum+", Gray.

B. Keystone Series Modular Jacks
   1. Modular connectors for CAT6 UTP 4-pair cables, 8-position modular jacks, and compliant to TIAJEAI-S68-B.2 Chapter 5. And CAT6 rated,
   2. Modular connectors shall be T568A wired.
      a. #K688TBU; CAT6 8-position jack "Mini-Jack PowerSum+", Blue.
      b. #K688TYL; CAT6 8-position jack "Mini-Jack PowerSum+", Yellow.
      c. #K688TWH; CAT6 8-position jack "Mini-Jack PowerSum+", White.
      d. #K688TIG, CAT6 8-position jack "Mini-Jack PowerSum+", Gray.

2.8 WORKSTATION OUTLETS

A. Faceplates for Standard Plush-Mount Outlets
   1. Faceplates for standard flush-mount outlet shall have 2, 4, or 6 ports.
   2. Faceplates that include required accessories, such as icons, blank inserts, labels
and label windows.
   a. #CFPE2EI, "Executive Series" faceplate with labels, 2 port.
   b. #CFPE4EI, "Executive Series" faceplate with labels, 4 port.
   c. #CFPE6EI, "Executive Series" faceplate with labels, 6 port.

B. Faceplate for Wall Phone Outlets
1. Faceplates for wall phone outlets shall have 1 modular jack and two mounting studs.
2. Stainless steel
   a. #KVP5E; wall phone faceplate, stainless steel, with jack

C. Frame for Lab Desk Outlets
1. Frames for lab desk outlets shall be fully compatible with the outlet box and the specified modular connectors. The outlet box is anticipated to accept a 06-type (duplex) device.
   a. # CF1062EI; 106-type duplex frame

2.9 LABELS
A. Provide labels that are machine printable with a laser printer, ink jet printer, thermal transfer printer, or hand-held printer.

B. Labels for Horizontal Cables
1. Adhesive backed labels and self-laminating feature.
2. Fit the horizontal cables listed above (i.e., shall fully \>Tap around the cable's jacket).
3. A 2"x.03" printable area minimum, in size and white in color.
4. Manufacturer:
   a. Panduit.
   1) LJSL7 - Y3-1; labels for cable diameters 0.16"-0.32", white, desktop printer (laser or ink jet)

C. Labels for Modular Patch Panels
1. Adhesive backed labels.
2. Fit above the port without overlap to the next port or to the port itself.
3. A 0.61" x 0.33" printable area minimum.
4. Manufacturer:
   a. Panduit.
      1) #CPPLF-5BU; labels for patch panels, blue, desktop printer (laser or ink jet)
      2) #CPPLF-5; labels for patch panels, white, desktop printer (laser or ink jet)

2.10 MISCELLANEOUS COMPONENTS

A. Velcro Cable Ties
   1. Width: .75”.
   2. Color: Velcro cable ties the same color as the able Lo which it is being applied.
   3. Manufacturers:
      a. Panduit
         1) #HLS-15R-0 Black, 15’ r11, cut to length.

2.11 WLAN Access points shall be Cisco Aironet 1140 series and shall receive two links. The installation shall very per instance (wall mount, ceiling mount…etc.).

PART 3 - EXECUTION

3.1 GENERAL

A. Comply with the General Execution requirements of Section 27 0000 and latest PCCD standard.

3.2 INSTALLATION

A. Horizontal Cable
   1. Cable runs shall have continuous sheath continuity, homogenous in nature. Splices are not permitted anywhere.
   2. Installation
      a. Maintain a minimum bend radius of 6 times the cable diameter during and after installation.
      b. Maintain pulling tension within manufacturer's limits.
      c. Protect cable during installation. Replace cable if damaged during installation.
      d. Place cables with no kinks, twists, or impact damage to the sheath.
      e. Place a pull string along with cables where run in conduit. Tie off end of pull string in ceiling spaces to prevent the string from falling into the conduit.
3. Routing
a. Maintain maximum cable length of 90 meters from the termination in the IDF to the termination at the user's faceplate.
b. When routing horizontally within telecom rooms, utilize the overhead cable tray/runway.
c. When routing vertically within telecom rooms, utilize the wall mounted vertical cable runway and support every 24 inches on center using cable ties.
d. Place and suspend cables in a manner to protect them from physical interference or damage.
e. Route cables a minimum of 6" away from power sources to reduce interference from EMI.
f. Support cables utilizing cable hangers from primary pathway to device pathway or in areas without primary pathway.
g. Route cables at 90-degree angles, allowing for bending radius, along corridors for ease of access. Do not route through an adjacent space if a corridor borders at least one wall of the room.
h. Provide a 10 foot (minimum) sheathed cable slack loop at each end of the run. In the Telecommunications Rooms, place the slack in the overhead cable tray/ruway. At the workstation, place cable in ceiling space supported from a cable hanger.
i. Provide six inches (minimum) of sheathed cable slack behind each workstation outlet faceplate. Coil the slack cable inside the raceway, within the wall, or in the junction box (if used), per the cabling manufacturer's installation standards.
j. At the equipment bay in the Telecommunications Room, divide cables equally between both sides of equipment rack such that a cable does not travel past the midpoint of the rack prior to termination.

4. Termination
a. Properly strain relieves cables at termination points per manufacturer's instructions.
b. Terminate copper pairs at both ends on the specified connecting hardware.
c. Perform terminations in accordance with manufacturer's instructions and TIA/EIA-568-B standard installation practices.
d. Perform post-installation testing as described in the Telecommunication Testing specification.

B. Outlet Faceplates
1. Mount faceplates plumb square, and at the same level as adjacent device faceplates.
2. Patch gaps around faceplates so that faceplate covers the entire opening.
C. Outlet Modular Connectors

1. Terminate cable pairs onto the connector; terminations shall conform to manufacturer's latest installation requirements
2. Replace terminations and connectors not passing the required media test (refer to Section 16719

D. Discrete Patch Panels and Horizontal Management Panels

1. Provide discrete patch panels in a quantity to allow termination of data cables served from respective IDF. Install into rack bays as shown on Drawings.
2. Install the discrete patch panels as shown on the Drawings. If configuration is not shown, install the discrete patch panels in association with the horizontal management panels such that a management panel is mounted above and below given modular patch panel.
3. Assemble and install discrete patch panels and horizontal management panels according to the manufacturer's instructions.

E. Data Patching

1. In IDFs, provide one data CAT5E/CAT6 modular patch cord per data link from the horizontal data termination field to the distributed switch. Utilize the horizontal and vertical management components to properly route the patch cord.

F. Termination Block, for Dedicated Voice Cables

1. Refer to Section 1671 for rack-mounted termination block information.
2. Provide 4-pair IDC connectors and labels [or the Horizontal cables.
3. Terminate the cables at the positions shown on the Drawings. If termination positions are not shown, terminate the Horizontal cables on the unused block starting at the first position (top row, left side).

G. Voice Patching/Crossconnects

1. In IDFs, provide one l-pair crossconnect to length from pair #1 per voice link of the horizontal voice termination field to an available pair on the backbone voice termination field. Utilize the horizontal and vertical management components to properly route the crossconnect wire.
2. Splices in crossconnect wire are prohibited
3. Record crossconnections for MDF crossconnection purposes and for record documents.
4. Color:
   a. For digital handsets, provide: White-Blue / Blue-White
   b. For analog handsets, provide: White-Red / Red-White

3.3 LABELING
A. General Requirements

1. Labeling, identifier assignment, and label colors shall conform to TWEIA-606-A Administration Standard and as approved by the Owner or PCCD’s Representative before installation.
2. Permanent labels with machine-generated text (hand written labels will not be accepted).
3. The contractor is responsible for labeling of Passive network equipment. The Panduit Patch panels and Faceplates are preferred by Peralta for their labeling features. It is Contractor’s responsibility to review the labeling standard with PCCD and select compatible equipment. High-density patch panels should be avoided.
4. The labeling shall follow and fully coordinated with latest PCCD Standard. Testing shall not be performed until passive equipment (cables, patch panels, jacks, etc) is fully installed, labeled and tested by the contractor.

B. Label Formats (See PCCD Standard)

1. Horizontal Cable Labels
   a. Text Attributes: Black, 1/8" high, minimum, or #12 font size.
   b. Install labels on both ends of cables no more than 4" from the edge of the cable jacket.
   c. Install labels such that they are visible by a technician from a normal stance.

2. Patch Panel Labels;
   a. Use modular patch panel labels included in the product packaging. Request approval by the Engineer for other labels,
   b. Use a label color for the respective field type, per TIAEIA-606. c. Text Attributes: Black, 3/32” high, minimum, or #10 font size.

3. 110 Termination Block Labels
   a. Use 110 Termination block labels included in the product packaging. Request approval by the Engineer for other labels.
   b. Use a label color for the respective field type, per TNEIA-606. c. Text Attributes: Black. 3/32” high, minimum, or # 10 font size.

4. Outlet Labels
   a. Use outlet labels included in the product packaging. Request approval by the Engineer for other labels.
   b. Label Background: White.
   c. Text Attributes: Black, 1/8” high, minimum, or #12 font size.
   d. Install label in the top label window. Leave the bottom label window blank.
C. Identifier Assignment

1. General: Separate label fields of the identifier with a hyphen.
2. Horizontal Cables (Reference only, see latest PCCD standard)
   a. First field: the originating IDF room identity; for example: "AA2.1".
   b. Second field: the destination room number; for example: "147".
   c. Third field: a unique sequential outlet number; for example: "0 J" (1st outlet in room).
   d. Fourth field: a unique port number; for example: "1" (1st port. of the outlet).
   e. Fifth field: the cable type; for example: "CA’1’6".
   f. Example: "AA2.1-147-01-1-CAT6"

3. Outlets (Reference only, see latest PCCD standard)
   a. First field: the originating IDF room identity; for example: "AA2.1".
   b. Second field: the destination room number; for example: "147".
   c. Third field: a unique sequential outlet number; for example: ';01" (1st outlet in room).
   d. Example: "AA2.1-147-01"

4. Individual Ports at the Outlets (Reference only, see latest PCCD standard)
   a. First field: a unique sequential number; for example: "1"

5. Individual Ports at the Modular Patch Panels (Reference only, see latest PCCD standard)
   a. First field: the End User Room Number; for example: "147".
   b. Second field; outlet port number; for example: "1" (1st port of the outlet).
      Example: "147-1"

3.4 FINAL INSPECTION

A. Inspect installed products and work in conjunction with the Owner or PCCD's Representative.

B. Develop a punchlist for items needing correction.

C. Issue punchlist to Engineer for review prior to performing punchlist with the Engineer.

D. Repair defects prior to system acceptance.

E. Inspect installed products and work in conjunction with the Engineer for sign off.

3.5 SCHEDULE CONSIDERATIONS
A. The PM shall give reasonable notice to the District and College Information Technology Staff of the anticipated completion of the Contractor’s work and planned occupancy dates:
   Staff:
   College of Alameda- Joe Camara and Bala Sampathrai

B. Information Technology staff are responsible for installation and testing of active network components (routers, switches, etc). However, this work cannot be performed until passive equipments (cables, patch panels, jacks, etc) is fully installed, labeled and tested by the contractor. The completion of passive network equipment work must occur reasonably in advance of the scheduled occupancy date, and no less than one week. The magnitude of the project scope dictates the required amount of the time needed for active component installation and testing.

