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Architecture, Interior Design & Planning

Project Manual

Ocean Springs School District Ocean Springs Middle School 2023 HVAC Replacement

*3600 Hanshaw Road
Ocean Springs, MS 39564*

Project No. 23034.00

07/31/2023

Set Number

Architect's Seal



TABLE OF CONTENTS

**OCEAN SPRINGS SCHOOL DISTRICT
OCEAN SPRINGS MIDDLE SCHOOL 2023 HVAC REPLACEMENT
3600 HANSHAW ROAD
OCEAN SPRINGS, MISSISSIPPI 39564
PROJECT NO. 23034.00**

DIVISION 0 - PROCUREMENT AND CONTRACTING REQUIREMENTS

SECTION 001113 - ADVERTISEMENT FOR BIDS
SECTION 002113 - INSTRUCTIONS TO BIDDERS
SECTION 002213 - SUPPLEMENTARY CONDITIONS
SECTION 004200 - PROPOSAL FORM
SECTION 005200 - AGREEMENT FORM
SECTION 005200.01 - INSURANCE AND BONDS EXHIBIT
SECTION 005200.02 - MANDATORY ADDENDUM TO ALL OCEAN SPRINGS SCHOOL DISTRICT
CONTRACTS
SECTION 007200 - GENERAL CONDITIONS NOTICE

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 011000 - SUMMARY
SECTION 012100 - ALLOWANCES
SECTION 012300 - ALTERNATES
SECTION 012500 - SUBSTITUTION PROCEDURES
SECTION 012600 - CONTRACT MODIFICATION PROCEDURES
SECTION 012900 - PAYMENT PROCEDURES
SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION
SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION
SECTION 013300 - SUBMITTAL PROCEDURES
SECTION 014000 - QUALITY REQUIREMENTS
SECTION 014200 - REFERENCES
SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS
SECTION 016000 - PRODUCT REQUIREMENTS
SECTION 017300 - EXECUTION
SECTION 017700 - CLOSEOUT PROCEDURES
SECTION 017823 - OPERATION AND MAINTENANCE DATA
SECTION 017839 - PROJECT RECORD DOCUMENTS
SECTION 017900 - DEMONSTRATION AND TRAINING

NOT APPLICABLE:

*DIVISION 02 - EXISTING CONDITIONS
DIVISION 03 - CONCRETE
DIVISION 04 - MASONRY
DIVISION 05 - METALS
DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES
DIVISION 07 - THERMAL AND MOISTURE PROTECTION
DIVISION 08 - OPENINGS
DIVISION 09 - FINISHES
DIVISION 10 - SPECIALTIES
DIVISION 11 - EQUIPMENT*

DIVISION 12 - FURNISHINGS
DIVISION 13 - SPECIAL CONSTRUCTION
DIVISION 14 - CONVEYING EQUIPMENT

DIVISION 20 - PLUMBING AND HVAC GENERAL PROVISIONS

SECTION 200010 - MECHANICAL GENERAL PROVISIONS
SECTION 200020 - BASIC MECHANICAL REQUIREMENTS
SECTION 200030 - MECHANICAL SUBMITTALS AND SHOP DRAWINGS
SECTION 200035 - MECHANICAL SYSTEMS AND EQUIPMENT WARRANTIES
SECTION 200040 - MECHANICAL CLOSE-OUT REQUIREMENTS
SECTION 200050 - BASIC MECHANICAL MATERIALS AND METHODS
SECTION 200060 - PIPES AND PIPE FITTINGS
SECTION 200100 - VALVES
SECTION 200120 - PIPING SPECIALTIES
SECTION 200140 - SUPPORTS AND ANCHORS
SECTION 200170 - ELECTRICAL REQUIREMENTS
SECTION 200190 - MECHANICAL IDENTIFICATION
SECTION 200250 - MECHANICAL INSULATION

NOT APPLICABLE:

DIVISION 21 - FIRE SUPPRESSION
DIVISION 22 - PLUMBING

DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

SECTION 230520 - CHEMICAL TREATMENT
SECTION 230670 - PACKAGED AIR CONDITIONERS
SECTION 230885 - AIR CLEANING/TREATMENT
SECTION 230980 - CONTROLS AND INSTRUMENTATION
SECTION 230990 - TESTING, ADJUSTING AND BALANCING

DIVISION 26 - ELECTRICAL

SECTION 260010 - BASIC ELECTRICAL REQUIREMENTS
SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS
SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS
SECTION 262416 - PANELBOARDS
SECTION 262726 - WIRING DEVICES
SECTION 262816 - DISCONNECT SWITCHES

NOT APPLICABLE:

DIVISION 27 - COMMUNICATIONS
DIVISION 28 - ELECTRONIC SAFETY AND SECURITY
DIVISION 31 - EARTHWORK
DIVISION 32 - EXTERIOR IMPROVEMENTS
DIVISION 33 - UTILITIES
DIVISION 99 - FORMS

END OF TABLE OF CONTENTS

SECTION 001113 - ADVERTISEMENT FOR BIDS

Notice is hereby given that sealed hard copy bids or electronic bids will be received for the project named below by the **Ocean Springs School District, 2300 Government Street, Ocean Springs, MS 39564** until **11:00 AM on August 29, 2023**. Bids may be submitted directly to the location listed below or electronically through the Electronic Bidding System as listed below:

Location for Receipt of Sealed Hard Copy Bids:

**Central Office
Ocean Springs School District
2300 Government Street
Ocean Springs, MS 39564**

Location for Receipt of Electronic Bids:

Access the following website and log in: www.centralauctionhouse.com. Access the "Central Bidding" link, access the "Browse Public Bids: Mississippi Agencies" link, access the "Ocean Springs School District" link, and access the "Ocean Springs Middle School 2023 HVAC Replacement" link. For any questions related to the electronic bidding process, please call Central Bidding directly at (225) 810-4814.

Plans and Specifications Entitled:

**Ocean Springs School District
Ocean Springs Middle School 2023 HVAC Replacement
3600 Hanshaw Road
Ocean Springs, MS 39564**

May be inspected at the office of the Architect named below, or may be obtained from the Architect as set out below:

Bid documents are available from Central Bidding in electronic format only; Central Bidding does not offer paper prints. The cost of bid documents from Central Bidding varies depending on the subscription level of each bidder. Questions regarding Central Bidding website should be handled directly with Central Bidding at (225) 810-4814

As an additional option, bid documents can be obtained as paper prints or in electronic format from Planhouse Printing via the www.jbhmplans.com website. Cost of CD and/or the cost of paper prints will be listed on the www.jbhmplans.com website. Questions regarding Planhouse Printing and www.jbhmplans.com should be handled directly with Planhouse at (662) 407-0193.

Bid documents are non-refundable and must be purchased through either the www.centralauctionhouse.com or www.jbhmplans.com website.

All plan holders are required to have a valid email address for registration.

Partial sets will not be issued.

Proposals submitted in hard copy shall be submitted in duplicate only upon the blank proposal forms provided with the specifications and must be accompanied by Proposal Security in the form of Certified Check or acceptable Bid Bond in the amount equal to at least five percent (5%) of the Base Bid. Proposals submitted electronically shall be completed upon the blank proposal form provided with the specifications, and uploaded in .PDF format as directed by the Electronic Bidding System. Proposal Security shall also be uploaded in .PDF format to accompany bids submitted electronically. If an electronic bid is submitted, an original hard copy of all Proposal Documents, including Proposal Security, shall be provided to the Architect within three (3) business days after bid receipt, if requested. In either case, such security to be forfeited as liquidated damages, not penalty, by any bidder who fails to carry out the terms of the proposal, execute contract and post Performance Bond in the form and amount within the time specified. The Bid Bond, if used, shall be payable to the Owner.

Bids on the Project must be received on or before the period scheduled for the Project and no bid withdrawn after the scheduled closing time for the Project for a period of sixty (60) days.

All bids submitted in excess of \$50,000.00 by a Prime or Subcontractor to do any erection, building, construction, repair, maintenance, or related work must comply with the Mississippi Contractors Act of 1985, by securing a Certificate of Responsibility from the State Board of Contractors. Each bid, exceeding \$5,000.00, must be accompanied by the Bidder's certified check or a bid bond, duly executed by the Bidder as principal and having surety thereon, a surety company approved by the Owner and signed by an agent, regularly commissioned and licensed to transact business in Mississippi, in the amount of five percent of the bid. All bid bonds must be accompanied by the appropriate Power of Attorney. No Power of Attorney is necessary with a certified check.

The Owner reserves the right to reject any and all bids on any or all projects and to waive informalities.

OWNER:

**Ocean Springs School District
2300 Government Street
Ocean Springs, MS 39564**

ARCHITECT:

**JBHM Architects, P.A.
308 East Pearl Street, Suite 300
Jackson, MS 39201
PH: (601) 352-2699**

DATES OF ADVERTISEMENT: July 31, 2023
August 7, 2023

END OF SECTION **001113**

ADVERTISEMENT FOR BIDS

001113 - 2

SECTION 002113 - INSTRUCTIONS TO BIDDERS**PART 1 - GENERAL****1.01 GENERAL REQUIREMENTS**

- A. Interpretations: Should a bidder find discrepancies in or omissions from the plans and specifications or be in doubt as to their written meaning, he should immediately notify the Architect in writing. The Architect will then send a written instruction or interpretation to all known holders of the documents if deemed appropriate by the Architect. Neither the Owner nor the Architect will be responsible for nor bound by any oral instructions or for a bidder's failure to make inquiry.
- B. Addenda: Any addenda to the plans and/or specifications issued before or during the time of bidding will become a part of the Contract and receipt of same must be acknowledged by Bidder in his proposal.
- C. "Or Equal" Substitutions: Refer to Section 002213, Paragraphs 3.4.2 and 3.4.4 and to Section 012500 - "Or Equal" Substitutions: Bidder is advised that some sections of the specifications may not allow for substitutions and that the requirements of Sections 002213 and 012500 must be strictly complied with to obtain a substitution where substitution is allowed. Failure to strictly comply with Sections 002213 and 012500 and any requirements in the technical specifications which do not conflict with and which are in addition to Sections 002213 and 012500 may, in the Owner's sole discretion, result in the rejection of the request for "or equal" substitution.
- D. Construction Documents: As indicated in the Advertisement for Bids, Contract Documents will be issued on CD only. Bidders should include in Base Bid Proposal cost of printing all documents required for construction, as-built drawings, and close out documents.

1.02 BIDDING

- A. Contract for Construction: Lump sum, single bid received from General Contractors and shall include General, Mechanical, Electrical, and Sitework as well as all other work shown on plans and specified herein.
- B. Subcontractors and Suppliers: The Bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a Subcontract or Purchase Order under this Contract must be acceptable to the Owner.
 - 1. The Owner may make such investigation as he deems necessary to determine the ability of the Bidder or subcontractors or suppliers to perform the work, and the Bidder shall furnish to the Owner all such

information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Contract and to complete the work contemplated therein within the time required.

2. All subcontractors must have a current, valid, Contractor's License and/or Certificate of Responsibility where Bid exceeds \$50,000.00.
3. Listing of Subcontractors and Suppliers:
 - a. So that the Owner may be assured that only qualified and competent subcontractors and suppliers will be utilized on the Project and to prevent "bid-shopping" and/or "bid-chopping", each Bidder shall identify within seven (7) days after Bid receipt date the name of the subcontractor and supplier used by the Bidder in his bid for each subcontractor and supplier whose bid or quote exceeds \$50,000.00. Bidder's List shall be provided on the Listing Form provided with the Proposal Form. A Bidder's failure to indicate the name(s) of the subcontractors and major suppliers included in his lump sum price within seven (7) days after Bid receipt may result in the rejection of the Bidder's bid as nonresponsive.
 - b. The successful Bidder shall use the subcontractor and supplier identified by him as being included in his lump sum price, provided however, the Bidder assumes the risk that the subcontractor or supplier listed within the seven (7) day period will be acceptable to the Owner and the Architect. The Bidder shall not substitute another subcontractor for the listed subcontractor or supplier unless agreed to in writing by the Owner.
 - c. If Bidder lists itself as a supplier for any of the classifications listed, then the Bidder will be required to furnish such product from its manufacturing inventory and to demonstrate to the Owner and Architect that it has satisfactory qualifications and prior experience manufacturing and furnishing such materials, equipment and/or products. If Bidder lists itself as a subcontractor for any of the classifications listed, then the Bidder will be required to perform the work with its own regularly employed personnel and to demonstrate to the Owner and Architect that it has satisfactory qualifications and prior experience performing such work with its own regularly employed personnel. The Owner reserves the right to reject any bid if the evidence submitted by Bidder fails to satisfy the Owner that the Bidder has satisfactory qualifications and prior experience performing such work and/or furnishing such materials, equipment and/or products.

1.03 CERTIFICATE OF RESPONSIBILITY

- A. Each Bidder submitting a bid equal to or in excess of \$50,000.00 on public or private projects must show on his bid and on the face of the envelope containing the bid, his Certificate of Responsibility Number, as required by Section 31-3-21 (latest revision) Mississippi Code. If the bid does not exceed \$50,000.00, a notation so stating must appear on the face of the envelope.
- B. Each subcontractor shall also have a Certificate of Responsibility Number, as required by Section 31-3-21 (latest revision), Mississippi Code.
- C. Evidence: No bid will be opened, considered or accepted unless the above information is given as specified. Sufficient evidence that said Certificate of Responsibility has been issued and is in effect at the time of receiving bids must be submitted if required by the Owner or the Architect. Likewise, it shall be the responsibility of the General Contractor to require a Certificate of Responsibility Number from any subcontractor that falls in the category of "B" above.
- D. In accordance with Mississippi law, if the Bidder is a joint venture, either the joint venture or all of the Contractors which make up the joint venture must hold certificates of responsibility from the State Board of Contractors.

1.04 PRE-BID CONFERENCE

- A. A pre-bid conference has been scheduled for **2:00 PM on Tuesday, August 15, 2023** and will be held at the Ocean Springs School District Central Office (2300 Government Street, Ocean Springs, MS 39564). A site tour of the project site will be available following the meeting at Central Office.
- B. All general contract/major subcontract Bidders and Suppliers are urged to attend.
- C. All Bidders are expected to have familiarized themselves with conditions relating to the Work prior to the pre-bid conference.

1.05 NON-RESIDENT CONTRACTOR

- A. When a non-resident Contractor submits a bid for a Mississippi public project, he shall include with bid a copy of his resident State's current law pertaining to such State's treatment of non-resident Contractors as required by Section 31-3-21, Mississippi Code, (latest revisions) or a letter stating that his resident State has no such law pertaining to such State's treatment of non-resident contractors.

1.06 BID SECURITY

- A. Each bid, exceeding \$5,000.00, must be accompanied by the Bidder's certified check or a bid bond, duly executed by the Bidder as principal and having surety thereon, a surety company approved by the Owner and **signed by an agent**,

regularly commissioned and licensed to transact business in Mississippi, in the amount of five percent of the bid. All bid bonds must be accompanied by the appropriate Power of Attorney designating the Mississippi Resident Agent. The Bidder as principal will, within the time required, enter into a formal contract and give a good and sufficient bond to secure the performance of the terms and conditions of the contract. Otherwise, the Principal and Surety will pay unto the obligee the difference in money between the amount of the bid of the said Principal and the amount for which the obligee legally contracts with another party to perform work if the latter amount be in excess of the former, but in no event shall liability hereunder exceed the penal sum.

1.07 OPENING OF PROPOSALS

- A. Refer to the Advertisement for Bids.

1.08 PREPARATION OF BID

- A. Conditions of Work: Each Bidder must fully inform himself of the conditions relating to the construction of the project and employment of labor thereon. 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 his Contract. The Contractor must employ methods or means to cause no interruptions of or interference with the work of any other Contractor.
- B. Examination of Site: All Bidders, including the general contractor and subcontractors, will visit the site of the building, and inform themselves of all conditions. Failure to visit the site will in no way relieve the successful Bidder from his obligation to complete all work in accordance with the Contract Documents without additional cost to the Owner.
- C. Staging and Access: All Bidders, including the general contractor and subcontractors, acknowledge that the construction premises are restricted and that access is affected by the location of the Project, by the Facilities surrounding the Project and by other construction either presently being performed or proposed to be performed during the performance of this Contract. All Bidders, including the general contractor and subcontractors, further acknowledge that such limitations in space and accessibility have been taken into account in estimating their bids.
- D. Laws and Regulations: The Bidder's attention is directed to the fact that all applicable state laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project apply to the Contract. The successful Bidder shall be required to comply with all applicable laws, ordinances, rules and regulations at no additional cost to Owner whether such laws, ordinances, rules and/or regulations are enacted or adopted or become effective before or after bid opening.

- E. **Obligation of Bidder:** At the time of opening of bids, Bidder will be presumed to have inspected the site and to have read and be thoroughly familiar with the plans and specifications, including all addenda.
- F. **Telegraphic and Facsimile Modifications:** A Bidder may modify his bid by telegraphic or facsimile communication at any time, provided such communication is received by the Owner prior to the scheduled time for opening bids. Written confirmation must be received within two days from the bid opening time or no consideration will be given the telegraphic or facsimile modifications.

1.09 PROPOSALS

- A. **Form:** Submit all proposals on forms provided and fill all applicable blank spaces without interlineation, alteration, or erasure and recapitulations of the work to be done. No oral, telegraphic, or telephonic proposals will be considered. Any addenda issued during the bidding must be noted on the Proposal Form.
- B. **Withdrawal:** Any bid may be withdrawn prior to the time for opening of bids or authorized postponement thereof. Any bid received after the time and date specified will not be considered. All bids are irrevocable offers to contract at the price bid which may not be withdrawn until sixty (60) days after bid opening.
- C. **Submittal:** Submit bids in duplicate in an opaque sealed envelope bearing on the outside, the name and Certificate of Responsibility number of the Bidder, his address, bid opening date, time, complete project name, and project number.
- D. Any bid modification or qualification on the outside of the envelope will be considered only if accompanied by signature and title of person making the modification.
- E. **Mailing:** If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to:

**Central Office
Ocean Springs School District
2300 Government Street
Ocean Springs, MS 39564**

- F. Bidders are urged to deliver their bid to the Owner. Owner will not be responsible for misdelivery of mail or express deliveries.

1.10 CONTRACT

- A. **Award of Contract:** Award shall be made to the lowest and best Bidder, pursuant to Mississippi law and these Instructions to Bidders. The lowest bid shall be the base bid or combination of base bid and those alternates which

produce a total within available funds. The Owner reserves the right to waive irregularities and to reject any and all bids.

- B. Evaluation of the lowest and best Bidder, pursuant to Mississippi law and these Instructions to Bidders, will include but not be limited to the following:
1. The submitted bid price.
 2. The Bidder's relevant experience with Public and/or School projects of similar size, complexity, cost, and schedule constraints. To facilitate this evaluation, each bidder shall include with their Proposal a list of projects completed within the last five (5) years that are similar to this project in size, complexity, cost, and schedule constraints. Include no less than the following information:
 - a. Name of the project
 - b. Owner's name and contact information
 - c. Contract original sum and final contract amount
 - d. Contract original substantial completion date and actual substantial completion date
 - e. Indicate if there were any claims, liquidated damages imposed, etc.
 3. The Bidder's proposed Project Manager's relevant experience with Public and/or School projects of similar size, complexity, cost, and schedule constraints. To facilitate this evaluation, each bidder shall include with their Proposal a resume of the Proposed Project Manager.
 4. The Bidder's proposed Superintendent's (on-site foreman's) relevant experience with Public and/or School projects of similar size, complexity, cost, and schedule constraints. To facilitate this evaluation, each bidder shall include with their Proposal a resume of the Proposed Project Superintendent.
- C. Disqualification of Bidder: The Owner reserves the right to award to other than the low Bidder when, in the Owner's judgment, it is in his best interest to do so. The Owner reserves the right to request information from prospective Bidders as necessary in order to determine if circumstances for disqualification exist. For instance, a Bidder may be disqualified for such reasons as:
1. Bidder being in arrears on existing contracts.
 2. Bidder being in litigation with the Owner or the institution/agency.
 3. Bidder having defaulted on or failed to satisfactorily complete a previous contract with the Owner, including Bidder's failure to satisfactorily fulfill the warranty obligations of a previous contract with the Owner.
 4. The above is not an inclusive list.
- D. Security for Faithful Performance: When the bid exceeds \$5,000.00 and simultaneously with his delivery of the executed Contract, the Contractor will furnish a payment and a performance bond in accordance with Section 31-5-51 et. seq. of the Mississippi Code (latest revision). The surety on such bonds will be a duly authorized surety company licensed to do business in the state of Mississippi which is acceptable to the Owner and which is listed on the United

States' Treasury Department's list of acceptable sureties. Such payment and performance bonds shall be executed in the amount of the contract conditioned on the faithful performance of the work according to the plans, specifications, and contract documents.

