

TECHNICAL SPECIFICATIONS MANUAL

**GREENSBURG SALEM SCHOOL DISTRICT
HVAC UPGRADES AT THREE SCHOOLS
GREENSBURG, PENNSYLVANIA 15601
CITY OF GREENSBURG, WESTMORELAND COUNTY**

Prepared For:

**GREENSBURG SALEM SCHOOL DISTRICT
1 ACADEMY HILL
GREENSBURG, PA 15601
T: 724-832-2901**

**PROJECT NO. GBG ON-CALL 2023
Contract No. GBG 2023-1.0009M - Mechanical Construction
Contract No. GBG 2023-1.0009E - Electrical Construction**

Prepared By:

**CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
PITTSBURGH, PENNSYLVANIA**

CEC Project 327-839.0009

September 2023



Civil & Environmental Consultants, Inc.

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**DIVISION 00 – PROCUREMENT AND CONTRACTING
REQUIREMENTS**

INVITATION TO BID

On behalf of the **GREENSBURG SALEM SCHOOL DISTRICT (GSSD), CIVIL & ENVIRONMENTAL CONSULTANTS, INC. (CEC)** will accept sealed Bids for the **GREENSBURG SALEM SCHOOL DISTRICT HVAC UPGRADES AT THREE SCHOOLS** project located at 65 Mennel Drive, and 55 Mclaughlin Drive Greensburg, PA 15601 and in the City of Greensburg, Westmoreland County, PA and 140 CC Hall Drive located in New Alexandria, PA until 2:00 p.m. (prevailing time as determined by the GSSD date and time stamp clock) on **OCTOBER 16, 2023** to Allison Willis, Business Manager and Board Secretary, of the Greensburg Salem School District. Allison Willis is located at the administrative offices at 1 Academy Hill Place in Greensburg, PA 15601. Should the school district approve a bid, it shall be accepted on **OCTOBER 24, 2023**, at 7:00 PM and special approval from the Greensburg Salem School District Board. Said Meeting shall, unless further notice to the contrary is issued, be held remotely pursuant to the previously advertised procedures, which are available upon request at the address and telephone number identified below. No emailed bids will be accepted.

Work generally consists of the following:

- Mobilization & Demobilization
- Insurance, Bonds, and Permits
- Work indicated on the project drawings and specifications for the HVAC upgrades and associated work
- Contract No. GBG 2023-1.0009M is for Mechanical Construction
- Contract No. GBG 2023-1.0009E is for Electrical Construction

Bidders can obtain an electronic complete set of the Contract Documents for the above-mentioned project at www.cecinc.com/projects-for-bid-pittsburgh starting **SEPTEMBER 18, 2023**.

Contract Documents will not be mailed. There will be no exceptions. Questions shall be submitted in writing via email to Civil & Environmental Consultants, Inc. to the attention of: Scott Maritzer, AIA (smaritzer@cecinc.com). **QUESTIONS WILL NOT BE RESPONDED TO AFTER 4:00 P.M. ON OCTOBER 10, 2023.**

Contract documents, including drawings and specifications, will be on file and available for viewing (hard copy or digital depending on location) upon appointment only during normal business hours, at the following office locations:

1. Greensburg Salem School District (Hard Copy) c/o Karl Spudy
1 Academy Hill Place
Greensburg, PA 15601
(724) 832-2910

A non-mandatory Pre-Bid Meeting is scheduled for 10:00 A.M. on **SEPTEMBER 26, 2023** at the project site. Persons planning to attend the pre-bid meeting are requested to contact Scott Maritzer, AIA at Civil & Environmental Consultants, Inc. via email at: (smaritzer@cecinc.com).

A certified check or bank draft, payable to the order of the **GREENSBURG SALEM SCHOOL DISTRICT**, negotiable U.S. Government bonds, or a satisfactory bid bond executed by the Bidder and an acceptable surety authorized to do business in the Commonwealth of Pennsylvania, in an amount equal to ten percent (10%) of the total amount bid shall be submitted with each bid.

The successful Bidder will be required to furnish an assurance of completion in the form of satisfactory performance and payment bonds, each in the amount of 100% of the Contract Price and certificate of insurance prior to award of the Contract. The Contractor awarded the Work shall provide construction maintenance securities as outlined in the Supplemental General Conditions of the contract documents.

Notice is hereby given that the successful Bidders shall comply with the following:

1. Contractor agrees to comply with all applicable federal and state statutes and regulations including, but not limited to, the Building Energy Conservation Act, the Steel Products Procurement Act, the Trade Practices Act, the Public Works Contractor's Bond Act of 1967, and the Flood Plain Management Act. The Contractor must also comply with the Americans with Disabilities Act and agrees to minimize pollution and will strictly comply with all applicable related laws and regulations.
2. The Contractor agrees to comply with nondiscrimination/sexual harassment provisions and will include such provisions in all contracts and subcontracts.
3. Contractor must ensure that no contractor or subcontractor is currently under suspension or debarment by the Commonwealth, any state or the federal government.
4. Contractor must actively recruit minority and women's subcontractors or subcontractors with substantial minority representation among their employees.
5. Contractor and its subcontractors shall furnish progress reports, status reports, project account statements, certificates, approvals, etc.

The school district reserves the right to reject any or all bids, to waive any informalities in the bidding, or to advertise for new proposals, if in the judgment of the GSSD, it is in their best interest.

No bidder may withdraw a bid within ninety (90) days after the actual date of opening thereof. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the GSSD and the Bidder.

Greensburg Salem School District, Solicitor

SECTION 002113 - INSTRUCTIONS TO BIDDER

002113.1 DEFINED TERMS

- 1.1 The term "Bidder" means one who directly submits a Bid, as distinct from a sub-Bidder, who submits a Bid to a Bidder. The term "Successful Bidder" means the lowest, responsible Bidder to whom Owner (on the basis of Engineer's evaluation as hereinafter provided) makes an award. The term "Bid Document" includes the Invitation for Bid, Instructions to Bidder, Technical Specifications, Contract, Bid Documents, Bid Drawings, and all Addenda issued prior to receipt of Bid.
- 1.2 Other terms used in the Bid Documents and not defined elsewhere have the following meanings which are applicable to both the singular and plural thereof:
- Owner / Property Maintenance
Greensburg Salem School District
1 Academy Hill Place
Greensburg, PA 15601
Contact Person: Karl Spudy.
 - Engineer
Civil & Environmental Consultants, Inc.
700 Cherrington Parkway
Moon Township, PA 15108
Contact Person: Scott Maritzer, AIA
 - Contractor
The Contractor is the company responsible for performing all construction activities outlined on and in the Bid Drawings and Technical Specifications. The Contractor is ultimately responsible for the quality of the finished product.

002113.2 COPIES OF BID DOCUMENTS

- 2.1 A complete set of Bid Documents must be used in preparing Bid; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bid Documents.
- 2.2 Owner and Engineer in making copies of Bid Documents available on the above terms do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

002113.3 RECEIPT AND OPENING OF BID PROPOSALS

- 3.1 Bid shall be submitted to the mailing address indicated in the Invitation for Bid.
- 3.2 The time scheduled for the receipt of proposals shall be in accordance with the Invitation for Bid. After the proposals have been checked and examined, but until the actual award and execution of a Contract, the Owner reserves all its rights with respect to the rejection of bids.

002113.4 PREPARATION OF BID PROPOSAL

- 4.1 Various forms are included in this bound volume of Bid Documents. The Bidder is required to use the forms and submit the complete proposal intact to the Owner. All blank spaces must be filled in as noted in ink or type. Proposals must give the prices proposed both in words (where noted) and figures with amounts extended and totaled where required. No changes shall be made in the forms or in the items mentioned therein. Erasures and other changes in the Bid must be explained or noted and initialed by the Bidder. In the event of any discrepancy between the written amounts and the figures, the written amounts shall govern.
- 4.2 The Bidder shall sign his proposal in the blank space provided for this purpose. If the proposal is made by a partnership or corporation, the name and address of the partnership or corporation shall be indicated, together with the names and addresses of the partners or officers. If the proposal is made by a partnership, it must be acknowledged by one of the partners; if made by a corporation, by one of the officers.
- 4.3 Bidder shall furnish with his Bid Proposal the following Bid Proposal Documents:
- Bid Form Price Total (Included with this Bid Document);
 - Bid Form Affidavit (Included with this Bid Document);
 - Bid Form Attachments No. 1, 2, 3 and 4 (Included with this Bid Document);
 - Fringe Benefit Letter (Provided by Bidder);
 - Preliminary Project Schedule (Provided by Bidder);
 - Certificate of Insurance (Provided by Bidder);

002113.5 OBLIGATION OF BIDDER

- 5.1 At the time of the opening of Bids, each Bidder will be presumed to have thoroughly and completely inspected the site of the Work, to have read, and to be thoroughly familiar with the Bidding Documents (including all addenda). The failure or omission of any Bidder to receive or examine any form, instrument, or document shall in no way relieve any Bidder from any obligation in respect to his Bid.
- 5.2 Each Bidder must be fully informed of the conditions relating to the construction and labor under which the Work will be performed, including the provisions of the Pennsylvania State Labor Law. Failure to do so will not relieve a successful Bidder of his obligations to furnish all material and labor necessary to carry out the provision of the Contract Documents and to complete the contemplated Work for the consideration set forth in his Bid. Insofar as is possible, the Contractor in the carrying out of his Work must employ such methods or means as will not cause any interruption of or interference with the daily operations of adjacent properties, the Work of any other Contractor, or the safety or convenience of the public.

002113.6 CONDITIONS OF WORK

- 6.1 Each Bidder must inform himself fully of the conditions relating to the construction and labor under which the Work will be performed; failure to do so will not relieve a successful Bidder of his obligation to furnish all material and labor necessary to carry out the provisions of the Contract Documents and to complete the contemplated Work for the consideration set forth in his Bid. Each Bidder, in bidding, represents that he relies exclusively upon his own investigations and he makes his Bid with a full knowledge of conditions and the kind, quality, and quantity of Work performed.

002113.7 SUBMISSION OF BID PROPOSALS

- 7.1 Bid Proposals must be submitted no later than the time specified in the Invitation for Bid or as otherwise directed by the Owner, unless the time for the opening of proposals has been postponed.
- 7.2 Bid Proposals must be addressed to the Owner and/or Engineer as noted in the Invitation to Bid.

002113.8 SUBCONTRACTORS

- 8.1 Contractor agrees to bind specifically every Subcontractor to the applicable terms and conditions of the Bid Documents for the Benefit of Owner and/or Engineer.
- 8.2 Contractor shall be fully responsible for all acts and omissions by them and of persons and organizations for whose acts, any of them, may be liable to the same extent that he is responsible for the acts and omissions of persons directly employed by him.
- 8.3 The Bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a Subcontract under this Contract must be acceptable to the Owner and/or Engineer, and the approval of the proposed Subcontract award cannot be given by the Owner and/or Engineer unless and until the successful Bidder submits all information and evidence to the Owner and/or Engineer regarding the proposed Subcontractor as may be required.

002113.9 WITHDRAWAL OF BID PROPOSALS

- 9.1 Any proposal may be withdrawn by the Bidder prior to the scheduled time for the receipt of Bids or authorized postponement thereof provided the Bidder's written request for withdrawal is delivered to the Owner and/or Engineer before the proposals are opened. No Bidder may withdraw his proposal after the actual opening thereof. A proposal which has been withdrawn will be returned to the Bidder unopened at the time of the opening of the other proposals.

002113.10 BASIS OF AWARD

- 10.1 The Contract will be awarded to that responsible Bidder as determined by the Owner and/or Engineer in its sole discretion whose Total Bid Price is the lowest number of dollars and who has demonstrated the ability to perform this type of work, unless the proposals are rejected.
- 10.2 In the event there is a discrepancy between the prices written in words and written in figures, the prices written in words shall govern.

- 10.3 The Owner and/or Engineer will not be bound by the award, nor shall any Work be performed on account of the proposed Contract until the Contract has been fully executed, delivered, and approved.

002113.11 QUALIFICATIONS OF BIDDERS

- 11.1 The Owner and/or Engineer may make such investigation as it deems necessary to determine the ability of the Bidder to perform the Work, and the Bidder shall furnish to the Owner and/or Engineer all such information and data for this purpose as may be needed. The Owner and/or Engineer reserves the right to reject any proposal if the evidence submitted by or investigation of such Bidder fails to satisfy the Owner and/or Engineer that such Bidder is properly qualified to carry out the obligations of the Contract and to complete the Work contemplated therein or has previously failed to properly perform or complete on time any Contract.

002113.12 RIGHT TO REJECT BID PROPOSALS

- 12.1 The Owner and/or Engineer reserves the right to reject any or all proposals or to accept the proposal that in its judgment will be for the best interests of the Owner and/or Engineer. Any proposal which contains any omissions, alterations of forms, additions, or alternates not called for, or any qualifications, erasures, or corrections to conform to the requirements stated herein may be disregarded and rejected as improper, except that the Owner and/or Engineer may waive any defects or irregularities. Any proposals which are submitted or received after the scheduled closing time for the receipt of proposals will be rejected and returned without being opened.

- 12.2 When two or more Bids are equal, the Owner and/or Engineer reserves the right to select the Contractor in its sole discretion.

002113.13 REQUIREMENTS OF BONDS

- 13.1 A 10 percent Bid Bond or Certified Check is required for this project.
- 13.2 The successful Contractor shall provide a surety bond, acceptable to the Owner for the faithful performance of the contract, and shall furnish a similar labor and materialman's bond. The amount of each bond shall be indicated by the sum total from comparison of bids.

002113.14 INSURANCE

- 14.1 The Contractor shall maintain, in force, during the performance of the Work all insurance policies as described in the Contract.

- 14.2 Certificate of Insurance

The Contractor shall submit with the signed Contract two (2) copies of the "Certificate of Insurance," a copy of which is attached to these general specifications. The certificates are to be completed in each and every category by the Contractor's insurance company(s) and signed by an authorized agent(s) of the insurance company(s). The Contractor shall not commence any work under this Contract until such "Certificate of Insurance" is in the hands of and approved by the Owner.

14.3 Workmen's Compensation Insurance

14.3.1 The Contractor shall carry Workmen's Compensation insurance during the life of the Contract to insure his statutory liability to his employees in the state or states in which the work under this Contract is to be performed, plus \$1,000,000 Employer's Liability coverage, and in case any work is sublet, the Contractor's shall require the subcontractor similarly to provide Workmen's Compensation Insurance for all of the latter's employees unless such employees are covered by the protection afforded the Contractor. Where a code number is used on the certificate for this insurance, the title and description of the code number must include the project name and contract number.

14.3.2 In case any class of employees engaged in hazardous work under this contract at the site of the project is not protected under Workmen's. Compensation Statute, the Contractor shall provide adequate insurance coverage for the protection of his employees not otherwise protected.

14.4 Public Liability and Property Damage Insurance

14.4.1 The Contractor shall take out and maintain, during the life of this contract, sufficient comprehensive public liability and property damage insurance as will protect him and any subcontractor performing work covered by this contract, from claims for damages for personal injury, including accidental death, as well as from claims for property damages, which may arise from operations under this contract whether such operations be by himself or by any subcontractor or by anyone directly or indirectly employed by either of them.

14.4.2 The property damage insurance shall cover both above ground and underground structures. Property Damage Liability coverage is to include C (collapse) U (underground) X (explosion) hazard. Insurance policies and certificates of same shall state in words that the coverage is "for the installation of HVAC improvements and shall include any underground structure damage." The amounts of such insurances shall be as follows.

14.4.3 Comprehensive General Liability and Property Damage: The Contractor shall carry the Comprehensive form of General Liability and Property Damage Insurance during the life of the Contract covering all risks itemized in the form for "Certificate of Insurance" provided for in this Contract. The limits shall be not less than \$1,000,000 Combined Single Limit.

14.4.4 The Contractor shall likewise take out and maintain either as separate policies or as a coverage included in said Public Liability and Property Damage Insurance during the life of this contract, similar Public Liability and Property Damage Insurance in similar amounts in favor of the RAAC and any Municipality or Political sub-division within the bounds of which the contract work is to be performed.

14.4.5 Comprehensive Automobile Liability and Property Damage: The Contractor shall carry the Comprehensive form of Automobile Liability and Property Damage Insurance during the life of the Contract covering all risks itemized in the form for "Certificate of Insurance" provided for in this Contract and (a)

Contractor's own automotive equipment (b) hired and non-owned vehicles. The limits shall be not less than \$1,000,000 Combined Single Limit.

- 14.4.6 Umbrella and/or Excess Liability: The Contractor shall carry Umbrella and/or Excess Liability Insurance during the life of the Contract covering all risks above the limits shown above. The limit shall be not less than \$2,000,000.

002113.15 FAILURE TO EXECUTE CONTRACT

- 15.1 If the successful Bidder shall fail to execute the Contract, he shall be deemed to have refused to enter into the Contract and to have waived all claim to the Work, and he shall pay the Owner all damages sustained by the Owner and/or Engineer as a consequence of his failure to enter into the Contract including all loss from delay and interference with the Owner and/or Engineer's construction program and the difference between the amount of the successful Bidder's proposal and the amount for which the Owner and/or Engineer may contract with another to perform the Work covered by said proposal, if the latter be in excess of the former.

002113.16 CORRECTIONS, ERRORS, ADDENDA, AND INTERPRETATION

- 16.1 Correction by erasures or other changes in the Bid Proposal must be explained or noted over the signature of the Bidder.
- 16.2 If a Bidder finds any omissions, discrepancies, or errors in the Contract Documents or is in doubt as to the meaning of the Contract Drawings and Technical Specifications or other Contract Documents, he should notify the Owner and/or Engineer, who may correct, amend, or clarify such documents by an interpretation. If he fails to notify the Owner and/or Engineer, he will be held rigidly to the Owner and/or Engineer's interpretation of the Contract Drawings and Technical Specifications after the Contract is executed.
- 16.3 No interpretation of the meaning of the plans, specifications, or other Bid Documents will be made to any Bidder orally. Every request for such interpretation should be in writing, addressed to the Owner and/or Engineer, and to be given consideration must be received at least five (5) days prior to the date fixed for the opening of the Bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed to all prospective Bidders (at the respective addresses furnished for such purpose) not later than three (3) days prior to the date fixed for the opening of Bids. It shall be the Bidder's responsibility to contact the Owner and/or Engineer within this three (3) day period to verify receipt of all addenda issued.
- 16.4 If the Owner and/or Engineer shall deem any matter arising thereafter of such importance as to require correction, amendment, or clarification, he may postpone the time for the opening of Bids by notifying each prospective Bidder of such postponement by mail, facsimile, or telephone and issue an addendum. Failure of any Bidder to receive any addendum shall not relieve the Bidder from obligations under his Bid if such addendum is actually sent to the Bidder at the address furnished by him at the time he obtains copies of the Bid Documents. All addenda so issued, whether sent by mail, facsimile, carrier, or obtained in person by Contractor (including representatives) shall become part of the Contract Documents.

- 16.5 Any information which may be given to Bidders other than by means of the Contract Documents or addenda issued in accordance with the foregoing stipulations is given informally and shall not be used as a basis of a claim against the Owner or Engineer.

002113.17 INDEMNIFICATION

- 17.1 Contractor shall indemnify and hold harmless the Greensburg Salem School District, its agents, employees, workmen, and servants from and against all claims, damages, or losses and expenses including Attorney's fees arising out of or resulting from the performance of the work, provided that any such claim, damage, loss or expense (a) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) including the loss of use resulting therefrom and (b) is caused in whole or in part by any negligent act or omission of Contractor, any Subcontractor, or anyone for whose acts of them may be liable, regardless of whether or not it is caused in part by the negligence of a party indemnified hereunder.
- 17.2 In any and all claims against Greensburg Salem School District, any of its agents or employees by any employee of the Contractor, Subcontractor, or anyone for whose acts any of them may be liable, the indemnification obligation under subparagraph 17.1 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or any Subcontractor under Workmen's Compensation acts, disability benefit acts, or other employee acts.
- 17.3 Any provision of subparagraph 17.1 in respect of indemnification which is prohibited or unenforceable by law in the State in which the work, or other performance described in this contract, is cited shall be ineffective to the extent of such prohibition or unenforceability, and shall not invalidate the remaining provisions of subparagraph 17.1 or this Agreement.

002113.18 INTENT OF CONTRACT DOCUMENTS

- 18.1 The Invitation for Bid, Instructions to Bidder, Technical Specifications, the Bid, Bid Drawings, all Addenda, and the Contract, are all part of the Contract Documents. The intent of the Contract Documents is to obtain a complete, constructable, and efficient job. It shall be understood that the Bidder has satisfied himself as to the full requirements of the Contract Documents and has based his Bid Proposal upon such understanding.