END OF SECTION
PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and supplementary
   Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

   1. Pathways.
   2. UTP cable.
   3. 50/125-micrometer, optical fiber cabling.
   5. Cable connecting hardware, patch panels, and cross-connects.

B. Related Sections:

   1. Section 26 05 19 – Low Voltage Electrical Power Conductors and Cables.

1.3 DEFINITIONS


B. Cross-Connect: A facility enabling the termination of cable elements and their
   interconnection or cross-connection.

C. EMI: Electromagnetic interference.

D. IDC: Insulation displacement connector.

E. LAN: Local area network.

F. RCDD: Registered Communications Distribution Designer.

G. UTP: Unshielded twisted pair.

1.4 BACKBONE CABLING DESCRIPTION

A. Backbone cabling system shall provide interconnections between communications
   equipment rooms, main terminal space, and entrance facilities in the
   telecommunications cabling system structure. Cabling system consists of backbone
cables, intermediate and main cross-connects mechanical terminations, and patch cords or jumpers used for backbone-to-backbone cross-connection.

B. Backbone cabling cross-connects may be located in communications equipment rooms or at entrance facilities. Bridged taps and splitters shall not be used as part of backbone cabling.

1.5 PERFORMANCE REQUIREMENTS

A. General Performance: Backbone cabling system shall comply with transmission standards in TIA/EIA-568-B.1, when tested according to test procedures of this standard.

1.6 SUBMITTALS

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

1. For coaxial cable, include the following installation data for each type used:
   a. Nominal OD.
   b. Minimum bending radius.
   c. Maximum pulling tension.

B. Shop Drawings:

1. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.
2. System Labeling Schedules: Electronic copy of labeling schedules that are part of the cabling and asset identification system of the software.
3. Cabling administration drawings and printouts.
4. Wiring diagrams to show typical wiring schematics including the following:
   b. Patch panels.
   c. Patch cords.
5. Cross-connects and patch panels. Detail mounting assemblies, and show elevations and physical relationship between the installed components.
6. Cable tray layout, showing cable tray route to scale, with relationship between the tray and adjacent structural, electrical, and mechanical elements. Include the following:
   a. Vertical and horizontal offsets and transitions.
   b. Clearances for access above and to side of cable trays.
   c. Vertical elevation of cable trays above the floor or bottom of ceiling structure.
   d. Load calculations to show dead and live loads as not exceeding manufacturer's rating for tray and its support elements.
C. Qualification Data: For Installer, qualified layout technician, installation supervisor, and field inspector.

D. Source quality-control reports.

E. Field quality-control reports.

F. Maintenance Data: For splices and connectors to include in maintenance manuals.

G. Software and Firmware Operational Documentation:
   1. Software operating and upgrade manuals.
   2. Program Software Backup: On magnetic media or compact disk, complete with data files.
   3. Device address list.
   4. Printout of software application and graphic screens.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.
   1. Layout Responsibility: Preparation of Shop Drawings by an RCDD.
   2. Installation Supervision: Installation shall be under the direct supervision of Registered Technician, who shall be present at all times when Work of this Section is performed at Project site.
   3. Testing Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.
   4. Testing Agency Qualifications: An NRTL.
   5. Testing Agency’s Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing.

B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: 25 or less.
   2. Smoke-Developed Index: 50 or less.
   3. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.

C. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

1. Test optical fiber cable to determine the continuity of the strand end to end. Use or optical loss test set.
2. Test optical fiber cable while on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector, including the loss value of each. Retain test data and include the record in maintenance data.
3. Test each pair of UTP cable for open and short circuits.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.10 COORDINATION

A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.

1.11 SOFTWARE SERVICE AGREEMENT

A. Technical Support: Beginning with Substantial Completion, provide software support for two years.

B. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.

1. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade computer equipment if necessary.

1.12 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Patch-Panel Units: two of each type.
2. Connecting Blocks: two of each type.
PART 2 - PRODUCTS

2.1 PATHWAYS

A. General Requirements: Comply with TIA/EIA-569-A.

B. Cable Support: NRTL labeled for support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.
   1. Support brackets with cable tie slots for fastening cable ties to brackets.
   2. Lacing bars, spools, J-hooks, and D-rings.
   3. Straps and other devices.

C. Conduit and Boxes: Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems." Flexible metal conduit shall not be used.
   1. Outlet boxes shall be no smaller than 2 inches wide, 3 inches high, and 2-1/2 inches deep.

2.2 BACKBOARDS

A. Backboards: Plywood, fire-retardant treated, 3/4 by 48 by 96 inches. Comply with requirements in Division 06 Section "Rough Carpentry" for plywood backing panels.

2.3 UTP CABLE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Belden CDT Inc.; Electronics Division.
   2. CommScope, Inc.
   3. Mohawk; a division of Belden CDT.
   4. Tyco Electronics/AMP Netconnect; Tyco International Ltd.
   5. Superior Essex.
   6. General Cable Technologies Corporation.

B. Description: 100-ohm, 100-pair UTP, formed into 25-pair binder groups covered with a thermoplastic jacket and overall metallic shield.
   1. Comply with ICEA S-90-661 for mechanical properties.
   2. Comply with TIA/EIA-568-B.1 for performance specifications.
   4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and CEC for the following types:
      a. Communications, General Purpose: Type CMR
      b. Communications, Plenum Rated: Type CMP, complying with NFPA 262.
      c. Communications, Riser Rated: Type CMR, complying with UL 1666.
2.4 UTP CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Tyco Electronics/AMP Netconnect; Tyco International Ltd.
2. Panduit.
3. Leviton.

B. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.

C. Connecting Blocks: 110-style IDC for Category 6. Provide blocks for the number of cables terminated on the block, plus 25 percent spare. Integral with conductor bodies, including plugs and jacks where indicated.

D. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables.

E. Number of Terminals per Field: One for each conductor in assigned cables.

F. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.

1. Number of Jacks per Field: One for each four-pair conductor group of indicated cables, plus spares and blank positions adequate to suit specified expansion criteria.

G. Jacks and Jack Assemblies: Modular, color-coded, eight-position modular receptacle units with integral IDC-type terminals.

H. Patch Cords: Factory-made, 4-pair cables in 36-inch lengths; terminated with 8-position modular plug at each end.

1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.
2. Patch cords shall have color-coded boots for circuit identification.

2.5 OPTICAL FIBER CABLE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Superior Essex Part Number W3018HGA1.
B. Description: One (1) 12 strand MM, one (1) 6 strand SM, 50/125-micrometer, tight buffer, optical fiber cable. Outer Sheath Color: Different than existing station wiring (not Red). Outer Sheath NAPA Rating: CM or CMP.

1. Comply with ICEA S-83-596 for mechanical properties.
2. Comply with TIA/EIA-568-B.3 for performance specifications.
3. Comply with TIA/EIA-492AAAA-B for detailed specifications.
4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444, UL 1651, and CEC for the following types:
5. General Purpose, Nonconductive: Type OFN or OFNG.
   a. Plenum Rated, Nonconductive: Type OFNP, complying with NFPA 262.
   b. Riser Rated, Nonconductive: Type OFNR, complying with UL 1666.
   c. General Purpose, Conductive: Type OFC or OFCG.
   d. Plenum Rated, Conductive: Type OFCP, complying with NFPA 262.
   e. Riser Rated, Conductive: Type OFCR, complying with UL 1666.
6. Conductive cable shall be aluminum armored type.

7. Maximum Attenuation: 3.50 dB/km at 850 nm; 1.5 dB/km at 1300 nm.

8. Minimum Modal Bandwidth: 160 MHz-km at 850 nm; 500 MHz-km at 1300 nm.

C. Jacket:

2. Cable cordage jacket, fiber, unit, and group color shall be according to TIA/EIA-598-B.
3. Imprinted with fiber count, fiber type, and aggregate length at regular intervals not to exceed 40 inches.

2.6 OPTICAL FIBER CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Leviton
2. Panduit.

B. Cross-Connects and Patch Panels: Modular panels housing multiple-numbered, duplex cable connectors.

1. Number of Connectors per Field: One for each fiber of cable or cables assigned to field, plus spares and blank positions adequate to suit specified expansion criteria.

C. Patch Cords: Factory-made, dual-fiber cables in 36-inch lengths.

D. Cable Connecting Hardware:
2. Quick-connect, simplex and duplex, Type LC connectors. Insertion loss not more than 0.75 dB.
3. Type SFF connectors may be used in termination racks, panels, and equipment packages.

2.7 GROUNDING
A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems." for grounding conductors and connectors.
B. Comply with ANSI-J-STD-607-A.

2.8 IDENTIFICATION PRODUCTS
A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

2.9 SOURCE QUALITY CONTROL
A. Testing Agency: Engage a qualified testing agency to evaluate cables.
B. Factory test cables on reels according to TIA/EIA-568-B.1.
C. Factory test UTP cables according to TIA/EIA-568-B.2.
D. Factory test multimode optical fiber cables according to TIA/EIA-526-14-A and TIA/EIA-568-B.3.
E. Cable will be considered defective if it does not pass tests and inspections.
F. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 ENTRANCE FACILITIES
A. Coordinate backbone cabling with the protectors and demarcation point provided by communications service provider.

3.2 WIRING METHODS
A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces, in attics, and in gypsum board partitions where unenclosed wiring method may be used. Conceal raceway and cables except in unfinished spaces.
1. Install plenum cable in environmental air spaces, including plenum ceilings.
2. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."

B. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

C. Wiring within Enclosures: Bundle, lace, and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.3 INSTALLATION OF PATHWAYS

A. Cable Trays: Comply with NEMA VE 2 and TIA/EIA-569-A.

B. Comply with requirements for demarcation point, pathways, cabinets, and racks specified in Division 27 Section "Hangers and Supports for Communication Systems." Drawings indicate general arrangement of pathways and fittings.