- E. Time of Completion: By submission of its bid, Bidder agrees to commence work on or before a date specified in a written "Notice to Proceed" and to fully complete the Project within the time stated in the Bid Proposal Form.
- F. Liquidated Damages for Failure to Enter Into Contract: The successful Bidder, upon his failure or refusal to execute and deliver the Contract and required bonds within ten days after he has received notice of the acceptance of his bid, will forfeit to the Owner as liquidated damages the security deposited with his bid.
- G. Liquidated Damages for Failure to Substantially Complete Project in Time Stipulated: Applicable when stipulated sum is shown in Section 002213, Paragraph 9.11.

1.11 BID DOCUMENTS

- A. Plans and Specifications are available, unless noted otherwise on the Advertisement for Bid, at the office of the Architect, JBHM Architects, P.A., 308 East Pearl Street, Suite 300, Jackson, MS 39201.
- B. No partial sets of documents will be issued or accepted for return.

END OF SECTION **002113**

SECTION 002213 - SUPPLEMENTARY CONDITIONS

PART 1 GENERAL

1.1 DESCRIPTION

- A. The following Supplementary Conditions modify the "General Conditions of the Contract for Construction," AIA Document A201, 2017. Where a portion of the General Conditions is modified or deleted by the Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect. In the event of a conflict between the General Conditions of the Contract for Construction and Section 002213, Section 002213 shall control even if the conflicting provision in the General Conditions of the Contract for Construction is not expressly revised or deleted by reference in Section 002213.
- B. The General Conditions may also be supplemented or amplified elsewhere in the Contract Documents by provisions located in, but not necessarily limited to, Division 1 of the Specifications.

1.2 SUPPLEMENTS

ARTICLE 1 - GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS:

Delete the last sentence in Article 1.1.1 and insert the following:

The Contract Documents shall include the Instructions to Bidders, the plans, the specifications, including Divisions 0 through 16, all Addenda and modifications to the plans and/or specifications, the Agreement between Owner and Contractor, the performance and payment bonds, the notice to proceed and any executed change orders. Information and documentation pertaining to soil investigation data, laboratory investigations, soil borings and related information included herein are not part of the Contract Documents. In the event of a conflict between the provisions of Division 0 and any other section of the Contract Documents, such other sections(s) shall govern.

1.1.2 THE CONTRACT

Add the following to the end of Article 1.1.2:

Large scale drawings shall govern over small scale drawings where there are differences or conflicts between such drawings. Where the word "similar" appears on the plans, it shall not be interpreted to mean "identical" and shall require the Contractor to coordinate the actual conditions and dimensions of the location where the "similar" conditions are shown to occur.

1.1.9 MISCELLANEOUS DEFINITIONS

Add the following:

The term "products" as used in these Supplementary Conditions includes materials, systems and equipment.

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1.2.4 Add the following Article 1.2.4:

It is the intent of the Contract Documents that the Contractor shall properly execute and complete the Work described by the Contract Documents, and unless otherwise provided in the Contract, the Contractor shall provide all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services, whether temporary or permanent and whether or not incorporated in the Work, in full accordance with the Contract Documents and reasonably inferable from them as necessary to produce the intended results.

1.2.5 Add the following Article 1.2.5:

The Contract Documents shall be interpreted collectively, each part complementing the others and consistent with the intent of the Contract Documents. Unless an item shown or described in the Contract Documents is specifically identified to be furnished or installed by the Owner or others or is identified as "Not In Contract" ("N.I.C."), the Contractor's obligation relative to that item shall be interpreted to include furnishing, assembling, installing, finishing, and/or connecting the item at the Contractor's expense to produce a product or system that is complete, appropriately tested, and in operable condition ready for use or subsequent construction or operation by the Owner or separate contractors. The omission of words or phrases for brevity of the Contract Documents, the inadvertent omission of words or phrases, or obvious typographical or written errors shall not defeat such interpretation as long as it is reasonably inferable from the Contract Documents as a whole.

Words or phrases used in the Contract Documents which have well-known technical or construction industry meanings are to be interpreted consistent with such recognized meanings unless otherwise indicated.

Except as noted otherwise, references to standard specifications or publications of associations, bureaus, or organizations shall mean the latest edition of the referenced standard specification or publication as of the date of the Advertisement of Bids.

In the case of 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.

Generally, portions of the Contract Documents written in longhand take precedence over typed portions, and typed portions take precedence over printed portions.

Any doubt as to the meaning of the Contract Documents or any obscurity as to the wording of them, shall be promptly submitted in writing to the Architect for written interpretation, explanation, or clarification.

1.7 BUILDING INFORMATION MODELS USE AND RELIANCE – Delete this Article 1.7 entirely.

ARTICLE 2 - OWNER

2.2 EVIDENCE OF THE OWNER'S FINANCIAL ARRANGEMENTS

2.2.1 Add the following to the beginning of Article 2.2.1:

"If the Project is a private project, not funded by public funds, then . . .".

2.2.2 Delete Article 2.2.2 entirely.

2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.3.1 Delete Article 2.3.1 in its entirety.

2.3.4 Delete Article 2.3.4 in its entirety.

2.3.6 Delete Article 2.3.6 in its entirety and insert the following:

As indicated in the Advertisement for Bids, Contract Documents will be issued via hard copy and / or CD. Bidders should include in their Base Bid Proposal, the cost of printing all documents required for construction, as-built drawings, and close out documents.

2.4 OWNER'S RIGHT TO STOP THE WORK

2.4 Delete Article 2.4 in its entirety and insert the following:

2.4 If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents as required by Article 12.2 or fails to carry out Work in accordance with the Contract Documents or fails to perform any of its obligations under the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated. However, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Article 6.1.3.

The rights and remedies under this Article 2.4 are in addition to and do not in any respect limit any other rights of the Owner, including its termination rights under Article 14.

ARTICLE 3 - CONTRACTOR

3.1 GENERAL

3.1.1 Add the following at the end of Article 3.1.1:

The relationship of Contractor to Owner shall be that of independent contractor, and nothing in the Contract Documents is intended to nor should it be construed as creating any other relationship, expressed or implied, between Owner and Contractor.

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.5 Add the following Article 3.2.5:

The Owner is entitled to deduct from the Contractor's pay applications for amounts paid to the Architect for evaluating and responding to the Contractor's requests for information that are not prepared in accordance with the Contract Documents or where the requested information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

3.4 LABOR AND MATERIALS

3.4.2 Add the following to the end of Article 3.4.2:

Some Sections of the Specifications may not allow substitution of materials, products or equipment. Where substitution is allowed the request for substitution will only be considered if made in strict accordance with the requirements of Article 3.4.4 below and Section 01630.

3.4.4 Add the following Article 3.4.4:

After the Contract has been executed, the Owner and the Architect may consider a request for the substitution of products in place of those specified only under the conditions set forth in Section 01630 of the specifications.

By making requests for substitutions, the Contractor:

- .1 Represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respect to that specified;
- .2 Represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;
- .3 Certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently becomes apparent; and
- .4 Shall coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects at its costs.

All substitutions shall be submitted within 30 days of the Notice to Proceed, as per Section 01630.

3.4.5 Add the following Article 3.4.5:

Contractor represents that it has independently investigated, considered and understands the labor conditions in the area surrounding the Project and acknowledges that such conditions may impact the Contractor's cost and/or time of performance of the Contract. Therefore, Contractor further represents that the

Contract Price is based upon Contractor's independent investigations into such labor conditions and that the Contract time is reasonable, and the date of Substantial Completion is obtainable. As a result, Contractor assumes the risk of increased costs, if any, incurred by it arising out of or related to such labor conditions and acknowledges that Contractor and its surety will reimburse Owner for any additional costs Owner incurs arising out of or related to such labor conditions.

3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

3.7.1 Delete Article 3.7.1 in its entirety and insert the following:

The Contractor shall secure and pay for the building permit and all other permits, fees, licenses, inspections and all other approvals and charges necessary for proper execution and completion of the Work.

3.7.3 Delete the words "knowing it to be" from Article 3.7.3.

3.8.2.3 Add the following to the end of Article 3.8.2.3:

. . . except when installation is specified to be included as part of the allowance in the General Requirements (Division 1 of the Specifications).

3.9 SUPERINTENDENT

Add the following to the end of Article 3.9.1:

The Contractor shall also employ a competent project manager who shall be primarily responsible for the Contractor's home office activities in connection with the Contract.

The Owner shall have the right, which shall be exercised in a reasonable fashion, to approve the project manager and/or superintendent employed by the Contractor, either before or during the progress of construction.

The superintendent and project manager for the project shall be designated by the Contractor at the pre-construction conference. After Owner's approval of such project manager and superintendent, they shall not be replaced by the Contractor without the Owner's prior written consent, which consent is required unless the Contractor submits proof satisfactory to the Owner that the superintendent and/or the project manager should be terminated by the Contractor for cause.

3.10 CONTRACTOR'S CONSTRUCTION AND SUBMITTAL SCHEDULES

3.10.1 Add "but, in any event, no less than submission of a revised schedule with each monthly application for payment pursuant to Section 9.3" between "intervals" and "as" in the fourth sentence.

3.10.3 Delete Article 3.10.3 in its entirety and insert the following:

Time being of the essence, the Contractor shall perform the Work in accordance with the most recent schedule submitted to and approved by the Owner and Architect.

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

3.12.6 Add the following to the end of Article 3.12.6:

In reviewing Shop Drawings, Product Data, Samples and similar submittals the Architect shall be entitled to rely upon the Contractor's representation that such information is correct and accurate.

3.12.8 Add the following to the end of Article 3.12.8:

Unless such written notice has been given, the Architect's approval of a Shop Drawing, Product Data, Sample or similar submittal shall not constitute approval of any changes not requested on the prior submittal.

3.12.9 Add the following to the end of Article 3.12.9:

The Architect's review of the Contractor's submittals will be limited to examination of an initial submittal and one (1) resubmittal. The Architect's review of additional submittals will be made only with the consent of the Owner after notification by the Architect. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for evaluation of such additional resubmittals.

3.12.10.1 Delete the second sentence entirely and replace with: "The performance and design criteria specified by the Architect in the Contract Documents shall be prepared in accordance with the applicable standard of care."

3.18 INDEMNIFICATION

3.18.1 Add the word "defend," before the word "indemnify" in the first line, add the words "or Nonperformance" after the word "performance" in the third line and delete the phrase which begins "provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself)," to the end of the sentence.

ARTICLE 4 - ARCHITECT

4.2 ADMINISTRATION OF THE CONTRACT

4.2.4 Delete the last sentence entirely.

4.2.10 Delete Article 4.2.10 in its entirety.

ARTICLE 5 - SUBCONTRACTORS

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Delete the phrase "Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract" from the first sentence of Article 5.2.1 and insert the following in lieu thereof:

“The Contractor, with its first Application for Payment and as a condition to the Owner’s obligation to make payments to Contractor under Article 9 of the General Conditions as supplemented herein,”

5.2.5 Add the following Article 5.2.5:

The Contractor’s unauthorized substitution of any subcontractor, supplier, person or entity previously identified by Contractor in accordance with Article 5.2.1 shall entitle the Owner to reject the work, materials or product furnished and require removal and replacement at no additional cost to the Owner.

ARTICLE 6 - CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

Delete Articles 6.1.1, 6.1.2, 6.1.3, 6.1.4 in their entirety and insert the following:

6.1 The term “Separate Contractor(s)” shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner’s own forces and to award separate contracts either in connection with other portions of the Project or other construction or operation on the site. In such event, the Contractor shall coordinate its activities with those of the Owner and of Separate Contractors so as to facilitate the general progress of all work being performed by all parties. Cooperation will be required in the arrangement for the storage of materials, and in the detailed execution of the Work.

The Contractor, including his subcontractors, shall keep informed of the progress and the detailed work of the Owner or Separate Contractors and shall immediately notify the Architect of lack of progress or delays by Separate Contractors which are affecting Contractor’s Work. Failure of Contractor to keep informed of the progress of the work of the Owner or Separate Contractors and/or failure of Contractor to give notice of lack of progress or delays by the Owner or Separate Contractors shall be deemed to be acceptance by Contractor of the status of progress by Separate Contractors for the proper coordination and completion of Contractor’s Work. If, through acts or neglect on the part of the Contractor, the Owner or any Separate Contractors shall suffer loss or damage or assert any claims of whatever nature against the Owner, the Contractor shall defend, indemnify and hold harmless the Owner from any such claims or alleged damages, and the Contractor shall resolve such alleged damages or claims directly with the Separate Contractors.

6.2 MUTUAL RESPONSIBILITY

6.2.3 Delete Article 6.2.3 in its entirety.

ARTICLE 7 - CHANGES IN THE WORK

7.1 GENERAL

7.1.3 Add the following to the end of Article 7.1.3:

Except as permitted in Article 7.3, a change in the Contract Sum or the Contract Time shall only be accomplished by written change order. Therefore, the Contractor acknowledges that it is not entitled to a change in the Contract Sum or the Contract Time in the absence of a written change order on the basis of the course of conduct or dealings between the parties and/or the Owner's express or implied acceptance of alterations or additions to the Work and/or the Owner has been unjustly enriched by the Contractor's Work or any other basis otherwise allowed by law or the facts and Contractor agrees that any such extra or changed work was performed by it as a volunteer.

7.2 CHANGE ORDERS

7.2.2 Add the following Article 7.2.2:

Contractor's execution of a change order constitutes a final settlement to the Contract Sum and construction schedule and the Contract Time for all matters relating to or arising out of the change in the Work that is the subject of the change order including, but not limited to, all direct and indirect costs associated with such change, all extended direct job site and home office overhead expenses and any and all delay and impact cost for the change, whether alone or in combination with other changes, including any impact, ripple or cumulative effect resulting therefrom, if any.

7.2.3 Add the following Article 7.2.3:

Adjustments to the Contract Sum by change order shall be based upon one of the methods set forth in Article 7.3.3.1, 7.3.3.2, 7.3.3.3 or 7.3.3.4, as appropriate. A reasonable allowance for the combined overhead and profit included in the change order shall be based upon the schedule set forth in Article 7.3.11, as supplemented.

7.2.4 Add the following Article 7.2.4:

In order to facilitate consideration of change order requests, all such requests, except those involving an amount less than \$500 must be accompanied by a complete itemization of costs, including labor, materials and subcontractor costs which shall likewise be itemized. Changes for more than \$500 will not be approved without such itemization.

7.3 CONSTRUCTION CHANGE DIRECTIVES

7.3.5 Add "Owner or" between "the" and "Contractor" in both places they appear in this Article.

7.3.8 Delete the first sentence and insert the following:

The amount of credit to be given by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be the actual net cost plus reasonable allowance for overhead on net cost and profit thereon as approved by the Architect and Owner.

7.3.11 Add the following Article 7.3.11:

The allowance for overhead and profit combined, including extended direct job and home office overhead and any and all delay, impact, inefficiency, disruption and ripple effect to be included in the total cost to the Owner, shall be based on the following

schedule:

- .1 For the Contractor, for work performed by the Contractor's own forces, 15 percent of the cost.
- .2 For the Contractor, for work performed by the Contractor's subcontractor, 10 percent of the amount due the subcontractor.
- .3 For each subcontractor or sub-subcontractor involved, for work performed by that subcontractor or sub-subcontractor's own forces, 15 percent of the cost.
- .4 For each subcontractor, for work performed by the subcontractor's sub-subcontractor's, 10 percent of the amount due the sub-subcontractor.
- .5 Costs to which overhead and profit is to be applied shall be determined in accordance with Article. 7.3.4.

ARTICLE 8 - TIME

8.2 PROGRESS AND COMPLETION

8.2.1 Add the following to the end of the second sentence:

and that the Contractor is fully capable of properly completing the Work within the Contract Time.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.3 Add the following to the end of Article 8.3.3:

No delay, interference, hindrance or disruption, from whatever source or cause, in the progress of the Contractor's Work shall be a basis for an extension of time and/or additional compensation, unless the delay, interference, hindrance or disruption (1) is without the fault and not the responsibility of the Contractor, its subcontractors and/or suppliers and (2) directly affects the overall completion of the Work as reflected on the critical path of the Contractor's updated and accepted construction schedules. The Contractor expressly agrees that the Owner shall have the benefit of any float in the construction schedule and that delays to construction activities, which do not affect the overall completion of the Work, do not entitle the Contractor to any extension in the Contract Time and/or increase in Contract Sum.

8.3.4 Add the following Article 8.3.4:

All claims by the Contractor for an increase in the Contract Time must follow the procedures set forth in Articles 15.1.2, 15.1.3, 15.1.5 and 15.1.6, including the requirement that the Contractor give written notice of any claim within twenty-one (21) days after occurrence of the event giving rise to such claim or within twenty-one (21) days after the Contractor first recognizes the condition giving rise to the claim, whichever is earlier.

8.3.5 Add the following Article 8.3.5:

If the Contractor submits a schedule indicating or otherwise expressing an intent to complete the Work prior to the date of substantial completion, the Owner shall have no

liability to the Contractor for any failure by the Contractor to complete the Work prior to the expiration of the Contract Time.

ARTICLE 9 - PAYMENTS AND COMPLETION

9.3 APPLICATION FOR PAYMENTS

9.3.1 Add the following sentence to the end of Article 9.3.1:

The form of Application for Payment will be the current edition of the AIA Document G702, Application and Certification for Payment, supported with AIA Document G703, Continuation Sheet.

9.3.1.3 Add the following Article 9.3.1.3:

In any contract awarded by the state of Mississippi or any agency, unit or department of the State of Mississippi, or by any political subdivision thereof, the amount of retainage that may be withheld is governed by Mississippi law.

9.3.2.1 Add the following Article 9.3.2.1:

Payment for materials stored at some location other than the Project site, may be approved by the Architect and the Owner after the Contractor has submitted the following items:

- .1 An acceptable Lease Agreement between the Contractor or one of its subcontractors or suppliers and the owner of the land, or building, where the materials are stored covering the specific area where the materials are located.
- .2 Consent of Surety or other acceptable bond to cover the materials stored off-site.
- .3 All Perils Insurance coverage for the full value of the materials stored off-site.
- .4 A Bill of Sale from the Manufacturer to the Contractor for the stored materials.
- .5 A complete list and inventory of materials manufactured, stored and delivered to the storage site and of materials removed from the storage site and delivered to the Project.
- .6 A review by the Architect of the materials stored off-site prior to release of payment.
- .7 Proof of payment of stored materials verified by the supplier must be submitted to the Architect within thirty (30) days of the Application for Payment on which payment for said materials was made. If proof of payment is not submitted within thirty (30) days, then payment for said materials will be deducted from the next application for payment and withheld until proof of payment is received.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

9.5.1.7 Delete the word "repeated".

9.5.1.8 Add the following Article 9.5.1.8:

The letter from the Contractor which is required by Article 15.1.6.2 has not been received.

9.6 PROGRESS PAYMENTS

9.6.1 Delete Article 9.6.1 in its entirety and insert the following:

Subject to the conditions of the Contract, the Owner shall make payment to the Contractor in the amount certified within thirty (30) days after receipt of the Certificate for Payment from the Architect. Payment shall not be considered late until thirty (30) days after Owner's receipt of the approved Certificate for Payment from the Architect.

9.6.1.1 Contractor's Applications for Payment shall be submitted on or before the 25th day of each month. Any application not submitted on or before this date may not be processed or approved until the following month.

9.6.7 Delete the word "Unless" from the first sentence and insert the phrase "Whether or not."

Add the following to the end of Article 9.6.7:

The amount retained by the Contractor from each payment to each Subcontractor and material supplier shall not exceed the percentage retained by the Owner from the Contractor for the Subcontractor's Work.

9.7 FAILURE OF PAYMENT

9.7 In the first sentence, delete the words "or awarded by binding dispute resolution".

9.8 SUBSTANTIAL COMPLETION

9.8.1 Delete Article 9.8.1 in its entirety and insert the following:

Substantial completion for purposes of this Contract occurs only upon Contractor's compliance with the following conditions precedent: (a) the Contractor furnishes to the Architect all close-out documents required by the Contract Documents in a form satisfactory to the Architect and the Owner, (b) the Contractor furnishes the manufacturers' certifications and/or warranties required by the Contract Documents; (c) the Contractor furnishes the Guarantee of Work set forth hereinbelow; and (d) the Architect certifies that the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended purpose.

The Guarantee of Work shall be submitted as a separate document signed by Contractor and Contractor's Surety and shall state the following:

Contractor and Contractor's Surety hereby guarantee that all Work performed on the Project is free from defective and/or nonconforming materials and workmanship and that for a period of one year from the date of substantial completion or such longer period of time as may be called for in the Contract

Documents for such portions of the Work, Contractor or its Surety will repair and/or replace any defective and/or nonconforming materials and workmanship in accordance with the requirements of the Contract Documents.

9.8.2.1 Add the following Article 9.8.2.1:

The Contractor shall be responsible for the costs of inspections made by the Architect including any and all other related expenses incurred by the Architect for providing services for the Project required by failure of the Contractor to achieve final acceptance / completion of the Project within 30 days after the first occurrence of the below described events:

1. Specified date of Substantial Completion; or
2. Actual date of Substantial Completion.
3. More than two (2) reviews of close out documents.