002113.19 COMPLIANCE WITH LAWS

- 19.1 The Bidder's attention is directed to the fact that all applicable federal regulations, state laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout, and they will be deemed to be included in the Contract the same as though herein written out in full.
- 19.2 The Bidder's attention is directed to the requirements for compliance with applicable sections of the Pennsylvania State Labor Law regarding hiring practices and payment of wages.

002113.20 SIGNING OF THE CONTRACT

- 20.1 The successful Bidder will be required to execute the Contract, post Bonds and deliver the specified Certificates of Insurance to the Owner within (10) days (no other specified

time) after posted notice to him. In case the Bidder shall fail to do so, he will be deemed to have abandoned the Contract and the Owner may thereupon re-advertise or otherwise award said Contract, and recover the losses sustained by such abandonment out of the Bidder's Surety or Certified Check.

002113.21 MINIMUM / PREVAILING WAGE RATES

The project will be required to follow the most current Prevailing Wage Rates issued by the Pennsylvania Bureau of Labor Law Compliance.

002113.22 MAINTENANCE BOND

22.1 Upon completion of the Contract, and prior to the final payment, a Maintenance Bond shall be furnished by the Contractor to the Owner as a guarantee against defective workmanship and materials.

22.2 The Maintenance Bond shall be in an amount equal to one hundred percent (100%) of the Final Contract Value, for a period of one year, unless otherwise specified.

002113.23 CHANGES IN THE WORK

23.1 No changes in the work covered by the approved Contract Documents shall be made without having prior written approval of the Owner.

23.2 Without invalidating the Agreement, the Owner may, at any time or from time to time, order additions, deletions or revisions in the work; these will be authorized by Change Orders. Upon receipt of a Change Order, the Contractor will proceed with the work involved. All such work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price, or an extension or shortening of the Contract Time, an equitable adjustment will be made.

23.3 Charges or credits for the work covered by the approved change shall be determined by one or more, or a combination of the following methods:

- (a) Unit Bid prices previously approved.
- (b) An agreed Lump Sum.
- (c) The actual cost of:
 - 1. Labor, including foremen;
 - 2. Materials entering permanently into the work;
 - 3. The Ownership or rental cost of construction plant and equipment during the time of use of the extra work;
 - 4. Power and consumable supplies for the operation of power equipment;
 - 5. Insurance;
 - 6. Social Security and Old Age and Unemployment contributions.

To the cost under (c) there shall be added a fixed fee to be agreed upon but not to exceed fifteen percent (15%) of the estimated cost of the work. The fee shall be compensation to cover the cost of supervision, overhead, bond, profit and any other general expenses.

23.4 The Engineer may authorize minor changes or alterations in the work not involving extra cost and not inconsistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order.

- 23.5 Additional work performed by the Contractor without authorization of a Change Order will not entitle him to an increase in the Contract Price or an extension of the Contract Time, except in the case of an emergency when the Engineer will authorize any necessary emergency work.
- 23.6 The Owner will execute any appropriate Change Order prepared by the Engineer covering changes in the work to be performed and work performed in an emergency and any other claim of the Contractor for a change in the Contract Time or the Contract Price which is approved by the Engineer.
- 23.7 It is the Contractor's responsibility to notify his Surety of any changes affecting the general scope of the work or change in the Contract Price and the amount of the applicable bonds shall be adjusted accordingly. The Contractor will furnish proof of such adjustment to the Owner.

002113.24 WARRANTY AND GUARANTEE, CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

- 24.1 The Contractor warrants and guarantees to the OWNER and the Engineer that all materials and equipment will be new unless otherwise specified and that all work will be of good quality and free from faults or defects and in accordance with the requirements of the Contract Documents and of any inspections, tests or approvals.
- 24.2 All unsatisfactory work, all faulty or defective work and all work not conforming to the requirements of the Contract Documents or of such inspections, tests or approvals shall be considered defective.
- 24.3 All defective work, whether or not in place, may be rejected, but prompt notice of all defects shall be given to the Contractor.
- 24.4 If required by the Engineer -prior to approval of final payment, the Contractor will promptly, without cost to the Owner and as required by the Engineer, either correct any defective work whether or not fabricated, installed or completed, or if the work has been rejected by the Engineer, remove it from the site and replace it with non-defective work.
- 24.5 If the Contractor does not correct such defective work or remove and replace such rejected work within a reasonable time, all as required by written notice from the Engineer, the Owner may have the deficiency corrected or the rejected work removed and replaced. All direct or indirect costs of such correction or removal and replacement, including compensation for additional professional services shall be paid by the Contractor, and an appropriate Change Order shall be issued deducting all such costs from the Contract Price. The Contractor will also bear the expense of making good all work of others destroyed or damaged by his correction, removal or replacement of his defective work.
- 24.6 If, after the approval of final payment and prior to the expiration of one (1) year after the date of Substantial Completion or as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, any work is found to be defective the Contractor will, promptly without cost to the Owner and in accordance with the Owner's written instructions, either correct such defective work, or if it has been rejected by the Owner, remove it from the site and replace it with non-defective work.

- 24.7 If the Contractor does not promptly comply with the terms of such instructions, the Owner may have the defective work corrected or the rejected work removed and replaced. All direct and indirect costs of such removal and replacement, including compensation for additional professional services, will be paid by the Contractor or his Surety.
- 24.8 If, instead of requiring correction or removal and replacement of defective work, the Owner (and, prior to approval of final payment, also the Engineer) prefers to accept it, he may do so. In such case, if acceptance occurs prior to approval of final payment, a Change Order shall be issued incorporating the necessary revisions in the Contract Documents, including an appropriate reduction in the Contract Price.

002113.25 APPLICATION FOR PAYMENT FOR WORK PERFORMED

- 25.1 While each work task will be measured in various different units, each task item will be paid for by the unit price for quantities verified by the Engineer, based on satisfactory completion of work as agreed to by the Contractor and the Engineer. The Contractor may submit to the Engineer an application for partial payment for the work he believes has been adequately completed as of the date of the Application so submitted.
- 25.2 The application shall contain a schedule of the values of the work performed including quantities and appropriate unit prices as set forth in the Contract. The schedule shall be satisfactory in form and substance to the Engineer.
- 25.3 The Contractor warrants and guarantees that title to all work, materials, and equipment covered by such a payment will have passed to the Owner as a condition of payment; and such material, work, and equipment is free of all liens, claims, security interests and other encumbrances.
- 25.4 The application for partial payment must be conveyed to the Engineer by the Thursday preceding the first Wednesday of any month. Applications not received by the Engineer on the set Thursday will necessarily have to wait for payment in the following month.
- 25.5 The Engineer will, within three (3) days after receipt of each application for payment, either indicate in writing his approval of payment, or return the application to the Contractor indicating in writing his reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit to the application. The Owner will, upon presentation to him of an approved Application for Payment, pay the Contractor the amount approved by the Engineer by taking the proper legal steps as provided by law.

002113.26 APPROVAL OF PAYMENTS

- 26.1 The Engineer's approval of any payment requested in an Application for Payment shall constitute a representation by him to the Owner, based on the Engineer's on-site observations of the work in progress as an experienced and qualified design professional and on his review of the Application for Payment and the supporting data, that the work has progressed to the point indicated; that to the best of his knowledge, information and belief, the quality of the work is in accordance with the Contract Documents, and that the Contractor is entitled to payment of the amount approved.
- 26.2 By approving any such payment, the Engineer shall not thereby be deemed to have represented that he made exhaustive or continuous on-site inspections to check the

quality or the quantity of work, or that he has reviewed the means, methods, techniques, sequences, and procedures of construction or that he has made any examination to ascertain how or for what purpose the Contractor has used the monies paid or to be paid on account of the Contract Price. Payments shall be made to the Contractor on the basis of ninety percent (90%) of the approved monthly statement. The Engineer's approval of final payment shall constitute an additional representation by him to the Owner that the conditions precedent to the Contractor's being entitled to final payment has been fulfilled. Payments shall be made as the work progresses. The Greensburg Salem School District shall pay to the Contractor 90% of the contract price for such completed work, if such completed work is less than 50% of the entire contract. Estimates of work completed after 50% of the total contract shall be paid at 95%. When the entire work has been completed and tested, the Greensburg Salem School District shall pay to the Contractor the full amount due for the entire work less 5%.

- 26.3 The Engineer may refuse to approve the whole or any part of any payment if in his opinion he is unable to make such representations to the OWNER. He may also refuse to approve any such payment, or because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously approved, to such extent as may be necessary in his opinion to protect the OWNER from loss because:
- (a) The work is defective;
 - (b) Claims have been filed or there is reasonable evidence indicating the probably filing thereof.
 - (c) The Contract Price has been reduced because of modifications;
 - (d) The OWNER has been required to correct defective work, or
 - (e) Unsatisfactory prosecution of the work, including failure to clean up as required.

002113.27 SUBSTANTIAL COMPLETION

- 27.1 Substantial Completion is defined as the date certified by the Engineer when the construction of the project or a specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the project or specified part can be utilized for the purposes for which it was intended, or if there be no such certification, the date when final payment is due.
- 27.2 All work for this contract shall be completed within 60 days from the date established in notice to proceed.

BID FORM PRICE TOTAL

Contract Title: Greensburg Salem School District -HVAC Upgrades at Three Schools, Greensburg, PA

Name of Bidder: _____

Address of Bidder: _____

If Bidder is a corporation, list all shareholders owning five percent or more of Bidder's stock.

_____, _____,

If Bidder is a partnership, list all partners.

_____, _____, _____

Pursuant to and in conjunction with the Invitation to Bid and the Instructions to Bidder relating hereto, the undersigned as a Bidder proposes and agrees to furnish and complete at the Site the services specified in the Contract Documents, in the manner therein prescribed and in accordance with all addenda issued by Owner prior to the opening of Bids, for a series of fixed unit and firm lump sum prices which total:

_____ (Dollars)
(Written Dollar Amount)

(\$ _____)

All prices are valid for ninety (90) days from the Bid Date. A breakdown of the Bid should be presented on the attached Bid Form.

Alternates:

In accordance with Division 1 Section "Alternates", we agree to add/delete the included in each alternate as follows:

ALTERNATE NO. A1: _____

Add/Deduct

_____ (Dollars)
(Written Dollar Amount)

(\$ _____)

BID FORM AFFIDAVIT

STATE OF __))
COUNTY OF _____)) SS:

_____, being duly sworn, deposes and says that _____ is
_____, (President, Secretary, Treasurer, etc.) of _____ and that the
foregoing Bid and all statements therein contained are true and correct.

Sworn to before me this _____ day of _____, 20_____.

Notary Public
(SEAL)

My commission expires _____

**BID FORM ATTACHMENT NO. 1
BIDDER'S CHECKLIST**

Each item is to be initialed to indicate compliance and this form shall be signed and submitted with the Bid Forms.

- _____ Bidders Checklist (Attachment No. 1)
- _____ Subcontractors/Suppliers List (Attachment No. 2)
- _____ Non-Collusion Affidavit (Attachment No. 3)
- _____ Bidder Acknowledgment (Attachment No. 4)
- _____ Certificate of Insurance (Copy)

Signature of Bidder:

By: _____

Title: _____

Address: _____

Date: _____

**BID FORM ATTACHMENT NO. 2
SUBCONTRACTORS/SUPPLIERS LIST**

The Contractor shall list the name and address of all subcontractors that will supply material or perform work as part of this Project. Subcontractors shall be subject to the approval of the Owner and Engineer.

<u>SCOPE</u>	<u>NAME AND COMPLETE ADDRESS</u>
1.	
2.	
3.	

SIGNATURE OF BIDDER

By: _____

Title: _____

Address: _____

Date: _____

**BID FORM ATTACHMENT NO. 4
BIDDER ACKNOWLEDGMENT**

The Bidder acknowledges, represents, and covenants:

1. That the Bid includes all applicable taxes.
2. That if there are inconsistencies between the Engineer's specifications and the Bidder's Bid, the Engineer's specifications shall control.
3. That it has received Addenda Nos. _____, _____, _____, _____ to the Contract Documents.
4. That this Bid is based upon using qualified local labor for all field work done under the Contract.
5. That it has made a careful examination of the location of the Work, and determined the amount and character of the Work and the equipment and materials necessary to complete the same in compliance with the Contract Documents, and has become acquainted with labor conditions and all other conditions which would affect the Work and shall complete the Work in and under conditions it may encounter or create, without delay or extra cost to the Engineer.
6. That this Bid is, in all respects, fair and is made in good faith, without collusion or fraud.
7. That if written notice of the acceptance of this Bid is mailed, faxed, or delivered to the Bidder within 30 days after the Bid Date, Bidder will, within 10 days after the date of such mailing, faxing, or delivering of such notice, execute and deliver the Contractor Services Agreement.
8. Notwithstanding any entireties or similar clauses contained in any of the Contract Documents, upon Engineer's acceptance of the Bid and the execution of the Contractor Services Agreement by the Engineer and the Bidder, the Contractor shall be bound by all terms and conditions contained in the Contract Documents as defined in the Instructions to Bidder.

Signature of Bidder: _____

By: _____

Title: _____

Address: _____

Date: _____

CONTRACT AGREEMENT

THIS AGREEMENT made this _____ day of _____ in the year Two Thousand Twenty Three, by and between _____ hereinafter called the CONTRACTOR and the Greensburg Salem School District, hereinafter called GSSD.

WITNESSETH, that the Contractor, and the GSSD for the considerations named herein, agree as follows:

ARTICLE I – SCOPE OF WORK – The Contractor shall furnish all of the materials and perform all of the work and do all else necessary to complete the contract work as shown on the drawings and described in the specifications, and shown in or described by all agenda or bulletin thereto, as prepared by GSSD, acting as provided in these contract documents for Contract No. _____.

and shall do everything required by this agreement and the contract documents.

ARTICLE II – THE CONTRACT SUM

The GSSD shall pay the Contractor for the performance of the Contract, subject to any addition and/or deductions provided therein, in current funds in accordance with the lump sum bid prices of the bid sheet.

ARTICLE III – COMMENCEMENT OF WORK AND TIME OF COMPLETION

The work to be performed under this contract shall be commenced on or before _____ and shall be fully completed within _____ (_____) practical working days from and including said date.

ARTICLE IV – FULL PAYMENT

Full payment for the completed work shall be made in accordance with the provisions of the SPECIFICATIONS.

ARTICLE V – The Contractor will pay for all materials which he is required to furnish hereunder and for all service rendered hereunder in the performance of this contract and it is specifically understood and agreed that any person or corporation furnishing such materials or rendering such service may maintain an action to recover for the same against the obliger in the bond given in connection herewith as though such person or corporation was named therein, provided the action is brought within one year after the time the cause of action accrued.

ARTICLE VI – This agreement and the related specifications, with all of the executed forms therein required, shall constitute the Contract Documents, of _____ pages, including the bid prices and the contract plans of _____ pages or sheets and they are all as fully a part of this contract as if hereto attached or herein repeated.

IN WITNESS WHEREOF, the parties hereto have executed this agreement in counterparts the day and year as above written.

By _____

TITLE

WITNESS:

ATTEST:

SECRETARY

GREENSBURG SALEM
SCHOOL DISTRICT

By: _____

Title: _____

ATTEST:

Title: _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____ as Principal and _____, of the State of _____, a corporation existing under the laws of the State of _____, and authorized to transact business in the Commonwealth of Pennsylvania, as Surety, are held and firmly bound unto _____, herein after called the OBLIGEE, in the sum of _____ Dollars (\$ _____) lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the accompanying Proposal or Bid Dated _____, 20____, for Contract _____.

NOW, THEREFORE, the condition of the Bond shall be such that is the Principal, upon due acceptance of said Proposal and award of a contract to him by the Oblige, shall execute and deliver the Agreement, shall furnish to the Oblige bonds with good and sufficient surety as may be required by the Contract Documents, and shall furnish to the Oblige proper evidence of effectiveness of insurance coverage, respectively, within the time, in the forms and in the amounts, as appropriate, required by the Contract Documents, then this Bond shall be void; otherwise, this Bond shall be and shall remain in full force and effect.

The Principal and the Surety agree to pay to the Oblige the difference between the amount of said Proposal, as accepted by the Oblige, and any higher amount for which the required work shall be contracted for by the Oblige, together with any additional advertising cost~, Engineer's fees, legal fees and any and all other fees and expenses incurred by the Oblige by reason of the failure of the Principal to enter into such Agreement with the Oblige, or to furnish such Bonds, or to furnish evidence of effectiveness of such insurance coverage; Provided, however, that:

- (1) the obligation of the Surety shall not exceed the stated principal amount of this Bond; and
- (2) if the Oblige should not procure an executed contract with any other persons for the performance of the work contemplated in said Proposal, as accepted by the Oblige, upon the same terms and conditions, other than price, as provided in the Contract Documents, within the period covered by the Contract Document during which no proposals of bidders may be withdrawn, whether because of the lack of other proposals, or because of the inability or refusal of any other bidder to enter into an appropriate contract, or because the cost under any higher proposal would be greater than the Oblige shall determine, In its sole discretion, that it can afford, then the Principal and the Surety agree to pay the Oblige the full amount of this Bond as liquidated damages.

It is the intention of the parties hereto to be legally bound by this instrument.

Signed, sealed and delivered in _____ counterparts this _____
day of _____ 20____.

(INDIVIDUAL PRINCIPALS SIGN HERE)

_____ (SEAL)

_____ (SEAL)

_____ (SEAL)

_____ (SEAL)

In the presence of:

(CORPORATE PRINCIPALS SIGN HERE)

_____ (SEAL)

BY _____

ATTEST:

(SURETY SIGN HERE)

PERFORMANCE/MAINTENANCE BOND

KNOW BY ALL MEN THESE PRESENTS, that we, _____,
as Principal, and _____, as Surety,
are held and firmly bound unto the Greensburg Salem School District (hereinafter called the Obligee), in
full and just sum of _____, DOLLARS
(_____) lawful money of the United States, for the payment of which sum well and truly to be
made, we bind ourselves, our heirs, administrators, executors, successors, and assigns, jointly and severally, firmly
by these presents.

WHEREAS, said principal has entered into a certain contract with said Obligee, dated _____,
_____ (hereinafter called the Contract) for furnishing and installing the materials required under which
contract and all of the contract documents herein referred to for said work shall be deemed a part hereof as
fully as it set out therein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the principal
shall faithfully perform the contract, or any amendment of extension of, or addition to said contract and
during one year guarantee period, on his part, of the time and in the manner therein provided and satisfy all
claims and demands incurred in or for the same, or growing out of the same, or for injury or damage to
persons or property in the performance thereof, and shall fully indemnify and save harmless the said Obligee
from any and all cost and damage which the said Obligee may suffer by reason of failure to do so, and shall
fully reimburse and repay the said Obligee any and all outlay and expense which it may incur by reason of
such default, then this obligation shall be null and void; otherwise it shall remain in full force and virtue.

The said surety, for value received, hereby stipulates and agrees that no change, extension of time,
alteration or addition to the terms of the contract or to the work to be performed thereunder to the
specifications accompanying the same shall in any ways affect its obligations on this bond, and it does
hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract
or to the work or to the specifications.

Signed, sealed and delivered in _____ counterparts this
_____ day of _____ 20__.

(INDIVIDUAL PRINCIPALS SIGN HERE)

_____ (SEAL)
_____ (SEAL)
_____ (SEAL)
_____ (SEAL)

In the presence of:

(CORPORATE PRINCIPALS SIGN HERE)

_____ (SEAL)
BY _____

ATTEST:

(SURETY SIGN HERE)

LABOR AND MATERIALS BOND

KNOW ALL MEN BY THESE PRESENTS, that we, _____
as Principal, and _____ as Surety,
are held and firmly bound Greensburg Salem School District (hereinafter called the Obligee), in full and
just sum of _____, DOLLARS (_____) lawful money of the
United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs,
personal representatives, successors and assigns, jointly and severally firmly by these presents.

WHEREAS, said principal has entered into a certain contract with said Obligee, dated
_____, 20____ hereinafter called the Contract for

which contract and all of the contract documents herein referred to for said work shall be deemed part
thereof as fully as if set out herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH that if said principal
and all subcontractors to whom any portion of work, provided for in said contract is sublet and all assignees
of said Principal and of such subcontractors shall promptly make payments for all labor performed, services
rendered and materials furnished in the prosecution of the work provided for in said contract, or in any
amendment or extension of or addition to said contract, then the above obligation shall be void, otherwise
to remain in full force and effect: PROVIDED, however, that this bond is subject to the following conditions
and limitations:

(a) All persons who have performed labor, rendered services, or furnished materials or machinery
incident to the performance of the work, etc., provided in the contract on account of any pursuant to which
this bond is given, may maintain an action to recover for the same against the Obliger in this bond as though
such person was named therein, provided the action accrued.

(b) In no event shall the Surety be liable for a greater sum than the penalty of this bond, or subject
to any suit action or proceeding thereon that is instituted later than one year after the complete performance
of said contract and final settlement thereof.