C. Comply with TIA/EIA-569-A for pull-box sizing and length of conduit and number of bends between pull points.

D. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.

E. Install manufactured conduit sweeps and long-radius elbows whenever possible.

F. Pathway Installation in Communications Equipment Rooms:
   1. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.
   2. Install cable trays to route cables if conduits cannot be located in these positions.
   3. Secure conduits to backboard when entering room from overhead.
   4. Extend conduits 3 inches above finished floor.
   5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

G. Backboards: Install backboards with 96-inch dimension vertical. Butt adjacent sheets tightly, and form smooth gap-free corners and joints.

3.4 INSTALLATION OF CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:
   2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
3. Install 110-style IDC termination hardware unless otherwise indicated.
4. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
5. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
6. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Use lacing bars and distribution spools.
8. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
9. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
10. In the communications equipment room, install with a 10-foot minimum service at the MDF/IDF cabinets and each workstation.
11. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.
12. Fiber optic cable shall be permanently labeled on both ends at the fiber patch panel and all junction boxes with their IDF or MDF destination using (P-touch) labeling, (i.e. to MDF).
13. Fiber optic cables shall be terminated on both ends with SC style connections.
14. Fiber optic rack mount enclosures will be installed at the top of wall mount and freestanding equipment rack.
15. Fiber optic cables are to be installed by Contractor, provided UL rated inner duct where conduit pathways are not provided.
16. All wire (copper, fiber and ground) will enter and or exit equipment closets by passing through Contractor provided and installed EMT conduit fastened where needed by uni-strut.
17. A minimum of insulated #6 AWG copper conductor(s) wire will be provided and installed by the Contractor and grounded in MDF/IDF.

C. UTP Cable Installation:
2. Do not untwist UTP cables more than 1/2 inch from the point of termination to maintain cable geometry.

D. Optical Fiber Cable Installation:
2. Cable may be terminated on connecting hardware that is rack or cabinet mounted.
E. Open-Cable Installation:

1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend UTP cable not in a wireway or pathway, a minimum of 8 inches above ceilings by cable supports not more than 60 inches apart.
3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

F. Group connecting hardware for cables into separate logical fields.

G. Separation from EMI Sources:

1. Comply with BICSI TDMM and TIA/EIA-569-A recommendations for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.
6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches.

3.5 CODES AND STANDARDS

A. The Following are codes and standards that apply to this installation:
1. TIA/EIA-568B- Commercial BLDG telecommunication wiring standard.
2. TIA/EIA-569- Commercial BLDG standards for telecommunications pathways and spaces.
3. TIA/EIA-606- Administration standard for the telecommunications infrastructure of commercial Buildings.
4. TIA/EIA-607- Commercial building grounding and bonding requirements for telecommunications
5. TIA/EIA-67- Transmission performance spec's for field testing of "UTP" cabling systems
6. ISO.IEC 8802-3- ANSI/IEEE 802.3 series standards.

3.6 FIRESTOPPING

A. Comply with requirements in Division 07 Section "Penetration Firestopping." Comply with TIA/EIA-569-A, Annex A, "Firestopping."

B. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.7 GROUNDING

A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with ANSI-J-STD-607-A.

C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least 2-inch clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.

D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

3.8 IDENTIFICATION

A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

1. Administration Class: 2.
2. Color-code cross-connect fields and apply colors to voice and data service backboards, connections, covers, and labels.

B. Comply with requirements in Division 09 Section "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.

C. Cable Schedule: Install in a prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and
destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for Project.

D. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, backbone pathways and cables, entrance pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors.

E. Cable and Wire Identification:

1. Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
3. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet.
4. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
   a. Individually number wiring conductors connected to terminal strips and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device with name and number of particular device as shown.
   b. Label each unit and field within distribution racks and frames.
5. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.

F. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA 606-A, for the following:
   1. Cables use flexible vinyl or polyester that flexes as cables are bent.

3.9 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections:
   1. Visually inspect UTP and optical fiber jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for
compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-B.1.

2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.

3. Test UTP copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.

   a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.2. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.

4. Optical Fiber Cable Tests:

   a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-B.1. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.

   b. Link End-to-End Attenuation Tests:

      1) Horizontal and multimode backbone link measurements: Test at 850 or 1300 nm in 1 direction according to TIA/EIA-526-14-A, Method B, One Reference Jumper.

      2) Attenuation test results for backbone links shall be less than 2.0 dB. Attenuation test results shall be less than that calculated according to equation in TIA/EIA-568-B.1.

D. Data for each measurement shall be documented. Data for submittals shall be printed in a summary report that is formatted similar to Table 10.1 in BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.

E. Remove and replace cabling where test results indicate that they do not comply with specified requirements.

F. End-to-end cabling will be considered defective if it does not pass tests and inspections.

G. Prepare test and inspection reports.

H. The power meter test results shall be recorded and printed using the software provided with the test equipment. Provide a hard and soft copy of the fiber optics test results to Alvord SD IT Department including a copy of the test equipment software. Hard copy test result must be provided in an 8-1/2“ x 11” binder including a cover sheet.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Work included:

1. Fire alarm control panel (FACP)
2. Initiation devices.
3. Annunciation devices.
5. Fire alarm auxiliary equipment control.
6. Record drawings.
7. Pre-testing and final testing.

B. Work furnished and installed under another Section, but connected complete under this Section:

1. Fire sprinkler alarm system flow switches, valve monitors and post indicating valves.

1.2 RELATED SECTIONS

A. Section 260500: Common Work Results for Electrical
B. Section 260519: Low-Voltage Electrical Power Conduits and Cables

1.3 REFERENCES

A. NFPA 72 - Installation, Maintenance, and Use of Protective Signaling Systems.
B. California Referenced Standards Code Part 12, Title 24 (CBC Standard with California Amendments).
1.4 APPROVALS

A. The system must have proper listing and/or approval from the following nationally recognized agencies:

   UL   Underwriters Laboratories, Inc.

   CSFM  California State Fire Marshal

B. The Fire Alarm Contractor shall submit shop drawings to the Project Architect before commencing work.

1.5 CONTRACTOR QUALIFICATIONS

A. All work specified in this Section shall be performed (furnished, installed and connected) by a qualified fire alarm contractor. The fire alarm contractor shall provide the following documentation to show compliance with contractor qualifications.


2. Proof of Experience: Proof that the fire alarm contractor has been regularly engaged in the business of fire alarm contracting consisting of, but not limited to, engineering, fabrication, installation, and servicing of fire alarm systems of the type specified herein for at least the past ten (10) consecutive years. Provide a statement summarizing any pending litigation involving any officer or principal of/or the company, the nature of the litigation and what effect the litigation may carry as it relates to this work in the worst case scenario. Non-disclosure of this item, if later discovered, may result, at the owner's discretion, in the contractor bearing all costs and any cost related to associated delays in the progress of the work.

3. Insurance Certificates: Copy of fire alarm contractor's current liability insurance and state industrial insurance certificates in conformance with the contract documents.

4. Project List: A List containing at least ten (10) California installations completed within the last five (5) years by the fire alarm contractor that are comparable in scope and nature to that specified in the contract document.

5. Service Capability: Documentation indicating in detail that the fire alarm contractor has competent engineering, installation, service personnel and facilities with reasonable stock of service parts within 50 air miles of the job site.

6. Authorization Letters: Letters from the fire alarm equipment manufacturer stating that the fire alarm contractor is the Factory Authorized Distributor, and is trained and certified for the equipment provided in the main building and is licensed to purchase and install that software required to provide the specified functions.

7. Certification:
a. Proof that the fire alarm contractor is Underwriters Laboratories, Inc. (UL) listed under the classification of "PROTECTIVE SIGNALING SERVICES-LOCAL, AUXILIARY, REMOTE STATION AND PROPRIETARY (UUJS).

b. Copy of the National Institute for Certification in Technologies (NICET) Certificate. Proof that the Technician Level 2 certificate holders are a part of the fire alarm contractor’s local facility servicing this project and will be actively involved in this project.

8. Proof of Trained Personnel: Documentation that the fire alarm contractor has on staff personnel factory-trained and certified for the equipment proposed for this project. Also, a statement that personnel meeting these qualifications are in the local facility, and will be maintained at that facility throughout the project and the warranty period.

1.6 INSTALLATION COMPANY

A. The fire alarm contractor shall be UL listed company under the UL classification of (UUJS). The installation company shall UL certify this installation.

B. The fire alarm contractor shall have a NICET Certified Engineering Technologist and Technicians on staff in their facility directly involved with this project to ensure technical expertise to this project and adherence with these specifications.

C. The fire alarm contractor shall maintain sufficient stock on hand and have a fully equipped service organization capable of guaranteeing response time within 8 hours of service calls, 24 hours a day, 7 days a week to service completed systems.

D. Equipment, wire and materials shall only be installed by the fire alarm contractor. An installation company other than the fire alarm contractor shall not be acceptable.

E. The fire alarm contractor shall provide, install and test all equipment related to this section.

F. All equipment and accessories to be the product of one manufacturer regularly engaged in manufacture of fire alarm systems and whose products have been in satisfactory use in similar service for not less than 5 years.

G. Supply all equipment and accessories new, free from defects, and listed by Underwriters' Laboratories, Inc. or Factory Mutual Research Corporation.

H. Supply all equipment and accessories in compliance with the applicable standards listed in Article 1.05 of this section and with all applicable national, state and local codes.

I. The fire alarm plans and specifications contain herein, have been submitted, reviewed and approved by DSA on the basis of fire alarm equipment and devices scheduled on fire alarm plans. Therefore, if the fire alarm equipment and devices manufacturer
proposed by the Contractor differs from one scheduled on plans and approved by DSA it is **Contractor’s sole responsibility** to obtain appropriate DSA approvals and stamps for plans, prepared by the Contractor depicting equipment by different manufactures at no additional cost to the District. This requirement is applicable even if Contractor proposes to use any of two other acceptable manufacturers listed herein, if such is not scheduled on fire alarm plans.

1.7 DESCRIPTION

A. This section of the specifications included for a complete operational system provision of devices and connection to the fire alarm equipment that was provided under the main building modernization project. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, auxiliary control devices of power supplies, and wiring as shown on the drawings and specified herein.