The costs of the Architect's additional services shall be deducted by the Owner from the Contractor's final application for payment to pay the Architect for additional services required by the Contractor's failure to achieve final completion of the project within the 30-day period described above. These additional services are above and beyond any liquidated damages that the Owner may be due per Contract Documents.

9.8.4 Delete the last sentence of Article 9.8.4 and insert the following:

Warranties required by the Contract Documents shall commence and continue for one (1) year from the date of Substantial Completion except that the roof system shall be warranted for a period of three (3) years from the date of Substantial Completion.

9.8.5 Add the following to the end of Article 9.8.5:

Contractor's execution of the Certificate of Substantial Completion constitutes Contractor's representation that the items on the list accompanying the Certificate can and will be completed by Contractor and his subcontractors within thirty (30) days of Contractor's execution of the Certificate. Based upon this representation by Contractor and upon the acknowledgment of the Architect that the listed items remaining can be completed within thirty (30) days, the Owner agrees to execute the Certificate of Substantial Completion. If Contractor fails to complete the items on the list within thirty (30) days of Contractor's execution of the Certificate, then the Owner, at its option and without prejudice to any other rights or remedies it may have under this Contract or otherwise and without notice to Contractor or Surety, may proceed to have same completed and to deduct the reasonable costs thereof from the amounts then due or thereafter to become due to Contractor.

9.8.6 Add the following Article 9.8.6:

The costs of inspections made by Architect which are not required by Articles 4, 9.8 or 9.10 of the General Conditions and any other inspection required by Article 12 other than the year-end inspection itself, will be the responsibility of the Contractor and will be deducted by the Owner from the Application for Payment submitted after the Owner's receipt of the Architect's statement for its costs of additional inspections. These costs are not the result of Contractor's failure to timely complete the Contract within the specified time and, therefore, such costs are in addition to and not a part of any liquidated damages calculation, if any.

9.8.7 Add the following Article 9.8.7:

Upon the Owner's acceptance of the Work as substantially complete and upon Contractor's compliance with all conditions precedent to substantial completion as stated in Section 002213, Article 9.8.1 and upon application by the Contractor, the Owner will pay to the Contractor all retainage held by the Owner less an amount equal to the greater of (a) two percent (2.0%) of the Contract Sum, or (b) two hundred percent (200%) of the estimated cost of the Work remaining to be performed by the Contractor in accordance with the Architect's determination. Final payment, including all retainage, shall be made at the time and in the manner provided for final payment in accordance with the provisions of Article 9.10 and the additional conditions precedent to final acceptance / payment set forth in Section 002213, Article 9.8.5.

9.9 PARTIAL OCCUPANCY OR USE

9.9.1.2 Add the following Article 9.9.1.2:

The Owner's occupancy or use of any completed or partially completed portions of the Work shall not affect Contractor's obligation to complete incomplete items on the list attached to the Certificate of Substantial Completion within the time fixed in the Certificate and does not waive Owner's right to obtain completion of incomplete items at Contractor's expense upon Contractor's failure to timely complete same.

9.11 LIQUIDATED DAMAGES

Liquidated Damages. Time being of the essence of this Contract and a matter of material consideration thereof, a reasonable estimate in advance is established to cover losses incurred by the Owner if the Project is not substantially complete on the date set forth in the Contract Documents. The Contractor and his Surety will be liable for and will pay the Owner the sums hereinafter stipulated as fixed and agreed as liquidated damages for each calendar day for delay until the Work is substantially complete. The Contractor and his Surety acknowledge that the Owner's losses caused by the Contractor's delay are not readily ascertainable and that the amount estimated per day for liquidated damages is reasonable and is not a penalty.

The amount established per day for liquidated damages is **\$500.00**.

ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS Add the following to the end of Article 10.1:

The Architect shall not administer the Contractor's performance of its duties and responsibilities under Article 10 (including Articles 10.1 through 10.6) because the initiation, maintenance and supervision of safety precautions and programs is the sole responsibility of the Contractor as means, methods, techniques, sequences and procedures of construction and, therefore, is not part of the Contractor's scope of Work which is to be administered by the Architect.

ARTICLE 11 - INSURANCE AND BONDS

SEE AIA DOCUMENTS A101 – 2017 EXHIBIT A & A201-2017 GENERAL CONDITIONS

11.4 LOSS OF USE, BUSINESS INTERRUPTION, AND DELAY IN COMPLETION ` INSURANCE

11.4 Delete Article 11.4 in its entirety.

ARTICLE 12 - UNCOVERING AND CORRECTION OF WORK

12.1 UNCOVERING OF WORK

12.1.2 Delete the second sentence of Article 12.1.2 entirely and replace with:

“If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner’s expense.”

12.2 CORRECTION OF WORK

12.2.2 AFTER SUBSTANTIAL COMPLETION

12.2.2.1 Add the following to the end of Article 12.2.2.1:

Prior to the end of the one-year period, (three years for roof systems), the Architect may schedule a warranty inspection which shall be attended by the Architect, the Owner, the Contractor and all major subcontractors. During this inspection, the parties shall identify all defective and/or nonconforming items and fix a time within which all defective and/or nonconforming items shall be repaired and/or replaced.

12.2.2.1.1 Add the following Article 12.2.2.1.1:

Within the one-year period (three years for roof systems) provided for in the Guarantee of Work required by Article 9.8.1, if repairs or replacement are requested by Owner in connection with the Work which, in the opinion of the Owner, are rendered necessary as a result of the use of materials, equipment or workmanship which are inferior, defective or not in accordance with the Contract Documents, the Contractor and/or its Surety shall promptly, upon receipt of notice from and without expense to the Owner, place in satisfactory condition in every particular, all such Work, correct all defects therein and make good all damages to the building, site, equipment or contents thereof; and make good any work or materials or the equipment and contents of said buildings or site disturbed in fulfilling any such guarantee. If, after notice or within the time agreed upon by the parties at the warranty inspection, the Contractor and/or its Surety fail to proceed promptly to comply with the terms of the guarantee, the Owner may have the defects corrected in accordance with Article 2.5 and the Contractor and his Surety shall be liable for all expenses incurred. All special guarantees applicable to definite parts of the Work stipulated in the Contract Documents shall be subject to the terms of this paragraph during the first year of the life of such special guarantee.

ARTICLE 13 - MISCELLANEOUS PROVISIONS

13.5 INTEREST

13.5 Delete Article 13.5 in its entirety and insert the following:

Payments due and unpaid under the Contract Documents shall bear interest as provided by applicable Mississippi law.

13.6 ATTORNEYS' FEES AND EXPENSES

Add the following Article 13.6 to private projects not funded in whole or in part by public monies.

The prevailing party in any dispute between the parties arising out of or related to this Agreement or the breach thereof, shall be entitled to reasonable attorneys' and expert witness(es) fees and expenses incurred in pursuing or defending any claim.

ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

14.1.1.4 Delete Article 14.1.1.4 in its entirety.

14.1.3 Delete ", as well as reasonable overhead and profit on Work not executed," between "executed" and "and" in the third line.

14.2 TERMINATION BY THE OWNER FOR CAUSE

14.2.1.1 Delete the word "repeatedly" from Article 14.2.1.1.

14.2.1.3 Delete the word "repeatedly" from Article 14.2.1.3.

14.2.1.5 Add the following Articles 14.2.1.5 and 14.2.1.6:

.5 fails to achieve Substantial Completion of the Project as described in Section 002213, Article 9.8.5, within the time stated therein;

.6 fails to meet any deadline required by the Contract. Contractor acknowledges that time is of the essence of this Contract and that all deadlines required by the Contract are critical to timely completion of the Contract. Therefore, Contractor agrees that its failure to meet any deadline constitutes a substantial and material breach of this Contract, entitling the Owner to terminate the Contract.

14.2.2 Delete the word "certification" in the first sentence and insert the word "advice".

14.2.4 Delete the phrase "Initial Decision Maker" and insert the word "Architect".

14.2.5 Add the following Article 14.2.5:

If the Owner terminates the Contract for cause, and it is determined for any reason that the Contractor was not actually in default under the Contract at the time of termination, the Contractor shall be entitled to recover from the Owner the same amount as the Contractor would be entitled to receive under a termination for convenience as provided by Article 14.4. The foregoing shall constitute the Contractor's sole and exclusive remedy for termination of the Contract. In no event shall the Contractor be entitled to special, consequential, or exemplary damages, nor shall the Contractor be entitled to anticipated profits resulting from termination of this

Contract.

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

- 14.4.3 Add after the end of that sentence: "The Contractor shall not be entitled to receive any payment for either overhead or profit on work not performed."

ARTICLE 15 - CLAIMS AND DISPUTES

- 15.1.2 Delete the phrase "in accordance with the requirements of the final dispute resolution method selected within the Agreement".

15.1.6 CLAIMS FOR ADDITIONAL TIME

- 15.1.6.2 Add the following to the end of Article 15.1.6.2:

The Contractor must submit each month with his Application for Payment a separate letter stating that he is requesting an extension of time for abnormal adverse weather or that he has no claim for an extension for that period of time. Payment is not due on the Application for Payment until the letter is received. Complete justification, including weather reports, daily reports, correspondence and any other supporting data must be provided for each day for which a request for time extension is made. A letter or statement that the Contractor was delayed is not as adequate justification. The receipt of this request and data by the Architect will not be considered as Owner or Architect approval of a time extension in any way.

- 15.1.6.3 Add the following Article 15.1.6.3:

Time Extension for Weather Not Allowed: Add the following in lieu of Article 15.1.6.3:

The Contractor assumes the risk of both normal and abnormally adverse weather and will not be entitled to any time extension or Contract price adjustment for either normal or abnormally adverse weather encountered during construction, notwithstanding any other provision of the Contract to the contrary.

- 15.1.6.4 Add the following Article 15.1.6.4:

Claims for increase in the Contract Time shall set forth in detail the facts and circumstances which support such Claim, including but not limited to, the cause of such delay, the date such delay began to affect the critical path, the date such delay ceased to affect the critical path and the number of days of additional time requested. The Contractor shall not be entitled to an increase in the Contract Time for delays which did not affect the critical path or to the extent there were concurrent non-excusable delays. The Contractor may be requested to provide additional documentation to substantiate its Claim, including but not limited to, schedules that indicate all activities affected by such delay.

- 15.1.8 Add the following Article 15.1.8:

The Contractor expressly agrees that the Article 15 Claims and Disputes process is the only dispute resolution mechanism that will be recognized by the parties for any claims put forward by the Contractor, notwithstanding any other claimed theory of entitlement on the part of the Contractor or its subcontractors or suppliers against

the Owner and/or the Architect or any of their design consultants, including, but not limited to, all claims of breach of contract, breach of warranty, misrepresentation, negligence, professional negligence, and/or any other tort.

15.2 INITIAL DECISION

15.2.4 Add “within thirty (30) days” to the end of Article 15.2.4.

15.3 MEDIATION

15.3.1 Delete the phrase “shall be subject to mediation as a condition precedent to binding dispute resolution” and insert the phrase “may be subject to mediation upon mutual agreement of the Owner and Contractor”.

15.3.2 Delete the word “shall: in the first sentence wherever it appears and insert the word “may”.

15.3.3 Delete Article 15.3.3 in its entirety.

15.4 ARBITRATION

15.4.1 Delete the words “parties have” in the first sentence and insert the words “Owner has” and delete the phrase “unless the parties mutually agree” in the first sentence and insert the phrase “unless the Owner chooses”.

15.4.4 CONSOLIDATION OR JOINDER

15.4.4 Delete Article 15.4.4, including subparts .1 - .3, in its entirety and insert the following:

15.4.4.1 The Owner, at its sole discretion, may consolidate any arbitration, if any, conducted under this Agreement with any other arbitration to which it is a party where the Owner determines that the arbitrations to be consolidated substantially involve common questions of law or fact and the Owner, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration.

END OF SECTION 002213

SECTION 003126 - EXISTING HAZARDOUS MATERIAL INFORMATION

PART 1 – GENERAL

1.01 DESCRIPTION

- 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 Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions.
- B. Hazardous Materials Investigation: The District maintains Asbestos Surveys on file.
- C. Bidders shall assume that no Asbestos Containing Materials will be encountered within the work areas. Should Contractor uncover materials suspected to contain hazardous materials in the process of demolition work, notify Architect.
- D. Additional Investigation:
 - 1. Prior to bidding, Contractor may visit the site and acquaint himself with conditions.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION **003126**

SECTION 004200 - PROPOSAL FORM

(Submit in Duplicate)

BIDDER: _____

ADDRESS: _____

DATE: _____

**Ocean Springs School District
2300 Government Street
Ocean Springs, MS 39564**

RE: Ocean Springs Middle School 2023 HVAC Replacement

Having carefully examined the Contract Documents and all addenda for the referenced Project, as well as the premises and conditions affecting the work, I, the undersigned, propose to furnish all labor, materials, and services required by the Contract Documents in accordance with the conditions of said Contract Documents for the sums set forth below:

BASE BID: _____
_____ (\$ _____).

ALTERNATE NO. 1 (ADD): HVAC Replacement in Classrooms 202, 204, 206, 208, and 210:

_____ (\$ _____).

ALTERNATE NO. 2 (ADD): HVAC Replacement in Classrooms 215, 217, and 219:

_____ (\$ _____).

ALTERNATE NO. 3 (ADD): HVAC Replacement in Classrooms 207, 209, and 211:

_____ (\$ _____).

TOTAL BID: (Include Base Bid and all Additive Alternates):

_____ (\$_____).

PROPOSED PERSONNEL AND RELEVANT EXPERIENCE:

Prime Bidder shall include the following information, with his bid, such that the lowest and best bidder may be evaluated:

1. Attach a list of projects completed within the last five (5) years that are similar to this project in size, complexity, cost, and schedule constraints. Include no less than the following information:
 - a. Name of the Project
 - b. Owner's name and contact information
 - c. Contract's original sum and final contract amount
 - d. Contract's original Substantial Completion date and actual Substantial Completion date
 - e. Indicate if there were any claims, Liquidated Damages imposed, etc.
2. Attach a resume of the Proposed Project Manager.
3. Attach a resume of the Proposed Project Superintendent

I (We) agree to hold our bid open for acceptance for sixty (60) calendar days from the date of bid opening.

If awarded this Contract, I, (We), agree to execute a Contract and start work on September 25, 2023 (the anticipated effective date of the Notice to Proceed) and to complete the entire work in three hundred (300) consecutive calendar days. Therefore, the specified date of substantial completion shall be July 21, 2024.

By signing this proposal form, _____ (insert company name) is certifying that neither _____ (insert company name) nor any potential subcontractors are debarred or suspended or are otherwise excluded or ineligible for participation in Federal Assistance Programs.

The attached Non-Collusive Form must also be completed, notarized, and included when submitting this Proposal. Any requested information not submitted may cause Proposal to be rejected.

LIQUIDATED DAMAGES: For each calendar day thereafter that substantial completion of the contract is delayed, liquidated damages will be assessed as follows: \$500.00 per calendar day. NO TIME EXTENSIONS WILL BE ALLOWED.

As required by Section 002113-1.06, "Bid Security", Bid Security in the form of a bid bond or cashier/certified check is attached hereto in the amount of 5% of the base bid amount and shall become the property of the Owner in the event the Agreement and required Bonds are not executed within the time set forth hereinbefore as liquidated damages for the delay and additional expense to the Owner caused thereby.

ADDENDUM RECEIPT: The receipt of the following Addenda to the Bidding Documents is hereby acknowledged:

Addendum No.:	_____	Dated:	_____
Addendum No.:	_____	Dated:	_____
Addendum No.:	_____	Dated:	_____
Addendum No.:	_____	Dated:	_____
Addendum No.:	_____	Dated:	_____

SUBCONTRACTOR AND SUPPLIER LISTING:

So that the Owner may be assured that only qualified and competent subcontractors and suppliers will be utilized on the project and to prevent "bid-shopping" and/or "bid-chopping", the low Bidder shall identify on the attached form within seven (7) days after bid receipt the names of the subcontractors and suppliers used by the Bidder in his bid for each subcontractor and supplier whose bid exceeds \$50,000.00.

Bidder acknowledges that his failure to indicate the name(s) of the subcontractors and suppliers included in his lump sum price within seven (7) days after bid receipt may result in the rejection of the Bidder's bid as nonresponsive and that Bidder's listing of itself as a subcontractor or supplier for any of the classifications or categories listed below means that Bidder will furnish the product from its manufacturing inventory or perform such work with its own regularly employed personnel and that Bidder has satisfactory qualifications and prior experience performing such work with its regularly employed personnel or manufacturing and furnishing such product from its manufacturing inventory. Bidder further acknowledges that he assumes the risk of removing and replacing work performed and/or products furnished by unauthorized substitutions of listed subcontractors and suppliers who will be rejected in accordance with Section 002213, Paragraph 5.2.5:

[TO BE COMPLETED IF A CORPORATION]

Our Corporation is chartered under the laws of the State of _____, and the names, titles and business addresses of the principal officers are as follows (non-resident Bidders see Section 002113, Paragraph 1.05):

Name	Address (City, State Zip)	Title

[TO BE FILLED IN IF A PARTNERSHIP]
 Our Partnership is composed of the following individuals:

Name	Address (City, State Zip)	Title

Notice of acceptance of our bid may be mailed, telegraphed, faxed or delivered to:

[INSERT COMPANY NAME AND ADDRESS]

SIGNED: _____

TITLE: _____

CERTIFICATE OF RESPONSIBILITY NO.: _____

DIRECTIONS FOR MAILING:

Submit bid papers in sealed envelope marked as indicated in the Instructions to Bidders, inserted in opaque sealed envelope marked as follows:

Address To:

Ocean Springs School District
2300 Government Street
Ocean Springs, MS 39564

OR

DIRECTIONS FOR ELECTRONIC BID:

Access the following website and log in: www.centralauctionhouse.com. Access the "Central Bidding" link, access the "Browse Public Bids: Mississippi Agencies" link, access the "Ocean Springs School District" link, and access the "Ocean Springs Middle School 2023 HVAC Replacement" link. For any questions related to the electronic bidding process, please call Central Bidding directly at (225) 810-4814.

Bid for Ocean Springs Middle School 2023 HVAC Replacement

to be opened at 11:00 AM on Tuesday, August 29, 2023.

FORM OF NON-COLLUSIVE AFFIDAVIT

AFFIDAVIT

(Prime Bidder shall include this form, completed, with his bid)

State of _____

County of _____

_____, being first duly sworn, deposes and says:

That he is _____ the party making the (a partner or officer of the firm of, etc.) foregoing proposal or bid, that such proposal or bid is genuine and not collusive or sham; that said bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any bidder or person, to put in a sham bid or to refrain from bidding, and has not in any manner, directly or indirectly, sought by agreement or collusion, communication or conference, with any person, to fix the bid price of affiant or of any other bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against _____ (Insert Owner Name) or any person interested in the proposed contract; and that all statements in said proposal or bid are true.

Signature of: _____

Bidder, if the bidder is an individual:

Partner, if the bidder is partnership

Officer, if the bidder is a corporation:

Subscribed and sworn to before me the _____ day of _____, 20____

My commission expires _____

SECTION 005200 - AGREEMENT FORM

1.01 DESCRIPTION

- A. The Owner will use AIA Document A101, 2017 Edition, Standard Form of Agreement Between Owner and Contractor, where basis for Payment is a Stipulated Sum as a part of the Contract Documents.
- B. A copy of this document is on file at the Architect's office. All Bidders shall read and understand the referenced document.

END OF SECTION **005200**

SECTION 005200.01 - INSURANCE AND BONDS EXHIBIT

1.01 DESCRIPTION

- A. The Owner will use AIA Document A101, 2017 Edition, Exhibit A Insurance and Bonds. This insurance and bonds exhibit is a critical part of the A101-2017, Standard Form of Agreement Between Owner and Contractor and should be discussed with legal and insurance counsel.
- B. A sample of AIA Document A101-2017, Exhibit A Insurance and Bonds dated 07/31/2023 is attached to this section. Upon project award, this document will be finalized and will become an exhibit to the A101-2017 Owner-Contractor Agreement.

END OF SECTION 005200.01

DRAFT AIA® Document A101™ – 2017

Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the « » day of « » in the year « »
(In words, indicate day, month and year.)

for the following **PROJECT**:
(Name and location or address)

«Ocean Springs Middle School 2023 HVAC Replacement
«P.N. 23034.00 »

THE OWNER:
(Name, legal status and address)

«Ocean Springs School District
2300 Government Street
Ocean Springs, MS 39564 »« »
«Telephone Number: 228.875.7706»
«Fax Number: 228.875.7708 »« »

THE CONTRACTOR:
(Name, legal status and address)

« »« »
« »

TABLE OF ARTICLES

- A.1 GENERAL
- A.2 OWNER'S INSURANCE
- A.3 CONTRACTOR'S INSURANCE AND BONDS
- A.4 SPECIAL TERMS AND CONDITIONS

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201™–2017, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Document A201™–2017, General Conditions of the Contract for Construction. Article 11 of A201™–2017 contains additional insurance provisions.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

§ A.2.2 Liability Insurance

The Contractor will pay for and maintain such insurance as will protect the Owner and Architect from their contingent liability to others for damages because of bodily injury, including death, which may arise from operations under this Contract and other liability for damages which the Contractor is required to insure under any provision of this Contract. Certificate of this insurance shall be filed with the Owner and Architect and will be the same limits set forth in this Exhibit A, Article A.3.2.2.