(c) As used herein: The term "person" refers to any person, firm or corporation who has furnished
materials or machinery to be used on or incorporated in the work or the amendment or extension of or
addition to said contract, and/or to any person engaged in the prosecution of the work provided for in said
contract or in any amendment or extension of or addition to said contract, who is an agent, servant or
employee of the Principal, or of any subcontractor, and also anyone so engaged who performs the work of
a laborer or of a mechanic regardless of and contractual relationship between the principal or any
subcontractor or any assigned or said Principal or of said subcontractor and such laborer or mechanic, but
shall not include office employees not regularly stationed at the site of the work.

The said Surety, for the value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of this contract or to the work to be performed thereunder of the specifications accompanying the same shall in anyway affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition of time, alteration or addition to the terms of the contract or to the work or to the specifications.

Signed, sealed and delivered in _____ counterparts this
_____ day of _____ 20__.

(INDIVIDUAL PRINCIPALS SIGN HERE)

_____ (SEAL)

In the presence of:

(CORPORATE PRINCIPALS SIGN HERE)

BY _____ (SEAL)

ATTEST:

(SURETY SIGN HERE)

DOCUMENT 003119 - EXISTING CONDITION INFORMATION

TIPS:

To view non-printing **Editor's Notes** that provide guidance for editing, click on Masterworks/Single-File Formatting/Toggle/Editor's Notes.

To read detailed research, technical information about products and materials, and coordination checklists, click on Masterworks/Supporting Information.

1.1 EXISTING CONDITION INFORMATION

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of the Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.
- B. Existing drawings that include information on existing conditions including previous construction at Project site are available for viewing at the office of Owner.
- C. Survey information that includes information on existing conditions, prepared by CEC, is available for viewing as part of Drawings.
- D. Related Requirements:
- E.
 - 1. Document 002113 "Instructions to Bidders" for the Bidder's responsibilities for examination of Project site and existing conditions.

DOCUMENT 008000 – GENERAL CONDITIONS

PART 1 - A draft copy of AIA Document A201-2007, "GENERAL CONDITIONS FOR THE CONTRACT FOR CONSTRUCTION - 2007" shall be in effect for the duration of the project. This draft document, its requirements and stipulations, and any additions or deletions to it shall become part of the Contract Documents. The Contractor shall be responsible for legally obtaining and supplying an executed copy of this document for signature by Owner upon notice of award.

DOCUMENT 008050 - SUPPLEMENTARY CONDITIONS

The following supplements modify the draft copy of the General Conditions of the Contract for Construction, AIA Document 201-2007. Where a portion of the draft copy of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect. Bidder agrees that submission of a bona fide bid for the work described in the Bidding Documents indicates acceptance of all unaltered and altered portions of the draft General Conditions modified herein and that these requirements and modifications shall become part of final legal and binding Contract.

They are interpreted by Civil & Environmental Consultants, Inc as the property of the GREENSBURG SALEM SCHOOL DISTRICT.

Any discrepancies in these conditions shall be brought to the attention of the Architect prior to placing bid.

ARTICLE 1 - GENERAL PROVISIONS

1.1 Basic Definitions

1.1.1 **The Contract Documents;** revise the last sentence to read "The Contract Documents do include other documents including the following bidding requirements:

- Instructions to Bidders
- Sample and Draft Forms
- The Contractor's Bid
- Portions of any addenda related to bidding requirements.

1.1.3 **The Work;** add the following clause:

"1.1.3.1 Temporary facilities, tools and other portions of the work which are not to be delivered to the Owner at or prior to Final Completion shall not be subject to the provisions of subparagraph 2.3 of the General Conditions except to the extent that they may interfere with or otherwise adversely affect the Owner's use of or interest of the Project."

Paragraph 1.1 BASIC DEFINITIONS. To paragraph 1.1.5, THE DRAWINGS, add the following subparagraphs:

1.1.5.1 The Drawings are diagrammatic. Exact slopes, pitches, locations of equipment and points of termination shall be verified by Contractor and approved by owner. This shall include both new work and existing conditions. Should it be found that any system or equipment cannot be installed as shown on the Drawings, the Architect shall be notified in writing before installing or making changes to layout.

1.1.5.2 Contractor shall carefully examine the Contract Drawings and Specifications. If any discrepancies occur between the Drawings or between the Drawings and Specifications, the Contractor shall report such discrepancies to the Architect in writing and obtain written instructions as to the manner in which to proceed. No departures from the Contract Documents shall be made without prior written approval of the Architect.

The following subparagraphs shall be added:

1.1.9 The Bid

The offer or proposal submitted by the contractor on the forms authorized by law are made part of this agreement. The contractor shall perform the work so prescribed for the amount set forth in said bid.

1.1.10 The Architect/Engineer

The Architect for this project and the work to be done is Civil & Environmental Consultants Inc, 700 Cherrington Parkway, Moon Township, PA 15108.

1.1.11 The Contractor

The Contractor is the entity identified in the agreement and who has executed all the documents and is the entity referenced throughout the General Conditions of the Contract and the Supplemental Conditions.

1.1.12 The Owner

The Owner is "Greensburg Salem School District" for whom the work is to be performed.

1.1.13 Award

The award of the contract will be to the lowest responsible bidder whose qualifications indicate the award will be in the best interest of the Owner and whose proposal complies with all of the prescribed requirements. No notice of award will be given until the Owner has concluded such investigations as it deems necessary to establish the responsibility, qualifications, and financial ability of the bidders to do the work in accordance with the contract documents, bidding documents, and all other documents to the satisfaction of the Owner and the Architect within the time prescribed. Owner reserves the right to reject the bid of any bidder who does not pass such investigation to Owner's satisfaction."

1.2 Correlation and Intent of the Contract Documents; add the following clauses to subparagraph 1.2.1;

1.2.1.1 The term "reasonably inferable" includes work necessary to "provide" work indicated or specified, as defined in Section 014200 - References; that is: furnish and install, complete in place and ready for use.

- 1.2.1.2 In the case of an inconsistency between Drawings and Specifications or within either Document, not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.
- 1.2.1.3 Details referenced to portions of the Work shall apply to other like portions of the Work not otherwise detailed.
- 1.2.1.4 The Contractor shall request from the Architect interpretation of any apparent discrepancies, conflicts, or omissions in the Specifications and Drawings. Subcontractors shall forward such requests through the Contractor. Such requests, and the Architect's interpretation, shall be in written form; other forms of communications may be used to expedite resolutions of concerns but will not be binding.
 - 1.2.1.4.1 Contractor shall utilize "Request for Information" (RFI) form as described in Section 013100 - Project Management and Coordination.
- 1.2.1.5 Should either the Owner or Contractor consider that the Architect's interpretations are cause for changes to the Contract Sum or the Contract Time, that party shall either bring such considerations to the attention of the Architect, request a revised interpretation, or shall make a claim in accordance with Article 15 of the General Conditions.

1.4 Interpretation; add the following subparagraph:

- 1.4.1 Wherever in the Contract Documents an item of work is referred to in the singular number, such references shall apply to as many such items as are required to complete the Work."

ARTICLE 2 – OWNER

Delete subparagraph 2.2.5 and substitute the following:

- “2.2.5 The Contractor shall be furnished, free of charge, an electronic copy of the contract documents. Hard copies will not be provided.

2.4 Owner’s Right to Carry Out the Work; delete the first sentence of paragraph 2.4 and substitute the following:

“If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, commence and continue to carry out the Work.”

ARTICLE 3 – CONTRACTOR

- 3.3 Supervision and Construction Procedures; add the following subparagraph

“3.3.4 The Contractor shall be responsible for coordination of the work of Subcontractors, and for dissemination of relevant communications to affected Subcontractors.”

3.4 Labor and Materials; add the following subparagraph:

“3.4.4 The Contractor will be held to be thoroughly familiar with conditions affecting labor in the locale of the Project, including, but not limited to, trade jurisdictions and agreements, incentive and premium time pay, procurement, living and commuting conditions. Contractor shall assume responsibility for costs resulting from his failure to verify conditions affecting his labor.”

3.5 Warranty; add the following subparagraphs:

“3.5.2 The Contractor shall, in addition, furnish special warranties required by the Specifications.

3.5.3 The provisions of Article 12 of the General Conditions, and Supplementary Conditions thereto, further define the Contractor’s responsibilities relative to general and special warranties.”

3.6 Taxes; add the following subparagraphs:

“3.6.1.1 The Owner retains the right to the refund of all such taxes from which it is exempt pursuant to 24 Pa. Stat 7-776 or other law.

3.6.1.2 Contractor will fill out all required paper work, shall assist the Owner as necessary to obtain a refund of sales tax on all materials permanently incorporated into the building or premises, or any other tax paid by Contractor but refundable to Owner. All such claims for tax refund shall be in the name of and for the exclusive benefit of the owner, and any such refund obtained by the Contractor shall become the immediate property and possession of the owner.

3.6.1.3 This provision shall apply to all Contractors and subcontractors and shall be included by Contractor in all of its contracts with subcontractors.”

3.9 Superintendent; delete subparagraphs 3.9.2 and 3.9.3 and replace with the following subparagraph as follows:

“3.9.2 Contractors shall, within ten (10) days after signing the Contract, submit the names and resumes of their superintendents. This will include previous work experience, qualifications, and references. Provide names and telephone numbers of references. The superintendent shall be satisfactory to the Architect and Owner in all respects. The Architect and Owner shall have the right to require the Contractor to dismiss from the Project any superintendent whose performance is not satisfactory to the Architect or the Owner. The Contractor shall not replace the superintendent without the prior written consent of the Architect and the Owner.”

3.10 Contractor’s Construction Schedules; add the following subparagraph:

“3.10.1.1 Schedules shall comply with the requirements of Section 013200 – Construction Progress Documentation”

3.10.2 In the first sentence, delete the word “promptly” and substitute “within 10 days” and delete the word “approval” and substitute “review”.

In the second sentence, delete the word “approval” and substitute “review”

“3.10.4 Equipment Manufacturers and Subcontractors:

1. Equipment Manufacturer: Within 30 days after award of Contract and prior to submission of the 2nd Application for Payment, the Contractor shall furnish the Architect with a written list of all proposed equipment or product manufacturers for which product data submittals are required. Include the following data for each product:
 - a. Specification section number and paragraph
 - b. Equipment description (eg, AHU, Boiler, Pumps, etc)
 - c. Equipment Manufacturer, Model Number, and Contract Document Identification Number
2. Submittal of equipment manufacturers list does not negate requirements for submission of product data, shop drawings, samples, quality control, and contract closeout, or compliance with substitution request submittals.

3.10.5 List of Subcontractors:

Subcontractors: Prior to the 2nd Application for Payment, the Contractor shall furnish the Architect with a written list of the names of persons or entities proposed as subcontractors for any portion of the work, along with a description of tasks to be performed by each proposed subcontractor.”

3.11 Documents and Samples at the Site

3.11.1 In the first sentence delete the word “approved” and change “submittals” to read “submittals, as specified in Section 013300 – Submittal Procedures.”

Delete second sentence and substitute: “Except for samples authorized to be used in the Work, these shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed. Samples shall be delivered to the Architect upon completion of the Work if requested, and otherwise shall become the property of the Contractor and shall be removed from the site.”

Add the following subparagraph to paragraph 3.11:

“3.11.2 Detailed requirements are specified in Section 017700 – Closeout Procedures.”

3.12 Shop Drawings, Product Data, and Samples

3.12.7 In the third line, delete the word “approved” and substitute “reviewed”

3.12.8 In the third and eleventh lines, delete the word “approval” and substitute “review”

Add the following subparagraph to 3.12:

“3.12.11 Detailing requirements are specified in Section 013300 – Submittal Procedures and Section 016000 – Product Requirements.”

3.14 Cutting and Patching; add the following subparagraph:

“3.14.3 Detailed requirements are specified in Section 017300 – Execution.”

3.16 Access to Work; add the following subparagraph:

“3.16.2 The Contractor shall promptly notify the Architect and Owner of the presence of hazardous conditions at the Site, including the start of hazardous operations or the discovery or exposure of hazardous substances.”

3.18 Indemnification

Add the following subparagraph:

“3.18.1.1 The Contractor shall indemnify and hold harmless the Owner against any assertion of claims for mechanics’ liens by Subcontractors, Sub-subcontractors, or material suppliers and against any assertion of security interests by suppliers of goods or materials.

No provision of this Subparagraph shall give rise to any duties on the part of the Architect not otherwise provided for by the contractor or by law.

In the event that any party is requested but refuse to honor the indemnity obligations hereunder, then the party refusing to honor such requests shall, in addition to all other obligations, pay the cost of bringing any such action, including attorney’s fees to the party requesting indemnity.”

ARTICLE 4 – ADMINISTRATION OF THE CONTRACT

4.1 Architect

4.1.1 After the words “practicing architecture” add “in Pennsylvania and”

Replace subparagraph 4.1.3 with the following:

“4.1.3 In cases of termination of the employment of the Architect, the Owner shall appoint another Architect whose status under the Contract Documents shall be that of the former Architect.”

ARTICLE 5 – SUBCONTRACTORS

5.2 Award of Subcontracts and Other Contracts for Portions of the Work

Delete Subparagraph 5.2.3 in its entirety

5.3 Subcontractual Relations

Add subparagraph 5.3.2 as set forth below:

“5.3.2 Notwithstanding any provision of Subparagraph 5.3.1, any part of the Work performed for the Contractor by a Subcontractor or its Sub-subcontractor shall be pursuant to a written Subcontract between the Contractor and such Subcontractor (or the Subcontractor and its Sub-subcontractor at any tier), which shall be prepared on a form of subcontract satisfactory to the Owner in all respects. Each such subcontract shall contain provisions that:

1. Require that such Work be performed in accordance with the requirements of the Contract Documents;
2. Waive all rights that contracting parties may have against one another, or that the Subcontractor may have against the Owner, for damages caused by fire or other perils covered by the insurance described in the Contract Documents;
3. Require the Subcontractor to carry and maintain insurance coverage in accordance with the Contract Documents, and to file certificates of such coverage with the Contractor;
4. Require the Subcontractor to submit certificates and waivers of liens for work completed by it and its Sub-subcontractors as a condition to the disbursement of the progress payment next due and owing;
5. Require submission to Contractor or Subcontractor, as the case may be, of Applications for Payment in a form supplied by the Owner, together with clearly defined invoices and billings supporting all such applications under each subcontract to which the Contractor is a party;
6. Report, so far as predictable, unit prices and any other feasible formula for use in the determination of costs of changes in the Work;
7. Require each Subcontractor to furnish to the Contractor in a timely fashion all information necessary for the preparation and submission of the reports required herein;”

ARTICLE 6 – CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

6.2 Mutual Responsibility

6.2.3 Delete and replace with the following:

“6.2.3 Costs caused by delays or by improperly timed activities or defective construction shall be borne by the party responsible therefor, excepting, however, Owner, and Architect, who shall not be liable to any Contractor or Subcontractor for claims or damages of a monetary or other nature caused by or arising out of delays contemplated or not contemplated at the signing of the Contract. The sole remedy against the Owner for delays shall be an allowance to a successful claimant of addition of time for completion of work.”

Add subparagraph 6.2.6 as set forth below:

“6.2.6 Should the Contractor cause damage to the work or property of any separate contractor, the Contractor shall upon due notice, promptly attempt to settle with such other contractor by agreement, or otherwise to resolve the dispute. If such separate contractor sues or initiates a legal proceeding against the Owner, Architect, on account of any damage alleged to have been caused by the Contractor, the Owner, Architect shall notify the Contractor who shall defend such proceedings at the Contractor’s expense, and if any judgment or award against the Owner, Architect arises therefrom the Contractor shall pay or satisfy it and shall reimburse the Owner, Architect for all attorney’s fees, court or other legal costs which the Owner, Architect has incurred.”

ARTICLE 7 – CHANGES IN THE WORK

7.2 Change Orders

Add the following subparagraphs:

“7.2.2.1 In order to facilitate review of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials, and Subcontracts. There shall be no allowance for small tool usage and/or miscellaneous expendables. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change be approved without such itemization.

7.2.2 Methods used in determining adjustments to the contract sum shall be one, or a combination, of those listed in 7.3.3”

7.3 Construction Change Directives

7.3.7 In the first sentence, delete the words “a reasonable amount” and change to “an allowance for overhead and profit in accordance with Clauses 7.3.11.1 through 7.3.11.5 below.”

Add the following subparagraphs to 7.3:

“7.3.11 In subparagraph 7.3.6 and 7.3.12, the allowance for the combined overhead and profit included in the total cost to the Owner shall be based on the following schedule:

7.3.11.1 For the Contractor, for Work performed by the Contractor’s own forces, 10 percent of the cost.

- 7.3.11.2 For the Contractor, for Work performed by the Contractor's Subcontractor, 5 percent of the amount due the Subcontractor.
- 7.3.11.3 For each Subcontractor or Sub-subcontractor involved, for Work performed by the Subcontractor's or Sub-subcontractor's own forces, 10 percent of the cost.
- 7.3.11.4 For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, 5 percent of the amount due the Sub-subcontractor.
- 7.3.11.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.6.
- 7.3.11.6 Cost itemization shall be submitted as set forth in Subparagraph 7.2.2."

ARTICLE 8 – TIME

8.1 Definitions

Delete subparagraph 8.1.2 and substitute the following:

- "8.1.2 The work to be performed under this contract shall commence after required insurance has been obtained and approved and within seven days after execution of a contract between the Owner and Contractor, or upon date of "Notice to Proceed", whichever is sooner."

ARTICLE 9 – PAYMENTS AND COMPLETION

9.2 Schedule of Values

Add the following subparagraph:

- "9.2.2 Schedule of Values format and content are specified in Section 012900 – Payment Procedures".

9.3 Applications for Payment

Add the following Clauses:

- "9.3.1.3 Applications for Payment requirements and content are specified in Section 012900 – Payment Procedures.

9.3.1.4 Retainage:

To ensure proper performance of the Contract, the Owner shall retain ten (10%) percent of all amounts due the Contractor until the work is substantially completed in accordance with Clause 9.8. When the work is substantially completed, one-half (1/2) of the amount retained by the Owner shall be returned to the Contractor: provided, that the Architect in conjunction with the Owner's Project Representative approves the application for payment and reduction of Retainage, and provided further that the Contractor is making satisfactory progress and there is no specific cause for greater withholding. Payments are subject to provision of Paragraph 9.6. The Owner shall retain five (5%) percent of all amounts due the

Contractor after the work is substantially completed, based on progress payment requests. Provided however, that in the event a dispute arises between the Owner and the Contractor, which dispute is based upon increased costs occasioned by delays or other actions of the Contractor or Subcontractors, additional retainage in the sum of one and one-half (1-1/2) times the amount of any possible liability may be withheld until such time as a final resolution is agreed to by all parties directly or indirectly involved, unless the Contractor causing the additional claim furnishes a bond satisfactory to the Owner to indemnify the Owner against the claim. All monies retained by the Owner may be withheld from the Contractor until substantial completion of the work in the project or until all claims are settled, whichever is the longest time.”

9.6 Progress Payments

Add the following Clause to subparagraph 9.6.2:

“9.6.2.1 If a Contract for Overall Construction is awarded, payment for work performed by Subcontractors will, upon certification by Contractor, be paid directly to the Subcontractor in accordance with applicable contracts law.”

9.8 Substantial Completion

Add the following subparagraph:

“9.8.3.1 If the Contractor has not completed or corrected all items, whether or not included on the original list, by the time the second inspection is performed by the Architect, all time spent by the Architect subsequent to the second inspection shall be compensated by the Owner at the rates established by the Owner/Architect agreement and such compensation shall be deducted from amounts owed the Contractor.

9.9 Partial Occupancy or Use

9.9.1 In the third sentence after “Contractor shall” insert the words “obtain a Certificate of Occupancy and Certificates of Inspection and similar documents required by authorities having jurisdiction and”.

Add the following to Article 9:

ARTICLE 10 – PROTECTION OF PERSONS AND PROPERTY

10.2 Safety of Persons and Property

Add the following subparagraph to Clause 10.2.2:

“10.2.2.1 The Contractor shall give immediate notice to the Owner and Architect of the onset of any hazardous conditions at the site, which could require the implementation of safety programs or measures by personnel visiting the site.”

Add the following subparagraph to Clause 10.2.3:

“10.2.3 The Contractor shall implement a hazard communication program including:

1. The contractor must provide the Owner at the initial job meeting a written hazard communication program which describes how the criteria in 29 CFR 1926.59 (f), (g), and (h) will be met:
2. The aforesaid written hazard communication program must include descriptions as to how labeling and other forms of warning; Material Safety Data Sheets; and employee information and training will be handled;
3. The contractor shall be required, at the initial job site meeting, to provide the Owner with a then current list of hazardous chemicals that will be utilized at the work place. In addition to the list, material safety data sheets must be supplied to the owner:
4. The contractor shall inform the owner in writing of the methods used to inform employees of the hazards associated with non-routine tasks;
5. The contractor that uses or will store hazardous chemicals at the work place shall provide the Owner and all other employers at a site with copies of all Material Safety Data Sheets applicable during work performed at the site and shall routinely inform the Owner and all other parties of any precautionary measures that need to be taken to protect employees during the work place’s normal operating conditions and in foreseeable emergencies.”