B. The fire alarm system shall comply be zone non-coded addressable. It shall be 24 VDC closed circuits, electronically supervised, common signaling, device indicating, automatic alarm type, operating from manual pull stations and smoke detectors.

C. Activation of any alarm initiating device shall:

1. Cause any audible and visible evacuation alarm devices to sound and/or pulse throughout the system until silenced at the FACP.
2. Display individual addressable initiating device and/or zone number in alarm with a minimum of 80 character alphanumeric display at FACP.
3. Illuminate the zone of the initiating device in alarm at the FAA.
4. Display on terminal and printout a hard copy record of the device type, location, status, time and date on printer.
5. Transit alarm signal to remote monitoring station.

D. System shall provide supervisory signals for the following:

1. System trouble consisting of:
   a. Removal of an alarm initiating device from any circuit.
   b. An open or ground fault in any initiating circuit.
   c. An open, short or ground fault in an annunciation circuit.
   d. A ground fault on any DC line.
   e. Removal of system input, output or control module.
   f. Improper condition of battery or charger.

E. Failure of any circuit supervised by the FACP shall:

1. Cause the trouble buzzer at the FACP to sound continuously until silenced.
2. Caused the offending addressable device and/or zone to display at the FACP.
3. Cause the offending zone to illuminate the trouble light at the FAA.
4. Display on terminal and printout on the system printer.
5. Transmit a trouble signal to remote monitoring system.
F. Failure of AC power shall:

1. Cause the trouble buzzer at the FACP to sound continuously until silenced.
2. Display condition at the FACP.
3. Cause automatic transfer to standby battery. All system functions shall be operational during power failure.

1.8 SCOPE

A. The existing campus main fire alarm system is manufactured by Silent Knight. All new fire alarm equipment and devices shall be compatible with the existing fire alarm panel. Re-program existing main fire alarm control panel to include all added devices. Provide additional devices and programming accessories as required whether indicated or not on plans for a fully operational fire alarm system.

B. Circuiting Guidelines

1. All system smoke and heat detectors shall be of the Addressable Analog type. Although each individual device point number and message shall be displayed on the LCD, the initiating devices shall be zoned as follows to provide the appropriate indication on the LED Annunciator.
2. Provide one alarm-initiating zone per device as shown on the plans and annunciator(s).
   a. Fire protection flow switch per building.
   b. Area smoke/heat detectors per building.

1.9 SUBMITTALS

A. Section 013300 – Submittal Procedures.

B. Provide shop drawing containing the following but not limited to:

1. Riser Diagram.
2. Typical Device Wiring Diagram.
3. Wire Legend.
4. Battery Calculation for each control panel, power supply, field power supply and network annunciator.
5. Worst Case Voltage drop for each circuit type per building.
6. Scaled floor plans showing all conduits, sizes, and quantity of conductors.
7. Mounting Height of each devices and back box requirement.
8. Zoning and address description legend.

C. Provide product data booklets with the following but not limited to:

1. Wire.
2. Battery Calculation for each control panel, power supply, field power supply and network annunciator.
3. Size of Batteries to be used in each panel.
4. Worst Case Voltage drop for each circuit type per building.
5. CSFM listing sheet for each component.

1.10 PROJECT RECORD DOCUMENTS

A. Record actual locations of initiating devices, signaling appliances, and end-of-line devices.

1.11 OPERATION AND MAINTENANCE DATA

A. Operation Data: Operating instructions.
B. Maintenance Data: Maintenance and repair procedures.
C. Re-program existing Main Fire Alarm Control Panel to monitor added devices. Re-programming shall not be limited for relay, module and auxiliary devices required for the complete reprogramming and installation.

1.12 WARRANTY

A. Contractor shall warrant completed fire alarm system wiring and equipment to be free from inherent mechanical and electrical defects, for a period of one year from date of completed and certified test, or from date of first beneficial use, whichever comes last.
B. System manufacturer shall include an agreement whereby system will be inspected and tested in accordance with NFPA-72, Chapter 7. Testing shall be conducted by a local factory trained technician, who will upon completion of testing, provide the District with written records of testing. This agreement shall be in effect for a period of two years after initial testing and acceptance by the District. Cost of such agreement shall be part of Contractor’s bid.

1.13 EXTRA MATERIALS

A. Furnish under provisions of Section 017700: Closeout procedures.
B. Provide 30% manual stations of each type (minimum of one for each type) rods.
C. Provide six keys of each type.
D. Provide 30% of each type of smoke and heat (minimum of one of each type) detector.
E. Provide 30% of each type of audible and visual alarm device (minimum of one of each type).
F. Provide 10% lamps for remote indicating units. (Minimum of one for each type)
G. Provide 10% lamps for strobe units. (Minimum of one for each type)
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products as manufactured by “SimplexGrinnel” to be compatible with existing campus main fire alarm control panel. See Fire alarm plans for project specific panel model type.

2.2 SYSTEM COMPONENTS

A. Programmable Electronic Horns: (Indoor/Outdoor)

1. Electronic horns shall operate on 24 VDC nominal, minimum 75dBA sound level at 10 feet. Shall conform to the applicable requirements of UL 464.
2. Shall be suitable for mounting on the wall or ceiling.
3. Shall be semi-flush or surface mounted as shown on plans.
4. Flush mounted devices on the exterior of buildings; device shall be installed in a (finish red) back box with a weatherproof cover.

B. Strobe Lights:

1. Shall operate on 24 VDC nominal, 15, 30, 75, 110 candela at a rate of 1 flash per second, white Lexan lens.
2. Shall meet the requirements of the ADA and UL 1971.
   a. The maximum pulse duration shall be 2/10ths of one second
   b. Intensity shall be as specified on the drawings.
   c. The flash rate shall be one flash per second.
   d. The appliance shall be placed 80 inches to bottom of device above the highest floor level within the space, or 6 in below the ceiling, which ever is the lower.

C. Audible/Visual Combination Devices:

1. Shall meet the applicable requirements of Section A listed above.
2. Shall meet the requirements of Section B listed above for visibility.
3. Audible and visual devices for new classroom buildings shall operate on separate circuits.

D. Manual Stations:

1. Manual Stations shall be provided to connect to the monitor module that connects to the Fire Alarm Control Panel Signaling Line Circuit (SLC) Loops.
2. All operated stations shall have a positive, visual indication of operation that cannot be reset without the use of a key.
3. Stations shall be suitable for surface mounting, or semiflush mounting as shown on the plans, and shall be installed at 48 inches above the finished floor.
4. Manual stations shall be constructed of high impact Lexan, with operating
instructions provided on the cover. The word FIRE shall appear on the manual station in letters one half inch (12.7 mm) in size or larger.

E. Intelligent Photoelectric Smoke Detectors:

1. Smoke detectors shall be intelligent and addressable devices, and shall connect with two wires to one of the Fire Alarm Control Panel Signaling Line Circuit loops.
2. The detectors shall use the photoelectric (light-scattering) principle to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.
3. The detector shall be ceiling mount and shall include a twist lock base. All electronics shall be contained within detector head and shall plug-in to terminal base. The detector shall be field programmable and contain external indication that is readily visible.
4. The detector sensitivity shall be set through the Fire Alarm Control Panel, and shall be adjustable in the field through the field programming of the system. Sensitivity may be automatically adjusted by the panel on a time-of-day basis. Long term changes to the received signal caused by environmental variations shall be automatically compensated.
5. Detectors located above finished ceiling or in areas which are not readily visible shall be provided with remote indicator LED’s.

F. Intelligent Heat Detectors:

1. Heat Detectors shall be Intelligent and Addressable devices or conventional type with individual monitor module, and shall connect with two wires to one of the Fire Alarm Control Panel Signaling Line Circuits.
2. The detectors shall use and electronic sensor to measure thermal conditions caused by a fire.
3. The detectors shall be ceiling mount and shall include a twist lock base.
4. Detectors located above finished ceiling or in areas which are not readily visible shall be provided with remote indicator LED’s.

G. Monitor Module:

1. Addressable Monitor modules shall be provided to connect one supervised IDC zone of conventional Alarm Initiating Devices (any NO. dry contact device) to one of the Fire Alarm Control Panel Signaling Line Circuit (SLC) Loops.
2. The Monitor Module shall mount in a 4-inch square, 2 1/8” deep electrical box.
3. For difficult to reach areas, the monitor module shall be available in a miniature package and shall be no larger than 2-3/4 inch (70 mm) x 1-1/4 inch (31.7 mm) x 1/2 inch (12.7 mm). This version need not include Style D or an LED.
H. Control Module:

1. Addressable Control Modules shall be provided control functions with Form "C" contracts rated at 2.0 amps at 30VDC, 0.6 amps at 120VAC.
2. The Control Module shall mount in a 4-inch square 2 1/8" deep electrical box.

I. Initiation/Annunciation Modules:

1. All modules shall be plug-in, dynamically supervised and easily replaceable. Field wiring shall be connected to the panel with removable multi-conductor connectors to facilitate rapid removal and replacement of both the module and wiring for ease of serving the panel. The modules shall be system interconnected by a card edge connector.
2. Provide zone input addressable modules for monitoring non-addressable initiating circuits.
3. Provide programmable signal modules on output circuits for operation of DC audible devices.
4. Provide as needed, programmable supplementary relay modules containing four independent relays fitted with form “C” contacts, rated 120VAC, 5 amps inductive.

J. Auxiliary Relays:

1. Provide sufficient SPDT auxiliary relay contacts to provide necessary functions specified.

2.3 BATTERIES

A. Battery:

1. Shall be Gel-Cell type.
2. Battery shall have sufficient capacity to power the fire alarm system for not less than twenty-four hours plus ten minutes of alarm upon a normal AC power failure.
3. The batteries are to be completely maintenance free.

2.4 REMOTE POWER SUPPLIES

A. The Remote Power Supplies for Notification appliances shall be as manufactured by Silent Knight. See Fire alarm plans for project specific remote power supply model type. Intelligent Power Supply shall hang on the main S-Bus and be programmed through the intelligent fire panel control unit.

2.5 WIRE

A. All low voltage wire required in this section shall be furnished and installed by the fire alarm contractor.
B. All wire shall be installed in conduit. Wiring installed in underground conduits shall be approved for wet applications in accordance with the National Electric Code.

C. All fire alarm system wiring shall be new.

D. Wiring shall be in accordance with local stated and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 14 AWG for Initiating Device Circuits and Signaling Line Circuits, and 12 AWG for Indicating Appliance Circuits.

E. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.

F. Wiring used for the multiplex communication loop shall be 18AWG twisted and shielded and installed in conduit. The system shall permit use of IDC and IAC wiring in the same conduit with the communication loop.