§ A.2.3 Required Property Insurance

§ A.2.3.1 The Contractor shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Contractor's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until final payment has been made as provided in Article 9.10 of the AIA A201-2017 or until no person or entity other than the Owner has an insurable interest in the property required by this Section A.2.3 to be covered, whichever is later. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

§ A.2.3.1.1 Causes of Loss. The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:

(Indicate below the cause of loss and any applicable sub-limit.)

Causes of Loss	Sub-Limit

§ A.2.3.1.2 Specific Required Coverages. The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:

(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

Coverage	Sub-Limit

§ A.2.3.1.3 The Contractor shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 Deductibles and Self-Insured Retentions. If the property insurance requires minimum deductibles, the Contractor shall pay the deductible and all other costs not covered because of such deductibles. If the Contractor or insurer increases the required minimum deductibles above the amounts so identified or if the Contractor elects to purchase this insurance with voluntary deductible amounts, the Contractor shall be responsible for payment of the additional costs not covered because of such increased or voluntary deductibles.

§ A.2.3.1.5 The insurance required by this Section A.2.3.1 shall provide coverage for physical damage to property while it is in storage and in transit to the construction site on an 'all-risks' completed value form.

§ A.2.3.1.6 The insurance required by this Section A.2.3.1 shall provide coverage for property owned by the Contractor and used on the Project, including scaffolding and other equipment.

§ A.2.3.2 Occupancy or Use Prior to Substantial Completion. The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

§ A.2.3.3 Insurance for Existing Structures

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Contractor shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Contractor shall be responsible for all co-insurance penalties.

§ A.2.4 Optional Extended Property Insurance.

The Owner shall purchase and maintain the insurance selected and described below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)

[] **§ A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance**, to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.

[] **§ A.2.4.2 Ordinance or Law Insurance**, for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

[] **§ A.2.4.3 Expediting Cost Insurance**, for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

[] **§ A.2.4.4 Extra Expense Insurance**, to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

[] **§ A.2.4.5 Civil Authority Insurance**, for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

[] **§ A.2.4.6 Ingress/Egress Insurance**, for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

- [] **§ A.2.4.7 Soft Costs Insurance**, to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

<< >>

§ A.2.5 Other Optional Insurance.

The Owner shall purchase and maintain the insurance selected below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

- [] **§ A.2.5.1 Cyber Security Insurance** for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. *(Indicate applicable limits of coverage or other conditions in the fill point below.)*

<< >>

- [] **§ A.2.5.2 Other Insurance**
(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage

Limits

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner and Architect as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies and the Contractor's certificate of insurance must state that the Owner and Architect are additional insureds under the referenced CGL policy and that all of Contractor's contractual liabilities, including but not limited to its indemnity obligations, are covered by such CGL policy.

Any language contained on the certificate of insurance form or elsewhere to the contrary is deemed stricken.

The certificate of insurance must also state that all of Contractor's contractual liabilities, including but not limited to its indemnity obligations, are covered. Any terms and conditions contained in the certificate of insurance which are contrary to the Contractor's contractual obligations are hereby stricken from the certificate.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall

apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

§ **A.3.1.4** Furnish one copy of the certificate herein required for each copy of the Agreement, specifically setting forth evidence of all coverage required. Furnish to the Owner and Architect, copies of any endorsements that are subsequently issued amending coverage or limits. If the coverages are provided on a claims-made basis, the policy date or retroactive date shall predate the Contract and the termination date of the policy, or the applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment.

§ **A.3.2 Contractor's Required Insurance Coverage**

§ **A.3.2.1** The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

§ **A.3.2.2 Commercial General Liability**

§ **A.3.2.2.1** Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than «One Million Dollars» (\$ «1,000,000») each occurrence, «One Million Dollars» (\$ «1,000,000») general aggregate, and «Two Million Dollars» (\$ «2,000,000») aggregate for products-completed operations hazard, providing coverage for claims including

- .1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
- .2 personal injury and advertising injury;
- .3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;
- .4 bodily injury or property damage arising out of completed operations; and
- .5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

§ **A.3.2.2.2** The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

- .1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
- .2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
- .3 Claims for bodily injury other than to employees of the insured.
- .4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
- .5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
- .6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
- .7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
- .8 Claims related to roofing, if the Work involves roofing.
- .9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
- .10 Claims related to earth subsidence or movement, where the Work involves such hazards.
- .11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ **A.3.2.3** Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than «One Million Dollars» (\$ «1,000,000») per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ **A.3.2.4** The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ **A.3.2.5** Workers' Compensation at statutory limits.

§ **A.3.2.6** Employers' Liability with policy limits not less than «One Million Dollars» (\$ «1,000,000») each accident, «One Million Dollars» (\$ «1,000,000») each employee, and «One Million Dollars» (\$ «1,000,000») policy limit.

§ **A.3.2.7** Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

§ **A.3.2.8** If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ **A.3.2.9** If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ **A.3.2.10** Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ **A.3.2.11** Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ **A.3.2.12** Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ **A.3.3 Contractor's Other Insurance Coverage**

§ **A.3.3.1** Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

« »

§ **A.3.3.2** The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

[] § **A.3.3.2.1** Property insurance of the same type and scope satisfying the requirements identified in

Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below: *(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)*

«Builder's Risk \$Complete Contract Cost
Or Installation Floater \$Cost of Material to be covered »

[« »] § A.3.3.2.2 Railroad Protective Liability Insurance, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate, for Work within fifty (50) feet of railroad property.

[« »] § A.3.3.2.3 Asbestos Abatement Liability Insurance, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

[« »] § A.3.3.2.4 Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

[« »] § A.3.3.2.5 Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

[«X»] § A.3.3.2.6 Other Insurance
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage	Limits
OWNERS & CONTRACTORS PROTECTIVE LIABILITY: Bodily Injury & Property Damage Bodily Injury & Property Damage	\$1,000,000 Aggregate \$1,000,000 Per Occurrence
EXCESS LIABILITY: (Umbrella on projects over \$500,000) Bodily Injury & Property Damage (Combined Single Limit)	\$2,000,000 Aggregate \$2,000,000 Per Occurrence

§ A.3.4 Performance Bond and Payment Bond

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:
(Specify type and penal sum of bonds.)

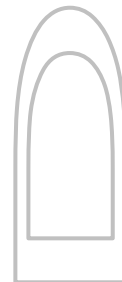
Type	Penal Sum (\$0.00)
Payment Bond	\$Complete Contract Cost
Performance Bond	\$Complete Contract Cost

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

«A.4.1 All insurance must be written by insurance companies that are rated in the A.M. Best Key Rating Guide-Property & Casualty, with a policy holder’s rating of “A”. The Ocean Springs School District, its administration, board members, and employees are to be named as additional insured on the Commercial General Liability, Commercial General Liability, Commercial Automobile Liability, and Commercial Umbrella or Excess Liability Policies. These respective additional insured endorsements shall include primary & non-contributory wording. The Commercial General Liability additional insured endorsement shall include Products/Completed Operations Coverage. All required policies shall provide a waiver of subrogation in favor of the Ocean Springs School District, its administration, board members, and employees. All required policies shall have an endorsement providing a Thirty (30) Day Notice of Cancellation to the Ocean Springs School District before cancellation of said policies for any reasons. »

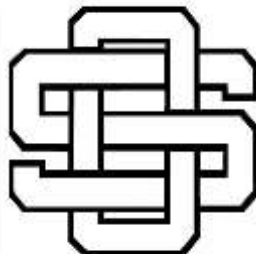


SECTION 005200.02 - MANDATORY ADDENDUM TO ALL OCEAN SPRINGS SCHOOL DISTRICT CONTRACTS

1.01 DESCRIPTION

- A. The Owner has a Mandatory Addendum to All Ocean Springs School District Contracts. This Mandatory Addendum is a critical part of the A101-2017, Standard Form of Agreement Between Owner and Contractor and should be discussed with legal and insurance counsel.
- B. A sample of this Mandatory Addendum to All Ocean Springs School District Contracts dated 07/31/2023 is attached to this section. Upon project award, this document will be finalized and will become an exhibit to the A101-2017 Owner-Contractor Agreement.

END OF SECTION **005200.02**



Mandatory Addendum to All Ocean Springs School District Contracts

This Addendum between the Ocean Springs School District (“OSSD”) and (“Contractor”) is an integral part of the contract. Contractor acknowledges that OSSD is a state subdivision and is subject to the laws of the State of Mississippi governing actions of state agencies. Contractor further acknowledges that OSSD does not waive, relinquish or forfeit any of the rights, benefits, protections, guaranties or prohibitions that may be provided under any law, statute, regulation or policy. The parties agree that this Addendum is incorporated into the contract and agree that should any provision of the contract conflict with this Addendum, the terms of the Addendum control.

1. OSSD contracts are governed by the laws of the State of Mississippi. Any provision that purports to set venue outside of the State of Mississippi is deleted.

U.S. Const. Amend XI; Miss. Code Ann. § 11-11-3; Miss. Code Ann. § 11-45-1; City of Jackson v. Wallace, 196 So. 223 (1940); Miss. AG Op., Clark (June 2, 2002); Miss. AG Op., Nowak (November 19, 2005).

2. OSSD does not waive its sovereign immunity. OSSD shall only be responsible for liability resulting from the negligent actions of its officers, agents, and employees acting within the course and scope of their official duties.

Miss. Code Ann. § 11-46-1, et seq.

3. OSSD does not waive its Constitutional Eleventh (11th) Amendment immunity.
U.S. Const. Amend. XI.

4. Any reference to OSSD waiving its right to a trial by jury are deleted.
Miss. AG Op., Chamberlin (October 18, 2002).

5. OSSD does not agree to any provisions wherein the credit of the State of Mississippi is pledged or loaned in aid of any person, association, or corporation.
Miss. Const. Art. 14 § 258; Miss. AG Op., Stringer (January 25, 2006).

6. Any reference to payment of attorney’s fees by OSSD are deleted.

Miss. AG Op., Nowak (January 23, 2009); Miss. AG Op., Stringer (January 25, 2006).

7. OSSD does not agree to pay extra compensation, fees, or allowances after service rendered or contract made, or for any payment not authorized by law.
Miss. Const. Art. 4, § 96; Miss. AG Op., Stringer (January 25, 2006).
8. Any references to OSSD limiting OSSD's damages to the contract price or any other set amount are deleted.
Miss. Const. Art. 4 § 100; Miss. AG Op., Clark (June 7, 2002); Miss. AG Op., Chamberlin (October 18, 2002).
9. Any references to OSSD indemnifying or holding harmless the Contractor or any other party are deleted.
Miss. Const. Art. 4 § 100; Miss. AG Op., Clark (June 7, 2002); Miss. AG Op., Chamberlin (October 18, 2002).
10. Any provisions limiting the time for OSSD to pursue legal action are deleted.
Miss. Const. Art. 4 § 100; Miss. AG Op., Clark (June 7, 2002); Miss. AG Op., Chamberlin (October 18, 2002).
11. Any reference to OSSD waiving any cause of action it may have against Contractor or any other party as a result of Contractor's breach of the contract, or Contractor's own negligence or willful misconduct or the negligence or willful misconduct of Contractor's employees or agents are deleted.
Miss. Const. Art. 4 § 100; Miss. AG Op., Clark (June 7, 2002); Miss. AG Op., Chamberlin (October 18, 2002).
12. Any reference to OSSD limiting damages, remedies or waiving any claim are deleted.
Miss. Const. Art. 4 § 100; Miss. AG Op., Clark (June 7, 2002); Miss. AG Op., Chamberlin (October 18, 2002).
13. Any provisions giving the Contractor exclusive control over litigation are deleted. OSSD does not agree that Contractor may represent, prosecute or defend legal actions in the name of OSSD.
14. Any references to OSSD submitting to binding arbitration are deleted.
Miss. AG Op., Clark (June 7, 2002); Miss. AG Op., Chamberlin (October 18, 2002)
15. With the exception of any expressed limitation of remedies for breach of implied warranties of merchantability and fitness for a particular purpose concerning computer software and services performed on computer hardware and computer software, which are sold between merchants, any provisions which would limit the Contractor's liability to OSSD or allow Contractor to waive any applicable warranties (express or implied) are deleted.

Miss. Const. Art. 4 § 100; Miss. Code Ann. §75-2-719; Miss. AG Op., Clark (June 2, 2002); Miss. AG Op., Chamberlin (October 18, 2002); Miss. AG Op., Long (February 22, 2009).

16. Any references to OSSD limiting or waiving any common law warranty are deleted.
Miss. AG Op., Clark (June 7, 2002); Miss. AG Op., Chamberlin (October 18, 2002).
17. OSSD does not make any warranty.
Miss. Const. Art. 4, § 100; Miss. AG Op., Clark (June 7, 2002); Miss. AG Op., Chamberlin (October 18, 2002).
18. OSSD will deliver payments to Contractor. Any provision that requires OSSD pay Contractor any late charges is governed by Miss. Code Ann. § 31-7-305.
19. OSSD is a public agency of the State of Mississippi and is subject to the Mississippi Public Records Act, Miss. Code Ann. § 25-61-1, et seq., and the Mississippi Accountability and Transparency Act of 2008, Miss. Code Ann. § 27-104-151, et seq.
20. Contractor represents and warrants that it will ensure its compliance with the Mississippi Employment Protection Act, Miss. Code Ann. § 71-11-1, et seq., and will register and participate in the status verification system for all newly hired employees. Any provision penalizing OSSD for hiring an employee who works for the Contractor is deleted.
21. The continuance of any OSSD contract is based on the availability of funds. Should there be no funds available for any succeeding funding period; the contract will be cancelled as of the end of the funding period with no further obligation on the part of OSSD. This contract is cancellable with thirty (30) days' notice to the vendor at the end of the fiscal period if the event funds are not appropriated by the funding authority. (Any property covered by a lease shall be returned to lessor).
22. Any provision requiring OSSD to name the contractor as an additional insured is deleted.
23. Neither party may assign its rights or delegate its duties under the contract without the prior written consent of the other party, which shall not be unreasonably withheld.
24. Contractor recognizes that OSSD, as a political subdivision of the State of Mississippi, enters into this contract only to the extent authorized by Mississippi law.
25. Contractor acknowledges that the individual executing the contract on behalf of OSSD is doing so only in his/her official capacity only, and to the extent that any provision contained in the contract exceeds his/her authority, Contractor agrees that it will not look to that individual in his/her personal capacity or otherwise seek to hold him/her individually liable for exceeding such authority.

CONTRACTOR

By: _____
(Original Signature of Principal or General Agent)

NAME/TITLE _____

COMPANY: _____

DATE: _____

OCEAN SPRINGS SCHOOL DISTRICT

By: _____
(Original Signature of Authorized Representative)

TITLE: _____

DATE: _____

SECTION 007200 - GENERAL CONDITIONS NOTICE

1.01 DESCRIPTION

- A. The General Conditions of the Contract for Construction, AIA Document A201 - 2017 of the American Institute of Architects, as revised at Section 002213, if not bound in this volume are incorporated by reference as though fully written herein.
- B. Contractors are presumed to be familiar with this document. A copy may be obtained from the Architect or examined in his office.
- C. All persons intending to provide goods or services in connection with this work are required to read and understand the referenced document prior to proceeding.
- D. See Section 002213 - Supplementary Conditions. In the event of a conflict between the General Conditions of the Contract for Construction, AIA Document A201 - 2017 and Section 002213, Section 002213 shall control even if the conflicting provision in the General Conditions of the Contract for Construction, AIA Document A201 - 2017 is not expressly deleted or revised by reference in Section 002213.

END OF SECTION **007200**

SECTION 011000 - SUMMARY

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:

1. Project information.
2. Work covered by Contract Documents.
3. Work Under Other Contracts.
4. Access to site.
5. Coordination with occupants.
6. Work restrictions.
7. Specification and drawing conventions.

- B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

- A. Project Identification: Ocean Springs Middle School 2023 HVAC Replacement

1. Project Location:

- a. Ocean Springs Middle School
3600 Hanshaw Road
Ocean Springs, MS 39564

- B. Owner: Ocean Springs School District, 2300 Government Street, Ocean Springs, MS 39564.

- C. Architect: JBHM Architects, 308 East Pearl Street, Suite 300, Jackson, MS 39201.
Phone: 601-352-2699.

- D. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. Mechanical Engineer: GSK Mechanical, Inc.
2. Electrical Engineer: WELCON Electrical Consultants, PLLC

- E. Contractor: To be awarded the project via competitive bid ("lowest and best" selection).
- F. Project Web Site: A project Web site administered by Architect will be used for purposes of managing communication and documents during the construction stage.
1. See Section 013100 "Project Management and Coordination." for requirements for using the Project Web site.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and generally consists of the following:
1. Replacement of existing HVAC equipment, including associated electrical work.
 2. The Work includes a Base Bid and Add Alternate No. 1, No. 2, and No. 3.
- B. Type of Contract and Work Sequence:
1. Project will be constructed under a single prime contract.
 2. As stated in Section 004200 Proposal Form, the anticipated effective date of the Notice to Proceed is September 25, 2023. The entire work shall be completed in three hundred (300) consecutive calendar days. Therefore, the specified date of substantial completion shall be July 21, 2024.

1.5 WORK BY OWNER

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

1.6 WORK UNDER OTHER CONTRACTS

- A. Separate Contract: Although no separate contracts are currently anticipated, the Owner may award separate contracts for performance of certain construction operations at the site. Those operations will be conducted simultaneously with work under this Contract
- B. Should the Owner award separate contracts, cooperate fully with separate contractors so that work under those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts.

1.7 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations

to perform the Work indicated on Drawings and as indicated by requirements of this Section.

- B. Use of Site: Limit use of Project site to areas where the Work is indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Limits: Confine construction operations to areas where the Work is indicated.
 2. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
 - c. All materials and equipment shall be brought onto the site by making use of such roadways and drives as designated by the Owner and Architect and across the grounds along routes established by the Owner and Architect.
 - d. Any streets, roadways, sidewalks, grounds, plantings, trees, or other property that may be damaged as a result of the contract work shall be properly repaired or fully replaced by the contractor to the full satisfaction of all interests involved.
 - e. No more space that is absolutely necessary will be permitted to be used on the grounds immediately around a construction site, and the contractor must use every care against damage to the grounds. The entire site, upon completion of the project, shall be left in the same state as found to exist at the start of the work.
- C. From the start of the work until the entire completion of the work, the Contractor shall keep on hand an adequate crew of laborers and/or other personnel to keep the entire building and surrounding streets, sidewalks, alleys, etc., free from any dirt, rubbish, and other debris resulting from the execution of this contract. At all times, the site of the work shall present a neat, orderly, and workmanlike appearance.
- D. If sufficient parking area is not available within the designated storage and working area for the vehicles of workmen employed on the building, the contractor shall require workmen to park their vehicles in area designated by the Owner and Architect. Workmen failing to comply with traffic and parking regulation of the school shall be removed from the job at the request of the proper school officials.
- E. The contractor will manage the work of this contract in such a manner as to not unnecessarily interfere with the normal school operations. The contractor expressly undertakes at his own expense to comply with the regulations governing the operations of premises which are occupied and to perform his contract in such a manner as not to interrupt or interfere with the operation of the school and to perform after working hours, or on Sunday or regular holidays without additional expense to the Owner, any work necessary to comply with this stipulation.
- F. Contractor shall coordinate any and all after-hours work with the Owner in the event of a school activity at the facility (PTA Meeting, Open House, Athletic Event, etc.).

- G. The Owner will not be responsible for the safety of the Contractor's work, materials, or equipment. Protection of the property within the contract work area both day and night shall be the responsibility of the Contractor.
- H. Signs, lights, barricades, covered walkways, signals, fences, etc., shall be utilized night and day to protect students and personnel on the campus.
- I. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.8 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
 - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
 - 3. Take all precautions necessary to protect the building and its occupants during the construction period.
- B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
 - 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
 - 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
 - 3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
 - 4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.9 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.