10.2.4 In the first line after the word “methods” insert the words “not prohibited by the Contract Documents”.

10.3 Hazardous Materials

10.3.2 In the first and fifth sentences, delete the words “been rendered harmless” and substitute “been removed or rendered harmless”

Add the following Clauses to Article 10:

“10.5 Construction Safety Policy

10.5.1 In the event the Owner adopts a “Construction Safety Policy” it shall be part of the Contract Documents, and may be reviewed and obtained in the office of the Owner.

10.5.2 The Contractor shall provide adequate protection for parts of the present buildings and their contents and occupants wherever Work under this Contract is performed.

10.6 Administration Policy-Accidents/Incidents

10.6.1 In the event that the Owner adopts a Administration Policy-Accidents/Incidents, policy and procedure for reporting accidents and incidents that take place with any building or on the grounds of the site; the document will be part of the Contract Documents.

10.6.2 All accidents/incidents that occur at this site shall be reported on forms provided by the Owner and filed with Owner.

10.6.3 The referenced document and forms may be reviewed and obtained in the office of the Owner.”

ARTICLE 11 – INSURANCE AND BONDS

11.1 Contractor’s Liability Insurance

11.1.1.1 Delete the semicolon at end of clause and insert the words “, including private entities performing Work at the site and exempt from the coverage on account of number of employees or occupation, which entities shall maintain voluntary compensation coverage at the same limits specified for mandatory coverage for duration of the Project;”

11.1.1.2 Delete period at end of clause and insert the words “or persons or entities excluded by statute from the requirements of clause 11.1.1.1 but required by the Contract Documents to provide the insurance required by the clause;”

Add the following subparagraphs to 11.1:

“11.1.1.9 Liability Insurance shall include all major divisions of coverage and be on a comprehensive basis including:

1. Premises Operations (including X, C, and U coverage’s as applicable)
2. Independent Contractor’s Protective
3. Products and Completed Operations
4. Personal Injury Liability with Employment Exclusion deleted
5. Contractual, including specified provision for Contractor’s obligation under paragraph 3.18
6. Owned, non-owned and hired motor vehicles
7. Broad Form Property Damage including Completed Operations.

11.1.1.10 Civil & Environmental Consultants, Inc shall be named as additional insured by all Contractors

11.1.1.11 If the General Liability coverages are provided by a Commercial General Liability Policy on a claim made basis, the policy date or Retroactive Date shall predate the Contract; the termination date of the policy or applicable extended reporting period shall be no earlier than the termination date of coverage’s required to be maintained after final payment, certified in accordance with subparagraph 9.10.2”

Add the following to subparagraph 11.1.2:

“11.1.2.2 The insurance required by subparagraph 11.1.1 shall be written for not less than the following limits, or greater if allowed by law:

1. Worker’s Compensation:
 - a. State: Statutory
 - b. Applicable Federal (eg Longshoremen’s): Statutory
 - c. Employer’s Liability:
 - i. \$100,000 per Accident
 - ii. \$500,000 Disease, Policy Limit
 - iii. \$100,000 Disease, Each Employee
 - d. Benefits Required by Union Labor Contracts: As Applicable
2. Comprehensive or Commercial General Liability (including Premises-Operations; Independent Contractor’s Protective; Products and Completed Operations; Broad Form Property Damage):
 - a. Bodily Injury:
 - i. \$3,000,000 Each Occurrence
 - ii. \$4,000,000 Aggregate
 - b. Property Damage:
 - i. \$3,000,000 Each Occurrence
 - ii. \$3,000,000 Aggregate
 - c. Products and Completed Operations to be maintained for a period of two years after final payment:
 - i. \$3,000,000 Aggregate
 - d. Property Damage Liability Insurance shall provide X (explosion), C (collapse) and U (underground) coverage.
 - e. Broad Form Property Damage Coverage shall include Completed Operations

- f. If the General Liability coverage's are provided by a Commercial Liability policy, the:
 - i. General Aggregate shall not be less than \$3,000,000 and it shall apply, in total, to this Project only;
 - ii. Fire damage limit shall not be less than \$500,00 on any one fire;
 - iii. Medical expense limit shall not be less than \$50,000 on any one person
3. Contractual Liability:
 - a. Bodily Injury:
 - i. \$1,000,000 Each Occurrence
 - ii. \$2,000,000 Aggregate
 - b. Property Damage:
 - i. \$1,000,000 Each Occurrence
 - ii. \$2,000,000 Aggregate
4. Personal Injury, with Employment Exclusion deleted:
 - a. \$1,000,000 Aggregate
5. Business Auto Liability (including owned, non-owned and hired vehicles):
 - a. \$1,000,000 Each Occurrence
6. Umbrella Excess Liability:
 - a. \$1,000,000 over primary insurance
 - b. \$10,000 retention for self-insured hazards each occurrence.

Add the following subparagraph to 11.1.3:

“If this insurance is written on the Comprehensive General Liability policy form, the Certificates shall be AIA Document G705, Certificate of Insurance. If this insurance is written on a Commercial General Liability policy form, ACCORD form 25S will be acceptable.”

Add the following to paragraph 11.1:

“11.1.5 All certificates of insurance shall contain the following endorsement within:

11.1.5.1 The Owner is interested in maintenance of this insurance and it is agreed that policies represented by this certificate will not be canceled or changed without thirty (30) days prior written notice to the Owner by return receipt mail.

11.1.5.2 It is agreed that policies represented by this certificate shall indemnify and hold harmless the Owner, the Architect, and their agents and employees as per paragraph 3.18.

11.1.6 Certificates of Insurance shall be issued by an insurance company holding an AM Best Rating of VII or better.”

11.2 Owner’s Liability Insurance

Add the following subparagraph:

“11.2.1.1 The Contractor shall purchase and maintain insurance covering the Owner’s contingent liability for claims which may arise from operations under the Contract.”

11.3 Property Insurance

11.3.1 In the first sentence, delete the words “Unless otherwise provided, the Owner” and substitute “the Contractor”.

11.3.1 Add the following sentences: “The form of policy for this coverage shall be Completed Value. If the Owner is damaged by the failure of the Contractor to maintain such insurance, then the Contractor shall bear all reasonable costs properly attributable thereto.”

Delete Clause 11.3.1.2

Delete Clause 11.3.1.3

Delete subparagraph 11.3.4

Delete subparagraph 11.3.6 and substitute the following:

“11.3.6 Before an exposure to loss may occur, the Contractor shall file with the Owner two certified copies of the policy or policies providing this Property Insurance coverage, each containing those endorsements specifically related to the Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the Owner.

11.3.7 Delete this subparagraph

11.3.8 Delete the first sentence and change to: A loss insured under this property insurance shall be adjusted by the Contractor as fiduciary and made payable to the Contractor as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgage clause and of subparagraph 11.3.10

11.3.9 Delete the word “Owner”, and substitute “Contractor” each time the former word appears.

11.3.10 Delete the word “Owner”, and substitute “Contractor” each time the former word appears.

11.4 Performance Bond and Payment Bond

11.4.1 Delete subparagraph 11.4.1 and substitute the following:

“11.4.1 The Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder. Bonds may be obtained through the Contractor’s usual source and the cost thereof shall be included in the Contract Sum. The amount of each bond shall be equal to one hundred (100%) percent of the Contract Sum.

11.4.1.1 The Contractor shall deliver the required bonds to the Owner not later than three days following the date the Agreement is entered into, or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

11.4.1.2 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.”

ARTICLE 13 – MISCELLANEOUS PROVISIONS

Add Paragraph 13.8 Equal Opportunity as follows:

“13.8 Equal Opportunity

13.8.1 According to 62 Pa CSA 3701, the Contractor agrees that:

1. That in hiring of employees for the performance of the work under this contract, or any subcontract, no Contractor, Subcontractor, or any person acting on behalf of the Contractor or Subcontractor, shall, by reason of gender, race, creed, or color, discriminate against any citizen of this Commonwealth who is qualified and available to perform the work to which the employment relates.
2. No Contractor, Subcontractor, or any person on their behalf shall, in any manner, discriminate against or intimidate any employee hired for performance of work under his contract on account of gender, race, creed, or color.”

END OF DOCUMENT 000805

PREVAILING WAGE STATEMENT

Prevailing Wage Rate information for the HVAC UPGRADES AT THREE SCHOOLS for the Greensburg Salem School District can be found in the following pages.

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project Name:	GREENSBURG SALEM SCHOOL DISTRICT HVAC UPGRADES AT THREE SCHOOLS
Awarding Agency:	GREENSBURG SALEM SCHOOL DISTRICT
Contract Award Date:	10/24/2023
Serial Number:	23-07746
Project Classification:	Building
Determination Date:	9/18/2023
Assigned Field Office:	Pittsburgh
Field Office Phone Number:	(412)565-5300
Toll Free Phone Number:	(877)504-8354
Project County:	Westmoreland County

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 23-07746 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Asbestos & Insulation Workers	8/1/2022		\$41.40	\$28.51	\$69.91
Asbestos & Insulation Workers	8/1/2023		\$42.40	\$29.01	\$71.41
Boilermakers	6/1/2016		\$40.90	\$27.61	\$68.51
Bricklayer	12/1/2022		\$36.55	\$24.71	\$61.26
Carpenters - Piledriver/Welder	1/1/2023		\$40.63	\$21.22	\$61.85
Carpenters - Piledriver/Welder	1/1/2024		\$42.13	\$21.97	\$64.10
Carpenters - Piledriver/Welder	1/1/2025		\$43.38	\$22.72	\$66.10
Carpenters - Piledriver/Welder	1/1/2026		\$44.63	\$23.47	\$68.10
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	7/1/2022		\$37.67	\$19.93	\$57.60
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2023		\$39.69	\$19.93	\$59.62
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2024		\$41.49	\$19.93	\$61.42
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2025		\$43.34	\$19.93	\$63.27
Cement Mason/Concrete Finisher	6/1/2019		\$31.27	\$19.39	\$50.66
Cement Masons	6/1/2022		\$32.57	\$22.59	\$55.16
Cement Masons	6/1/2023		\$33.07	\$23.59	\$56.66
Drywall Finisher	6/1/2022		\$32.00	\$21.89	\$53.89
Drywall Finisher	6/1/2023		\$32.39	\$23.75	\$56.14
Drywall Finisher	6/1/2024		\$34.01	\$24.88	\$58.89
Electricians & Telecommunications Installation Technician	12/26/2022		\$48.31	\$29.29	\$77.60
Elevator Constructor	1/1/2023		\$56.14	\$42.83	\$98.97
Glazier	9/1/2021		\$32.61	\$27.19	\$59.80
Glazier	9/1/2022		\$34.05	\$28.65	\$62.70
Iron Workers	6/1/2022		\$38.39	\$34.27	\$72.66
Iron Workers	6/1/2023		\$38.89	\$35.02	\$73.91
Laborers (Class 01 - See notes)	1/1/2023		\$25.82	\$19.46	\$45.28
Laborers (Class 01 - See notes)	1/1/2024		\$26.82	\$19.46	\$46.28
Laborers (Class 01 - See notes)	1/1/2025		\$27.32	\$19.96	\$47.28
Laborers (Class 01 - See notes)	1/1/2026		\$27.82	\$20.46	\$48.28
Laborers (Class 02 - See notes)	1/1/2023		\$25.97	\$19.46	\$45.43
Laborers (Class 02 - See notes)	1/1/2024		\$26.97	\$19.46	\$46.43
Laborers (Class 02 - See notes)	1/1/2025		\$27.47	\$19.96	\$47.43
Laborers (Class 02 - See notes)	1/1/2026		\$27.97	\$20.46	\$48.43
Laborers (Class 03 - See notes)	1/1/2023		\$28.97	\$19.46	\$48.43
Laborers (Class 03 - See notes)	1/1/2024		\$29.97	\$19.46	\$49.43
Laborers (Class 03 - See notes)	1/1/2025		\$30.47	\$19.96	\$50.43
Laborers (Class 03 - See notes)	1/1/2026		\$30.97	\$20.46	\$51.43
Laborers (Class 04 - See notes)	1/1/2021		\$23.57	\$19.32	\$42.89
Landscape Laborer (Skilled)	1/1/2020		\$21.64	\$16.98	\$38.62
Landscape Laborer (Skilled)	1/1/2023		\$23.79	\$18.28	\$42.07
Landscape Laborer (Skilled)	1/1/2024		\$24.79	\$18.53	\$43.32
Landscape Laborer (Skilled)	1/1/2025		\$25.79	\$18.78	\$44.57

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 23-07746 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Landscape Laborer (Skilled)	1/1/2026		\$26.79	\$19.03	\$45.82
Landscape Laborer (Tractor Operator)	1/1/2020		\$21.94	\$16.98	\$38.92
Landscape Laborer (Tractor Operator)	1/1/2023		\$24.09	\$18.28	\$42.37
Landscape Laborer (Tractor Operator)	1/1/2024		\$25.09	\$18.53	\$43.62
Landscape Laborer (Tractor Operator)	1/1/2025		\$26.09	\$18.78	\$44.87
Landscape Laborer (Tractor Operator)	1/1/2026		\$27.09	\$19.03	\$46.12
Landscape Laborer	1/1/2020		\$21.22	\$16.98	\$38.20
Landscape Laborer	1/1/2023		\$23.37	\$18.28	\$41.65
Landscape Laborer	1/1/2024		\$24.37	\$18.53	\$42.90
Landscape Laborer	1/1/2025		\$25.37	\$18.78	\$44.15
Landscape Laborer	1/1/2026		\$26.37	\$19.03	\$45.40
Millwright	6/1/2020		\$41.68	\$20.32	\$62.00
Operators (Class 01 - see notes)	6/1/2022		\$38.89	\$23.69	\$62.58
Operators (Class 01 - see notes)	6/1/2023		\$40.69	\$23.89	\$64.58
Operators (Class 01 - see notes)	6/1/2024		\$41.69	\$24.39	\$66.08
Operators (Class 02 -see notes)	6/1/2022		\$32.82	\$23.69	\$56.51
Operators (Class 02 -see notes)	6/1/2023		\$34.62	\$23.89	\$58.51
Operators (Class 02 -see notes)	6/1/2024		\$35.62	\$24.39	\$60.01
Operators (Class 03 - See notes)	6/1/2022		\$30.03	\$23.69	\$53.72
Operators (Class 03 - See notes)	6/1/2023		\$31.83	\$23.89	\$55.72
Operators (Class 03 - See notes)	6/1/2024		\$32.83	\$24.39	\$57.22
Painters Class 6 (see notes)	6/1/2022		\$29.50	\$22.82	\$52.32
Painters Class 6 (see notes)	6/1/2023		\$30.56	\$24.01	\$54.57
Painters Class 6 (see notes)	6/1/2024		\$32.14	\$24.93	\$57.07
Painters Class 6 (see notes)	6/1/2025		\$34.16	\$25.81	\$59.97
Pile Driver Divers (Building, Heavy, Highway)	1/1/2023		\$58.70	\$21.22	\$79.92
Pile Driver Divers (Building, Heavy, Highway)	1/1/2024		\$60.95	\$21.97	\$82.92
Pile Driver Divers (Building, Heavy, Highway)	1/1/2025		\$62.82	\$22.72	\$85.54
Pile Driver Divers (Building, Heavy, Highway)	1/1/2026		\$64.70	\$23.47	\$88.17
Piledrivers	1/1/2023		\$39.13	\$21.22	\$60.35
Piledrivers	1/1/2024		\$40.63	\$21.97	\$62.60
Piledrivers	1/1/2025		\$41.88	\$22.72	\$64.60
Piledrivers	1/1/2026		\$43.13	\$23.47	\$66.60
Plasterers	6/1/2022		\$31.44	\$19.74	\$51.18
Plasterers	6/1/2023		\$32.14	\$20.54	\$52.68
Plumbers and Steamfitters	6/1/2023		\$38.57	\$26.26	\$64.83
Pointers, Caulkers, Cleaners	12/1/2022		\$35.47	\$20.88	\$56.35
Roofers	6/1/2022		\$36.04	\$19.13	\$55.17
Roofers	6/1/2023		\$37.00	\$19.92	\$56.92
Sheet Metal Workers	7/1/2021		\$38.76	\$30.00	\$68.76
Sheet Metal Workers	7/1/2022		\$39.50	\$31.43	\$70.93
Sheet Metal Workers	8/1/2023		\$41.00	\$32.94	\$73.94
Sign Makers and Hangars	7/15/2022		\$30.54	\$24.35	\$54.89
Sign Makers and Hangars	7/15/2023		\$31.76	\$24.63	\$56.39

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 23-07746 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Sprinklerfitters	4/1/2023		\$44.33	\$28.04	\$72.37
Steamfitters	6/1/2022		\$44.15	\$27.32	\$71.47
Steamfitters	6/1/2023		\$46.10	\$28.37	\$74.47
Stone Masons	12/1/2022		\$38.56	\$23.61	\$62.17
Terrazzo Finisher	12/1/2022		\$36.13	\$18.03	\$54.16
Terrazzo Mechanics	12/1/2022		\$35.49	\$20.32	\$55.81
Tile Finisher	12/1/2022		\$28.76	\$17.34	\$46.10
Tile Setter	12/1/2022		\$35.64	\$21.81	\$57.45
Truckdriver class 1(see notes)	1/1/2023		\$33.18	\$22.21	\$55.39
Truckdriver class 1(see notes)	1/1/2024		\$34.93	\$22.71	\$57.64
Truckdriver class 1(see notes)	1/1/2025		\$36.43	\$23.21	\$59.64
Truckdriver class 1(see notes)	1/1/2026		\$37.93	\$23.71	\$61.64
Truckdriver class 2 (see notes)	1/1/2023		\$33.64	\$22.52	\$56.16
Truckdriver class 2 (see notes)	1/1/2024		\$35.39	\$23.02	\$58.41
Truckdriver class 2 (see notes)	1/1/2025		\$36.89	\$23.52	\$60.41
Truckdriver class 2 (see notes)	1/1/2026		\$38.39	\$24.02	\$62.41
Truckdriver class 3 (see notes)	1/1/2016		\$28.23	\$16.98	\$45.21
Window Film / Tint Installer	10/1/2019		\$25.00	\$2.63	\$27.63

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 23-07746 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Carpenter	1/1/2023		\$38.60	\$20.59	\$59.19
Carpenter	1/1/2024		\$40.10	\$21.34	\$61.44
Carpenter	1/1/2025		\$41.35	\$22.09	\$63.44
Carpenter	1/1/2026		\$42.60	\$22.84	\$65.44
Carpenter Welder	1/1/2023		\$40.10	\$20.59	\$60.69
Carpenter Welder	1/1/2024		\$41.60	\$21.34	\$62.94
Carpenter Welder	1/1/2025		\$42.85	\$22.09	\$64.94
Carpenter Welder	1/1/2026		\$44.10	\$22.84	\$66.94
Carpenters - Piledriver/Welder	1/1/2023		\$40.63	\$21.22	\$61.85
Carpenters - Piledriver/Welder	1/1/2024		\$42.13	\$21.97	\$64.10
Carpenters - Piledriver/Welder	1/1/2025		\$43.38	\$22.72	\$66.10
Carpenters - Piledriver/Welder	1/1/2026		\$44.63	\$23.47	\$68.10
Cement Finishers	1/1/2023		\$34.14	\$25.05	\$59.19
Cement Finishers	1/1/2024		\$35.14	\$26.30	\$61.44
Cement Finishers	1/1/2025		\$35.94	\$27.50	\$63.44
Cement Masons	1/1/2020		\$32.84	\$21.10	\$53.94
Electric Lineman	5/27/2019		\$47.38	\$26.30	\$73.68
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	6/1/2020		\$37.29	\$32.87	\$70.16
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	6/1/2023		\$38.89	\$35.02	\$73.91
Laborers (Class 01 - See notes)	1/1/2023		\$29.95	\$25.50	\$55.45
Laborers (Class 01 - See notes)	1/1/2024		\$32.20	\$25.50	\$57.70
Laborers (Class 01 - See notes)	1/1/2025		\$33.70	\$26.00	\$59.70
Laborers (Class 01 - See notes)	1/1/2026		\$34.70	\$27.00	\$61.70
Laborers (Class 02 - See notes)	1/1/2023		\$30.11	\$25.50	\$55.61
Laborers (Class 02 - See notes)	1/1/2024		\$32.36	\$25.50	\$57.86
Laborers (Class 02 - See notes)	1/1/2025		\$33.86	\$26.00	\$59.86
Laborers (Class 02 - See notes)	1/1/2026		\$34.86	\$27.00	\$61.86
Laborers (Class 03 - See notes)	1/1/2023		\$30.50	\$25.50	\$56.00
Laborers (Class 03 - See notes)	1/1/2024		\$32.75	\$25.50	\$58.25
Laborers (Class 03 - See notes)	1/1/2025		\$34.25	\$26.00	\$60.25
Laborers (Class 03 - See notes)	1/1/2026		\$35.25	\$27.00	\$62.25
Laborers (Class 04 - See notes)	1/1/2023		\$30.95	\$25.50	\$56.45
Laborers (Class 04 - See notes)	1/1/2024		\$33.20	\$25.50	\$58.70
Laborers (Class 04 - See notes)	1/1/2025		\$34.70	\$26.00	\$60.70
Laborers (Class 04 - See notes)	1/1/2026		\$35.70	\$27.00	\$62.70
Laborers (Class 05 - See notes)	1/1/2023		\$31.36	\$25.50	\$56.86
Laborers (Class 05 - See notes)	1/1/2024		\$33.61	\$25.50	\$59.11
Laborers (Class 05 - See notes)	1/1/2025		\$35.11	\$26.00	\$61.11
Laborers (Class 05 - See notes)	1/1/2026		\$36.11	\$27.00	\$63.11
Laborers (Class 06 - See notes)	1/1/2023		\$28.20	\$25.50	\$53.70
Laborers (Class 06 - See notes)	1/1/2024		\$30.45	\$25.50	\$55.95
Laborers (Class 06 - See notes)	1/1/2025		\$31.95	\$26.00	\$57.95
Laborers (Class 06 - See notes)	1/1/2026		\$32.95	\$27.00	\$59.95