G. All field wiring shall be completely supervised. In the event of a primary power failure, disconnected standby battery, removal of any internal modules, or any open circuits in the field wiring; a trouble signal will be activated until the system and its associated field wiring are restored to normal condition.78

PART 3 - EXECUTION

3.1 INSTALLATION

A. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system and shall be as recommended by the manufacturer. All wiring shall be in conduit.

B. Install all necessary conductors to all devices indicated on Drawings, make all necessary conductor terminations to all devices, for a complete system to function as specified or indicated on Drawings.

C. There shall be no splices made in junction boxes. All terminations shall be in terminal cabinets or on equipment terminals.

D. All conductors shall be installed within conduits, boxes, and terminal cabinets, in a manner that shall provide for completely metal enclosed installation. Furnish and install all conductors necessary to connect all incoming and outgoing circuits, including spare conductors, to terminal strips within terminal cabinets.

E. Wiring within equipment and terminal cabinets shall be terminated on terminal blocks having a terminal for each required connection. Wiring shall be cabled, neatly laced and securely fastened in place so that no weight is imposed on any equipment or terminals.
F. Install required terminal blocks within each terminal cabinet. Terminal blocks shall be installed on inside back of cabinets only, not on side. All incoming wiring shall be terminated on the left side of terminal blocks, and all outgoing wiring shall be terminated on the right side of the terminal blocks.

G. Conductors shall be color coded and tagged with code markers at each terminal cabinet, junction box, pullbox and equipment. A wire index shall be typed and installed on terminal cabinet door. Each index shall be covered with clear plastic adhesive cover. Wiring shall be identified as to building and location of devices in the index.

H. Wiring within equipment and terminal cabinets shall be carefully strapped, and shall be formed in rectangular configuration. Each wire shall be properly numbered in numerical order and shall maintain same number throughout site.

3.2 TESTING

A. Upon completion of the work and after all electrical connections have been made and the system is in full operation, the alarm system shall be tested and defective work shall be corrected.

B. Acceptance testing of Fire Detection System shall be as required by the State Fire Marshal, and local authority having jurisdiction. Contractor shall be responsible for identifying required testing, coordinating scheduling, and conducting tests necessary to achieve occupancy certification. Tests shall include following:

1. An operation of each signal-initiating device (smoke detectors, heat detectors and pull stations).
2. An operation of each indicating device (alarm horn and alarm lamp).
3. Operation of features of system under normal operation.
4. Operation of supervisory features of system.
5. Operation of features of system on standby power, with primary power off.

C. A hard copy of the analog value of each initiating input/device shall be given to the District and Authority having jurisdiction upon completion of system tests. These values shall be used as reference in future test to determine sensor maintenance.

D. Upon completion of installation of fire alarm equipment, Contractor shall provide to the District a signed, written statement confirming that fire alarm equipment was installed in accordance with the Specifications, wiring diagrams, instructions, and directions provided by manufacturer.

E. Contractor shall complete the Inspection and Testing form as required by NFPA 72 Chapter 7 and shall submit to the District's Electrical Inspector one copy of the completed form.

3.3 TRAINING

A. The Contractor shall include an allowance for eight (8) hours of competent
representative at the Project site, at a time requested by the District, for training of the District's operating personnel.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Excavating topsoil.
   2. Excavating subsoil.
   3. Cutting, grading, filling, rough contouring, compacting, site for portable building pads, and drainage.

B. Related Sections:
   1. Section 31 23 17 - Trenching: Trenching and backfilling for utilities.
   2. Section 31 23 23 - Fill: General building area backfilling.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

B. ASTM International:
   2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft\(^3\) (2,700 kN-m/m\(^3\))).

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Materials Source: Submit name of imported materials suppliers.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.
1.5 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM C136.

B. Maintain one copy of each document on site.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify site conditions for the Work are as indicated on Drawings.

C. Verify survey bench mark and intended elevations for the Work are as indicated on Drawings.

3.2 PREPARATION

A. Call Local Utility Line Information service USA North at 811/800-227-2600 not less than five working days before performing Work.

   1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Identify required lines, levels, contours, and datum.

C. Protect utilities indicated to remain from damage.

D. Protect plant life, lawns, and other features remaining as portion of final landscaping.

E. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be regraded without mixing with foreign materials for use in finish grading.

B. Do not excavate wet topsoil.

C. Stockpile on site to depth not exceeding 4 feet and protect from erosion. Stockpile material on 36 mil Hypalon material and cover over with same material until reused.
D. Do not remove topsoil from site.

3.4 SUBSOIL EXCAVATION

A. Excavate subsoil from areas to be further excavated

B. Do excavate and process wet material to obtain optimum moisture content.

C. Stockpile subsoil in area on site to depth not exceeding 4 feet and protect from erosion.

D. Stability: Replace damaged or displaced subsoil as specified for fill.

3.5 FILLING

A. Fill areas to contours and elevations with clean materials.

B. Place fill material in continuous layers and compact as required.

C. Maintain optimum moisture content of fill materials to attain required compaction density.

D. Slope grade away from building pads minimum 5 percent slope for minimum distance of 10 ft, unless noted otherwise.

E. Make grade changes gradual. Blend slope into level areas.

F. Install Work in accordance with Public Work's standards of the City of Alameda and the County of Alameda.

3.6 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Top Surface of Subgrade: Plus or minus 1/10 foot from required elevation.

3.7 FIELD QUALITY CONTROL

A. Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Perform laboratory material tests in accordance with ASTM D1557.

C. Perform in place compaction tests in accordance with the following:

D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Excavating trenches for utilities from 5 feet outside portable buildings to School site utility services.
   2. Compacted fill from top of utility bedding to subgrade elevations.
   3. Backfilling and compaction.

B. Related Sections:
   2. Section 31 22 13 - Rough Grading: Topsoil and subsoil removal from site surface.
   4. Section 33 11 16 - Site Water Utility Distribution Piping: Water piping and bedding from building to utility service.
   5. Section 33 31 00 - Sanitary Utility Sewerage Piping: Sanitary sewer piping and bedding from building to utility service.
   6. Section 33 41 00 - Storm Utility Drainage Piping: Storm sewer piping and bedding from building to utility service.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

B. ASTM International:
   1. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
   2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).

1.3 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit, or cable.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
B. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.

C. Materials Source: Submit name of imported fill materials suppliers.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with Public Work’s standards of the City of Alameda and the County of Alameda.

B. Maintain one copy of each document on site.

1.6 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify Work associated with any lower elevation utility is complete before placing higher elevation utilities.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 LINES AND GRADES

A. Excavate trenches for pipes to lines and grades indicated on Drawings.

1. Architect/Engineer reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.

B. Use laser-beam instrument with qualified operator to establish lines and grades.

3.2 PREPARATION

A. Call Local Utility Line Information service USA North at 811/800-227-2600 not less than five working days before performing Work.

1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Identify required lines, levels, contours, and datum locations.

C. Protect plant life, lawns, and other features remaining as portion of final landscaping.

D. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
3.3 TRENCHING

A. Excavate subsoil required for utilities to utility service.

B. Do not advance open trench more than 200 feet ahead of installed pipe.

C. Cut trenches sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with Work.

D. Excavate bottom of trenches maximum 2 feet wider than outside diameter of pipe.

E. Excavate trenches to depth indicated on Drawings. Provide uniform and continuous bearing and support for bedding material and pipe utilities.

F. When subsurface materials at bottom of trench are loose or soft, excavate to greater depth until suitable material is encountered.

G. Cut out soft areas of subgrade not capable of compaction in place. Backfill and compact to density equal to or greater than requirements for subsequent backfill material.

H. Trim excavation. Remove loose matter.

I. Correct areas over excavated areas with compacted backfill as specified for authorized excavation.

J. Remove excess subsoil not intended for reuse, from site.

3.4 SHEETING AND SHORING

A. Sheet, shore, and brace excavations to prevent danger to persons, structures and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.

B. Support trenches more than 5 feet deep excavated through unstable, loose, or soft material. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation.

C. Repair damage to new and existing Work from settlement, water or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.

3.5 BACKFILLING

A. Backfill trenches to contours and elevations with clean fill materials.
B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

C. Place fill material in continuous layers and compact as required.

D. Employ placement method that does not disturb or damage utilities in trench.

E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. Do not leave more than 50 feet of trench open at end of working day.

G. Protect open trench to prevent danger to the public.

3.6 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Top Surface of Backfilling under Paved Areas: Plus or minus 0.10 feet from required elevations.

C. Top Surface of General Backfilling: Plus or minus 0.10 feet from required elevations.

3.7 FIELD QUALITY CONTROL

A. Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Perform laboratory material tests in accordance with ASTM D1557.

C. Perform in place compaction tests in accordance with the following:


D. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.

3.8 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished work.

B. Reshape and re-compact fills subjected to vehicular traffic during construction.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Backfilling portable building pad to subgrade elevations.
   2. Fill under paving.

B. Related Sections:
   1. Section 31 22 13 - Rough Grading: Site filling.
   2. Section 31 23 17 - Trenching: Backfilling of utility trenches.
   3. Section 33 05 16 – Utility Structures
   4. Section 33 11 16 - Site Water Utility Distribution Piping.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:
   1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils
      Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:
   1. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in
      Place by the Sand-Cone Method.
   2. ASTM D1557 - Standard Test Methods for Laboratory Compaction
      Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Materials Source: Submit name of imported fill materials suppliers.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with Public Work’s standards of the City of Alameda and
   the County of Alameda.

B. Maintain one copy of each document on site.
PART 2 PRODUCTS

PART 3 EXECUTION

3.1 PREPARATION
A. Compact subgrade to density requirements for subsequent backfill materials.
B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with clean fill and compact to density equal to or greater than requirements for subsequent fill material.
C. Scarify subgrade surface to depth of 6 inches.
D. Proof roll to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

3.2 BACKFILLING
A. Backfill areas to contours and elevations with clean materials.
B. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.
C. Place fill material in continuous layers and compact as required.
D. Employ placement method that does not disturb or damage other work.
E. Maintain optimum moisture content of backfill materials to attain required compaction density.
F. Slope grade away from building minimum 5 percent slope for minimum distance of 10 ft, unless noted otherwise.
G. Make gradual grade changes. Blend slope into level areas.