1. From full Notice to Proceed, the Contractor will have 24-hour access to all work areas, subject to the terms and conditions of the Contract and as permitted by code and local ordinance / authorities having jurisdiction.
 2. Do not disturb portions of the site or existing buildings beyond the areas in which the Work is indicated. Limit use of the premises and confine operations to areas in which the Work is indicated.
 3. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
1. Notify Owner not less than two days in advance of proposed utility interruptions.
 2. Obtain Owner's written permission before proceeding with utility interruptions.
- C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
1. Notify Owner not less than two days in advance of proposed disruptive operations.
 2. Obtain Owner's written permission before proceeding with disruptive operations.
- D. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes.
- E. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.
- F. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- G. Objectionable Workmen: Any workman who may, because of improper conduct, become objectionable will be promptly removed by the Contractor at the request of the Owner and/or Architect:
1. Firearms of any kind are not allowed on school grounds. Possession on school grounds constitutes non-compliance.
 2. The possession or consumption of alcoholic beverages is forbidden on school grounds.
 3. The use of tobacco products inside any facility is prohibited.
 4. The Contractor shall comply with the Owner's alcohol-free, drug-free, tobacco-free, harassment-free and weapon-free policies and shall require compliance with those policies by Contractor's employees, subcontractors.
 5. Shirts and pants shall be worn by all workers at all times.
 6. The use of offensive language or gestures towards any person will not be tolerated, and is subject to being removed from the job site.
 7. Any workman who may, because of improper conduct, become objectionable shall be promptly removed by the contractor, at the request of the Owner.

8. Any sex offender is prohibited from working or volunteering at any child care services.

H. From the start of the work until the entire completion of the work, the Contractor shall keep on hand an adequate crew of laborers and/or other personnel to keep the work areas and site free from any dirt, rubbish, and other debris resulting from the execution of this contract. Remove all such debris from the building and site on a daily basis. At all times, the site of the work shall present a neat, orderly, and workmanlike appearance.

1.10 BACKGROUND CHECKS

A. In order to ensure compliance with Ocean Springs School District Board of Trustees Policy "FGDB", the Contractor, also interchangeably referred to as the contracting entity, shall:

1. The contracting entity shall provide the district with a list of all employees who may come into contact with students.
2. The contracting entity shall certify in writing that each employee who may come into contact with students has completed a criminal history background check and Child Abuse Registry check and that no disqualifying information has been located.
3. The contracting entity shall certify in writing that all employees who may come into contact with students have not been convicted of any crime of violence, serious felony, or any offense listed therein: possession or sale of drugs; murder, manslaughter, or armed robbery; rape, sexual battery, or sex offense as listed in MS Code Section 45-31-3(1); child abuse, arson, grand larceny, or burglary; or gratification of lust or aggravated assault. If any employee of a contractor has been determined to be guilty of a crime of violence, serious felony, or any offense as outlined above, the employee of the contractor shall be prohibited from entering district property in the presence of any student.
4. The contracting entity shall certify in writing that no employee has been determined to be a sex offender in the child abuse registry. Any employee identified in the child abuse registry shall be prohibited from entering district property.
5. General Contractors shall also assure that employees of subcontractors have not been convicted of a crime of violence, serious felony, or any offense included in #3; and, shall further complete child abuse registry checks for employees of all sub-contractors.
6. In the event of an emergency or exceptional circumstances such as where a student's health or safety is in jeopardy or when immediate repairs are needed to make a building safe for student, the Superintendent may relax the requirements of the policy for a period of time necessary to rectify the exceptional or emergency situation.

Upon project award, the Contractor will be required to complete and submit the "CRIMINAL BACKGROUND INVESTIGATION CERTIFICATION" document; an example document is attached to this section.

The Ocean Springs School District does offer Background Checks as a service to

contractors/vendors. The fee for this service is \$50.00 per contractor/vendor employee (i.e. each individual employee for which a Background Check will be performed). This service is performed at the Ocean Springs School District and an appointment is required (contact Maria Beidelman, Ocean Springs School District, (228) 875-7721). Vendors can have Background Checks performed by other service providers, as long as the vendor can complete the "CRIMINAL BACKGROUND INVESTIGATION CERTIFICATION" document in full.

1.11 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION **011000**

District: Ocean Springs School District
Section: F - Facility Expansion
Policy Code: FGDB - Project Administration Contract Awards Procedure

Whenever the Ocean Springs School District contracts for janitorial, landscaping, vending services, lawn service transportation, construction or any other service, the Superintendent or his/her designee shall ensure the following:

1. The contracting entity shall provide the district with a list of all employees who may come into contact with students.
2. The contracting entity shall certify in writing that each employee who may come into contact with students has completed a criminal history background check and Child Abuse Registry check and that no disqualifying information has been located.
3. The contracting entity shall certify in writing that all employees who may come into contact with students have not been convicted of any crime of violence, serious felony, or any offense listed therein: possession or sale of drugs; murder, manslaughter, or armed robbery; rape, sexual battery, or sex offense as listed in MS Code Section 45-31-3(1); child abuse, arson, grand larceny, or burglary; or gratification of lust or aggravated assault. If any employee of a contractor has been determined to be guilty of a crime of violence, serious felony, or any offense as outlined above, the employee of the contractor shall be prohibited from entering district property in the presence of any student.
4. The contracting entity shall certify in writing that no employee has been determined to be a sex offender in the child abuse registry. Any employee identified in the child abuse registry shall be prohibited from entering district property.
5. General Contractors shall also assure that employees of sub-contractors have not been convicted of a crime of violence, serious felony, or any offense included in #3; and, shall further complete child abuse registry checks for employees of all sub-contractors.
6. In the event of an emergency or exceptional circumstances such as where a student's health or safety is in jeopardy or when immediate repairs are needed to make a building safe for student, the Superintendent may relax the requirements of the policy for a period of time necessary to rectify the exceptional or emergency situation.
7. In situations involving employees of a contracting entity which have no contact with students, the Superintendent shall be authorized to relax the requirements of the policy.
8. The Superintendent may, in his/her discretion, also be authorized to decline enforcement of this policy with respect to vendors who deliver food, supplies, and soda and snack machine vendors.

In the letting of public contracts, preference shall be given to resident contractors, and a non-resident bidder domiciled in a state, city, county, parish, nation or political subdivision having laws granting preference to local contractors shall be awarded Mississippi public contracts only on the same basis as the non-resident bidder's state, city, county, parish, nation or political subdivision awards contracts to Mississippi contractors bidding under similar circumstances. Resident contractors actually domiciled in Mississippi, be they corporate, individuals or partnerships, are to be granted preference over non-residents in awarding of contracts in the same manner and to the same extent as provided by the laws of the state, city, county, parish, nation, or political subdivision of domicile of the non-resident. MS Code Section 31-7-47 (1995)

LEGAL REFERENCE: MS Code as cited

ADOPTED: 01/13/2009

Last Review Date: _____
Review History:[1/1/1900][1/1/1901]

Original Adopted Date: 1/13/2009

Approved/Revised Date: 1/13/2009

Record Id: 16511

CRIMINAL BACKGROUND INVESTIGATION CERTIFICATION

The undersigned does hereby certify to the Board of Trustees for the Ocean Springs School District (“District”) as follows:

That I am representative of _____ (“Contractor”), currently under contract (“Contract”) with the District; that I am familiar with the facts herein certified and am authorized and qualified to execute this certificate on behalf of Contractor.

Contractor certifies that all of its employees, as well as, employees of subcontractors, who may come into contact with students during the term of the contract with the District have had a criminal background check completed, as well as, a child abuse registry check and none have been located on the child abuse registry nor have any employees been found guilty of any crime of violence, serious felony, or offense listed in the District’s School Board Policy FGDB.

A complete and accurate list of Contractor’s employees and of all of its Subcontractors’ employees who may come in contact with District pupils during the course and scope of the Contract is attached hereto as Exhibit “A”.

The Contractor’s employees and employees of the Subcontractors that were located on the child abuse registry or who were convicted of a crime of violence, serious felony, or offense listed in the District’s School Board Policy FGDB are as follows:

- 1.
- 2.
- 3.
- 4.

Contractor acknowledges that he has reviewed School Board Policy FGDB of the Ocean Springs School District.

Dated: _____

CONTRACTOR

By: _____

Title: _____

SWORN TO AND SUBSCRIBED BEFORE ME this the _____ day of _____, 200__.

NOTARY PUBLIC

My Commission Expires:

SECTION 012100 - ALLOWANCES

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 governing allowances.
 - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
 - 1. Contingency allowances.

1.3 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.

1.4 ACTION SUBMITTALS

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

1.5 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.

1.6 COORDINATION

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

1.7 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Construction Change Directives that indicate amounts to be charged to the allowance.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, General Contractor's overhead, profit, tax, insurance, bonds, and other similar costs related to products and materials ordered by the Owner or selected by the Architect under allowance shall be included as part of the Contract Sum and not be part of the allowance.
- C. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.8 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.

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 Contingency Allowance: Include a contingency allowance of **\$20,000.00** for use according to the Owner's written instructions.

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 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 alternate 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. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.

- D. Schedule: A schedule of alternates 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. 1 (ADD)**: HVAC Replacement in Classrooms 202, 204, 206, 208, and 210.
1. Base Bid: No work in Classrooms 202, 204, 206, 208, and 210.
 2. Additive Alternate: HVAC Replacement in Classrooms 202, 204, 206, 208, and 210, as indicated throughout the Contract Documents.
- B. **ALTERNATE NO. 2 (ADD)**: HVAC Replacement in 215, 217, and 219.
1. Base Bid: No work in Classrooms 215, 217, and 219.
 2. Additive Alternate: HVAC Replacement in Classrooms 215, 217, and 219, as indicated throughout the Contract Documents.
- C. **ALTERNATE NO. 3 (ADD)**: HVAC Replacement in Classrooms 207, 209, and 211.
1. Base Bid: No work in Classrooms 207, 209, and 211.
 2. Additive Alternate: HVAC Replacement in Classrooms 207, 209, and 211, as indicated throughout the Contract Documents.

END OF SECTION **012300**

SECTION 012500 - SUBSTITUTION PROCEDURES**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 substitutions.
- B. Related Requirements:
 - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 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 form provided in Project Manual.
 - 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. 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.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. 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.
 - l. 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 ten 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 ten 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 accept the proposed substitute .

1.5 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately 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. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 30 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.

- d. Substitution request is fully documented and properly submitted.
- e. Requested substitution will not adversely affect Contractor's construction schedule.
- f. Requested substitution has received necessary approvals of authorities having jurisdiction.
- g. Requested substitution is compatible with other portions of the Work.
- h. Requested substitution has been coordinated with other portions of the Work.
- i. Requested substitution provides specified warranty.
- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION **012500**

“OR EQUAL” SUBSTITUTION

SR #: _____

TO: _____

PROJECT: _____

SPECIFIED ITEM: _____

Section	Page	Paragraph	Description
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The undersigned requests consideration of the following:

PROPOSED "OR EQUAL" SUBSTITUTION

Attached data includes product data and description, specifications, shop drawings, photographs, certified performance and test results adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents which the proposed substitution or "or equal" will require for its proper installation. Acceptance of the proposed "or equal" substitution will require the following changes:

The undersigned certifies that the following paragraphs, unless modified by attachments are correct:

1. The proposed "or equal" substitution does not affect dimensions shown on the drawings.
2. The undersigned will coordinate the installation of the proposed product and will make changes to other Work which may be required at no additional costs to the Owner.
3. The proposed "or equal" substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.

- 4. Maintenance and service parts will be locally available for the proposed "or equal" substitution.
- 5. The proposed product has been investigated and it has been determined that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.
- 6. The same warranty is available for the proposed product as for the specified product.
- 7. Any claim for additional costs and/or time in connection with the proposed "or equal" substitution are hereby waived.
- 8. The Owner will be reimbursed for review or redesign services associated with re-approval by authorities.
- 9. Incorporation or use of the proposed "or equal" substitution in the Work ____ is ____ or is not subject to payment of any license fee or royalty.

The undersigned agrees to pay all costs that result directly or indirectly from acceptance of such "or equal" substitute, including costs of redesign and claims of other contractors affected by the resulting change.

Submitted by: _____

Signature: _____

Firm: _____

Address: _____

Date: _____

Telephone: _____

Attachments: _____

For use by the design consultant:

_____ Accepted _____ Accepted as noted

_____ Not Accepted _____ Received too late

By: _____

Date: _____

Remarks: _____

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES**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 handling and processing Contract modifications.

1.3 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."

1.4 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 time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use forms acceptable to Architect.

- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include costs of labor and supervision directly attributable to the change.
 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
 7. Proposal Request Form: Use AIA Document G709, "Work Changes Proposal Request."

1.5 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.

1.6 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.

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: 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 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 necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 3. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 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.
 - 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
- 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.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
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. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
8. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
9. 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.
10. 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.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial 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.
1. All payments must be submitted to and approved by the Ocean Springs School District Board of Trustees. Board Meetings are typically held on the second Tuesday of each month.
 2. Submit draft copy of Application for Payment five days prior to due date for review by Architect.
 3. The Architect must receive an Application for Payment not later than the twenty-fifth (25th) day of each month, for inclusion on the Board agenda for the following month.
- 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 for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for

- Payment.
- c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- F. 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.
- G. 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.
- H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
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. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.
- I. 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. Products list (preliminary if not final).
 5. Schedule of unit prices.
 6. Submittal schedule (preliminary if not final), within 30 days of Notice To Proceed.
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of building permits.

10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction conference.
- J. 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 Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- K. 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, "Contractor's Affidavit of Payment of Debts and Claims."
 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 6. AIA Document G707, "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 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 provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Shop Drawings.
 - 4. Requests for Information (RFIs).
 - 5. Potential Change Order (PCO).
 - 6. Site Observation.
 - 7. Communication via Project Web site.
 - 8. Project meetings.

1.3 DEFINITIONS

- A. **REQUEST FOR INFORMATION (RFI):** Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.
- B. **POTENTIAL CHANGE ORDER (PCO):** Owner, Architect, or Contractor seeking price proposal for changes to the Work.

1.4 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.
- B. **Key Personnel Names:** Within 30 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in

attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, on Project Web site, and by each temporary telephone. Keep list current at all times.

1.5 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.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged

materials that are designated as Owner's property.

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally 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. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - c. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - d. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - e. Indicate required installation sequences.
 - f. 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. Supplement plan drawings with section drawings where required to adequately represent the Work.
 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. Indicate areas of conflict between light fixtures and other components.
 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. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
8. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
9. 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. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."

1.7 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 suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Form bound in Project Manual.
1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven 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 Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 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 10 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 monthly. Include the following:
 - 1. Project name.
 - 2. Name and address of Contractor.
 - 3. Name and address of Architect.
 - 4. RFI number including RFIs that were returned without action or withdrawn.
 - 5. RFI description.
 - 6. Date the RFI was submitted.
 - 7. Date Architect's 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 seven days if Contractor disagrees with response.
 - 1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 - 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.8 POTENTIAL CHANGE ORDER (PCO):

- A. General: Upon request, the contractor shall prepare and submit a PCO in the form specified.
 - 1. PCO shall include proper breakdown of materials and labor of all components with proper overhead and profit as allowed in Specification Section 002213 Supplementary Conditions.
- B. Content of PCO: Include a detailed, legible description of the breakdown per the following:
 - 1. Project name.
 - 2. Project number.
 - 3. Date.
 - 4. Name of Contractor.
 - 5. Name of Architect.
 - 6. PCO number, numbered sequentially.
 - 7. PCO subject.
 - 8. Contractor's signature.
 - 9. Attachments including breakdown.
- C. Architect's Action. Architect will review each PCO, determine action required, and respond. Allow ten (10) working days for Architect's response for each PCO. PCOs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. Architect's action may include a request for additional information, in which case the Architect's time for response will date from time of receipt of additional information.
2. Architect's action on PCOs that may result in a change to the Contract Time of the Contract Sum.

1.9 COMMUNICATION VIA PROJECT WEB SITE

A. SUMMARY:

1. The following project information will be communicated electronically using web-based service Newforma:
 - a. Submittals
 - b. Request for Information (RFI)
 - c. Proposal Requests (PR)
 - d. Potential Change Orders (PCO)
 - e. Change Orders
 - f. Construction Change Directives (CCD)
 - g. Applications for Payment
 - h. Notice to Proceed (NTP)
 - i. Site Observations
2. General contractor will be given access to Newforma by the Architect at no charge.
3. The electronic submittal process is not intended for color samples, color charts, or physical material samples. These items shall be logged in to the software by the general contractor; physical samples shall then be sent to the Architect for review.
4. For project closeout, contractor shall provide one complete hard copy of all close out documents for review. Once close out documents are approved, the contractor shall provide one corrected hard copy and two thumb drives or two CD's as well as all information documented on the project web site in accordance with Specification Section 017700 Closeout Procedures.

B. PROCEDURES

1. Electronic Submittal Preparation: Subcontractors and suppliers will not be provided access to the Newforma web site. All submittals/shop drawings shall be submitted to the general contractor, reviewed and stamped for approval, and then submitted to the Architect via Newforma.
 - a. Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents including verification of manufacturer/product dimensions and coordination of information with other parts of the work.
 - b. Architect/Engineer submittal review comments will be made available on Newforma for downloading. Contractor will receive e-mail notice of

- completed review.
- c. Distribution of reviewed submittals from subcontractors and suppliers is the responsibility of the general contractor.
2. Request for Information (RFI): Subcontractors and suppliers will not be provided access to the Newforma web site. All RFIs shall be submitted to the general contractor stamped "Request for Information" and then submitted by the general contractor via Newforma.
 3. Potential Change Orders (PCO): Subcontractors and suppliers will not be provided access to the Newforma web site. All PCOs shall be submitted via Newforma by the general contractor with complete breakdown of pricing for review and approval by the Architect.
 4. Observation Reports: Architectural and Engineering Reports will be issued through Newforma. Distribution to subcontractors and suppliers is the responsibility of the general contractor.

1.10 PROJECT MEETINGS

- A. General: 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 five days of the meeting.
- B. Preconstruction Conference: 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. Conduct the conference to review responsibilities and personnel assignments.
 2. 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.
 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Designation of key personnel and their duties.
 - d. Lines of communications.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.

- g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.
 - k. Preparation of record documents.
 - l. Use of the premises and existing building.
 - m. Work restrictions.
 - n. Working hours.
 - o. Owner's occupancy requirements.
 - p. Responsibility for temporary facilities and controls.
 - q. Procedures for moisture and mold control.
 - r. Procedures for disruptions and shutdowns.
 - s. Parking availability.
 - t. Office, work, and storage areas.
 - u. Equipment deliveries and priorities.
 - v. First aid.
 - w. Security.
 - x. Progress cleaning.
4. 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. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.

- r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: a project closeout conference, at a time convenient to Owner and Architect, but no later than 30 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for completing documentation.
 - e. Requirements for preparing operations and maintenance data.
 - f. Requirements for delivery of material samples, attic stock, and spare parts.
 - g. Requirements for demonstration and training.
 - h. Preparation of Contractor's punch list.
 - i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - j. Submittal procedures.
 - k. Coordination of separate contracts.
 - l. Owner's partial occupancy requirements.
 - m. Installation of Owner's furniture, fixtures, and equipment.
 - n. Responsibility for removing temporary facilities and controls.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

- E. Progress Meetings: Conduct progress meetings at monthly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. 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.
 3. 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.
 4. 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**

FROM: General Contractor

Address 1
Address 2

Phone: Number
Fax: Number

REQUEST FOR INFORMATION

RFI NO:	
DATE:	

SUBJECT:

PROJECT:

JBHM PROJECT NO.:
CONTRACTOR'S PROJECT NO.:

TO: JBHM Architects, P.A.

308 East Pearl Street, Suite 300
Jackson, MS 39201

Phone: 601.352.2699
Fax: 601.352.2693

REQUEST:

Requested by:

Response is needed within: days

Architect's Supplemental Instructions (ASI):

The Work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates your acknowledgement that there will be no change in Contract Sum or Contract Time.

Signed:

JBHM Response Date:

Returned Via: E-mail Fax Mail

pc:

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION**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 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.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting schedules and reports.
 - 2. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 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.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file, where indicated.
 - 2. Two paper copies.
- B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
- C. Construction Schedule Updating Reports: Submit with Applications for Payment.
- D. Daily Construction Reports: Submit at monthly intervals.
- E. Material Location Reports: Submit at monthly intervals.
- F. Site Condition Reports: Submit at time of discovery of differing conditions.
- G. Special Reports: Submit at time of unusual event.

1.5 QUALITY ASSURANCE

- A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:
 1. Review software limitations and content and format for reports.
 2. Verify availability of qualified personnel needed to develop and update schedule.
 3. Discuss constraints, including work stages area separations and partial Owner occupancy.
 4. Review delivery dates for Owner-furnished products.
 5. Review schedule for work of Owner's separate contracts.
 6. Review submittal requirements and procedures.
 7. Review time required for review of submittals and resubmittals.
 8. Review requirements for tests and inspections by independent testing and inspecting agencies.
 9. Review time required for Project closeout and Owner startup procedures.
 10. Review and finalize list of construction activities to be included in schedule.
 11. Review procedures for updating schedule.

1.6 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 20days, unless specifically allowed by Architect.
 2. Procurement Activities: Include procurement process activities for the following 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.
 - a. .
 3. 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.
 4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 5. 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.
 6. 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. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.

6. 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. Use of premises restrictions.
- 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. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- 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. Base schedule on the startup construction schedule and additional information received since the start of Project.
- 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.
- C. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.
- D. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated

reports showing the following:

1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Main events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.
10. Dollar value of activity (coordinated with the schedule of values).

E. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

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 (see special reports).
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.