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 23-07746 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Laborers (Class 07 - See notes)	1/1/2023		\$30.95	\$25.50	\$56.45
Laborers (Class 07 - See notes)	1/1/2024		\$33.20	\$25.50	\$58.70
Laborers (Class 07 - See notes)	1/1/2025		\$34.70	\$26.00	\$60.70
Laborers (Class 07 - See notes)	1/1/2026		\$35.70	\$27.00	\$62.70
Laborers (Class 08 - See notes)	1/1/2023		\$32.45	\$25.50	\$57.95
Laborers (Class 08 - See notes)	1/1/2024		\$34.70	\$25.50	\$60.20
Laborers (Class 08 - See notes)	1/1/2025		\$36.20	\$26.00	\$62.20
Laborers (Class 08 - See notes)	1/1/2026		\$37.20	\$27.00	\$64.20
Millwright	6/1/2020		\$41.68	\$20.32	\$62.00
Millwright	6/1/2023		\$45.50	\$23.72	\$69.22
Millwright	6/1/2024		\$47.59	\$23.72	\$71.31
Millwright	6/1/2025		\$49.72	\$23.72	\$73.44
Operators (Class 01 - see notes)	1/1/2023		\$36.79	\$23.58	\$60.37
Operators (Class 01 - see notes)	1/1/2024		\$38.59	\$24.03	\$62.62
Operators (Class 01 - see notes)	1/1/2025		\$40.39	\$24.23	\$64.62
Operators (Class 02 -see notes)	1/1/2023		\$36.53	\$23.58	\$60.11
Operators (Class 02 -see notes)	1/1/2024		\$38.33	\$24.03	\$62.36
Operators (Class 02 -see notes)	1/1/2025		\$40.13	\$24.23	\$64.36
Operators (Class 03 - See notes)	1/1/2023		\$32.88	\$23.58	\$56.46
Operators (Class 03 - See notes)	1/1/2024		\$34.68	\$24.03	\$58.71
Operators (Class 03 - See notes)	1/1/2025		\$36.48	\$24.23	\$60.71
Operators (Class 04 - See notes)	1/1/2023		\$32.42	\$23.58	\$56.00
Operators (Class 04 - See notes)	1/1/2024		\$34.22	\$24.03	\$58.25
Operators (Class 04 - See notes)	1/1/2025		\$36.02	\$24.23	\$60.25
Operators (Class 05 - See notes)	1/1/2023		\$32.17	\$23.58	\$55.75
Operators (Class 05 - See notes)	1/1/2024		\$33.97	\$24.03	\$58.00
Operators (Class 05 - See notes)	1/1/2025		\$35.77	\$24.23	\$60.00
Operators Class 1-A	1/1/2023		\$39.79	\$23.58	\$63.37
Operators Class 1-A	1/1/2024		\$41.59	\$24.03	\$65.62
Operators Class 1-A	1/1/2025		\$43.39	\$24.23	\$67.62
Operators Class 1-B	1/1/2023		\$38.79	\$23.58	\$62.37
Operators Class 1-B	1/1/2024		\$40.59	\$24.03	\$64.62
Operators Class 1-B	1/1/2025		\$42.39	\$24.23	\$66.62
Painters Class 1 (see notes)	6/1/2022		\$34.45	\$22.82	\$57.27
Painters Class 2 (see notes)	6/1/2019		\$35.25	\$20.06	\$55.31
Painters Class 2 (see notes)	6/1/2023		\$36.01	\$24.01	\$60.02
Painters Class 2 (see notes)	6/1/2024		\$38.09	\$24.93	\$63.02
Painters Class 2 (see notes)	6/1/2025		\$40.36	\$25.81	\$66.17
Painters Class 3 (see notes)	6/1/2022		\$36.77	\$22.82	\$59.59
Painters Class 3 (see notes)	6/1/2023		\$38.33	\$24.01	\$62.34
Painters Class 3 (see notes)	6/1/2024		\$40.66	\$24.93	\$65.59
Painters Class 3 (see notes)	6/1/2025		\$43.69	\$25.81	\$69.50
Painters Class 4 (see notes)	6/1/2019		\$28.20	\$20.06	\$48.26
Painters Class 5 (see notes)	6/1/2019		\$22.91	\$20.06	\$42.97

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 23-07746 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Pile Driver Divers (Building, Heavy, Highway)	1/1/2023		\$58.70	\$21.22	\$79.92
Pile Driver Divers (Building, Heavy, Highway)	1/1/2024		\$60.95	\$21.97	\$82.92
Pile Driver Divers (Building, Heavy, Highway)	1/1/2025		\$62.82	\$22.72	\$85.54
Pile Driver Divers (Building, Heavy, Highway)	1/1/2026		\$64.70	\$23.47	\$88.17
Piledrivers	1/1/2023		\$39.13	\$21.22	\$60.35
Piledrivers	1/1/2024		\$40.63	\$21.97	\$62.60
Piledrivers	1/1/2025		\$41.88	\$22.72	\$64.60
Piledrivers	1/1/2026		\$43.13	\$23.47	\$66.60
Steamfitters (Heavy and Highway - Gas Distribution)	5/1/2022		\$48.43	\$40.28	\$88.71
Truckdriver class 1(see notes)	1/1/2023		\$33.18	\$22.21	\$55.39
Truckdriver class 1(see notes)	1/1/2024		\$34.93	\$22.71	\$57.64
Truckdriver class 1(see notes)	1/1/2025		\$36.43	\$23.21	\$59.64
Truckdriver class 1(see notes)	1/1/2026		\$37.93	\$23.71	\$61.64
Truckdriver class 2 (see notes)	1/1/2023		\$33.64	\$22.52	\$56.16
Truckdriver class 2 (see notes)	1/1/2024		\$35.39	\$23.02	\$58.41
Truckdriver class 2 (see notes)	1/1/2025		\$36.89	\$23.52	\$60.41
Truckdriver class 2 (see notes)	1/1/2026		\$38.39	\$24.02	\$62.41
Truckdriver class 3 (see notes)	1/1/2019		\$29.59	\$19.82	\$49.41

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 010000 - GENERAL REQUIREMENTS

PART 1 - GENERAL (Not Used)

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 010000

SECTION 010100 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Work covered by the Contract Documents.
 - 2. Work phases.
 - 3. Use of premises.
 - 4. Specification formats and conventions.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Greensburg Salem School District “HVAC Upgrades at Three Schools”
 - 1. Project Locations:
 - a. High School: 65 Mennel Drive, Greensburg, PA 15601
 - b. Nicely Elementary: 55 Mclaughlin Drive, Greensburg, PA 15601
 - c. Metzgar Elementary: 140 CC Hall Drive, New Alexandria, PA 15670
- B. Owner: Greensburg Salem School District
 - 1. Greensburg Salem School District, 1 Academy Hill Place, Greensburg, PA 15601. #724-832-2901
- C. Architect/Engineer: Civil & Environmental Consultants Inc. and Allen Shariff Engineers
- D. The Work consists of the following:
 - 1. The project is for HVAC upgrades to three schools.
 - 2. Project will be constructed under a multi-prime contract. Contract will be for Mechanical Construction and Electrical Construction.

1.3 WORK SEQUENCE

- 1. All work shall be conducted in a single phase, as indicated on the Drawings and elsewhere in the Contract Documents. Milestone dates include.
 - a. AWARD CONTRACTS: OCTOBER 24, 2023
 - b. START CONSTRUCTION: OCTOBER 30, 2023
 - c. FINAL COMPLETION: OCTOBER 31, 2024

The work shall be conducted in the phases shown above and shall be in compliance with the milestone dates listed. Any deviation from these phases or the work and milestone dates included in each phase shall be subject to approval of the Owner.

- Work in the building shall be performed in a sequence to ensure that all building systems are systematically installed in an efficient manner. The mechanical and electrical rooms shall be constructed in an early sequence to permit rough-in.
- All work must be completed in a sequence approved by the Owner and Architect.
- The General Construction Contractor shall be the coordinating contractor among the sub-contractors for the project. All other sub-contractors shall cooperate and coordinate their work with the General Construction Contractor.
- Work not properly coordinated with the General Construction Contractor and within the design intent shall be reinstalled by the respective sub-contractor including all associated work at no additional cost to the Owner.
- Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.

1.4 USE OF PREMISES

- A. General: Contractor shall have full use of premises for construction operations, including use of Project site, during construction period. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Use of Site: Limit use of premises to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1.5 OWNER'S OCCUPANCY REQUIREMENTS

- A. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial 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 before Owner occupancy.
 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
 3. Before partial 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 building.
 4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

1.6 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 48-division format and CSI/CSC's "MasterFormat" numbering system.
 - 1. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.
- B. 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. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 010100

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Unit-cost allowances.
 - 3. Contingency allowances.
- C. Related Requirements:
 - 1. Section 012200 "Unit Prices" for procedures for using unit prices.
 - 2. Section 014000 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

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 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.4 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. 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.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.6 LUMP-SUM AND UNIT-COST 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.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.7 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.8 TESTING AND INSPECTING ALLOWANCES

- A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.
- B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.
- C. Costs of services not required by the Contract Documents are not included in the allowance.

- D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.9 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: Lump-Sum Allowance: Include the sum of \$5,000 (Five thousand dollars and zero cents). This allowance is for the anticipated Building Permit costs as indicated in Section 011000 "Summary".
1. This allowance includes material cost of the building permit only.
 2. This allowance is not for inspections or other fees from the Building Department, these fees are the responsibility of the General Contractor.
 3. This allowance is for the HVAC and Electrical contractor permits that may be required and which are the responsibility of the respective trade for which should be included in the Contract Sum for their portion of the work.
 4. Any unused amount from this Allowance shall be credited back to the Owner at Project Closeout.

END OF SECTION 012100

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include, as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation, whether or not indicated as part of alternate.
- B. Execute accepted alternates under the same conditions as other Work of the Contract.
- C. Schedule: A Part 3 "Schedule of Alternates" Article is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 01: High School split system replacement associated with the unit serving the storage rooms that are plan south below the media rooms and woodworking areas
 - 1. Base Bid: No work to the split system.
 - 2. Alternate: Mechanical and electrical contractor to provide cost to replace the split system that is not currently working in this area.

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

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.

1.3 ACTION 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.
 - 1. Substitution Request Form: Use CSI Form 13.1A.
 - 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 revisions 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 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.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - 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 a qualified testing agency to perform compatibility tests recommended by manufacturers.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on 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:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.

- b. Requested substitution provides sustainable design characteristics that specified product provided.
 - 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.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 30 days after the Notice to Proceed.
- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
 - 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. Requested substitution provides sustainable design characteristics that specified product provided.
 - 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 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

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, on AIA Document G710, "Architect's Supplemental Instructions."

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. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 10 days, when not otherwise specified, 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 forms acceptable to Architect.
- B. Contractor-Initiated Work Change 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 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Work Change Proposal Request Form: Use form acceptable to Architect.

1.4 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. 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 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.2 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate 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 at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - a. Architect will not review or certify initial Application for Payment until schedule of values has been submitted and approved by Architect.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 - 2. Arrange schedule of values consistent with format of AIA Document G703.

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
8. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Submittal schedule (preliminary if not final).
 5. List of Contractor's staff assignments.
 6. List of Contractor's principal consultants.
 7. Copies of building permits.
 8. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 9. Initial progress report.
 10. Report of preconstruction conference.
 11. Certificates of insurance and insurance policies.
- H. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- I. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706-1994, "Contractor's Affidavit of Payment of Debts and Claims."
 5. AIA Document G706A-1994, "Contractor's Affidavit of Release of Liens."
 6. AIA Document G707-1994, "Consent of Surety to Final Payment."

7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

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. Coordination drawings.
 - 2. Requests for Information (RFIs).
 - 3. Project Web site.
 - 4. Project meetings.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

- A. 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.

1.4 GENERAL COORDINATION PROCEDURES

- 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. 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.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities 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.

1.5 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to 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. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid.

2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility.

1.6 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.
- C. RFI Forms: AIA Document G716.

- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow 10 working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. Incomplete RFIs or inaccurately prepared RFIs.
 - g. RFI's that do not include a suggested solution from the contractor or sub-contractor that generated the RFI.
 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 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 5 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log bi-weekly. Software log with not less than the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect.
 4. RFI number including RFIs that were dropped and not submitted.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's response was received.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within five days if Contractor disagrees with response.
1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

1.7 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 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 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 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. Sustainable design requirements.
 - l. Preparation of record documents.
 - m. Use of the premises and existing building.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Procedures for moisture and mold control.
 - s. Procedures for disruptions and shutdowns.
 - t. Construction waste management and recycling.
 - u. Parking availability.
 - v. Office, work, and storage areas.
 - w. Equipment deliveries and priorities.
 - x. First aid.
 - y. Security.
 - z. 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 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:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Sustainable design requirements.
 - i. Review of mockups.
 - j. Possible conflicts.
 - k. Compatibility problems.
 - l. Time schedules.
 - m. Weather limitations.
 - n. Manufacturer's written instructions.
 - o. Warranty requirements.
 - p. Compatibility of materials.
 - q. Acceptability of substrates.
 - r. Temporary facilities and controls.
 - s. Space and access limitations.
 - t. Regulations of authorities having jurisdiction.
 - u. Testing and inspecting requirements.
 - v. Installation procedures.
 - w. Coordination with other work.
 - x. Required performance results.
 - y. Protection of adjacent work.
 - z. 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 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) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) 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 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
1. Contractor's construction schedule.
 2. Construction schedule updating reports.
 3. Daily construction reports.
 4. Site condition reports.

1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 2. Predecessor Activity: An activity that precedes another activity in the network.
 3. Successor Activity: An activity that follows another activity in the network.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Float: The measure of leeway in starting and completing an activity.
1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
1. Working electronic copy of schedule file, where indicated.
 2. PDF electronic file.
- B. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
- D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 - 3. Total Float Report: List of all activities sorted in ascending order of total float.
 - 4. Earnings Report: Compilation of Contractor's total earnings from commencement of the Work until most recent Application for Payment.
- E. Construction Schedule Updating Reports: Submit with Applications for Payment.
- F. Daily Construction Reports: Submit at monthly intervals.
- G. Site Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

- A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.

2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 3. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 5. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 4. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 5. Work Stages: Indicate important stages of construction for each major portion of the Work.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
- E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
 2. Unanswered Requests for Information.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
 5. Pending modifications affecting the Work and Contract Time.
- F. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule.

- G. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 30 days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.
 - 3. Approximate count of personnel at Project site.
 - 4. Equipment at Project site.
 - 5. Material deliveries.
 - 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 - 7. Accidents.
 - 8. Meetings and significant decisions.
 - 9. Unusual events.
 - 10. Stoppages, delays, shortages, and losses.
 - 11. Meter readings and similar recordings.
 - 12. Emergency procedures.
 - 13. Orders and requests of authorities having jurisdiction.
 - 14. Change Orders received and implemented.
 - 15. Construction Change Directives received and implemented.
 - 16. Services connected and disconnected.
 - 17. Equipment or system tests and startups.
 - 18. Partial completions and occupancies.
 - 19. Substantial Completions authorized.
- B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule three days before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate final completion percentage for each activity.

- B. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Periodic construction photographs.
- B. Related Requirements:
 - 1. Section 017700 "Closeout Procedures" for submitting photographic documentation as Project Record Documents at Project closeout.

1.2 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.
- B. Digital Photographs: Submit unaltered, original, full-size image files within three days of taking photographs.
 - 1. Digital Camera: Minimum sensor resolution of 8 megapixels.
 - 2. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Date photograph was taken.
 - d. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in JPG format, with minimum size of 8 megapixels.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

- A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 - 1. Date and Time: Include date and time in file name for each image.
 - 2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect.
- C. Preconstruction Photographs: Before starting construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.
 - 1. Flag construction limits before taking construction photographs.
 - 2. Take 20 photographs to show existing conditions adjacent to property before starting the Work.
 - 3. Take 20 photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
- D. Periodic Construction Photographs: Take 20 photographs weekly, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.
 - 1. Areas to be photographed include, but are not limited to:
 - a. Mechanical chased prior to be closed up
 - b. Underground utility installations prior to being backfilled
- E. Final Completion Construction Photographs: Take 20 color photographs after date of Substantial Completion for submission as Project Record Documents. Architect will inform photographer of desired vantage points.

END OF SECTION 013233

SECTION 013300 - SUBMITTAL PROCEDURES

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 Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 2. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 4. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

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 revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. See Evaluations for cautions on use of Architect's digital data files, in "Architect's Digital Data Files" Paragraph below, for submittals.
 - 1. Architect may, at Architect's discretion furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings for a stipulated, per Drawing/Sheet fee.

- a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - b. Contractor shall execute a data licensing agreement in the form of Agreement included in Project Manual.
 - c. No Electronic Data will be transferred until fees outlined in the Agreement are paid by the Contractor.
- 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. 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 reserves 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 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. Submittals received after 1:00 pm shall be considered as received the following day.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect 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.
- D. Paper Submittals: Place a permanent label or title block on each 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 on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 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., 061000.01). 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.
4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
- a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.
- a. Transmittal Form for Paper Submittals: Use AIA Document G810 (or other format approved for use by Architect prior to initial submittal).
 - b. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
 - 1) Project name.
 - 2) Date.
 - 3) Destination (To:).
 - 4) Source (From:).
 - 5) Name and address of Architect.
 - 6) Name of Construction Manager.
 - 7) Name of Contractor.
 - 8) Name of firm or entity that prepared submittal.
 - 9) Names of subcontractor, manufacturer, and supplier.
 - 10) Category and type of submittal.
 - 11) Submittal purpose and description.
 - 12) Specification Section number and title.
 - 13) Specification paragraph number or drawing designation and generic name for each of multiple items.
 - 14) Drawing number and detail references, as appropriate.
 - 15) Indication of full or partial submittal.
 - 16) Transmittal number.
 - 17) Submittal and transmittal distribution record.
 - 18) Remarks.
 - 19) Signature of transmitter.
- E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
 4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Architect, containing the following information:
 - 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. Names of subcontractor, manufacturer, and supplier.
 - h. Category and type of submittal.
 - i. Submittal purpose and description.
 - j. Specification Section number and title.
 - k. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - l. Drawing number and detail references, as appropriate.
 - m. Location(s) where product is to be installed, as appropriate.
 - n. Related physical samples submitted directly.
 - o. Indication of full or partial submittal.
 - p. Transmittal number.
 - q. Submittal and transmittal distribution record.
 - r. Other necessary identification.
 - s. Remarks.
- F. Options: Identify options requiring selection by Architect.
- G. Deviations: Identify deviations from the Contract Documents on submittals.
- H. 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 action stamp.
- I. 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.
- J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

- K. Email Requirements: Clearly label all subject lines with Project Name and submittal number and naming for ease of tracking and searching of electronic submittal submissions.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements:

1. Submit electronic submittals via email as PDF electronic files.
 - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
2. Action Submittals: If submitting paper copies, submit three paper copies of each submittal unless otherwise indicated. Architect will return two copies.
3. Informational Submittals: If submitting paper copies submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
4. 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.