3.3 TOLERANCES
A. Section 01 40 00 - Quality Requirements: Tolerances.
B. Top Surface of Backfilling: Plus or minus 0.10 feet from required elevations.
C. Top Surface of Backfilling under Paved Areas: Plus or minus 0.10 feet from required elevations.
D. Top Surface of General Backfilling: Plus or minus 0.10 feet from required elevations.
3.4 FIELD QUALITY CONTROL

A. 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Perform laboratory material tests in accordance with ASTM D1557.

C. Perform in place compaction tests in accordance with the following:

D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

E. Proof roll compacted fill surfaces under paving.

3.5 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished work.

B. Reshape and re-compact fills subjected to vehicular traffic.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Aggregate subbase.
   2. Aggregate base course.

B. Related Sections:
   1. Section 31 22 13 - Rough Grading: Preparation of site for base course.
   2. Section 31 23 17 - Trenching: Compacted fill under base course.
   3. Section 31 23 23 - Fill: Compacted fill under base course.
   4. Section 32 13 13 - Concrete Paving: Finish concrete surface course.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

B. ASTM International:
   1. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
   2. ASTM D2940 - Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Materials Source: Submit name of aggregate materials suppliers.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Furnish each aggregate material from single source throughout the Work.

B. Perform Work in accordance with Public Work's standards of the City of Alameda and the County of Alameda.

C. Maintain one copy of each document on site.
PART 2 - PRODUCTS

2.1 AGGREGATE MATERIALS

A. Subbase Aggregate: ASTM D2940; graded type.

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<thead>
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<th>Sieve Size</th>
<th>Percent Passing</th>
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</thead>
<tbody>
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<td>2 inches</td>
<td>100</td>
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<tr>
<td>No. 4</td>
<td>30 to 60</td>
</tr>
<tr>
<td>No. 200</td>
<td>0 to 12</td>
</tr>
</tbody>
</table>

B. Base Aggregate: ASTM D2940; graded type.

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 inches</td>
<td>100</td>
</tr>
<tr>
<td>1-1/2 inches</td>
<td>95 to 100</td>
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<td>No. 30</td>
<td>12 to 25</td>
</tr>
<tr>
<td>No. 200</td>
<td>0 to 8</td>
</tr>
</tbody>
</table>

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify compacted substrate is dry and ready to support paving and imposed loads.
   1. Proof roll substrate in minimum two perpendicular passes to identify soft spots.
   2. Remove soft substrate and replace with compacted fill as specified in Section 31 23 23.

C. Verify substrate has been inspected, gradients and elevations are correct.
3.2 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

B. Do not place fill on soft, muddy, or wet surfaces.

3.3 AGGREGATE PLACEMENT

A. Place aggregate equal thickness layers to total compacted thickness of 4 inches.

B. Roller compact aggregate to 98 percent maximum density.

C. Level and contour surfaces to elevations, profiles, and gradients indicated.

D. Add small quantities of fine aggregate to coarse aggregate when required to assist compaction.

E. Maintain optimum moisture content of fill materials to attain specified compaction density.

F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation From Flat Surface: 1/4 inch measured with 10 foot straight edge.

C. Maximum Variation From Thickness: 1/4 inch.

D. Maximum Variation From Elevation: 1/2 inch.

3.5 FIELD QUALITY CONTROL

A. Section 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Compaction testing will be performed in accordance with ASTM D1556.

C. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.6 COMPACTION

A. Compact materials to 98 percent of maximum density as determined from test strip, in accordance with ASTM D2940.
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Aggregate base course.
   2. Concrete paving for:
      a. Concrete sidewalks.

B. Related Requirements:
   1. Section 31 23 23 - Fill: Compacted subbase for paving.
   2. Section 32 11 23 - Aggregate Base Courses

1.2 REFERENCE STANDARDS

A. American Concrete Institute:
   1. ACI 301 - Specifications for Structural Concrete.
   2. ACI 304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete.

B. ASTM International:

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data:
   1. Submit data on concrete materials.

C. Samples: Submit [two] [_______] sample panels, [___x____] inch in size illustrating exposed aggregate finish.

D. Design Data:
   1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
      a. Hot and cold weather concrete work.
   2. Identify mix ingredients and proportions, including admixtures.
   3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.
E. Source Quality Control Submittals: Indicate results of tests and inspections.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301

B. Obtain cementitious materials from same source throughout.

C. Perform Work in accordance with Public Work’s standards of the City of Alameda and the County of Alameda.

D. Maintain one copy of each document on site.

PART 2 - PRODUCTS

2.1 AGGREGATE [SUBBASE] [BASE COURSE]

A. Aggregate Base Course: As specified in Section 32 11 23.

2.2 CONCRETE PAVING

A. Form Materials:
   1. Form Materials: Conform to ACI 301.

B. Concrete Materials:

2.3 SOURCE QUALITY CONTROL

A. Submit proposed mix design for review prior to commencement of Work.

B. Tests on cement, aggregates, and mixes will be performed to ensure conformance with specified requirements.

C. Test samples in accordance with ACI 301.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify compacted subbase is dry and ready to support paving and imposed loads.
1. Proof roll subbase with minimum two perpendicular passes to identify soft spots.
2. Remove soft subbase and replace with compacted fill as specified in Section 31 23 23.

C. Verify gradients and elevations of base are correct.

3.2 PREPARATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Moisten substrate to minimize absorption of water from fresh concrete.

C. Notify Architect/Engineer minimum 24 hours prior to commencement of concreting operations.

3.3 INSTALLATION

A. Subbase:
   1. Aggregate Subbase: Install as specified in Section 32 11 23.

B. Forms:
   1. Place and secure forms and screeds to correct location, dimension, profile, and gradient.
   2. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Placing Concrete:
   1. Place concrete in accordance with ACI 301
   2. Place concrete continuously over the full width of the panel and between predetermined construction joints.

D. Joints
   1. Place expansion joints at 20 foot intervals. Align curb, gutter, and sidewalk joints.

E. Finishing:
   1. Sidewalk Paving: Light broom, radius to 1/2 inch radius, and trowel joint edges.

F. Curing and Protection
   1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
   2. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
3. Cure floor surfaces in accordance with ACI 301.

3.4 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation of Surface Flatness: ¼ inch in 10 ft.

C. Maximum Variation From True Position: ½ inch.

3.5 FIELD QUALITY CONTROL

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

B. Perform field [inspection and] testing in accordance with ACI 301.

C. Testing firm will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.

D. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.6 PROTECTION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Immediately after placement, protect paving from premature drying, excessive hot or cold temperatures, and mechanical injury.

C. Do not permit pedestrian traffic over paving for 3 days minimum after finishing.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes precast concrete utility structures:

1. Drainage system catch basins.
2. Drainage system inlets.

B. Related Sections:

1. Section 31 23 16 - Excavation: Excavating for structures and foundation slabs.
2. Section 31 23 23 - Fill: Backfilling after structure installation.
3. Section 33 31 00 - Sanitary Utility Sewerage Piping: Piping connections to structures.
4. Section 33 41 00 - Storm Utility Drainage Piping: Piping connections to structures.

1.2 REFERENCES

A. American Association of State Highway Transportation Officials:

1. AASHTO M306 - Drainage Structure Castings.

B. American Concrete Institute:

1. ACI 318 - Building Code Requirements for Structural Concrete.
2. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
3. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete.

C. ASTM International:

3. ASTM C138/C138M - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
7. ASTM C192/C192M - Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.
8. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

D. National Precast Concrete Association:
   1. NPCA Quality Control Manual for Precast Plants.
   2. NPCA Plant Certification Program.

1.3 DESIGN REQUIREMENTS

A. Design structures for minimum loads in accordance with ASTM C857
   1. Roof Live Load: Comply with the following loading conditions, including impact load.
      a. Heavy Traffic: ASTM C857; A-16, maximum 16,000 lb each wheel.
      b. Medium Traffic: ASTM C857; A-12, maximum 12,000 lb each wheel.
      c. Light Traffic: ASTM C857; A-8, maximum 8,000 lb each wheel.
      d. Walkway Traffic: ASTM C857; A-0.3, maximum 300 psf.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings:
   1. Indicate structure locations, elevations, sections, piping, and sizes and elevations of penetrations.
   2. Indicate design, construction and installation details, typical reinforcement and additional reinforcement at openings for each type, size and configuration.

C. Product Data:
   1. Submit data for frames and covers, component construction, features, configuration, and dimensions.
1.5 QUALITY ASSURANCE

A. Obtain precast concrete utility structures from single source.

B. Perform Work in accordance with NPCA Quality Control Manual for Precast Plants.

C. Perform Work in accordance with Public Work’s standards of the City of Alameda and the County of Alameda.

D. Maintain one copy of each document on site.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Comply with precast concrete manufacturer’s instructions for unloading, storing and moving precast structures. Lift structures from designated lifting points.

C. Store precast concrete structures to prevent damage to Owner’s property or other public or private property. Repair property damaged from materials storage.

D. Mark each precast structure by indentation or waterproof paint showing date of manufacture, manufacturer, and identifying symbols and numbers shown on Drawings to indicate its intended use.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE UTILITY STRUCTURES

A. Furnish materials in accordance with Public Work's standards of the City of Alameda and the County of Alameda.

B. Precast Concrete Utility Structures: Reinforced precast concrete.

2.2 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I - Normal Portland type.


C. Water: Clean and not detrimental to concrete.
2.3 FRAMES AND COVERS
   A. Furnish materials in accordance with Public Work's standards of the City of Alameda and the County of Alameda.

2.4 ACCESS HATCHES
   A. Furnish materials in accordance with Public Work's standards of the City of Alameda and the County of Alameda.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
   B. Verify items provided by other sections of Work are properly sized and located.
   C. Verify correct size and elevation of excavation.
   D. Verify subgrade and bedding is properly prepared, compacted and ready to receive Work of this section.

3.2 PREPARATION
   A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.
   B. Do not install structures where site conditions induce loads exceeding structural capacity of structures.
   C. Inspect precast concrete structures immediately prior to placement in excavation to verify are internally clean and free from damage. Remove and replace damaged units.

3.3 INSTALLATION
   A. Install underground precast utility structures in accordance with ASTM C891.
   B. Lift precast concrete structures at lifting points designated by manufacturer.
   C. When lowering structures into excavations and joining pipe to units, take precautions to ensure interior of pipeline and structure remains clean.
   D. Install precast concrete base to elevation and alignment indicated on Drawings.
   E. Install precast concrete utility structures to elevation and alignment indicated on Drawings.
F. Assemble multi-section structures by lowering each section into excavation.
   1. Clean joint surfaces.
   2. Install watertight joint seals in accordance with manufacturer’s instructions.