2.4 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week 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 013300 - SUBMITTAL PROCEDURES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including the following:
 - 1. Contractor's construction schedule.
 - 2. Submittal schedule.
 - 3. Daily construction reports.
 - 4. Shop Drawings.
 - 5. Product Data.
 - 6. Samples.
 - 7. Quality assurance submittals.
- B. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:
 - 1. Permits.
 - 2. Applications for Payment.
 - 3. Performance and payment bonds.
 - 4. Insurance certificates.
 - 5. List of subcontractors.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Payment Procedures" specifies requirements for submittal of the Schedule of Values.
 - 2. Division 1 Sections "Closeout Procedures", "Operation and Maintenance Data", and "Project Record Documents" specifies requirements for submittal of Project Record Documents and warranties at project closeout.

1.3 DEFINITIONS

- A. Coordination Drawings show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or to function as intended.
 - 1. Preparation of Coordination Drawings is specified in Division 1 Section "Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.

- B. Field samples are full-size physical examples erected on-site to illustrate finishes, coatings, or finish materials. Field samples are used to establish the standard by which the Work will be judged.
- C. Mockups are full-size assemblies for review of construction, coordination, testing, or operation; they are not Samples.

1.4 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 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 elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
 - 3. Processing: To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.
 - a. Allow 21 days for initial review. Allow additional time if the Architect must delay processing to permit coordination with subsequent submittals.
 - b. If an intermediate submittal is necessary, process the same as the initial submittal.
 - c. Allow 21 days for reprocessing each submittal.
 - d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.
- B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
 - 1. Provide a space approximately 4 by 6 inches on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
 - 2. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of the Architect.
 - d. Name and address of the Contractor.
 - e. Name and address of the subcontractor.
 - f. Name and address of the supplier.

- g. Name of the manufacturer.
 - h. Number and title of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
- C. **Submittal Transmittal:** Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Architect using a transmittal form. The Architect will not accept submittals received from sources other than the Contractor.
- 1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.
 - 2. Transmittal Form: Use AIA Document G810 or similar.
- D. **Quantity of Submittals:** The Contractor shall submit multiple copies of each submittal as required including drawings, product data, and color samples as follows:
- 1. One copy will be retained by the Architect.
 - 2. One copy will be retained by the consulting engineer (as applicable).
 - 3. One copy will be retained by the Contractor for use in close out documents.
 - 4. One copy will be retained by the Contractor for office records.
 - 5. One copy will be retained by the Contractor for use on site.
 - 6. The Contractor shall submit additional copies as needed for distribution to subcontractors, coordination, or other purposes.
 - 7. See Division 15 Mechanical and Division 16 Electrical for number of submittals and additional requirements.

1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. **Bar-Chart Schedule:** Prepare a fully developed, horizontal bar-chart-type, contractor's construction schedule. Submit within 30 days after the date established for "Commencement of the Work."
- 1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values."
 - 2. Within each time bar, indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.
 - 3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
 - 4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.
 - 5. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.

6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Architect's procedures necessary for certification of Substantial Completion.
- B. Phasing: On the schedule, show how requirements for phased completion to permit Work by separate Contractors and partial occupancy by the Owner affect the sequence of Work.
- C. Work Stages: Indicate important stages of construction for each major portion of the Work, including submittal review, testing, and installation.
- D. Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.
- E. Cost Correlation: At the head of the schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of Work performed as of the dates used for preparation of payment requests.
 1. Refer to Division 1 Section "Applications for Payment" for cost reporting and payment procedures.
- F. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.
 1. When revisions are made, distribute 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 construction activities.
- G. Schedule Updating: Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.6 SUBMITTAL SCHEDULE

- A. After development and acceptance of the Contractor's Construction Schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for submittal of the Contractor's Construction Schedule.
 1. Coordinate Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products as well as the Contractor's Construction Schedule.
 2. Prepare the schedule in chronological order. Provide the following information:
 - a. Scheduled date for the first submittal.
 - b. Related Section number.
 - c. Submittal category (Shop Drawings, Product Data, or Samples).
 - d. Name of the subcontractor.
 - e. Description of the part of the Work covered.
 - f. Scheduled date for resubmittal.
 - g. Scheduled date for the Architect's final release or approval.

- B. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.
 - 1. When revisions are made, distribute 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 construction activities.
- C. Schedule Updating: Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.7 SHOP DRAWINGS

- A. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
- B. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings. Include the following information:
 - 1. Dimensions.
 - 2. Identification of products and materials included by sheet and detail number.
 - 3. Compliance with specified standards.
 - 4. Notation of coordination requirements.
 - 5. Notation of dimensions established by field measurement.
 - 6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 36 by 48 inches (890 by 1220 mm).
 - 7. Do not use Shop Drawings without an appropriate final stamp indicating action taken.

1.8 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.
 - 1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information. Include the following information:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.

- f. Notation of coordination requirements.
2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
3. Distribution: Furnish copies of all submittals to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
 - a. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
 - b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.9 SAMPLES

- A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.
 1. Mount or display Samples in the manner to facilitate review of qualities indicated. Prepare Samples to match the Architect's sample. Include the following:
 - a. Specification Section number and reference.
 - b. Generic description of the Sample.
 - c. Sample source.
 - d. Product name or name of the manufacturer.
 - e. Compliance with recognized standards.
 - f. Availability and delivery time.
 2. Submit Samples for review of size, kind, color, pattern, and texture. Submit Samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
 - a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least 3 multiple units that show approximate limits of the variations.
 - b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
 - c. Refer to other Sections for Samples to be returned to the Contractor for incorporation in the Work. Such Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.
 - d. Samples not incorporated into the Work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.

3. Preliminary Submittals: Submit a full set of choices where Samples are submitted for selection of color, pattern, texture, or similar characteristics from a range of standard choices.
 - a. The Architect will review and return preliminary submittals with the Architect's notation, indicating selection and other action.
 4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit 3 sets. The Architect will return one set marked with the action taken.
 5. Maintain sets of Samples, as returned, at the Project Site, for quality comparisons throughout the course of construction.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
 - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
- B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.
1. Field samples are full-size examples erected on-site to illustrate finishes, coatings, or finish materials and to establish the Project standard.
 - a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.10 QUALITY ASSURANCE SUBMITTALS

- A. Submit quality-control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.
- B. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.
 1. Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.
- C. Inspection and Test Reports: Requirements for submittal of inspection and test reports from independent testing agencies are specified in Division 1 Section "Quality Control."

1.11 ARCHITECT'S ACTION

- A. Except for submittals for the record or information, where action and return is required, the Architect will review each submittal, mark to indicate action taken, and return promptly.

1. Compliance with specified characteristics is the Contractor's responsibility.
- B. Action Stamp: The Architect will stamp each submittal with a uniform, action stamp. The Architect will mark the stamp appropriately to indicate the action taken, as follows:
1. Final Unrestricted Release: When the Architect marks a submittal "**No Exceptions Taken**," the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.
 2. Final-But-Restricted Release:
 - a) When the Architect marks a submittal "**Furnish As Corrected**," the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents. Final payment depends on that compliance.
 - b) When the Architect marks a submittal "**Submit Specified Item**," the Work covered by the submittal has omitted a required element, component, or a portion of the submittal. Provide a new submittal for the portion that is noted "**Submit Specified Item**" that complies with requirements of the Contract Documents. The portion that is not noted "**Submit Specified Item**" may proceed provided it complies with requirements of the Contract Documents.
 3. Returned for Resubmittal:
 - a) When the Architect marks a submittal "**Revise and Resubmit**," do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark. *Do not use, or allow others to use, submittals marked "Revise and Resubmit" at the Project Site or elsewhere where Work is in progress.* Final payment depends on that compliance.
 - b) When the Architect marks a submittal "**Rejected**," do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. This mark may also indicate that the architect suspects the submittals were not reviewed by the contractor prior to coming to the architect. Prepare a new submittal according to the notations; resubmit without delay with a full review of the general contractor. Repeat if necessary to obtain different action mark. *Do not use, or allow others to use, submittals marked "Rejected" at the Project Site or elsewhere where Work is in progress.* Final payment depends on that compliance.
 4. Other Action: Where a submittal is for information or record purposes or special processing or other activity, the Architect will return the submittal marked "Action Not Required."

- C. Unsolicited Submittals: The Architect will return unsolicited submittals to the sender without action.
- D. Shop Drawing Stamp: The following is the content of the Shop Drawing Review Stamp-

NO EXCEPTIONS TAKEN

REVISE AND RESUBMIT

REJECTED

SUBMIT SPECIFIED ITEM

FURNISH AS CORRECTED

This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with requirements of the drawing and specifications. The Contractor is responsible for confirming and correlating all quantities and dimensions and for selecting fabrication processes. The Contractor shall review for general conformance with techniques of construction and coordinate his work with that of all other trades to perform his work in a safe and satisfactory manner.

JBHM ARCHITECTS, P.A.

DATE: _____ BY: _____

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS**PART 1 - GENERAL****1.1 SUMMARY**

- A. 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. 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.
- B. Related Sections:
 - 1. Division 01 Section "Allowances" for testing and inspecting allowances.

1.2 DEFINITIONS

- A. 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.
- B. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of 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 ACTION SUBMITTALS

- A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.

1.4 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within days of , and not less than days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.

1. Project quality-control manager .

C. Testing and Inspection: Include in quality-control plan a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Owner-performed tests and inspections indicated in the Contract Documents.

1.5 REPORTS AND DOCUMENTS

A. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

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

B. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

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. 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 ; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to

authorities.

- B. 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. When testing is complete, remove test specimens, assemblies, 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.
- C. 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. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - a. Allow days for initial review and each re-review of each mockup.
- D. Integrated Exterior Mockups: Construct integrated exterior mockup in accordance with approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual specification sections, along with supporting materials.

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. 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.
- 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. Notify testing agencies at least hours in advance of time when Work that requires testing or inspecting will be performed.

- C. 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.
- D. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses. .

PART 2 - EXECUTION

2.1 TEST AND INSPECTION LOG

- A. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

END OF SECTION **014000**

SECTION 014200 - REFERENCES

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 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.

1.3 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.

1.4 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 in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
 - 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. ABMA - American Boiler Manufacturers Association; www.abma.com.
 - 8. ACI - American Concrete Institute; (Formerly: ACI International); www.abma.com.
 - 9. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
 - 10. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
 - 11. AF&PA - American Forest & Paper Association; www.afandpa.org.
 - 12. AGA - American Gas Association; www.aga.org.
 - 13. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
 - 14. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
 - 15. AI - Asphalt Institute; www.asphaltinstitute.org.
 - 16. AIA - American Institute of Architects (The); www.aia.org.
 - 17. AISC - American Institute of Steel Construction; www.aisc.org.
 - 18. AISI - American Iron and Steel Institute; www.steel.org.
 - 19. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
 - 20. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
 - 21. ANSI - American National Standards Institute; www.ansi.org.
 - 22. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.

23. APA - APA - The Engineered Wood Association; www.apawood.org.
24. APA - Architectural Precast Association; www.archprecast.org.
25. API - American Petroleum Institute; www.api.org.
26. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
27. ARI - American Refrigeration Institute; (See AHRI).
28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
29. ASCE - American Society of Civil Engineers; www.asce.org.
30. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
31. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
32. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
33. ASSE - American Society of Safety Engineers (The); www.asse.org.
34. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
35. ASTM - ASTM International; www.astm.org.
36. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
37. AWEA - American Wind Energy Association; www.awea.org.
38. AWI - Architectural Woodwork Institute; www.awinet.org.
39. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
40. AWPA - American Wood Protection Association; www.awpa.com.
41. AWS - American Welding Society; www.aws.org.
42. AWWA - American Water Works Association; www.awwa.org.
43. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
44. BIA - Brick Industry Association (The); www.gobrick.com.
45. BICSI - BICSI, Inc.; www.bicsi.org.
46. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
47. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.org.
49. CDA - Copper Development Association; www.copper.org.
50. CEA - Canadian Electricity Association; www.electricity.ca.
51. CEA - Consumer Electronics Association; www.ce.org.
52. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
53. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
54. CGA - Compressed Gas Association; www.cganet.com.
55. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
56. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
57. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
58. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
59. CPA - Composite Panel Association; www.pbmdf.com.
60. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
61. CRRC - Cool Roof Rating Council; www.coolroofs.org.
62. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
63. CSA - Canadian Standards Association; www.csa.ca.
64. CSA - CSA International; (Formerly: IAS - International Approval Services);

- www.csa-international.org.
65. CSI - Construction Specifications Institute (The); www.csinet.org.
 66. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
 67. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
 68. CWC - Composite Wood Council; (See CPA).
 69. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
 70. DHI - Door and Hardware Institute; www.dhi.org.
 71. ECA - Electronic Components Association; (See ECIA).
 72. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
 73. ECIA - Electronic Components Industry Association; www.eciaonline.org.
 74. EIA - Electronic Industries Alliance; (See TIA).
 75. EIMA - EIFS Industry Members Association; www.eima.com.
 76. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
 77. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
 78. ESTA - Entertainment Services and Technology Association; (See PLASA).
 79. EVO - Efficiency Valuation Organization; www.evo-world.org.
 80. FCI - Fluid Controls Institute; www.fluidcontrolsinstitute.org.
 81. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
 82. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
 83. FM Approvals - FM Approvals LLC; www.fmglobal.com.
 84. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
 85. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridarroof.com.
 86. FSA - Fluid Sealing Association; www.fluidsealing.com.
 87. FSC - Forest Stewardship Council U.S.; www.fscus.org.
 88. GA - Gypsum Association; www.gypsum.org.
 89. GANA - Glass Association of North America; www.glasswebsite.com.
 90. GS - Green Seal; www.greenseal.org.
 91. HI - Hydraulic Institute; www.pumps.org.
 92. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
 93. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
 94. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
 95. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
 96. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
 97. IAS - International Accreditation Service; www.iasonline.org.
 98. IAS - International Approval Services; (See CSA).
 99. ICBO - International Conference of Building Officials; (See ICC).
 100. ICC - International Code Council; www.iccsafe.org.
 101. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
 102. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
 103. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
 104. IEC - International Electrotechnical Commission; www.iec.ch.
 105. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.

106. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
107. IESNA - Illuminating Engineering Society of North America; (See IES).
108. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
109. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
110. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
111. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
112. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
113. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
114. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
115. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
116. ISO - International Organization for Standardization; www.iso.org.
117. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
118. ITU - International Telecommunication Union; www.itu.int/home.
119. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
120. LMA - Laminating Materials Association; (See CPA).
121. LPI - Lightning Protection Institute; www.lightning.org.
122. MBMA - Metal Building Manufacturers Association; www.mbma.com.
123. MCA - Metal Construction Association; www.metalconstruction.org.
124. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
125. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
126. MHIA - Material Handling Industry of America; www.mhia.org.
127. MIA - Marble Institute of America; www.marble-institute.com.
128. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
129. MPI - Master Painters Institute; www.paintinfo.com.
130. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
131. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
132. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
133. NADCA - National Air Duct Cleaners Association; www.nadca.com.
134. NAIMA - North American Insulation Manufacturers Association; www.naima.orgwww.naima.org.
135. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
136. NBI - New Buildings Institute; www.newbuildings.org.
137. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
138. NCMA - National Concrete Masonry Association; www.ncma.org.
139. NEBB - National Environmental Balancing Bureau; www.nebb.org.
140. NECA - National Electrical Contractors Association; www.necanet.org.
141. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
142. NEMA - National Electrical Manufacturers Association; www.nema.org.
143. NETA - InterNational Electrical Testing Association; www.netaworld.org.
144. NFHS - National Federation of State High School Associations; www.nfhs.org.
145. NFPA - National Fire Protection Association; www.nfpa.org.

146. NFPA - NFPA International; (See NFPA).
147. NFRC - National Fenestration Rating Council; www.nfrc.org.
148. NHLA - National Hardwood Lumber Association; www.nhla.com.
149. NLGA - National Lumber Grades Authority; www.nlga.org.
150. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
151. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
152. NRCA - National Roofing Contractors Association; www.nrca.net.
153. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
154. NSF - NSF International; www.nsf.org.
155. NSPE - National Society of Professional Engineers; www.nspe.org.
156. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
157. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
158. NWFA - National Wood Flooring Association; www.nwfa.org.
159. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
160. PDI - Plumbing & Drainage Institute; www.pdionline.org.
161. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
162. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
163. RFCI - Resilient Floor Covering Institute; www.rfci.com.
164. RIS - Redwood Inspection Service; www.redwoodinspection.com.
165. SAE - SAE International; www.sae.org.
166. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
167. SDI - Steel Deck Institute; www.sdi.org.
168. SDI - Steel Door Institute; www.steeldoor.org.
169. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
170. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
171. SIA - Security Industry Association; www.siaonline.org.
172. SJI - Steel Joist Institute; www.steeljoist.org.
173. SMA - Screen Manufacturers Association; www.smainfo.org.
174. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
175. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
176. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
177. SPIB - Southern Pine Inspection Bureau; www.spib.org.
178. SPRI - Single Ply Roofing Industry; www.spri.org.
179. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
180. SSINA - Specialty Steel Industry of North America; www.ssina.com.
181. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
182. STI - Steel Tank Institute; www.steeltank.com.
183. SWI - Steel Window Institute; www.steelwindows.com.
184. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
185. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
186. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
187. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
188. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.

189. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
190. TMS - The Masonry Society; www.masonrysociety.org.
191. TPI - Truss Plate Institute; www.tpinst.org.
192. TPI - Turfgrass Producers International; www.turfgrassod.org.
193. TRI - Tile Roofing Institute; www.tilerroofing.org.
194. UL - Underwriters Laboratories Inc.; www.ul.com.
195. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
196. USAV - USA Volleyball; www.usavolleyball.org.
197. USGBC - U.S. Green Building Council; www.usgbc.org.
198. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
199. WASTEC - Waste Equipment Technology Association; www.wastec.org.
200. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
201. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
202. WDMA - Window & Door Manufacturers Association; www.wdma.com.
203. WI - Woodwork Institute; www.wicnet.org.
204. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
205. WWPA - Western Wood Products Association; www.wwpa.org.

B. 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. This information is believed to be accurate as of the date of the Contract Documents.

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.

C. 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. Information is subject to change and is up to date as of the date of the Contract Documents.

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; www.quicksearch.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; www.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; The National Academies; 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. Pharmacopeial Convention; www.usp.org.
 19. USPS - United States Postal Service; www.usps.com.

D. 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. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

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 DLA Document Services; www.quicksearch.dla.mil.
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
5. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.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).

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 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 requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Sections:
 - 1. Division 01 Section "Summary" for work restrictions and limitations on utility interruptions.

1.3 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, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: sewer service use charges for sewer usage by all entities for construction operations.
- C. Water Service: water service use charges for water used by all entities for construction operations.
- D. Electric Power Service: electric power service use charges for electricity used by all entities for construction operations.

1.4 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.

1.5 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.

1.6 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.
- 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** or **galvanized steel** bases for supporting posts.
- C. Wood Enclosure Fence: Plywood, 6 feet high, framed with four 2-by-4-inch rails, with preservative-treated wood posts spaced not more than 8 feet apart.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, Construction Manager, and construction personnel office activities and to accommodate project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:

1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
 2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with not less than 1 receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- square tack and marker boards.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
1. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction and clean HVAC system as required in Division 01 Section "Closeout Procedures".
- C. Air Filtration Units: HEPA primary and secondary filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
1. Locate facilities to limit site disturbance as specified in Division 01 Section "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. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
 - 1. Toilets: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
 - 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- F. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Install electric power service overhead, unless otherwise indicated.
 - 2. Connect temporary service to Owner's existing power source, as directed by Owner.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- H. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.
1. Provide additional telephone lines for the following:
 - a. Provide a dedicated telephone line for each facsimile machine in each field office.
 - b. Provide one telephone line(s) for Owner's use.
 2. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Architect's office.
 - e. Engineers' offices.
 - f. Owner's office.
 - g. Principal subcontractors' field and home offices.
 3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.
- I. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access project electronic documents and maintain electronic communications. Equip computer with not less than the following:
1. Processor: Intel Pentium D or Intel CoreDuo, GHz processing speed.
 2. Memory: gigabyte.
 3. Disk storage: gigabyte hard disk drive and combination DVD-RW/CD-RW drive.
 4. Internet Service: Broadband modem, router and ISP, equipped with hardware firewall, providing minimum upload and download speeds at each computer.
 5. Backup: External hard drive, minimum gigabyte, with automated backup software providing daily backups.
- 3.3 SUPPORT FACILITIES INSTALLATION
- A. General: Comply with the following:
1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas as indicated on Drawings.
- C. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
 - 1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
 - 2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Division 31 Section "Earth Moving."
 - 3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
- D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- E. Parking: Provide temporary parking areas for construction personnel.
- F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
 - 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
 - 2. Remove snow and ice as required to minimize accumulations.
- G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
 - 1. Identification Signs: Provide Project identification signs as indicated on Drawings.
 - 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
 - 3. Maintain and touchup signs so they are legible at all times.
- H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 01 Section "Execution" for progress cleaning requirements.
- I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

J. Temporary Elevator Use: **Use of elevators is not permitted.**

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Division 01 Section "Summary."