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.
- 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.
 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, but no larger than 30 by 42 inches.
 3. Retain subparagraph below unless default submittal format specified elsewhere in this article applies.
 4. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
 - b. 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.
 5. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 6. 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.
 7. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
 8. 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 not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

9. 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 one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
10. 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 three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
 - 1) 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.
- D. 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. Submit product schedule in the following format:
 - a. PDF electronic file.
- E. Coordination Drawings Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."
- F. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
- G. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- H. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."
- I. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
- J. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."

- 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.
- L. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- 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 that 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.
- T. Schedule of Tests and Inspections: Comply with requirements specified in Section 014000 "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 written 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. 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 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.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "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 ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

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. 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.
 - 2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
 - 3. Specific test and inspection requirements are not specified in this Section.

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.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

- E. 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.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. 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(s).
- J. 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 INFORMATIONAL SUBMITTALS

- A. 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 Architect.

2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.

- B. 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.

1.5 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.
7. Identification of product and Specification Section.
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 Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
5. Other required items indicated in individual Specification Sections.

- C. 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.

1.6 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 in material, design, and extent to those indicated for this Project.
- 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 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. **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. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.

- d. When testing is complete, remove test specimens, assemblies, and mockups; 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 Architect, 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.
- J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 6. Demolish and remove mockups when directed unless otherwise indicated.
- K. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Specification Sections.

1.7 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. 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. 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.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. 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 manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. 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.
- E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect 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.
- F. 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.

- G. 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.

1.8 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Conducted by a qualified testing agency or special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections and in Statement of Special Inspections listed in the Contract Drawings, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect 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 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 TEST AND INSPECTION LOG

- A. Test and Inspection Log: 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 revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 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 017300 "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 014000

SECTION 014200 - REFERENCES

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": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- 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 Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
 1. AABC - Associated Air Balance Council; www.aabc.com.
 2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
 3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
 4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
 5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
 6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
 7. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org.
 8. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
 9. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
 10. AF&PA - American Forest & Paper Association; www.afandpa.org.
 11. AGA - American Gas Association; www.aga.org.
 12. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
 13. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
 14. AI - Asphalt Institute; www.asphaltinstitute.org.
 15. AIA - American Institute of Architects (The); www.aia.org.
 16. AISC - American Institute of Steel Construction; www.aisc.org.
 17. AISI - American Iron and Steel Institute; www.steel.org.
 18. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
 19. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
 20. ANSI - American National Standards Institute; www.ansi.org.
 21. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
 22. APA - APA - The Engineered Wood Association; www.apawood.org.
 23. APA - Architectural Precast Association; www.archprecast.org.
 24. API - American Petroleum Institute; www.api.org.
 25. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
 26. ARI - American Refrigeration Institute; (See AHRI).
 27. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
 28. ASCE - American Society of Civil Engineers; www.asce.org.
 29. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
 30. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
 31. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
 32. ASSE - American Society of Safety Engineers (The); www.asse.org.
 33. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.

34. ASTM - ASTM International; (American Society for Testing and Materials International); www.astm.org.
35. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
36. AWEA - American Wind Energy Association; www.awea.org.
37. AWI - Architectural Woodwork Institute; www.awinet.org.
38. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
39. AWPA - American Wood Protection Association; (Formerly: American Wood-Preservers' Association); www.awpa.com.
40. AWS - American Welding Society; www.aws.org.
41. AWWA - American Water Works Association; www.awwa.org.
42. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
43. BIA - Brick Industry Association (The); www.gobrick.com.
44. BICSI - BICSI, Inc.; www.bicsi.org.
45. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.com.
46. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
47. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bwfbadminton.org.
48. CDA - Copper Development Association; www.copper.org.
49. CEA - Canadian Electricity Association; www.electricity.ca.
50. CEA - Consumer Electronics Association; www.ce.org.
51. CFFA - Chemical Fabrics & Film Association, Inc.; www.chemicalfabricsandfilm.com.
52. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
53. CGA - Compressed Gas Association; www.cganet.com.
54. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
55. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
56. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
57. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
58. CPA - Composite Panel Association; www.pbmdf.com.
59. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
60. CRRC - Cool Roof Rating Council; www.coolroofs.org.
61. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
62. CSA - Canadian Standards Association; www.csa.ca.
63. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
64. CSI - Construction Specifications Institute (The); www.csinet.org.
65. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
66. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
67. CWC - Composite Wood Council; (See CPA).
68. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
69. DHI - Door and Hardware Institute; www.dhi.org.
70. ECA - Electronic Components Association; (See ECIA).
71. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
72. ECIA ? Electronic Components Industry Association; www.eciaonline.org.
73. EIA - Electronic Industries Alliance; (See TIA).
74. EIMA - EIFS Industry Members Association; www.eima.com.
75. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
76. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
77. ESTA - Entertainment Services and Technology Association; (See PLASA).
78. EVO - Efficiency Valuation Organization; www.evo-world.org.

79. FIBA - Fédération Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
80. FIVB - Fédération Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
81. FM Approvals - FM Approvals LLC; www.fmglobal.com.
82. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
83. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridarooft.com.
84. FSA - Fluid Sealing Association; www.fluidsealing.com.
85. FSC - Forest Stewardship Council U.S.; www.fscus.org.
86. GA - Gypsum Association; www.gypsum.org.
87. GANA - Glass Association of North America; www.glasswebsite.com.
88. GS - Green Seal; www.greenseal.org.
89. HI - Hydraulic Institute; www.pumps.org.
90. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
91. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
92. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
93. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
94. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
95. IAS - International Accreditation Service; www.iasonline.org.
96. IAS - International Approval Services; (See CSA).
97. ICBO - International Conference of Building Officials; (See ICC).
98. ICC - International Code Council; www.iccsafe.org.
99. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
100. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
101. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
102. IEC - International Electrotechnical Commission; www.iec.ch.
103. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
104. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
105. IESNA - Illuminating Engineering Society of North America; (See IES).
106. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
107. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
108. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
109. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
110. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
111. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
112. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
113. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
114. ISO - International Organization for Standardization; www.iso.org.
115. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
116. ITU - International Telecommunication Union; www.itu.int/home.
117. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
118. LMA - Laminating Materials Association; (See CPA).
119. LPI - Lightning Protection Institute; www.lightning.org.
120. MBMA - Metal Building Manufacturers Association; www.mbma.com.
121. MCA - Metal Construction Association; www.metalconstruction.org.

122. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
123. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
124. MHIA - Material Handling Industry of America; www.mhia.org.
125. MIA - Marble Institute of America; www.marble-institute.com.
126. MMPA - Moulding & Millwork Producers Association; (Formerly: Wood Moulding & Millwork Producers Association); www.wmmpa.com.
127. MPI - Master Painters Institute; www.paintinfo.com.
128. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
129. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
130. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
131. NADCA - National Air Duct Cleaners Association; www.nadca.com.
132. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
133. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
134. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
135. NCMA - National Concrete Masonry Association; www.ncma.org.
136. NEBB - National Environmental Balancing Bureau; www.nebb.org.
137. NECA - National Electrical Contractors Association; www.necanet.org.
138. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
139. NEMA - National Electrical Manufacturers Association; www.nema.org.
140. NETA - InterNational Electrical Testing Association; www.netaworld.org.
141. NFHS - National Federation of State High School Associations; www.nfhs.org.
142. NFPA - NFPA; (National Fire Protection Association); www.nfpa.org.
143. NFPA - NFPA International; (See NFPA).
144. NFRC - National Fenestration Rating Council; www.nfrc.org.
145. NHLA - National Hardwood Lumber Association; www.nhla.com.
146. NLGA - National Lumber Grades Authority; www.nlga.org.
147. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
148. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
149. NRCA - National Roofing Contractors Association; www.nrca.net.
150. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
151. NSF - NSF International; (National Sanitation Foundation International); www.nsf.org.
152. NSPE - National Society of Professional Engineers; www.nspe.org.
153. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
154. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
155. NWFA - National Wood Flooring Association; www.nwfa.org.
156. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
157. PDI - Plumbing & Drainage Institute; www.pdionline.org.
158. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
159. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
160. RFCI - Resilient Floor Covering Institute; www.rfci.com.
161. RIS - Redwood Inspection Service; www.redwoodinspection.com.
162. SAE - SAE International; (Society of Automotive Engineers); www.sae.org.
163. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
164. SDI - Steel Deck Institute; www.sdi.org.
165. SDI - Steel Door Institute; www.steeldoor.org.
166. SEFA - Scientific Equipment and Furniture Association; www.sefalabs.com.

167. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
168. SIA - Security Industry Association; www.siaonline.org.
169. SJI - Steel Joist Institute; www.steeljoist.org.
170. SMA - Screen Manufacturers Association; www.smainfo.org.
171. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
172. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
173. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
174. SPIB - Southern Pine Inspection Bureau; www.spib.org.
175. SPRI - Single Ply Roofing Industry; www.spri.org.
176. SRCC - Solar Rating and Certification Corporation; www.solar-rating.org.
177. SSINA - Specialty Steel Industry of North America; www.ssina.com.
178. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
179. STI - Steel Tank Institute; www.steeltank.com.
180. SWI - Steel Window Institute; www.steelwindows.com.
181. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
182. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
183. TCNA - Tile Council of North America, Inc.; (Formerly: Tile Council of America); www.tileusa.com.
184. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
185. TIA - Telecommunications Industry Association; (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
186. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
187. TMS - The Masonry Society; www.masonrysociety.org.
188. TPI - Truss Plate Institute; www.tpinst.org.
189. TPI - Turfgrass Producers International; www.turfgrasssod.org.
190. TRI - Tile Roofing Institute; (Formerly: National Tile Roofing Manufacturing Association); www.tilerroofing.org.
191. UBC - Uniform Building Code; (See ICC).
192. UL - Underwriters Laboratories Inc.; www.ul.com.
193. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
194. USAV - USA Volleyball; www.usavolleyball.org.
195. USGBC - U.S. Green Building Council; www.usgbc.org.
196. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
197. WASTEC - Waste Equipment Technology Association; www.wastec.org.
198. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
199. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
200. WDMA - Window & Door Manufacturers Association; www.wdma.com.
201. WI - Woodwork Institute; (Formerly: WIC - Woodwork Institute of California); www.wicnet.org.
202. WMMPA - Wood Moulding & Millwork Producers Association; (See MMPA).
203. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
204. WPA - Western Wood Products Association; www.wwpa.org.

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

1. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
 2. ICC - International Code Council; www.iccsafe.org.
 3. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.
- D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
1. COE - Army Corps of Engineers; www.usace.army.mil.
 2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
 3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
 4. DOD - Department of Defense; <http://dodssp.daps.dla.mil>.
 5. DOE - Department of Energy; www.energy.gov.
 6. EPA - Environmental Protection Agency; www.epa.gov.
 7. FAA - Federal Aviation Administration; www.faa.gov.
 8. FG - Federal Government Publications; www.gpo.gov.
 9. GSA - General Services Administration; www.gsa.gov.
 10. HUD - Department of Housing and Urban Development; www.hud.gov.
 11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; <http://eetd.lbl.gov>.
 12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
 13. SD - Department of State; www.state.gov.
 14. TRB - Transportation Research Board; National Cooperative Highway Research Program; www.trb.org.
 15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
 16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
 17. USDJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
 18. USP - U.S. Pharmacopeia; www.usp.org.
 19. USPS - United States Postal Service; www.usps.com.
- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list.
1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
 2. DOD - Department of Defense; Military Specifications and Standards; Available from Department of Defense Single Stock Point; <http://dodssp.daps.dla.mil>.
 3. DSCC - Defense Supply Center Columbus; (See FS).
 4. FED-STD - Federal Standard; (See FS).
 5. FS - Federal Specification; Available from Department of Defense Single Stock Point; <http://dodssp.daps.dla.mil>.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.

6. MILSPEC - Military Specification and Standards; (See DOD).
 7. USAB - United States Access Board; www.access-board.gov.
 8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).
- F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic Appliance and Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
 2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
 3. CDHS; California Department of Health Services; (See CDPH).
 4. CDPH; California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
 5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
 6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
 7. TFS; Texas Forest Service; Forest Resource Development and Sustainable Forestry; <http://txforests-service.tamu.edu>.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "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, testing agencies, and authorities having jurisdiction.
- B. 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.
- C. 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 INFORMATIONAL 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. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire prevention program.

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 and ICC/ANSI A117.1.

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. Portable 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 and bottom rails. Provide concrete bases for supporting posts.

2.2 TEMPORARY FACILITIES

- A. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

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.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."
- 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: 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.
- D. 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.
- E. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- F. 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.
 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. Contractor's emergency after-hours telephone number.
 - e. Architect's office.
 - f. Engineers' offices.
 - g. Owner's office.
 - h. Principal subcontractors' field and home offices.
 3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

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 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. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Section 312000 "Earth Moving."
 3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
 4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Section 321216 "Asphalt Paving."
- C. 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.
- D. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- E. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
1. Identification Signs: Provide Project identification signs.
 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.
- F. 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 progress cleaning requirements in Section 017300 "Execution."
- G. 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. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. 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.
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings.
- D. 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.
- E. 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. Perform control operations lawfully, using environmentally safe materials.
- F. 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.
- G. 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.
- H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- I. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- J. 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.

3.5 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. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. 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. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

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 Requirements:
 - 1. Section 012500 "Substitution Procedures" for requests for substitutions.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased 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, that is 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 ACTION 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. 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 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 013300 "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 013300 "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.

1.5 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. Protect 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.

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 other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "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.
 - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- B. Product Selection Procedures:
 - 1. Product: Where Specifications name a single manufacturer and product, Contractor shall treat that manufacturer or product listing as a "Basis of Design" only. Contractor is permitted to furnish the named manufacturer or product or to follow requirements listed in "Basis-of-Design Product" paragraph below.

2. Products:
 - a. 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.
 3. Manufacturers:
 - a. 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.
 4. 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 012500 "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 016000

SECTION 017300 - EXECUTION

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:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.

- B. Related Requirements:
 - 1. Section 011000 "Summary" for limits on use of Project site.
 - 2. Section 017700 "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 INFORMATIONAL SUBMITTALS

- A. Certificates: Submit certificate signed by professional engineer certifying that location and elevation of improvements comply with requirements.
- B. Certified Surveys: Submit two copies signed by land surveyor.
- C. 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. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and

- patch structural elements in a manner that could change their load-carrying capacity or increase deflection
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

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, 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. 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 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 Contractor, submit a request for information to Architect according to requirements in Section 013100 "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 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 limits on use of Project site.
 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 4. Inform installers of lines and levels to which they must comply.
 5. Check the location, level and plumb, of every major element as the Work progresses.
 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.

7. 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.

3.4 FIELD ENGINEERING

- A. 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.
- B. 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.
- C. 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.
- D. 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. 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. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. 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.
- H. 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.
- I. 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.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 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 (27 deg C).
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- 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.
- 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 014000 "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.

END OF SECTION 017300

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Section 024119 "Selective Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements.
 - 2. Section 311000 "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

1.2 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 - 2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until installation.
 - 4. Protect items from damage during transport and storage.
 - 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Owner's Use:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Procedures: Separate recyclable waste from other waste materials, trash, and debris.
 - 1. Provide appropriately marked containers or bins for controlling co-mingled recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

- A. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 - 1. Clean and stack undamaged, whole masonry units on wood pallets.
- B. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- C. Metals: Separate metals by type.
 - 1. Structural Steel: Stack members according to size, type of member, and length.
 - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- D. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- E. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- F. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- G. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- H. Carpet: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 - 1. Store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.

- I. Carpet Tile: Remove debris, trash, and adhesive.
 - 1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- J. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- K. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
 - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION 017419

SECTION 017700 - CLOSEOUT PROCEDURES

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.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 013233 "Photographic Documentation" for submitting final completion construction photographic documentation.
 - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.2 ACTION 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.

1.3 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.5 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 and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 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 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. 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 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 10 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. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
 - 6. Advise Owner of changeover in heat and other utilities.
 - 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 - 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 9. Complete final cleaning requirements, including touchup painting.

10. 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 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect 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.

1.6 FINAL COMPLETION PROCEDURES

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."

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 and warranty.

5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, Architect 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.

1.7 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 and proceeding from lowest floor to highest floor.

2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file. Architect will return annotated copy.

1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: 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, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 1. Bind warranties and bonds 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. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- C. 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.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

- 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 designated 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. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - p. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.

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 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 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

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.

1.2 CLOSEOUT 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. Architect will comment on whether content of operations and maintenance submittals are acceptable.
 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following formats (Note, operations and maintenance manuals are required to be submitted in BOTH formats):
1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
 - 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 will return two copies.
- C. 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 revise 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 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- 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.
- B. 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.
 - 3. Manual contents.
- C. 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 Authority.
 - 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.
- D. 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.
- E. 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.
- F. 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 on 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 on opening file.

G. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf 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. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. 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.
4. 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.

2.2 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.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
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.

2.3 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - 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.
 - 6. Normal shutdown instructions.

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.

2.4 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 and bonds, 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.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 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 and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.5 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.
- 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.
- 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 and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. 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.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

- C. 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.
- D. 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.
- E. 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.
- F. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
- B. Related Requirements:
 - 1. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit two set(s) of marked-up record prints and one annotated PDF electronic file.
- B. Record Specifications: Submit one paper copy and one annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy and one copy each of annotated PDF electronic files and directories of each submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Record data as soon as possible after obtaining it.

- c. Record and check the markup before enclosing concealed installations.
 2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Annotated PDF electronic file.
 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 3. Refer instances of uncertainty to Architect for resolution.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file.
 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. Note related Change Orders, record Product Data, and record Drawings where applicable.

- B. Format: Submit record Specifications as scanned PDF electronic file(s) of marked-up paper copy of Specifications.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as scanned PDF electronic file(s) of marked-up miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 017839

DIVISION 03 – CONCRETE

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete.
2. Concrete Forming and Accessories.
3. Concrete Reinforcing.
4. Concrete Finishing.
5. Concrete Curing.
6. Control, Expansion, and Contraction Joint Devices.

1.2 REFERENCES

A. Abbreviations and Acronyms:

1. American Concrete Institute (ACI).
2. Engineered Wood Association, formerly American Plywood Association (APA).
3. American Society of Mechanical Engineers (ASME).
4. American Society of Testing and Materials (ASTM).
5. American Welding Society (AWS).
6. Concrete Reinforcing Steel Institute (CRSI).
7. Federal Specifications and Standards (FS).
8. High Density Overlay (HDO).
9. International Code Council (ICC).
10. International Building Code (IBC).
11. National Ready Mixed Concrete Association (NRMCA).
12. Polyvinyl chloride (PVC).

B. References Standards:

1. ACI 117, Specification for Tolerances for Concrete Construction and Materials.
2. ACI 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
3. ACI 301, Specifications for Structural Concrete.
4. ACI 305.1, Specification for Hot Weather Concreting.
5. ACI 306.1, Standard Specification for Cold Weather Concreting.
6. ACI 308.1, Standard Specification for Curing Concrete.
7. ACI 318, Building Code Requirements for Structural Concrete.
8. ACI SP-66, ACI Detailing Manual.
9. American Society of Mechanical Engineers (ASME) A17.1.
10. American Society of Testing and Materials (ASTM) A706, Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
11. ASTM A775, Standard Specification for Epoxy-Coated Steel Reinforcing Bars.

12. ASTM A934, Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.
13. ASTM B221, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
14. ASTM C31/C31M, Standard Practice for Making and Curing Concrete Test Specimens in the Field.
15. ASTM C33, Standard Specification for Concrete Aggregates.
16. ASTM C39/C39M, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
17. ASTM C42/C42M, Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
18. ASTM C94/C94M, Standard Specification for Ready-mixed Concrete.
19. ASTM C150, Standard Specification for Portland Cement.
20. ASTM C172, Standard Practice for Sampling Freshly Mixed Concrete.
21. ASTM C173/C173M, Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
22. ASTM C260, Standard Specification for Air-entraining Admixtures for Concrete.
23. ASTM C330, Standard Specification for Lightweight Aggregates for Structural Concrete.
24. ASTM C494/C494M, Standard Specification for Chemical Admixtures for Concrete.
25. ASTM C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
26. ASTM C685/C685M, Standard Specification for Concrete Made By Volumetric Batching and Continuous Mixing.
27. ASTM C989, Standard Specification for Slag Cement for Use in Concrete and Mortars.
28. ASTM C1017/C1017M, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
29. ASTM C1218/C1218M, Standard Test Method for Water-soluble Chloride in Mortar and Concrete.
30. ASTM C1240, Standard Specification for Silica Fume Used in Cementitious Mixtures.
31. ASTM A1602,
32. ASTM D994, Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
33. ASTM D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
34. ASTM D6690, Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
35. ASTM E96/E96M, Standard Test Methods for Water Vapor Transmission of Materials.
36. ASTM E1643, Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.
37. ASTM E1745, Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
38. Concrete Reinforcing Steel Institute (CRSI) MSP-1, Manual of Standard Practice.