G. Remove knockouts or cut structure to receive piping without creating openings larger than required to receive pipe. Fill annular space with grout.

H. Connect pipe to structure and seal watertight. Cut pipe flush with interior of structure.

I. Backfill excavations for structures in accordance with Section 31 23 23.

3.4 FIELD QUALITY CONTROL

A. 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Pipe and fittings for site water line including domestic water line.
   2. Valves.
   3. Bedding and cover materials.

B. Related Requirements:
   1. Section 22 11 00 - Facility Water Distribution: Product and execution requirements for domestic water piping at building.
   2. Section 31 23 17 - Trenching: Execution requirements for trenching required by this section.
   3. Section 31 23 23 - Fill: Requirements for backfill to be placed by this section.

1.2 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:

B. American Society of Mechanical Engineers:
   1. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
   2. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

C. ASTM International:
   3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
   7. AWWA C500 - Metal-Seated Gate Valves for Water Supply Service.
   8. AWWA C504 - Rubber-Sealed Butterfly Valves.
9. AWWA C508 - Swing-Check Valves for Waterworks Service, 2 in. through 24 in NPS.
10. AWWA C509 - Resilient-Seated Gate Valves for Water-Supply Service.
11. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, 1/2 in. through 3 in., for Water Service.

1.3 SUBMITTALS
   A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
   B. Product Data: Submit data on pipe materials, pipe fittings, valves and accessories.

1.4 CLOSEOUT SUBMITTALS
   A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.
   B. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.
   C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.5 QUALITY ASSURANCE
   A. Valves: Manufacturer's name and pressure rating marked on valve body.
   B. Perform Work in accordance with Public Work's standards of the City of Alameda and the County of Alameda.
   C. Maintain one copy of each document on site.

1.6 DELIVERY, STORAGE, AND HANDLING
   A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
   B. Deliver and store valves in shipping containers with labeling in place.

PART 2 - PRODUCTS

2.1 WATER PIPING
   A. Copper Tubing: ASTM B88, Type K,L, annealed:
      2. Joints: Compression connection or AWS A5.8, BCuP silver braze.
B. Polyethylene Pipe: AWWA C901:
   1. Fittings: AWWA C901, molded or fabricated.
   2. Joints: Compression or Butt fusion.

2.2 GATE VALVES

   A. 2-1/2 inches and Smaller: AWWA C500, Brass or Bronze body, non-rising stem, inside screw, single wedge or disc, compression ends, with control rod, extension box and valve key.

   B. 3 inches and Larger: AWWA C509, Iron body, bronze trim, non-rising stem with square nut, single wedge, resilient seat, flanged ends, control rod, extension box and valve key.

PART 3 - EXECUTION

3.1 EXAMINATION

   A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

   B. Verify building service connection and municipal utility water main size, location, and invert are as indicated on Drawings.

3.2 PREPARATION

   A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation preparation.

   B. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.

   C. Remove scale and dirt on inside and outside before assembly.

   D. Prepare pipe connections to equipment with flanges or unions.

3.3 BEDDING

   A. Excavate pipe trench in accordance with Section 31 23 17 for Work of this Section.

   B. Form and place concrete for pipe thrust restraints at change of pipe direction. Place concrete to permit full access to pipe and pipe accessories.

   C. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches compacted depth; compact to 95 percent.

   D. Backfill around sides and to top of pipe in accordance with Section 31 23 23.
3.4 INSTALLATION - PIPE

A. Maintain separation of water main from sewer piping in accordance with local code.

B. Route pipe in straight line.

C. Install pipe to allow for expansion and contraction without stressing pipe or joints.

D. Form and place concrete for thrust restraints at each elbow or change of direction of pipe main.

E. Establish elevations of buried piping with not less than 2 ft of cover.

F. Backfill trench in accordance with Section 31 23 23.

G. Install Work in accordance with Public Work's standards of the City of Alameda and the County of Alameda.

3.5 INSTALLATION - VALVES

A. Set valves on solid bearing.

B. Center and plumb valve box over valve. Set box cover flush with finished grade.

C. Install Work in accordance with Public Work's standards of the City of Alameda and the County of Alameda.

3.6 FIELD QUALITY CONTROL

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

B. Perform pressure test on domestic site water distribution system in accordance with AWWA C600.

C. Compaction Testing for Bedding: In accordance with ASTM D1557.

D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sanitary sewage pipe.
2. Bedding and cover materials.

B. Related Sections:

1. Section 22 13 00 - Facility Sanitary Sewerage: Product and execution requirements for sanitary waste and vent piping at building.
2. Section 31 23 17 - Trenching: Execution requirements for trenching required by this section.
3. Section 31 23 23 - Fill: Requirements for backfill to be placed by this section.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:


B. ASTM International:

1. ASTM C14 - Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.

1.3 DEFINITIONS

A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data indicating pipe and pipe accessories.
C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents:
   1. Accurately record actual locations of pipe runs, connections, catch basins, and invert elevations.
   2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with Public Work's standards of the City of Alameda and the County of Alameda.

B. Maintain one copy of each document on site.

1.7 FIELD MEASUREMENTS

A. Verify field measurements and elevations are as indicated on the Drawings.

1.8 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate the Work with termination of storm sewer connection outside building, trenching, and connection to District’s site sanitary sewer utility service.

PART 2 - PRODUCTS

2.1 SUSTAINABILITY CHARACTERISTICS

2.2 SANITARY SEWAGE PIPE

A. Plastic Pipe: ASTM D3035, SDR 17, High Density Polyethylene (HDPE) material; outside nominal diameter of inches.

   1. Fittings: Molded Butt Fusion Fittings meeting ASTM D3261
   2. Joints: Flanged and Mechanical Joint Adapters meeting ASTM D3035
PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

3.2 PREPARATION

A. Hand trim excavations to required elevations. Correct over excavation with coarse aggregate.

B. Remove large stones or other hard matter which could damage pipe or impede consistent backfilling or compaction.

3.3 BEDDING

A. Excavate pipe trench in accordance with Section 31 23 17 for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.

B. Place bedding material at trench bottom, level materials in continuous layer not exceeding 6 inches compacted depth.

C. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 INSTALLATION - PIPE

A. Install pipe, fittings, and accessories in accordance with ASTM D2321. Seal joints watertight.

B. Place pipe on minimum 4 inch deep bed of filter aggregate.

C. Lay pipe to slope gradients noted on drawings with maximum variation from indicated slope of 1/8 inch in 10 feet.

D. Refer to Section 31 23 23 for backfilling and compacting requirements. Do not displace or damage pipe when compacting.

E. Install Work in accordance with Public Work's standards of the City of Alameda and the County of Alameda.

3.5 FIELD QUALITY CONTROL

A. 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
B. Request inspection prior to placing aggregate cover over pipe.

C. Compaction Testing: In accordance with ASTM D1557.

D. When tests indicate work does not meet specified requirements, remove work, replace and retest.

3.6 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished Work.

B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.
   1. Take care not to damage or displace installed pipe and joints during construction of pipe supports, backfilling, testing, and other operations.
   2. Repair or replace pipe that is damaged or displaced from construction operations.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Storm drainage piping.
2. Accessories.
3. Catch basins and plant area drains.
4. Bedding and cover materials.

B. Related Sections:

1. Section 22 14 00 - Facility Storm Drainage: Product and execution requirements for storm drainage piping within 5 feet of building.
2. Section 31 23 17 - Trenching: Execution requirements for trenching required by this section.
3. Section 31 23 23 - Fill: Requirements for backfill to be placed by this section.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:


B. ASTM International:

1. ASTM C14 - Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.

1.3 DEFINITIONS

A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data indicating pipe and pipe accessories.
C. Manufacturer's Installation Instructions: Submit special procedures required to install Products specified.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents:
   1. Accurately record actual locations of pipe runs, connections, catch basins, and invert elevations.
   2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with Public Work's standards of the City of Alameda and the County of Alameda.

B. Maintain one copy of each document on site.

1.7 FIELD MEASUREMENTS

A. Verify field measurements and elevations are as indicated on the Drawings.

1.8 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate the Work with termination of storm sewer connection outside building, trenching and connection to District's site storm sewer utility service.

PART 2 - PRODUCTS

2.1 STORM DRAINAGE PIPING

A. Plastic Pipe: ASTM D3035, SDR 17, High Density Polyethylene (HDPE) material; outside nominal diameter of inches.

   1. Fittings: Molded Butt Fusion Fittings meeting ASTM D3261
   2. Joints: Flanged and Mechanical Joint Adapters meeting ASTM D3035

2.2 CATCH BASINS AND AREA DRAINS

A. Catch Basin Lid and Frame Manufacturers:

   1. Irving Subway Grating Co. Model Reticuline Design Type S or V.
2. Bufnel Co Model Bufnel Bridge Decking.
3. Approved Equal.

B. Catch Basin Lid and Frame:
   1. Construction: Cast iron construction, hinged lid.
   2. Lid Design: Retilinear grill.
   3. Nominal Lid and Frame Size: 24 x 24 inch.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
   B. Verify trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

3.2 PREPARATION
   A. Hand trim excavations to required elevations. Correct over excavation with coarse aggregate.
   B. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

3.3 BEDDING
   A. Excavate pipe trench in accordance with Section 31 23 17 for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.
   B. Place bedding material at trench bottom, level materials in continuous layer not exceeding 6 inches compacted depth.
   C. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 INSTALLATION - PIPE
   A. Install pipe, fittings, and accessories in accordance with ASTM D2321. Seal joints watertight.
   B. Place pipe on minimum 4 inch deep bed of filter aggregate.
   C. Lay pipe to slope gradients noted on drawings with maximum variation from indicated slope of 1/8 inch in 10 feet.
D. Refer to Section 31 23 23 for backfilling and compacting requirements. Do not displace or damage pipe when compacting.

E. Install Work in accordance with Public Work’s standards of the City of Alameda and the County of Alameda.

3.5 INSTALLATION - CATCH BASINS AND CLEANOUTS

A. Form bottom of excavation clean and smooth to correct elevation.

B. Form and place Cast-In-Place Concrete base pad, with provision for storm sewer pipe end sections.

C. Level top surface of base pad; sleeve concrete shaft sections to receive storm sewer pipe sections.

D. Establish elevations and pipe inverts for inlets and outlets as indicated on Drawings.

E. Install Work in accordance with Public Work’s standards of the City of Alameda and the County of Alameda.

3.6 FIELD QUALITY CONTROL

A. 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Request inspection prior to placing aggregate cover over pipe.

C. Compaction Testing: In accordance with ASTM D1557.

D. When tests indicate work does not meet specified requirements, remove work, replace and retest.

3.7 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished Work.