B. Temporary Erosion and Sedimentation Control: Comply with **requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.**

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.

1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from the project site during the course of the project.
4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

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. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.

G. Site Enclosure Fence: Prior to commencing earthwork, 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 or As indicated on Drawings.
 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- I. Covered Walkway: Erect protective, covered walkway for passage of individuals through or adjacent to Project site. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction **and requirements indicated on Drawings**.
- 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.
- K. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by **Owner** from fumes and noise.
- L. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
1. Prohibit smoking in construction areas.
 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.
- 3.5 MOISTURE AND MOLD CONTROL
- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard, replace or clean stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use permanent HVAC system to control humidity.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record daily readings over a forty-eight hour period. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove materials that can not be completely restored to their manufactured moisture level within 48 hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. 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 Division 01 Section "Closeout Procedures."

END OF SECTION **015000**

SECTION 016000 - PRODUCT REQUIREMENTS**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 selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Sections:
 - 1. Division 01 Section "Allowances" for products selected under an allowance.
 - 2. Division 01 Section "Substitution Procedures" for requests for substitutions.
 - 3. Division 01 Section "References" for applicable industry standards for products specified.

1.3 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.

1.4 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. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor 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 Division 01 Section "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 Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.5 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.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. Refer to Divisions 02 through 49. Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "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.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered, unless otherwise indicated.
 - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
4. Manufacturers:
 - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered, unless otherwise indicated.
 - b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "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 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 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.
9. Correction of the Work.

- B. Related Sections:

1. Division 01 Section "Submittal Procedures" for submitting surveys.
2. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
3. Division 02 Section "Selective Structure Demolition" for demolition and removal of selected portions of the building.
4. Division 07 Section "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor or professional engineer.
- B. Certificates: Submit certificate signed by land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.
- C. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 - 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate how long services and systems will be disrupted.
- D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- E. Certified Surveys: Submit two copies signed by land surveyor.
- F. Final Property Survey: Submit 4 copies showing the Work performed and record survey data.

1.5 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 the 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. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.

- c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Mechanical systems piping and ducts.
 - f. Control systems.
 - g. Communication systems.
 - h. Conveying systems.
 - i. Electrical wiring systems.
 - j. Operating systems of special construction.
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. Other construction elements include but are not limited to the following:
- a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Equipment supports.
 - e. Piping, ductwork, vessels, and equipment.
 - f. Noise- and vibration-control elements and systems.
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.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

1.6 WARRANTY

- A. 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.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- 1. For projects requiring compliance with sustainable design and construction practices and procedures, utilize products for patching that comply with requirements of Division 01 Section "Sustainable Design Requirements."
- 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 the 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. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - a. Description of the Work.
 - b. List of detrimental conditions, including substrates.
 - c. List of unacceptable installation tolerances.
 - d. Recommended corrections.
 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction.

Coordinate with authorities having jurisdiction.

- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect according to requirements in Division 01 Section "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 or professional engineer to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 3. Inform installers of lines and levels to which they must comply.
 - 4. Check the location, level and plumb, of every major element as the Work progresses.
 - 5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 - 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 - 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for

- maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 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. Temporary Support: Provide temporary support of work to be cut.
- C. 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.
- D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements of Division 01 Section "Summary."
- E. 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.
- F. 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 Division 31 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.
- G. 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.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.

- b. Restore damaged pipe covering to its original condition.
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.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 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.
- H. 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 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 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.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to

regulations.

- a. Utilize containers intended for holding waste materials of type to be stored.
4. Coordinate progress cleaning for joint-use areas where more than one installer has worked.
- B. Site: Maintain Project site free of waste materials and debris.
 - C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
 - D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
 - E. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
 - F. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls."
 - G. 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.
 - H. 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.
 - I. 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.

3.9 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 01 Section "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper

operation without binding.

- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.11 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES**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 contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.

- B. Related Requirements:

1. Section 017300 "Execution" for progress cleaning of Project site.
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.
4. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.
5. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those sections.

- C. Contractor responsibilities:

1. General Contractor, sub-contractor, vendors, and suppliers are to provide complete close out documents in accordance with this section and the Contract Documents.
2. Contractor shall establish close out document conference to be held at Substantial Completion.
3. With the closeout submittal, the Contractor shall document, initial, and verify completion of the Contract Closeout Checklist provided by JBHM.
4. The Architect will review the closeout submission and notify the Contractor of any failures. The Architect will provide review of second closeout submittal. Any time spent by the Architect after the second review will be billed as additional services under Article 9.8.2.1 of Supplementary Conditions.

1.3 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents (AS BUILTS), 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 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.
11. Establish and notify all parties of closeout conference date and time. Preferably immediately following the substantial completion inspection unless otherwise approved by Architect/Owner.

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 substantial completion 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.

1.4 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 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.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A or similar form.
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. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
 4. Submit list of incomplete items in the following format:
 - a. PDF electronic file. Architect will return annotated file.

1.6 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. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of 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 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.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

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. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.
 - m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 - o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - q. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
 - r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - s. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Specification Section 015000 Temporary Facilities and Controls. Prepare written report.
- D. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."

END OF SECTION **017700**

Request for Substantial Completion Inspection

Project Number _____ Date _____

Project Name _____ Contractor _____

As the Contractor's representative for the referenced project I certify that I have completed the following items:	Date Completed	Initials
1. Prepare a list of items to be completed and corrected (Contractor's punch list), the value of items on the list, and reasons why the Work is not complete.		
2. Advise Owner of pending insurance changeover requirements.		
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.		
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.		
5. Prepare and submit Project Record Documents (AS BUILTS), operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.		
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.		
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.		
8. Complete startup testing of systems.		
9. Submit test/adjust/balance records.		
10. Terminate and remove temporary facilities from Project Site, along with mockups, construction tools, and similar elements.		
11. Advise Owner of changeover in heat and other utilities.		
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.		
13. Complete final cleaning requirements, including touchup painting.		
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.		
15. Establish and notify all parties of closeout conference date and time (preferably immediately following the S.C. Inspection)		

As the Contractor's representative for the referenced project I certify that I **understand** the following:

1. Final completion must be reached within 30 days of substantial completion or the Owner has the option to have remaining Work completed and to deduct reasonable costs from the amount due. (Section 002213)
2. The Owner may deduct from the final pay application for payment to the Architect for additional services required due to the Contractor's failure to achieve final completion within 30 days.

CERTIFIED BY: _____

Request for Final Completion Inspection

Project Number _____ Date _____

Project Name _____ Contractor _____

As the Contractor's representative for the referenced project I certify that I have completed the following items:	Date Completed	Initials
1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures".		
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.		
3. 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. Submit demonstration and training video recordings.		

As the Contractor's representative for the referenced project I certify that I **understand** the following:

1. Final completion is established as the date indicated on the Certificate of Final Completion.
2. As per Section 002213 all warranties commence at substantial completion.
3. Final pay application, Consent of Surety to Final Payment, the Release of Liens and certification of Payments of Debts and Claims cannot be submitted until all items listed above are complete.

CERTIFIED BY: _____

SECTION 017823 - OPERATION AND MAINTENANCE DATA**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 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.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 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 format:

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. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
1. Correct or 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 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
1. List of documents.
 2. List of systems.
 3. List of equipment.
 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Contractor.
 - 6. Name and contact information for Construction Manager.
 - 7. Name and contact information for Architect.
 - 8. Name and contact information for Commissioning 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.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 2. File Names and Bookmarks: Enable bookmarking of individual documents based 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.
- F. 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. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of

products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.

3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- D. 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.
 2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."
- E. 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 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 project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for final property survey.
 - 2. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 4. Divisions 02 through 49 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit two set(s) of marked-up record prints and PDF electronic files of scanned record prints. Submit record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit two paper-copy set(s) of marked-up record prints and PDF electronic files of scanned record prints. Print each drawing, whether or not changes and additional information were recorded.
 - 2) Architect will review and indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

- b. Final Submittal:
 - 1) Submit two paper-copy set(s) of marked-up record prints and PDF electronic files of scanned record prints. Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit two paper copies and PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit two paper copies and PDF electronic files of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit two paper copies and PDF electronic files of each submittal.
- E. Reports: Submit written report monthly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

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. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- 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. 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. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders, record Product Data, and record Drawings where applicable.

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 paper copy and scanned PDF electronic file(s) of marked-up paper copy of Product Data.
1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record 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 record Product Data as paper copy and scanned PDF electronic file(s) of marked-up paper copy of Product Data.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of 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**

SECTION 017900 - DEMONSTRATION AND TRAINING

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 instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and training video recordings.

1.3 INFORMATIONAL SUBMITTALS

- A. Attendance Record: For each training module, submit list of participants and length of instruction time.
- B. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.4 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.

2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project record documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.
3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
7. Maintenance: Include the following:

- a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
8. Repairs: Include the following:
- a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 1. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 1. Schedule training with Owner, through Architect, with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral, a written, or a demonstration performance-based test.
- F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Video Recording Format: Provide high-quality color video recordings with menu navigation in format acceptable to Architect.
- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
- D. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.
- E. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.
- F. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

END OF SECTION **017900**

SECTION 200010 - MECHANICAL GENERAL PROVISIONS

PART 1 GENERAL

1.1 SCOPE

Provide all material, equipment and labor, etc., required to complete installation specified herein and/or shown or scheduled on Contract Drawings.

1.2 MECHANICAL SPECIFICATION SECTION INDEX

Division 20 – Fire Protection, Plumbing and HVAC General Provisions

Section 200010 – Mechanical General Provisions

Section 200020 – Basic Mechanical Requirements

Section 200030 – Mechanical Submittals and Shop Drawings

Section 200035 – Mechanical Systems and Equipment Warranties

Section 200040 – Mechanical Close-out Requirements

Section 200050 – Basic Mechanical Materials and Methods

Section 200060 – Pipes and Pipe Fittings

Section 200100 – Valves

Section 200120 – Piping Specialties

Section 200140 – Supports and Anchors

Section 200170 – Electrical Requirements

Section 200190 – Mechanical Identification

Section 200250 – Mechanical Insulation

Division 23 – Heating, Ventilating and Air Conditioning (HVAC)

Section 230520 – Chemical Treatment

Section 230670 – Packaged Air Conditioners

Section 230885 – Air Cleaning/Treatment

Section 230980 – Controls and Instrumentation

Section 230990 – Testing, Adjusting and Balancing

1.3 DEFINITIONS

- A. ARCHITECT: Architectural Design firm or ARCHITECT OF RECORD, meaning general building designer whose professional seal appears on the majority of general construction Contract Documents, or their authorized representative.
- B. ENGINEER (ENGINEER-OF-RECORD): ENGINEER whose professional stamp appears on Contract Drawings, etc. In general, unless specifically denoted otherwise, ENGINEER-OF-RECORD in Division 20, 21, 22 and 23 Specification Sections denotes MECHANICAL ENGINEER-OF-RECORD.
- C. Exposed, or exposed to view: Those installations which can be seen, in whole or part.
- D. Finished Spaces: Inside the building extents.
- E. Inspect and/or Inspection: Utilized for the PROFESSIONAL'S construction period services and defines as "visits by the PROFESSIONAL to the Project at appropriate intervals during construction to become generally familiar with the progress and quality of the CONTRACTOR'S work and to determine if the work is proceeding in accordance with the Contract Documents."
- F. Outside: Synonymous with outdoors, outside of building, exposed to weather, etc.

- G. Plans: Denotes general Construction Drawings prepared by the A/E.
- H. PROFESSIONAL: Authorized representative of ENGINEER-OF-RECORD'S firm.
- I. Provide: Unless specifically denoted otherwise, the CONTRACTOR referred to shall be responsible for furnishing, providing, installing, connecting, and making item or system fully functional in a safe manner as recommended by the manufacturer and by Industry Standards.

1.4 APPLICABLE STANDARDS

- A. The intent is that the complete installation shall comply with applicable laws and ordinances, utility company regulations, and applicable requirements from the latest edition of the following:

ANSI	American National Standard Institute
ASHRAE	ASHRAE guides, Latest Editions
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing Materials
ICC	International Code Congress
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
UL	Underwriters Laboratories

City of Ocean Springs, Mississippi, Fire, Building, Gas, Plumbing and Mechanical Codes and Regulations, and governing authority having jurisdiction.

- B. Other applicable building, safety or fire codes having jurisdiction over equipment, materials or methods. The decision of the ENGINEER will be final in event of dispute over Code to use or its interpretation.

1.5 GENERAL CONDITIONS

- A. The General Conditions, Information to Bidders, Special Conditions, and other pertinent documents issued by the ARCHITECT are a part of these Specifications and shall be complied with in every respect.
- B. By the act of submitting a bid, this CONTRACTOR agrees that all of the Contract Documents and each of the divisions of the complete Specifications have been reviewed and studied, and all requirements and coordination resulting there from are included.
- C. This CONTRACTOR shall conform to standards prescribed by City, County, and State regulations or ordinances having jurisdiction. Any changes that may be necessary to conform to such regulations or ordinances shall be made by this CONTRACTOR without extra costs to the OWNER. Where code requirements are less than those shown on the Plans or in the Specifications, the Plans and Specifications shall be followed. Where applicable, NFPA requirements shall be met.
- D. The CONTRACTOR shall comply with all applicable provisions of the William-Steiger Occupational Safety and Health Act (O.S.H.A.).

- E. Permits required for the installation of the work, as well as all authorized code inspections, including all fees and assessments, shall be borne by and arranged for by the CONTRACTOR. The CONTRACTOR shall verify specific mechanical related provisions for permitting in advance, especially where additional design/installation documentation may be required, and include provisions and/or cost of same in this bid.
- F. This CONTRACTOR shall provide all items, articles, materials, operations or methods listed, mentioned, or scheduled on the Drawings and/or herein including all labor, materials, equipment and incidentals necessary, required or implied, for the completion of the various systems.

1.6 EXPLANATION AND PRECEDENCE OF DRAWINGS

- A. For purposes of clearness and legibility, Drawings are essentially diagrammatic and, although size and location of equipment are drawn to scale whenever possible, the CONTRACTOR shall make use of all data in the contract documents and shall verify this information at building site.
- B. Do not scale drawings having 1/4" or smaller scale. The Drawings indicate required size and points of termination of pipes and ducts, and suggest proper routes of pipe to conform to structure, avoid obstructions and preserve clearances. Because of small scale, it is not intended that Drawings indicate all necessary offsets, and it shall be the work of this Section to install work in such a manner as to conform to structure, avoid obstructions, preserve headroom and keep openings and passageways clear without further instruction or cost to the OWNER.
- C. It is intended that all apparatus be located symmetrically with architectural elements, and shall be installed at exact height and locations as shown on the Architectural Drawings.
- D. The CONTRACTOR shall be solely responsible for taking his own measurements and installing his work to suit conditions encountered.

1.7 SPECIAL CONDITIONS, MECHANICAL

- A. The right is reserved to move any element as much as ten (10') feet at no increase in cost provided CONTRACTOR is notified before work in question is fabricated or installed.
- B. The CONTRACTOR shall fully inform himself regarding any and all peculiarities and limitations of spaces available for the installation of all work and materials furnished and installed under the contract. He shall exercise due and particular caution to determine that all parts of his work are made quickly and easily accessible. The CONTRACTOR shall be guided by the architectural details and conditions existing at the job, correlating this work with that of the other trades, and report to the OWNER any discrepancies or interferences that are discovered. Failure to report such discrepancies and interferences shall result in the correcting of these errors or omissions by the CONTRACTOR at his own expense. All work which deviates from the Drawings and Specifications without prior approval of the OWNER, shall be altered by the CONTRACTOR at his own expense to comply with the Drawings and Specifications as directed.
- C. If equipment or fixtures to be furnished by OWNER and/or OWNER'S vendor are not delivered prior to final acceptance, services shall be capped or plugged at walls or floor as directed by ARCHITECT, ready for future connection.

- D. The CONTRACTOR shall coordinate his work with that of the OWNER, in order that there will be no delay in the proper installation and completion of the work. If, in the opinion of the OWNER, any piping, equipment, etc., has been improperly placed or installed due to lack of coordination with the other trades, such piping and equipment shall be relocated as directed by the OWNER at the CONTRACTOR'S expense.

1.8 SITE SAFETY

CONSULTANT'S site responsibilities are limited solely to the activities of CONSULTANT and CONSULTANT'S employees on site. These responsibilities shall not be inferred by any party to mean that CONSULTANT has responsibility for site safety. Safety in, on, or about the site is the sole and exclusive responsibility of the CONTRACTOR alone. The CONTRACTOR'S methods of work performance, superintendence of the CONTRACTOR'S employees and sequencing of construction are also the sole and exclusive responsibilities of the CONTRACTOR alone. The CONTRACTOR shall, to the fullest extent permitted by law, waive any claim against CONSULTANT and his employees and indemnify, defend, and hold CONSULTANT harmless from any claim or liability for injury or loss arising from CONSULTANT'S alleged failure to exercise site safety responsibility. The CONTRACTOR also shall compensate CONSULTANT for any time spent or expenses incurred by CONSULTANT in defense of any such claim. Such compensation shall be based upon CONSULTANT'S prevailing fee schedule and expense reimbursement policy. The term "any claim" used in this provision means "any claim in contract, tort or statute alleging negligence, errors, omissions, strict liability, statutory liability, breach of contract, breach of warranty, negligent misrepresentation, or other acts giving rise to liability.

PART 2 – PRODUCTS – NOT APPLICABLE

PART 3 – EXECUTION

3.1 WORKMANSHIP, MATERIALS AND EQUIPMENT

- A. All work shall be performed in a workmanlike manner and shall present a neat and mechanical appearance when completed. All materials shall be of type, quality and minimum rating prescribed herein or indicated on the Contract Drawings.
- B. If equipment or fixtures to be furnished by OWNER and/or OWNER'S vendor are not delivered prior to final acceptance, services shall be capped or plugged at walls or floor as directed by ARCHITECT, ready for future connection.

3.2 CLEAN-UP

- A. Do not allow mechanical related waste material or rubbish to accumulate in or about job site.
- B. At completion of work, remove all rubbish, tools, scaffolding and surplus materials from and about building, leaving work clean and ready for use without further cleaning required. Clean all equipment, piping, valves, fixtures, and fittings of grease, metal cuttings, insulation cement, dust, dirt, paper labels, etc.
- C. Any discoloration or other damage to parts of building, its finish or furnishings due to failure to properly clean or keep clean mechanical systems shall be repaired without additional cost to OWNER.
- D. All equipment, fixtures and installations, especially where installations are exposed to view, shall be thoroughly cleaned, polished, seams smoothed and/or sealed for a neat appearance.

3.3 INSPECTION OF PROPOSED CONSTRUCTION

Prior to submitting his bid, the CONTRACTOR shall visit the site of the proposed construction and shall thoroughly acquaint himself with existing utilities, working conditions to be encountered, etc. No additional compensation shall be allowed for conditions increasing the CONTRACTOR'S cost which were not known or appreciated by him when submitting his proposal if the condition was obvious and could have been discovered by him if he had visited the project site and thoroughly informed himself of all existing conditions which would affect his work, including requirements of local authorities to meet their procedures, special requirements, codes, etc.

3.4 TEMPORARY ENVIRONMENTAL CONDITIONING

Temporary heating, cooling and dehumidification capability shall be provided for this project beginning a minimum of 90 days prior to the original contract scheduled substantial completion date and maintained until the OWNER'S final acceptance of the project, or any phase thereof. The beginning of this temporary HVAC period is intended to align with general industry standard construction practice of providing a minimum suitable indoor environment for the installation and curing of adhesives, finishes, wall covering(s), tile ceiling/floors, etc. It is highly dependent upon the CONTRACTOR's comprehensive project coordination and scheduling efforts and shall be lengthened (begun earlier) should the CONTRACTOR install such systems and/or finishes which are recommended by the system and/or finish manufacturer to be installed and/or maintained in a minimum environmental condition. This interior space conditioning, known hereafter as "temporary HVAC", includes all areas of the project where the space will be similarly conditioned with heating, cooling and/or dehumidification capability after the project or any portion/phase thereof is completed.

During this minimal temporary HVAC period, the interior space shall be continuously monitored and controlled to provide the following:

1. maximum 85 degrees Fahrenheit dry bulb temperature.
2. minimum 60 degrees Fahrenheit dry bulb temperature.
3. maximum 60% relative humidity.

In effect, automatic controls for refrigeration, dehumidification, and heating shall be provided such that the indoor building environment, as described above, can be continually maintained. If a system and/or finish manufacturer recommends a more stringent requirement for conditioning, same shall be provided.

The CONTRACTOR shall coordinate such temporary provisions with the all trades and utility companies to accomplish this requirement including adequate temporary power to equipment, etc. All cost and coordination for these temporary HVAC provisions shall be the responsibility of the CONTRACTOR and included in his base bid.