1.3 DESIGN REQUIREMENTS

A. Formwork and Accessories:

1. Design, engineer, and construct formwork, shoring, and bracing in accordance with the most stringent requirements of ACI 117, ACI 318, and ACI 301 to achieve concrete shape, line, and dimension as indicated on Drawings.
2. Form and shoring design to be the responsibility of the Contractor.
3. Design forms and shoring to support, properly and safely, vertical and lateral loads for applicable construction, material, pre-stressing, environmental, impact, and other anticipated loads until the structure can carry such loads.

1.4 SUBMITTALS

- #### A. Refer to the Submittal Schedule at the end of Part 3 for a list of submittal requirements for this Section.

1.5 QUALITY ASSURANCE

A. Formwork and Accessories:

1. Perform Work in accordance with ACI 301, ACI 117, and ACI 318.
2. Plywood form panels to be marked with an APA grade mark.

B. Reinforcing:

1. Perform Work in accordance with ACI 318.
2. Prepare shop drawings in accordance with ACI SP-66.
3. Testing/inspection agencies to be in conformance with ASTM E329 and to qualify as an approved agency per ICC International Building Code requirements.

C. Concrete:

1. Perform Work in accordance with ACI 318.
2. Testing/inspection agencies to be in conformance with ASTM E329, and all tests to be performed in accordance with ACI 301 and ICC International Building Code requirements.
3. Submit proposed mix design for each class of concrete to the Engineer for review prior to commencement of work.
4. Acquire cement and aggregate from one source for Work.

- #### D. Finishing and Curing: Perform Work in accordance with ACI 301, ACI 308.1, and ACI 318.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Concrete:

1. Conform to ACI 305.1 when concreting during hot weather.
2. Conform to ACI 306.1 when concreting during cold weather.
 - a. Maintain concrete temperature after installation at minimum 50 degrees F for minimum 7 days.
 - b. For high early strength concrete, maintain concrete temperature after installation at minimum 50 degrees F for minimum 3 days.

1.7 COORDINATION

- A. Reinforcing: Coordinate with placement of formwork, formed openings, and other Work. Reinforcing steel not to be located or placed in the forms until form release and bond breaker coating work is completed.
- B. Concrete: Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.
- C. Finishing: Coordinate the Work with concrete floor placement and concrete floor curing.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Void Forms:

1. Deliver void forms and installation instructions in manufacturer's packaging.
2. Store off ground in ventilated and protected manner to prevent contamination, soiling, and/or damage.

B. Reinforcing:

1. Reinforcing to be delivered to the site in bundles marked with tags calling out bar size, length, grade, piece number, and bend diagram.
2. Mark reinforcing and accessories for proper identification and placement location.
3. Store materials off ground and protect from moisture and contamination.

C. Concrete:

1. Transport of ready-mix concrete to be in accordance with ASTM C94.
2. Ready-mix trucks to be in accordance with ASTM C94, NCRMA, and the Department of Transportation in the state where the project is located.
3. Admixtures to be added to the mix at the batch plant.
4. Disposal of excess concrete onsite is not permitted.
5. Mark reinforcing, accessories, and embedded items for proper identification and placement location.
6. Deliver packaged items in manufacturer's container with seals intact.

7. Store materials, except aggregate, off ground and protect from moisture and contamination.
8. Stockpile aggregate in manner to prevent contamination with other materials or with other sizes of aggregates. Conduct tests for determining conformance to requirements at point of batching. Do not use bottom 6 inches of aggregate piles in contact with ground. Allow sand to drain until it has reached uniform moisture content before it is used.
9. Store admixtures in manner to prevent contamination. Protect admixtures from extreme temperatures which would adversely affect their characteristics.

D. Curing:

1. Deliver curing materials in manufacturer's packaging including application instructions.
2. Store curing materials off ground and protect from moisture and contamination; protect materials from extreme temperature which would adversely affect their characteristics.

PART 2 - PRODUCTS

2.1 FORMWORK

- A. Plywood for Concrete Surfaces Not to be Exposed After Construction is Complete:
1. APA B-B Plyform exterior grade or better, Class I, with straight, sealed edges and 5/8-inch minimum thickness.
 2. HDO Plyform is acceptable.
- B. Plywood for Concrete Surfaces to be Exposed After Construction is Complete: APA HDO Plyform, exterior grade or better, Class I, with straight, sealed edges and 5/8-inch minimum thickness.
- C. Lumber: Dressed, tongue and grooved, free from loose knots.
- D. Metal: Smooth, clean, corrosion-free, without dents or holes, with closely-matching edges.
- E. Fiberglass: Smooth, clean, without dents or holes, with closely-matching edges.
- F. Laminated Round Fiber Tubes: Spirally laminated paper fiber, wax impregnated on exterior surfaces, interior ply allowing uniform moisture penetration.
- G. Void Forms: Moisture resistant treated paper faces, biodegradable, structurally sufficient to support weight of wet concrete mix until initial set; minimum 2 inches thick.
1. Manufacturers:
 - a. Deslauriers, Inc., Model <https://www.deslinc.com/box-voids> or Engineer-approved equivalent.

2.2 FORM RELEASE AGENTS

- A. Type acceptable to cement manufacturer, will not cause surface imperfections, non-staining, and compatible with field applied paints, toppings, linings, curing compounds, and other coatings.
- B. For concrete surfaces in water storage or treatment structures use agent that will be nontoxic within 30 days after use.
- C. Use same brand form release agent for all forms.

2.3 FORMWORK ACCESSORIES

- A. Form ties, anchors, and hangers to be of sufficient strength to completely resist displacement of forms due to construction loads and depositing of concrete.
- B. Provide ties and spreader form ties designed so no metal will be within 1 inch of surface when forms are removed.
- C. Where concrete surfaces are exposed to view, use form ties that will leave a depression not more than 1 inch in diameter when removed.
- D. Use water seal ties in concrete work containing waterstops.
- E. Provide form sealants and gaskets as necessary to provide tight forms.
- F. Corners: Chamfer, type; 3/4-inch x 3/4-inch size; maximum possible lengths.
- G. Dovetail Anchor Slot: Galvanized steel, 22 gauge thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
- H. Flashing Reglets: Galvanized steel, 22 gauge thick, longest possible lengths, with alignment splines for joints, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
- I. Bituminous Joint Filler: ASTM D1751.
- J. Anchor Bolt Sleeves:
 - 1. Manufacturers:
 - a. Wilson Anchor Bolt Sleeve Company, Model Wilson Sleeves, or Engineer-approved equivalent.
- K. Wall and Slab Sleeves: ASTM D1785, Schedule 40 PVC pipe.

2.4 WATERSTOPS

- A. Flexible PVC Waterstops: continuous 3/8-inch x 6-inch polyvinyl chloride, serrated without center bulb. Acceptable products as shown on Drawings.

- B. Cold Joint Waterstops: Volclay waterstop as manufactured by American Colloid Company or Engineer-approved equivalent.

2.5 REINFORCEMENT

- A. Deformed Reinforcement: ASTM A615; 60 ksi yield strength, steel bars, unfinished, unless otherwise noted.
- B. Weldable Reinforcement: ASTM A706; 60 ksi yield strength, steel bars, unfinished.
- C. Welded Plain Wire Fabric: ASTM A185; unfinished.

2.6 REINFORCEMENT ACCESSORIES

- A. Chairs, Bolsters, Bar Supports, and Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapor retarder puncture.
- B. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Class 1A or Class 3 type; size, and shape to meet Project conditions. Provide supports appropriate for concrete exposure and surface grinding/sandblasting requirements.
- C. Welding Reinforcing Splicing Devices: Exothermic welding type; full tension; sized to fit joined reinforcing and designed to develop 125 percent of the yield strength of the reinforcing steel.
 - 1. Manufacturers:
 - a. Erico Products, Inc., Model “Cadweld”, or approved equivalent.
- D. Mechanical Reinforcing Splicing Devices: Mechanical threaded type; full tension; sized to fit joined reinforcing and designed to develop 125 percent of the yield strength of the reinforcing steel.
 - 1. Manufacturers:
 - a. Erico Products, Inc., Model “Lenton”.
 - b. Erico Products, Inc., Model “Lenton Lock”.
- E. Epoxy Coating Patching Material: Conform to ASTM A775.

2.7 REINFORCEMENT FABRICATION

- A. Fabricate concrete reinforcement in accordance with CRSI and ACI SP-66, except ensure splice lengths are in accordance with ACI 318.
- B. Tie reinforcing bars in bundles and tag with non-rusting tags showing shop drawing numbers.

- C. Form standard hooks as indicated on Drawings with minimum bend diameters in accordance with ACI 318.
- D. Fabricate column reinforcement with offset bends at reinforcement splices.
- E. Spiral column reinforcement:
 - 1. Form from minimum 3/8-inch-diameter continuous deformed bar or wire.
 - 2. Spirals to have 1-1/2 extra finishing turns at top and bottom.
- F. Weld reinforcement in accordance with AWS D1.4.
- G. Epoxy-Coated Reinforcement: Clean surfaces, weld and re-protect welded joint in accordance with CRSI MSP-1.

2.8 REINFORCEMENT SHOP FINISHING

- A. Epoxy Coated Finish for Steel Bars: ASTM A775 or, for prefabricated steel bars, ASTM A934.
- B. Epoxy Coated Finish for Steel Wire: ASTM A884; Class A using ASTM A775.

2.9 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type II – Moderate Portland type.
- B. Aggregates:
 - 1. Normal Weight Aggregates: ASTM C33.
 - 2. Lightweight Aggregate: ASTM C330
 - 3. For slabs and watertight concrete conform to following:
 - a. Of total combined coarse and fine aggregates per mix design, do not allow material retained on any one sieve to be less than 8 percent nor more than 24 percent of total by weight, except for largest sieve and Nos. 30, 50, and 100 sieves.
 - b. Gradation requirement of ASTM C33 may be waived in order to meet ranges specified.
 - c. Retain 1 percent to 4 percent of total combined aggregates per mix design on 3/4-inch sieve.
 - d. Maintain 8 percent to 15 percent of total combined aggregates per mix design is retained on each of Nos. 30 and 50 sieves.
- C. Fly Ash: ASTM C618 Class C or F, except loss on ignition is not to exceed 3 percent.
- D. Silica Fume: ASTM C1240.
- E. Slag: ASTM C989; minimum Grade 100; ground granulated blast furnace slag.

F. Water: ASTM C1602.
2.10 ADMIXTURES

A. General:

1. No admixture to contain more than 0.05 percent chloride ions. In no case shall the resulting chloride content exceed ACI 318 provisions.
2. If slab toppings are bonded to concrete, manufacturer of topping to approve the type and brand of admixture used.
3. Submit information needed for manufacturer to determine if there is problem with compatibility.

B. Types:

1. Air-Entraining: ASTM C260.
2. Water-Reducing: ASTM C494, Type A.
3. High-Range Water-Reducing: ASTM C494, Type F or G.
 - a. Type F Acceptable Products and Manufacturers:
 - 1) "Eucon 37, Eucon 1037, or Plastol 5000" by Euclid Chemical Corp.
 - 2) "Daracem 100" or "ADVA 190" by W. R. Grace & Co.
 - b. Type G Acceptable Products and Manufacturers:
 - 1) "Eucon 537" by Euclid Chemical Corp.
 - 2) "Daracem 100" by W. R. Grace & Co.
4. Retarding: ASTM C494, Type B or D.
5. Accelerating:
 - a. ASTM C494, Type C or E. Non-chloride and non-thiocyanate type.
 - b. Acceptable Products and Manufacturers:
 - 1) "Accelguard 80" by Euclid Chemical Corp.
 - 2) "Polar Set: by W.R. Grace & Co.

2.11 ACCESSORIES

- A. Vapor Retarder/Barrier: As shown on Drawings.

2.12 JOINT DEVICES AND FILLER MATERIALS

A. Expansion Joint Cap:

1. Two-part plastic cap for use over preformed joint filler.
2. Acceptable Product and Manufacturer:
 - a. "Snap-Cap" by W. R. Meadows, Inc.

- B. Preformed Joint Filler:
 - 1. ASTM D5249, Type 2, nonextruding, 3/8-inch wide by full depth of concrete with top of cap strip at finished surface.
 - 2. Acceptable Product and Manufacturer: As shown on Drawings.
- C. Firm Preformed Joint Filler: ASTM D1751, nonextruding, full depth of concrete.
- D. Elastomeric Joint Materials:
 - 1. Sealant:
 - a. FS TT-S-00230, Type I, Class A, single component cold applied, pourable or gun grade, as applicable, polyurethane base.
 - b. Closely match color of adjacent exposed surface of concrete slab and closely match color of epoxy joint sealant.
 - c. Keep same color throughout project.
 - d. Sealant to be compatible with construction material placed against it.
 - e. Acceptable Product and Manufacturer: As shown on Drawings.
 - 2. Joint Back-Up Material:
 - a. Polyethylene foam, 60 percent closed cell.
 - b. Sealant to be compatible with any construction material to be placed against it, such as tile adhesive.
- E. Epoxy Joint Filler:
 - 1. 100 percent solids per ASTM D1259, two-part semi-rigid epoxy with instantaneous Shore A hardness minimum of 80 per ASTM D2240, adhesion to concrete of 150 to 250 psi per ASTM C321, minimum elongation of 6 percent per ASTM D638, and a tensile strength of 350 to 600 psi per ASTM D638 at 7 days. Filler to be compatible with construction material placed against it, such as tile adhesive.
 - 2. Closely match color of adjacent exposed surface of concrete slab. Keep same color throughout project.
 - 3. Acceptable Products and Manufacturers:
 - a. "Euco 700" by Euclid Chemical Corp.
 - b. "MM-80P" by Metzger-McGuire Co.
- F. Slab on Grade Dowels for Construction Joints: Smooth round bar, ASTM A36; saw cut, not sheared.

2.13 CONCRETE MIX

- A. General:
 - 1. Use only materials and their proportions included on concrete supplier's standard mix design forms for this Project that Engineer has given final review.

2. Measure and mix ingredients in accordance with most stringent requirements of ACI 211.1, ACI 301, and ASTM C94.

B. Workability: Must have proper consistency to be worked readily into forms and around reinforcement without segregation, voids or, excessive bleeding.

C. Provide concrete to the following criteria:

Type of Construction	Minimum 28-day Compressive Strength	Total Air	Minimum Cement Factor (Bags/cu. yd)	Maximum W/C Ratio
Footings, Pile Caps	4,000 psi	Optional (8% max)	5.0	--
Slabs on Ground	4,000 psi	No Air Entraining	5.5	0.56
Elevated Floor Slabs	4,000 psi	No Air Entraining	6.0	0.60 0.56
Concrete Columns	4,000 psi	No Air Entraining	6.0	0.60
Concrete Exposed to Weather	4,500 psi	4-8%	6.0	0.51
Liquid Retaining Structures	4,500 psi	4-8%	6.0	0.45
Other Concrete	4,000 psi	Optional (8% max)	5.5	0.60

D. Slump:

1. Proportion concrete so slump without adding mid-range or high-range water-reducing admixture or fibers, if used, would be as follows:

Types of Construction	Slump (in.)
Mass concrete (unreinforced concrete 3 feet or more in the least dimension)	2 (□1)
Floor Slabs and Pavement	4 (□1)
All Other Concrete	4 (□1)

2. If high-range water-reducing admixture is used, maximum slump after adding admixture to be 8 inches.

E. Admixtures:

1. Water-reducing admixture may be added to improve workability and reduce water content.

2. Mid-range or high-range water-reducing admixture may be added to improve workability or pumpability, lower water/cement ratio, increase ultimate and early strengths, and increase slump.
3. Provide an air-entraining admixture where air-entrainment is specified. Do not air-entrain interior floor slabs with troweled finish.
4. Other admixtures may be used only with written approval.
5. Do not use calcium chloride, or admixtures containing more than 0.05 percent chloride ions. In no case shall the resulting chloride content exceed ACI 318 provisions.
6. Use admixtures in accordance with manufacturer's recommendations.

F. Supplementary Cementitious Materials:

1. Fly ash may be used as partial replacement for Portland cement if approved by the Engineer and if other requirements of this Section are met. However, do not use fly ash in floor slabs. Use maximum percent of fly ash below for all mass equipment foundations.
2. If fly ash is used, ensure weight of fly ash divided by sum of cement and fly ash weights is at least 15 percent and does not exceed following:
 - a. Class C Fly Ash: 25 percent.
 - b. Class F Fly Ash: 20 percent.
3. Take special care concerning following:
 - a. Maintain air-entrainment at specified levels.
 - b. In cold weather ensure that concrete strength gain is above specified levels.

G. Average Compressive Strength Reduction: Permitted in accordance with ACI 318.

H. Site Mixed Concrete: Mix concrete in accordance with ACI 301 and 318. Use a central-mix type batch plant.

2.14 HARD AGGREGATE FLOOR SURFACE MATERIAL

- A. Provide factory mixed combination of Portland cement, plasticizers, and hard aggregate graded to produce maximum density.
- B. Acceptable Products and Manufacturers for Mineral Aggregate:
 1. "Surflex" (coarser gradation) by Euclid Chemical Co.
 2. "MasterTop 110 ABR" by Master Builders Solutions.

2.15 CURING MATERIALS

- A. Sheet Materials for Curing Concrete: ASTM C171.
 1. Synthetic Fiber/Plastic:

- a. White synthetic fiber matting securely attached to white plastic sheet backing.
 - b. Acceptable Products and Manufacturer:
 - 1) “Transguard 4000” by Fiber-Tec.
 - 2) “HydraCure” by PNA Construction Technologies.
2. Coated Burlap:
- a. ASTM C171, 10-ounce burlap with 4-mil minimum white opaque polyethylene extruded onto burlap.
 - b. Acceptable Product and Manufacturer: “Cure Lap” by Midco.
- B. Liquid Membrane Curing and Sealing Compound:
1. Conform to ASTM C1315, Type I (VOC compliant, 700 g/l).
 2. Styrene-acrylate or methyl-methacrylate type, 25 percent minimum solids content, clear, non- yellowing, with no styrene-butadiene.
 3. Acceptable Product and Manufacturer: “Super Rez-Seal” by Euclid Chemical Corp.
- C. Liquid Membrane Curing and Sealing Compound:
1. Conform to ASTM C1315, Type I (VOC compliant, 350 g/l).
 2. Styrene-acrylate or methyl-methacrylate type, 25 percent minimum solids content, clear, non- yellowing, with no styrene-butadiene.
 3. Acceptable Product and Manufacturer: “Super Aqua-Clear VOX or Super Diamond Clear VOX” by Euclid Chemical Corp.
- D. Curing Compound (Strippable):
1. Conform to ASTM C309.
 2. For use on slabs receiving subsequent applied finish.
 3. Acceptable Products and Manufacturer:
 - a. “Kurez DR VOX or Kurez W VOX” by Euclid Chemical Co.
- E. Liquid Sealer/Densifier:
1. High performance, deeply penetrating concrete densifier; odorless, colorless, VOC-compliant, non-yellowing silicate based solution designed to harden, dustproof and protect concrete floors subjected to heavy vehicular traffic and to resist black rubber tire marks on concrete surfaces.
 2. The compound must contain a minimum solids content of 20 percent of which 50 percent is silicate.
 3. Acceptable Products and Manufacturers:
 - a. “Diamond Hard” by The Euclid Chemical Company.
 - b. “Sealhard” by L & M Chemical Corp.

- F. Water: ASTM C1602.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Formwork and Accessories:

1. Verify lines, levels, and centers before proceeding with formwork. Verify dimensions agree with Drawings.
2. Verify that subgrade surfaces and excavations are ready to receive formwork.

B. Concrete:

1. Verify requirements per ACI 301 for concrete cover over reinforcement are met.
2. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

A. Formwork and Accessories:

1. Form surfaces to be free of dirt, mud, mortar, loose or nonadherent rust, and other foreign material.
2. Form and form liner surfaces to be against concrete to be treated with a form release agent prior to positioning of the forms and placement of the reinforcing steel and concrete.
3. Form surfaces to be against concrete at concrete surfaces exposed to view to be free of surface irregularities and patches and be capable of producing the desired finish.
4. Earth cuts may be used as forms for vertical surfaces of footings which are not to be exposed to view only where the soil is firm and stable and to be subject to prior review by project Geotechnical Engineer.
5. Earth form surfaces to be cut neat and accurate in size and shape and to be compact. Top edges of earth forms to be cleaned of loose material to prevent sloughing.
6. Concrete section dimensions to be increased as required to provide reinforcing steel with minimum specified cover at earth forms.

B. Reinforcement:

1. At the time of concrete placement, reinforcing steel to be free from dirt, mud, grease, oil, ice or snow, kinks, loose or non-adherent rust, loose mill scale, form-release coating/sealer or bond breaker, and any foreign matter or nonmetallic coating that adversely affects the bonding capacity of the reinforcing steel with the concrete.
2. Bars extending through construction joints to be cleaned of concrete and other contaminants prior to placement of subsequent concrete.