B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

1. Take care not to damage or displace installed pipe and joints during construction of pipe supports, backfilling, testing, and other operations.

2. Repair or replace pipe that is damaged or displaced from construction operations.

END OF SECTION
Peralta Community College District

Construction and Material Standards

Prepared By:

Peralta Community College District

Updated June 2010
# List of Contributors - 2010 Update

| General Services | Dr. Sadiq B. Ikharo, Vice Chancellor of General Services | Peralta Community College District  
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Oakland, CA 94606 (510) 466-7346 |
<table>
<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td>Atheria Smith, Planning &amp; Development Mgr.</td>
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<tr>
<td></td>
<td>L. Mark Sennette, Director of Capital Projects</td>
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<td></td>
<td>Joe Flatley, Design Manager</td>
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<tr>
<td>Maintenance and Operations</td>
<td>Robert W. Beckwith, Director of Maintenance and Operations</td>
</tr>
<tr>
<td>Technology Services</td>
<td>Janet Cragin, Director of Technology Services</td>
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</table>
DIVISION 08 DOORS & WINDOWS

08 10 00 DOORS & 08 70 00 DOOR HARDWARE CRITERIA

<table>
<thead>
<tr>
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<th>GENERAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The architect shall provide a survey, with the District Maintenance &amp; Operations Department present for the walk-through, of existing doors &amp; frames and door hardware. A matrix will be provided for the general condition (good, fair, poor) of the hardware. Based on the survey results, the architect shall make a decision which doors and frames and door hardware must be replaced.</td>
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<tr>
<td>1. B.</td>
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<tr>
<td>1. B. 1.</td>
<td>Provide concrete landing outside of all new exterior doors, for full extent of door swing area and of width sufficient to comply with ADA.</td>
</tr>
<tr>
<td>1. B. 2.</td>
<td>In all lanes of travel, new doors should be “right-hand reverse” swing wherever possible.</td>
</tr>
<tr>
<td>1. B. 3.</td>
<td>Provide interior and exterior staved lumber core of Douglas Fir, (or equal) with no joints occurring at stile and rail connection points. No formaldehyde.</td>
</tr>
<tr>
<td>1. B. 4.</td>
<td>Existing doors and frames, (in good condition), shall be reused. All hardware shall be replaced, as required, to meet the Americans with Disabilities Act (ADA) requirements.</td>
</tr>
<tr>
<td>1. B. 5.</td>
<td>Exterior Doors: Typically exterior doors and frames shall be galvanized steel doors and frames, SDI grade III extra heavy duty with bitumen back-primer, door frames to have continuous welds and no seams. However, solid wood doors, aluminum storefront doors or FRP doors are acceptable, situation dependent and shall be reviewed with the District Maint. &amp; Operations Dept. prior to specifying. Steel doors shall be center seamed “Ceco Medallion”, or equal.</td>
</tr>
<tr>
<td>1. B. 6.</td>
<td>High-use area doors shall be metal and shall be used at the following locations (alternate materials will be considered by the District, situation dependent):</td>
</tr>
<tr>
<td>1. B. 6. a.</td>
<td>Cafeteria</td>
</tr>
<tr>
<td>1. B. 6. b.</td>
<td>Gymnasiums and Locker Rooms</td>
</tr>
<tr>
<td>1. B. 6. c.</td>
<td>Public Use Rooms</td>
</tr>
<tr>
<td>1. B. 6. d.</td>
<td>Pool area</td>
</tr>
<tr>
<td>1. B. 6. e.</td>
<td>Main entrances (Store Front doors are acceptable subject to District Approval)</td>
</tr>
<tr>
<td>1. C.</td>
<td>Door Hardware:</td>
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<tr>
<td>1. C. 1.</td>
<td>Hanging Devices:</td>
</tr>
<tr>
<td>1. C. 1.b.</td>
<td>Butt Hinge by &quot;Ives&quot;, Model No. - 5BB1HW x NRP; finish - 630 Model No. 5BB1; Finish - 652</td>
</tr>
<tr>
<td>1. C. 2.</td>
<td>Securing Devices:</td>
</tr>
<tr>
<td>1. C. 2.b.</td>
<td>Exit Devices by &quot;Von Duprin&quot;, Model No. CD99NLx990NL; Finish - US26D Model No. CD99NLx990NL x CD99DT-990DT; Finish - US26D xSNBxKR4954 Mullion x 154 (at pairs); Finish - US26D 99L-2-F-996L-NL-R (F-rated single doors); Finish - US26D 99L-2-F-998L-NL-R x 99EO-F x KR9954 Mullion x 154 (F pairs); Finish - US26D</td>
</tr>
<tr>
<td>1. C. 2.c</td>
<td>Electronic Locks by &quot;Schlage&quot;: Model No. KC196-2x06xSFS (Cylindrical Lock, Battery Operated, Keypad, Audit Trail); Finish - US26D Model No. VIP5196xPXKx06xSFSxATK (Cylindrical Lock, Battery Operated, Keypad, Audit Trail, Time Zones); Finish - US26D Model No. VIP5100xPXxFSEx06xSFSxATK (Hardwire Cylindrical Lock for existing Access Control System); Finish - US26D Model No. CM993xPXKx06xSFSxATK (Cylindrical Lock, Battery Operated, Keypad, Audit Trail, Time Zones); Finish - US26D Model No. VIP993xPXxFSEx06xSFS (Hardwire Exit Trim for existing Access Control System); Finish - US26D</td>
</tr>
<tr>
<td>1. C. 2.d.</td>
<td>Padlocks by &quot;Schlage&quot;: Model No. KS Series for Small Format Interchangeable Core; Finish US26D</td>
</tr>
<tr>
<td>1. C. 2.e.</td>
<td>Key System by &quot;Schlage&quot;: Everest Patented Keyway Small Format Interchangeable Core Model No. 80-037 Interchangeable Core; Finish US26D Model No. 80-329 Rim Cylinder Interchangeable Core; Finish US26D</td>
</tr>
<tr>
<td>1. C. 2. f.</td>
<td>Model No. 80-302 Mortise Cylinder Interchangeable Core; Finish US26D</td>
</tr>
</tbody>
</table>
| 1. C. 2.g. | Coordinator by "Ives";  
Model No. COR x FL x MB (Storage & Utility Rooms); Finish USP  
Only use where required by Fire Code.  
Flush bolts by "Ives";  
Model No. FB31P (Automatic) (Metal doors) (Storage & Utility Rooms); Finish US26D  
Model No. FB41P (Automatic) (Wood doors) (Storage & Utility Rooms); Finish US26D  
Model No. FB51P (Manual) (Metal doors) (Storage & Utility Rooms); Finish US26D  
Model No. FB61P (Manual) (Wood doors) (Storage & Utility Rooms); Finish US26D |
| 1. C. 3. | Closing Devices:  
Closer by "LCN";  
Model No. 4041EDA; Finish 689  
All door frames to be reinforced for soffit shoe. |
| 1. C. 4. | Stops & Holders:  
Door Holder by "Glynn-Johnson";  
Model No. 100ADJ Series (Overhead); Finish – US26D |
| 1. C. 4.a | Door Holder by "Ives";  
Model No. WS45 (Automatic Holders & Stops); Finish – US26D  
Model No. FS43 (Automatic Door Stops & Holders); Finish – US26D |
| 1. C. 4.c. | Door Stop by "Ives";  
Model No. FS436 (Interior Floor Stops); Finish – US26D  
Model No. FS18S (Security Floor Stops); Finish – Black  
Model No. WS401/WS402 (Wall Stops); Finish – US26D |
| 1. C. 5. | Accessories:  
Kick Plate by "Ives"; Model No. 8400 series; Finish – US26D  
Mop Plate by "Ives"; Model No. 8400 series; Finish – US26D  
Push/ Pull Plates by "Ives"; Model No. 8400/8300 series; Finish – US26D  
Latch Guard by "Ives"; Model No.LG12; Finish – US26D  
Thresholds by "National Guard Products";  
Model No. 426 (1/2" x 6" Flat Saddle); Finish – Aluminum  
Model No. 322 (1/2" x 3" Flat Saddle at carpet and floor mats); Finish – Aluminum  
Model No. R Series Interlocking ramps at modernizations; Finish – Aluminum  
Thresholds shall be grout solid at exterior, locker/shower, toilet, kitchen, janitor and other wet area locations.  
Smoke Seal by "National Guard Products"; Model No. 2525 (1/4 x 3/8)
| 1. C. 5. f. | Silicone bulb with adhesive tape; Finish – White |
| 1. C. 5. g. | Weather Seal by “National Guard Products”; Model No. 162SA (at jambs); Finish – Aluminum |
| 1. C. 5. h. | Mullion Seal by “National Guard Products”; Model No. 5100; Finish – Black |
| 1. C. 5. i. | Door Silencer by “Ives”; Model No. SR64 series; Finish – Gray |
| 1. C. 5. j. | Astragal by “National Guard Products”; Model No. 139SS (Wood doors) (Use only where required by fire code) series; Finish – US26D |
| 1. C. 5. k. | Astragal by door manufacturer at hollow metal doors |
| 1. C. 5. l. | Drip Guard by “National Guard Products”; Model No. 16A (Exterior doors exposed to rain); Finish – Aluminum |
| 1. C. 6. | Keyways: |
| 1. C. 6. a. | Keyways by Schlage, Everest System. Lock hardware will be either US26D (brushed Nickel) or Dark Bronze, dependent on college preference. BCC will utilize Best cores and keys. Model No. B124 (at Merritt and College of Alameda) Model No. B123 (at Laney College, Berkeley City College and District Offices) |

**08 50 00 WINDOW CRITERIA**

1. Stops shall be removable only from interior using vandal-proof screws. Exterior stop shall be integral with frame. Double-hung or horizontal sliding windows are preferred. If ‘hopper’ or ‘casement’ windows are strongly preferred by Architects, they shall not project onto adjacent exterior walkways or into interior curtains or mini-blinds. Use of high windows requiring operating cranks is to be avoided. Window frames should be commercial grade anodized aluminum construction with thermal breaks. Andozing should match campus standard color unless otherwise approved by the District.

2. Glazing:

   New window glazing should be double pane windows with a fire rated glazing where required by code.

   Replacement windows for existing buildings may be single glazed or of an impact resistant material where approved by the District.

   Toilet, shower and locker room windows to be obscure glass.