3. Surface preparation for welding to be in accordance with AWS D1.4, except loose or non-adherent rust and loose mill scale, which are to be removed by wire brushing.
4. Turn tie wire ends away from concrete exterior.

C. Concrete:

1. Prior to placement of concrete, the formwork is to have been completed, all reinforcing steel and embedded items positioned and secured in place, the space in which the concrete is to be placed free of all debris and rubbish, spilled concrete, sloughed soil, standing water, etc., and the entire preparation inspected and accepted.
2. Steel floor deck surfaces to be against concrete to be free from dirt, mud, dust, grease, oil, wax, ice or snow, frost laitance, and/or unsound material, and any foreign matter or coating that adversely affects the bonding capacity of the concrete.
3. Prior to placing of subsequent concrete at construction joints, the contact surface to be cleaned by sandblasting or as specified by bonding agent manufacturer to remove all laitance, expose the aggregate, and roughen the surface to a minimum of 1/4-inch amplitude. Clean contact surfaces to remove loose and/or foreign material. Construction joints to be inspected prior to closing of forms and the placement of concrete.
4. Prevent damaging waterstops during construction joint preparation.
5. Prevent splattering concrete on exposed/finish surfaces.
6. Provide an operable backup vibrator on site to and during concrete placement.

3.3 FORMWORK INSTALLATION

A. Formwork – General:

1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of concrete during placement, unless it can be demonstrated that top forms can be omitted.
2. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient strength to maintain shape and position under imposed loads from construction operations.
3. Shored forms to be cambered to compensate for form deflection due to placement and hardening of concrete.
4. Carefully verify horizontal and vertical positions of forms. Correct misaligned or misplaced forms before placing concrete. Complete wedging and bracing before placing concrete.
5. Joints in form panels to be staggered and tight fitting. Solidly butt and align joints. Provide backup at joints as required to prevent leakage.
6. Apply form release agent in accordance with manufacturer's recommendations prior to placement of reinforcing steel, anchoring devices, and embedded items.
7. Install chamfer strips on external corners of beams, columns, pedestals, trenches, and as shown on Drawings.
8. Where shown on Drawings, install void forms in accordance with manufacturer's recommendations.

- a. Install in straight alignment for the entire length of the members with tight fit joints.
 - b. Void forms to be firmly held in place to prevent displacement before and during concrete placement.
 - c. Provide with inserts as required for the intended loading.
- B. Forms for Smooth Finish Concrete:
1. Use steel, plywood or lined board forms.
 2. Use clean and smooth plywood and form liners, uniform in size, and free from surface and edge damage capable of affecting resulting concrete finish.
 3. Install form lining with close-fitting square joints between separate sheets without springing into place.
 4. Use full size sheets of form lines and plywood wherever possible.
 5. Tape joints to prevent protrusions in concrete.
 6. Use care in forming and stripping wood forms to protect corners and edges.
 7. Level and continue horizontal joints.
 8. Keep wood forms wet until stripped.
- C. Forms for Surfaces to Receive Membrane Waterproofing: Use plywood or steel forms. After erection of forms, tape form joints to prevent protrusions in concrete.

3.4 INSTALLATION – INSERTS, EMBEDDED PARTS, AND OPENINGS FOR FORMWORK

- A. Install formed openings for items to be embedded in or passing through concrete work.
- B. Coordinate with Work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.
- C. Embedded Items:
1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features.
 2. Do not embed wood or uncoated aluminum in concrete.
 3. Securely anchor embedded items in correct location and alignment prior to placing concrete.
 4. Verify conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318 for size and location limitations.
- D. Openings for Items Passing Through Concrete:
1. Frame openings in concrete where indicated on Drawings. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections.
 2. Coordinate work to avoid cutting and patching of concrete after placement.
 3. Pipes and conduit passing through slabs, grade beams, and walls to pass through sleeved holes sized 1 inch in diameter larger than the outside diameter of the pipe/conduit. Sleeves to extend the full thickness of the section.

E. Form Ties:

1. Use sufficient strength and sufficient quantity to prevent spreading of forms.
2. Place ties at least 1 inch away from finished surface of concrete.
3. Leave inner rods in concrete when forms are stripped.
4. If necessary to grease tie threads, do not allow grease to contact remainder of tie when wall will be exposed to hydrostatic pressure.
5. Column clamps to be used in lieu of form ties at square and rectangular columns.

F. Construction Joints:

1. Install surfaced pouring strip where construction joints intersect exposed surfaces to provide straight line at joints.
2. Show no overlapping of construction joints. Construct joints to present same appearance as butted plywood joints.
3. Arrange joints in continuous line straight, true and sharp.

G. Screeds:

1. Set screeds and establish levels for tops of concrete slabs and levels for finish on slabs.
2. Slope slabs to drain where required or as shown on Drawings.
3. For concrete over waterproof membranes and vapor retarder membranes, use cradle, pad or base type screed supports which will not puncture membrane.
4. Staking through membrane is not to be permitted.

3.5 FORM CLEANING

- A. Clean forms and formed cavities of debris and rubbish, spilled concrete, sloughed soil, mud, standing water, ice or snow, tie wire trimmings, etc. prior to placing concrete.
- B. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
- C. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.6 FORM REMOVAL

- A. Prior to removal of non-weight supporting forms:
 1. Concrete to be hardened sufficiently to resist damage from removal operations, but in no case sooner than 24 hours.
- B. Prior to removal of weight supporting forms:

1. Concrete compressive strength to be at least 100 percent of compressive strength as determined from field-cured test cylinders, unless otherwise approved by the Engineer.
- C. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- D. Remove formwork progressively so no unbalanced loads are imposed on structure. Do not damage concrete surfaces during form removal.
- E. Obtain Engineer's permission for early removal of weight supporting formwork.

3.7 PLACING REINFORCING

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position beyond specified tolerance as defined in ACI 301 and CRSI MSP-1. Do not weld crossing reinforcement bars for assembly.
- B. Do not displace or damage vapor retarder.
- C. Accommodate placement of formed openings.
- D. Maintain concrete cover around reinforcement in accordance with ACI 318 and applicable building code.
- E. Reinforcing steel splices to be lap type unless detailed otherwise on the Drawings.
- F. Continuous horizontal bars to be installed in the longest possible lengths with ACI Class B lap splices in accordance with ACI 318 unless detailed otherwise on the Drawings.
- G. Spiral lap splices to be 48 bar diameters minimum or 12 inches, whichever is greater, unless detailed otherwise on the Drawings. Spirals to be provided with spacers in accordance with CRSI MSP-1.
- H. Reinforcing steel to be supported by use of bar supports at 4 feet on center maximum in any direction.
- I. Field bending of reinforcing steel not shown on the Drawings to be subject to prior review of the Engineer. Do not heat reinforcing bars for bending purposes.
- J. Welded Wire Fabric: Position fabric by supports spaced such that construction loads, including workers, do not cause permanent deflection of more than 1/2 inch.

3.8 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301 and ACI 318.
- B. Notify testing laboratory and Owner's Authorized Representative minimum 24 hours prior to commencement of operations.

- C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, and similar are not disturbed during concrete placement.
- D. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- E. Water may not be added to the mix at the site unless approved by the Engineer. In no case is the maximum water/cement ratio to be exceeded.
- F. Raking or flowing of concrete to move it or re-tempering of concrete is not permitted.
- G. Concrete to be conveyed/placed at a regular rate, as close as possible to final position. Prevent segregation of mix, and sequence in a manner which minimizes shrinkage. Concrete conveying equipment not to be supported on the reinforcing steel or supporting accessories.
- H. The use of aluminum equipment for conveying concrete and finishing is not permitted.
- I. Use tremies or other Engineer-approved method when drops over 5 feet are required and concrete will have to pass through obstructions, such as reinforcing.
- J. Unless otherwise specified, consolidate concrete by vibration. Consolidate concrete around reinforcement, embedded items and into corners of forms to eliminate honeycombing or planes of weakness due to air voids and stone pockets. Unless otherwise specified, use the largest and most powerful internal vibrators to consolidate the concrete. Workers shall be experienced in the use of vibrators. Do not use vibrators to move concrete within the forms. Use immersion-type vibrators with nonmetallic heads when consolidating concrete around epoxy-coated reinforcement. Spacing of immersion vibrator insertions shall not exceed 1-1/2 times the vibrator's radius of action in the concrete being consolidated.
- K. Place concrete in continuous operation for each panel or section determined by joints shown on the Drawings or as specified in these Specifications. Construction joints not shown on the Drawings or specified in these Specifications to be subject to prior review by the Engineer.
- L. Do not interrupt successive placement; do not permit cold joints to occur.
- M. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

3.9 FLOOR FINISHING

- A. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.1.
- B. Float finish surfaces scheduled to receive roofing, waterproofing membranes, and sand bed terrazzo. Power float and/or hand float surface.
- C. Broom finish exposed exterior walking surfaces, ramps and outside paving, unless noted otherwise on the Drawings.

- D. Screed slabs on grade level. Temporary screeds to be used. Wet screeding and jitterbugging is not permitted.
- E. Saw-cut joints within 12 hours after placing. Use 3/16-inch-thick blade, cut into 1/4 depth of slab thickness unless otherwise shown on Drawings.
- F. In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains at 1/8 inch per foot nominal or as indicated on Drawings.

3.10 CURING

A. General:

- 1. Cure concrete in accordance with ACI 308.1, except as noted.
- 2. Start curing as soon as concrete surface will not be damaged by curing operations.
- 3. Continuously cure concrete, except high early strength concrete, for at least 7 consecutive days.
- 4. Cure high early strength concrete for at least 5 consecutive days.
- 5. During curing period, do not allow any part of concrete to become dry.
- 6. Keep forms in contact with concrete wet during curing period unless type of form is impervious to water, such as metal or fiberglass.
- 7. If forms are removed before curing period is complete, continue curing immediately with one of following methods.

B. White Burlap-Polyethylene Sheeting:

- 1. Saturate burlap-polyethylene and place burlap-side down over floor slab areas.
- 2. Lap ends and sides 6 inches minimum. Laps and edges to be sealed and secured in such a manner as to prevent moisture escaping from concrete.

C. Polyethylene Film: Spread over floor slab areas, lap edges and sides, seal with pressure sensitive tape and cover with plywood.

D. Membrane Curing Compound: Apply curing compound in one coat.

- 1. Apply curing compound at coverage rate of 300 square feet maximum per gallon for broomed finish and abrasive aggregate finish.
- 2. For troweled finish and other finishes where curing compound can be used, apply curing and sealing compound at coverage rate of 400 square feet per gallon or the strippable curing compound at 300 square feet per gallon.
- 3. Do not use liquid curing compound on surface against which additional concrete, other finishing materials, coatings, tank linings or slab toppings are to be bonded if their bond will be affected by curing compound.
- 4. High solids content of curing compound may clog hand sprayers; plan for this by using power sprayer or other means of application as specified by the manufacturer if necessary.

5. For surfaces subjected to rainfall, immediately recoat at the rate specified above, within 3 hours after compound has been applied or surfaces damaged by subsequent construction operations within the curing period.
- E. Non-Membrane Forming Curing Compound: Apply curing compound in one coat Scrub compound into surface. Maintain surface wet with curing compound, without ponding for time recommended by manufacturer.

3.11 FIELD QUALITY CONTROL

- A. Concrete inspections to be performed in accordance with ICC International Building Code and as noted on Drawings.
- B. Sampling and Testing:
 1. Sampling Procedures: ASTM C172.
 - a. Cylinder Molding and Curing Procedures: ASTM C31 cylinder specimens, field cured.
 - b. Sample concrete and make one set of four standard 6-inch (150mm) diameter by 12-inch cylinders for every 75 cubic yards or less of each class of concrete placed each day and for every 5,000 square feet of surface area for slabs and walls.
 - c. All field-cured samples to be field-cured the same as the concrete they represent.
 - d. When volume of concrete for any class of concrete would provide less than five sets of cylinders, take samples from five randomly selected batches, or from every batch when less than five batches are used.
 - e. Make one additional cylinder during cold weather concreting, and field cure.
 - f. Use standard-cured cylinders for acceptance testing for specified strength.
 - g. Cylinders for substantiation of concrete strength for other construction purposes to be in addition to cylinders required for strength acceptance.
 2. Field Testing:
 - a. Slump Test Method: ASTM C143.
 - b. Air Content Test Method: ASTM C173.
 - c. Temperature Test Method: ASTM C1064.
 - d. Measure slump and temperature for each compressive strength concrete sample.
 - e. Measure air content in air entrained concrete for each compressive strength concrete sample.
 3. Cylinder Compressive Strength Testing:
 - a. Test Method: ASTM C39.
 - b. Test Acceptance: In accordance with ACI 318.
 - c. Test one cylinder at 7 days.

- d. Test two cylinders at 28 days when 6"x12" samples taken. Test three cylinders at 28 days when 4"x8" samples are taken.
 - e. Test one cylinder at 56 days only if 28-day tests are below the specified strength.
 - f. Dispose remaining cylinders when testing is not required.
4. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.
 5. Core Compressive Strength Testing:
 - a. Sampling and Testing Procedures: ASTM C42.
 - b. Test Acceptance: In accordance with ACI 318.
 - c. Drill three cores for each failed strength test from concrete represented by 28 and 56-day compressive strength tests that are below the specified strength.
 - d. Reinforcing steel locations to be determined prior to coring. Cutting of reinforcing steel due to coring is not permitted.
 6. Penetration resistance tests of concrete for indication of compressive strength to be in accordance with ASTM C803.
 - a. Test to be made on concrete where the 28 and 56-day compressive strength tests are below the specified strength.
 - b. Test to be made within 24 hours of the noncomplying cylinder tests.
 7. Core compressive strength and penetration resistance tests to be made at the Contractor's expense without additional cost to the Owner.
 8. Provide the following within 48 hours after completion of tests and inspections:
 - a. Test reports concerning slump, air content, temperature and compressive strengths of concrete and ambient temperature at the time of placement.
 - b. Inspection reports concerning concrete placement and slab surface flatness.

3.12 REINFORCING REPAIR

- A. Abraded and scarred areas on epoxy-coated surfaces as defined in CRSI Guidelines for Epoxy-Coated Reinforcing (including cut ends) to be repaired with patching compound with a minimum dry film thickness of 10 mils.

3.13 PATCHING AND CLEANING

- A. Honeycomb voids, rock pockets, and form tie holes to be cleaned to sound concrete and filled with grout or patching mortar mixed with diluted non-reemulsifiable bonding agent. Fins and projections to be removed.
- B. Patch imperfections in accordance with ACI 318 as directed by Engineer.

- C. Surface repairs to match the finish of the adjacent concrete surface and not to be visible at surfaces exposed to view.
- D. Clean all concrete splatter from exposed/finish surfaces. All cleaned surfaces to be equal to the original surface and splatter not to be visible.

3.14 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Need to repair or replacement of defective concrete will be determined by Owner's Authorized Representative. Additional inspections due to and correction of non-complying surfaces to be made at the Contractor's expense without additional cost to the Owner.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Owner for each individual area.

3.15 PROTECTION

- A. Barricade concrete surfaces immediately after finishing.
- B. Do not permit light traffic, except for curing purposes, over unprotected floor surface until concrete has obtained 60 percent of its specified compressive strength (7 days minimum) determined by field-cured test cylinders.
- C. Do not permit heavy traffic over unprotected floor surface until concrete has obtained its specified design strength determined by field-cured test cylinders. Ensure construction traffic does not exceed floor design loads.
- D. If concrete has been cured by water or sheet material, permit concrete to dry minimum of 2 additional days after curing is completed before removing barricades.
- E. Finish slabs to be protected from traffic, mud, dirt, concrete splatter, joint compound, sealants, paint, oil, grease, etc., during construction by use of a durable waterproof craft paper.
- F. Earth backfill behind walls not to be placed until the concrete has attained 100 percent of its specified 28-day compressive strength as substantiated by field-cured test cylinders.
- G. Walls with earth backfill behind and tied to slabs to be braced, and removal of bracing not to be allowed until the slab is complete and has attained 100 percent of its specified 28-day compressive strength as substantiated by field-cured test cylinders, unless otherwise approved by the Engineer.

END OF SECTION 033000

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.
 - 2. Urethane joint sealants.
 - 3. Latex joint sealants.
 - 4. Acoustical joint sealants.

1.3 PRECONSTRUCTION TESTING

- A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
 - 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 - 2. Conduct field tests for each application indicated below:
 - a. Each kind of sealant and joint substrate indicated.
 - 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 - 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
 - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

- 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information:
 1. Joint-sealant application, joint location, and designation.
 2. Joint-sealant manufacturer and product name.
 3. Joint-sealant formulation.
 4. Joint-sealant color.
- E. Qualification Data: For qualified Installer and testing agency.
- F. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- G. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
- I. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- J. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

K. Field-Adhesion Test Reports: For each sealant application tested.

L. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.

D. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion for silicone sealant.
2. Warranty Period: 5 years from date of Substantial Completion for urethane sealant.

- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 - 1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. **Compatibility:** Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. **VOC Content of Interior Sealants:** Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):
 - 1. Architectural Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
 - 4. Other: 750 g/l
- C. **Liquid-Applied Joint Sealants:** Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- D. **Stain-Test-Response Characteristics:** Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- E. **Suitability for Contact with Food:** Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
- F. **Colors of Exposed Joint Sealants:** As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

- A. **Single-Component, Nonsag, Traffic-Grade, Neutral-Curing Silicone Joint Sealant:** ASTM C 920, Type S, Grade NS, Class 100/50, for Use T.
 - 1. **Products:** Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pecora 311 NS Silicone Sealant.

- b. VOC < 40 g/L
 - c. JS #1
- B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.
- 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pecora Corporation; 890 NST.
 - b. VOC 98 g/L
 - c. JS #2
- C. Mildew-Resistant, Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT.
- 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pecora Corporation; 898NST.
 - b. VOC 50 g/L
 - c. JS #5

2.3 URETHANE JOINT SEALANTS

- A. Single-Component, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type S, Grade P, Class 25, for Use T.
- 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pecora Corporation; Urexpam NR-201.
 - b. VOC 50 g/L
 - c. JS #3
- B. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.
- 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pecora Dynatrol I-XL
 - b. VOC <100 g/L.
 - c. JS #7

2.4 LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pecora Corporation; AC-20+.
 - b. VOC 31 g/L
 - c. JS #4

2.5 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM C-919.
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pecora Corporation; AC-20 FTR.
 - b. VOC 31 g/L
 - c. JS #6.

2.6 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants in joints too shallow for backer rod.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
 - 4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
 - 5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.
- G. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - 1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 1 test for each 1000 feet of joint length thereafter or 1 test per each floor per elevation.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
3. Inspect tested joints and report on the following:
 - a. Whether sealants filled joint cavities and are free of voids.
 - b. Whether sealant dimensions and configurations comply with specified requirements.
 - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

- B. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces **JS-#1**.

1. Joint Locations:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - b. Joints between different materials listed above.
 - c. Other joints as indicated.
 2. Silicone Joint Sealant: Single component, nonsag, traffic grade, neutral curing.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Exterior joints in vert. surfaces/horizontal nontraffic surfaces **JS-#2**.
1. Joint Locations:
 - a. Control and expansion joints in unit masonry.
 - b. Joints between metal panels.
 - c. Joints between different materials listed above.
 - d. Perimeter joints between materials listed above and frames of doors windows and louvers.
 - e. Control and expansion joints in ceilings and other overhead surfaces.
 - f. Other joints as indicated.
 2. Silicone Joint Sealant: Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Interior joints in horizontal surfaces **JS-#3**.
1. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 - b. Control and expansion joints in tile flooring.
 - c. Other joints as indicated.
 2. Urethane Joint Sealant: Single component, s/l, traffic grade.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: Interior joints in vert. surfaces/horizontal nontraffic surfaces **JS-#4**.
1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.
 - c. Tile control and expansion joints.
 - d. Vertical joints on exposed surfaces of interior unit masonry walls and partitions.
 - e. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
 - f. Other joints as indicated.
 2. Joint Sealant: Latex.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

- E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces **JS-#5**.
1. Joint Sealant Location:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Tile control and expansion joints where indicated.
 - c. Other joints as indicated.
 2. Joint Sealant: Mildew resistant, single component, nonsag, neutral curing, Silicone.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- F. Joint-Sealant Application: Interior acoustical joints in vertical surfaces and horizontal nontraffic surfaces **JS-#6**.
1. Joint Location:
 - a. Acoustical joints where indicated.
 - b. Other joints as indicated.
 2. Joint Sealant: Acrylic Latex Acoustical.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
- G. One hour rated Application **JS-#7**: Use Dynatrol II two part Urethane Sealant with Mineral Wool or other UL rated system.

END OF SECTION 079200