While operating the systems, the intent is to protect the installations from dirt, dust, debris, etc. such that at substantial completion the systems are new, clean and ready for the OWNER's beneficial use. The CONTRACTOR is responsible for protection of the WORK to meet the design intent identified herein. The following minimum requirements shall be met:

1. Completed manufacturer equipment start-up forms must be filled out completely for each and every piece of equipment. Copy of same shall be maintained on file at the project site for verification. Failure to complete the form entirely or maintain copy at project site will result in equipment operation being discontinued without exception.

2. The exterior building envelope is complete including installation of all permanent doors, windows, walls, louvers, roof openings, etc.
3. ALL interior and exterior dust generating activities and subsequent cleanup is complete and approved by the ARCHITECT. Examples of this are exterior sitework around the building, interior sheet rock installation/finishing, floor grinding, spray application of paints/sealers, etc.
4. HVAC Systems shall have pleated air filters of types indicated in Section Air Cleaning/Treatment installed, monitored and periodically replaced when loaded.
5. All R/A grilles and/or openings into ductwork/plenums are fully covered, and protected with filter material of types indicated in Section Air Cleaning/Treatment. These filters shall be continually monitored and periodically replaced when loaded.
6. There is no reduction in specified equipment warranty, capacity, performance, or life of the equipment.
7. HVAC equipment manufacturer's recommendations don't indicate construction practices and installations are harmful to systems, equipment, etc.
8. HVAC equipment manufacturer start-up tests have been performed and accompanying forms have been transmitted to Professional for review. See HVAC equipment specification sections for more information. A copy of same shall be included in Close-out Documents. See Section *MECHANICAL CLOSE-OUT REQUIREMENTS*.

If new HVAC equipment cannot be utilized for providing indoor environmental control during construction for finishes, etc., the CONTRACTOR shall arrange for other temporary HVAC capacity as required.

If the CONTRACTOR fails to adhere to these guidelines for operation of the permanent building mechanical systems, corrective action by the CONTRACTOR will be required. Corrective action will be determined by the ENGINEER but may include any combination of the following:

1. Cleaning or Replacing Ductwork should it be found with visible dust/debris. A third-party testing/inspection representative may be required depending upon the extent of contamination.
2. Replacement or Cleaning of Equipment should it be found with visible dust/debris/damage. The respective equipment manufacturer's representative will be required to inspect and make written recommendations as to the corrective actions necessary to return the equipment to like new conditions.

The CONTRACTOR will be solely responsible for and include all cost associated with any required corrective actions.

However, permanent HVAC equipment, as described above, shall be fully operational during the last 30 days of the temporary HVAC period such that system performance and controls can be tested, adjusted and balanced per Section Testing, Adjusting and Balancing.

3.5 PHASED CONSTRUCTION AND PARTIAL OWNER OCCUPANCY

- A. Owner will occupy the premises during entire construction period, with the exception of areas under construction. Contractor shall cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations.
- B. Where HVAC is impacted by scope of work, Contractor is responsible for maintaining temperature and humidity levels as indicated above in paragraph *TEMPORARY ENVIRONMENTAL CONDITIONING*.
- C. In general, existing HVAC equipment shall remain active until new equipment is fully operational or temporary HVAC equipment shall be installed such that temperature and humidity levels are maintained at all times.

3.6 EXISTING UTILITIES AND SERVICES

- A. When encountered in work, protect existing active sewer, water, gas, electric, other utility services, structures; where required for proper execution of work, relocate them as directed. If existing active services are not indicated, contact PROFESSIONAL for instructions.
- B. When encountered in work area, whether or not indicated, cap or plug or otherwise discontinue existing inactive sewer, water, gas, electric, other utility service structures, of which action should be taken. If removal is required, request instructions from PROFESSIONAL.
- C. While work is in progress, except for designated short intervals during which connections are to be made, continuity of service shall be maintained to all existing utilities and systems. Interruptions shall be scheduled and coordinated with ARCHITECT and OWNER and approved in advance with the OWNER and serving utilities. If requested, downtime shall be limited to weekends and/or night periods to least disrupt normal use of these utilities. The CONTRACTOR shall be responsible for any interruptions to service and shall promptly repair any damages to existing systems caused by his operations.
- D. The accuracy of the location of existing underground, and otherwise concealed, HVAC, domestic, fire protection, sanitary and storm drainage utilities is not guaranteed. The CONTRACTOR shall, early in the project, prior to demolition of existing work and layout of new work, verify all underground and concealed work in the proximity of connections to existing services and routings.
- E. Immediately upon commencing construction, and prior to construction of any part of the facility involved in any way with utilities, the CONTRACTOR shall investigate thoroughly the size, capacity, arrangement and location of all mechanically related utilities. The CONTRACTOR shall immediately report any discrepancies or apparent problem involving the project that pertains to utilities. This applies to private as well as public utilities. This CONTRACTOR shall coordinate and utilize the services of public and private "locators" to ascertain the whereabouts of all underground utilities in the area where work is to be performed.

END OF SECTION

SECTION 200020 - BASIC MECHANICAL REQUIREMENTS

PART 1 – GENERAL

1.1 SCOPE

Furnish all labor, materials, services, and equipment required to complete the installation of complete and acceptable mechanical systems in accordance with these specifications and the contract drawings.

1.2 TESTS

- A. This CONTRACTOR shall conduct such tests as required to determine that systems and equipment, which he installs, conform to Specifications. CONTRACTOR shall supply all labor, materials, instruments, operations, etc., required to facilitate testing.
- B. Gauges, thermostats, and instruments used in testing shall be accurate, recently calibrated and approved by the PROFESSIONAL prior to test. Instruments installed permanently in systems as specified herein may be used in testing when approved by the ENGINEER.

PART 2 – PRODUCTS – NOT APPLICABLE

PART 3 – EXECUTION

3.1 MISCELLANEOUS WORK REQUIRED

- A. The CONTRACTOR shall provide foundations for equipment, chases, furring, framed openings in wall, partitions, etc., installation of wall louvers and grilles in doors, finish painting and all other similar work of a general construction nature. All roof flashing by CONTRACTOR.
- B. The CONTRACTOR shall bring adequate power to and make final connections to all equipment furnished under this Contract.
- C. All items of labor, materials and equipment not specifically stated herein or on Contract Drawings to be by others are required to make the systems complete and operative, shall be by this CONTRACTOR.

3.2 PROTECTION OF EQUIPMENT AND MATERIALS

- A. Responsibility for care and protection of equipment and materials under this Contract rests with this CONTRACTOR until equipment or materials have been tested and accepted.
- B. All pipe ends, valves, ductwork and parts of equipment left unconnected, permanently or temporary, shall be capped, plugged or properly protected at the end of each working day to prevent entry of foreign matter. During the construction process, cover ductwork exposed to weather and/or when not yet installed, with sheet metal caps screwed in place and sealed.
- C. Store equipment, ductwork including pipe and valves, off the ground and under cover. For storage outdoors, minimum 6-mil thick plastic shall be fitted to withstand splattering, ground water, precipitation and wind.
- D. Protect air handling unit coils by use of protective sheet metal panels or plywood.
- E. Damaged equipment shall be repaired or replaced at the option of the PROFESSIONAL. Finishes and/or scratched paint on equipment, etc., shall be repaired and repainted to match new condition(s).

- F. Do not bring insulated equipment or ductwork to job site until same can be adequately protected from wind, rain and damage, etc. In general, store ductwork in building(s) not yet fully enclosed, off the ground and under minimum 6-mil plastic sheeting, etc. This includes dual wall spiral and interior lined rectangular ductwork, and other similar equipment with liners, controls, etc., not recommended to be exposed to wind and water, etc. Such ductwork and equipment found damaged and/or damp shall be immediately replaced and shall not be utilized for this project.
- G. This CONTRACTOR shall protect his work at all times from danger by freezing, breakage, dirt, foreign materials, etc., and shall replace all work so damaged. The CONTRACTOR shall use every precaution to protect the work of others, and he will be held responsible for all damage to other work caused by his work or through the neglect of his workmen.

3.3 INSTALLATION COORDINATION

- A. The mechanical plans do not give exact elevations or locations of lines, nor do they show all the offsets, control lines, or other installation details. The CONTRACTOR shall carefully lay out his work at the site to conform to the structural conditions, to provide proper grading of lines, to avoid all obstructions, to conform to details of installation supplied by the manufacturers of the equipment to be installed, and to thereby provide an integrated, coordinated and satisfactory operating installation. In general ductwork has the right-of-way.
- B. If the CONTRACTOR proposes to install equipment, including piping and ductwork requiring space conditions other than those shown, or to rearrange the equipment, he shall assume full responsibility for the rearrangement of the space and shall have the ARCHITECT review the change before proceeding with the work. The request for such changes shall be accomplished by Shop Drawings of the space in question.
- C. The CONTRACTOR shall so coordinate the work of the several various trades that it may be installed in the most direct and workmanlike manner without hindering the other trades. Piping interferences shall be handled by giving precedence to pipe lines, which require a stated grade for proper operation. For example, sewer lines and condensate piping shall take precedence over water lines in determination of elevations. Where there is interference between sewer lines and condensate lines, the sewer lines shall have precedence and provisions shall be made in the condensate lines for looping them around the sewer lines. In all cases, lines requiring a stated grade for their proper operation shall have precedence over electrical conduit and ductwork.
- D. Piping, equipment, or ductwork shall not be installed in electrical equipment rooms or elevator machine rooms except as serving only those rooms. Outside of electrical equipment rooms, do not run piping or ductwork, or locate equipment, with respect to switchboards, panel boards, power panels, motor control centers or dry type transformers:
 - 1. Within 42" in front (and rear if free standing) of equipment; or
 - 2. Within 36" of sides of equipment.
 - 3. Clearances apply vertically from floor to structure/ceiling.

3.4 INSTALLATION DIRECTIONS

Obtain manufacturer's printed installation directions to aid in properly executing work on equipment requiring such directions. Submit such directions and installation details to

PROFESSIONAL for approval prior to time of installation for use in supervising work. If the manufacturer's installation instructions or details conflict with the Contract Document requirements, CONTRACTOR shall promptly make PROFESSIONAL aware in writing and request clarification.

3.5 MECHANICAL VERIFICATION AND INSPECTIONS

- A. The CONTRACTOR shall coordinate, with the A/E with a minimum ten (10) days advance notice, the inspection of mechanical sub-systems for the following:
 - 1. in-wall piping/ductwork
 - 2. above ceiling piping/ductwork
- B. These inspections shall be coordinated prior to wall and/or ceiling/attic insulation installation, (concealment) etc., such that these mechanical installations can be easily visually inspected by A/E for general conformance with Contract requirements. These installations shall not be concealed until such time the A/E indicates these mechanical installations are acceptable. If a re-inspection is required, an A/E revisit and a follow-up inspection shall be similarly coordinated with sufficient advance notice as approved by the A/E. Therefore, it is pertinent for the CONTRACTOR to inspect these type installations himself and verify that these installations are complete and in conformance with specified standards to minimize any time delays and/or coordination of construction sequencing, etc.
- C. The CONTRACTOR should note the following requirement for administering the punch list(s) and mechanical closeout documents associated with a substantial completion and/or final, etc.
- D. In general, the punch list(s) will be furnished with blanks for the CONTRACTOR and/or his Sub-Contractor(s) to initial and date, adjacent to each item, for coordination and verification efforts. The completed punch list shall be transmitted to A/E to allow them to thereafter schedule a follow-up visit for re-inspection and verification. It is, therefore, prudent for the CONTRACTOR, to administer the overall process, and verify that all punch list items are complete and in compliance with Contract requirements, prior to requesting a follow-up A/E inspection effort.
- E. The CONTRACTOR shall be liable for inspections and further administrative involvement required of the A/E after 30 days of the original scheduled completion date, and for re-inspections and involvement by the A/E caused by the CONTRACTOR'S negligence and failure to fully complete punch lists and Closeout Documents when required and/or requested.

END OF SECTION

SECTION 200030 - MECHANICAL SUBMITTALS AND SHOP DRAWINGS

PART 1 – GENERAL

1.1 SUBMITTALS AND SHOP DRAWINGS

- A. The submittal data to be furnished for this project shall comply with the Specifications and Contract Documents in their entirety. See *Division 01* for more information.
- B. Reproduction of design documents in any portion for use in a submittal is not acceptable.
- C. Provide all additional documentation required to obtain permanent permit for this project as may be required by Authorities Having Jurisdiction. All such additional documentation shall be considered a normal part of the shop drawing with the cost of same included.
- D. Selection of Materials and Equipment:
 1. Where a definite material or brand name is specified, it is not the intent to discriminate against any product of another manufacturer. Reference to a specific manufacturer's product by name, make or catalog number is intended to establish standards of quality, design, dimensions and appearance.
 2. Open competition is expected, but in all cases, complete data must be submitted for comparison and test when requested by the PROFESSIONAL. Burden of "proof of equality" lies solely with the CONTRACTOR.
 3. The products of various manufacturers have been used as the basis of design in preparation of these documents. It shall be the responsibility of the CONTRACTOR to ensure the submitted materials and equipment will fit into the space allotted. Furthermore, verify and maintain adequate access to equipment, valves, filters, lubrication outlets, etc. Any changes to the building or system design necessary shall be arranged for in writing before the materials and equipment is ordered. All costs involved in making such changes shall be borne by the CONTRACTOR.
 4. When submitting materials and equipment other than the basis of design, note the following minimum considerations:
 - a. Capacities shown are absolute minimum and must be equaled
 - b. Physical size, weight, etc. limitations
 - c. Noise and vibration levels
 - d. Interchangeability
 - e. Accessibility for maintenance and replacement
 - f. Compatibility with other materials, assemblies
 - g. Similar items shall be furnished by the same manufacturer and style whenever possible.
 5. The availability of service is of prime importance to the OWNER and was a major consideration in selecting the materials and equipment that are listed as the basis for design. Competent service must not only be available, but

must, in the case of specialty HVAC equipment and control systems, be a direct arm of the manufacturer. Further, the service agency, as a representative of this manufacturer, must have been in continuous operation in this area sufficient time to indicate a degree of permanence.

1.2 SAMPLES AND MOCK-UPS OF PROPOSED INSTALLATION

A. Samples:

1. Provide samples of equipment, components, control devices, etc. as requested by the PROFESSIONAL.
2. These samples are intended to demonstrate quality of construction of proposed installation materials and/or equipment.
3. In general, each substitution request made by the CONTRACTOR will likely require a sample be furnished for review. However, in some cases, samples will be requested of specified equipment, components, control devices, etc. to demonstrate to the Owner the proposed installations.

B. Mock-ups:

1. Provide mock-ups of the proposed installations as requested by the PROFESSIONAL.
2. These mock-ups shall be either in-place or separately constructed at the direction of the PROFESSIONAL.
3. In general, mock-ups shall be of completed proposed installations as coordinated between CONTRACTOR and PROFESSIONAL. In some cases, this will require different levels of completion or staged mock-up construction (i.e. ductwork with taps installed and sealant applied in one section without insulation and insulation applied in another). Some examples of these mock-ups are as follows:
 - a. Indoor air handling equipment and piping connections

PART 2 – PRODUCTS – NOT APPLICABLE

PART 3 – EXECUTION

3.1 SUBMITTALS AND SHOP DRAWINGS

- A. The following product data submittals for materials and equipment shall be submitted to PROFESSIONAL for approval:
 1. SECTION *CHEMICAL TREATMENT*
 - a. Chemicals for Closed Systems
 2. SECTION *PACKAGED AIR CONDITIONERS*
 - a. Split Systems (Equipment)
 3. SECTION *AIR CLEANING/TREATMENT*
 - a. Air Filters for Construction Period and Spares for Permanent use.
 4. SECTION *CONTROLS AND INSTRUMENTATION*
 - a. Control Devices
 - b. Override Timer

- c. Relays
 - d. Time Clock
 - e. DDC Controller
 - f. Local Temperature Relay Panel & Labeling
 - g. Wiring Diagrams and Shop Drawings
 - h. Sequence of Operation
 - i. Thermostat and Humidistat and Covers
 - j. Microprocessor Controls/Panel and Devices
5. SECTION *TESTING, ADJUSTING AND BALANCING*
- a. Testing, Adjusting and Balancing Agency, Certification Credentials, Sample Forms, Instrument List with Calibration History.
 - b. TAB Report – Preliminary with certification of mechanical systems safety and operating controls. Note: Submittal must be transmitted to the Professional 5 days prior to request for substantial completion inspection.

END OF SECTION

SECTION 200035 - MECHANICAL SYSTEMS AND EQUIPMENT WARRANTIES

PART 1 – GENERAL

1.1 SCOPE

Furnish all labor, materials, services, and equipment warranties as outlined herein for mechanical systems and equipment.

1.2 GUARANTEE AND WARRANTY

A. See Division 01 for warranty start date.

B. INDUSTRY STANDARD GUARANTEE:

See Architectural Specifications.

C. Test Period:

Each piece of equipment shall meet performance specifications after three months' actual operation to OWNER'S satisfaction.

D. CONTRACTOR shall replace, or make good, any defect due to faulty workmanship or material, which shall develop within one year from the beginning of the warranty period. This guaranty shall cover both material and labor. Leaking pipe work is considered faulty workmanship. This warranty shall include repair, removal of defective parts and installation of replacements. The CONTRACTOR shall also be responsible for property damage that results from defects in materials, improper controls or setup, and/or installation during the warranty period.

E. For first year after the warranty begins, CONTRACTOR shall provide, at no cost to the OWNER, any required maintenance and service necessary to assure the proper operation of the installations and systems. Latent defects arising during this period shall, upon notification by the OWNER, be promptly corrected at no additional cost to the OWNER. This shall include:

1. Refrigerant and Oil Replacement in Refrigeration Systems: Leaking refrigerant systems shall be repaired, proved tight, and charged with manufacturer's recommended refrigerant and lubricant, within any standard warranty period.
2. Any adjustments and service required, excluding filter monitoring and replacement.
3. Any necessary adjustments in system control set points when required, excluding filter monitoring.

F. The CONTRACTOR shall make inspections at end of 6th and 11th months after beginning of warranty related to the HVAC control system. During these inspections, the CONTRACTOR shall verify all control settings and recalibrate controls and sensors to match requirements as can be coordinated with PROFESSIONAL based on historical trend by data and to optimize system performance. Temperature and safety controls shall be adjusted as necessary to insure continuous, trouble free, safe, and automatic operation of systems including gas burner, refrigerating equipment, etc.

G. Extended Equipment Warranties

1. Definitions and General Requirements

- a. Extended warranties, defined as a warranty after the standard one (1) year warranty.
- b. "Comprehensive" is defined as a complete warranty except for acts of God and negligent maintenance or operation of the specified equipment as required of the OWNER.
- c. All comprehensive equipment warranties shall include all parts, labor, shipping, postage, freight, handling fees, etc., to accomplish any repair and/or replacement at no additional cost to OWNER. These warranty provisions will be binding on any CONTRACTOR and/or supplier/manufacturee unless specifically approved otherwise in writing by OWNER.
- d. Lack of specific action on any manufacturer's, supplier, and/or CONTRACTOR submitted alternate warranty shall not be construed as approval of same and shall not void the manufacturer and/or CONTRACTOR'S contractual obligation to provide specified warranty.
- e. Third party insurance and/or split CONTRACTOR labor/manufacturee's equipment/material warranties shall not be acceptable. Only manufacturer's comprehensive warranties shall be acceptable.

2. Extended Warranties Required

- a. Section *Packaged Air Conditioners* – 4 years compressor parts only non-prorated.

PART 2 – PRODUCTS – NOT APPLICABLE

PART 3 – EXECUTION

3.1 GUARANTEE AND WARRANTY

All certificates shall first be presented to the ARCHITECT for approval. After approval, copies of the certification(s) shall be forwarded to the OWNER by the CONTRACTOR.

END OF SECTION

SECTION 200040 - MECHANICAL CLOSE-OUT REQUIREMENTS

PART 1 – GENERAL – NOT APPLICABLE

PART 2 – PRODUCTS – NOT APPLICABLE

PART 3 – EXECUTION

3.1 AS BUILT DRAWINGS

Project Record Documents and As Built Drawings:

- A. Maintain at job site a set of contract record documents kept current by indicating thereon all changes, substitutions, etc., between work as specified and as installed.
- B. Show on record documents actual air quantities, water flow rates, valve or damper positions after balancing, etc.; also show, by actual dimension, location of all new and known existing underground work.
- C. At the completion of the project, furnish the OWNER three (3) set(s) of bluelines and three (3) complete, clean sets of specifications showing installed location, size, etc., of all work and material as taken from record documents. All as-built (on record) drawings shall be labeled "As-Built Drawings," dated and certified accurate by CONTRACTOR with his signature, on front page of all Drawing Blueline sets and Specifications.

3.2 OPERATION AND MAINTENANCE MANUALS

- A. Submit three (3) complete sets of bound brochures in 8-1/2" x 11" spring post binders, indexed and tabled by equipment type (Air Handler, Plumbing Fixtures, etc.).
- B. Include in these brochures written submittal data, manufacturers operating and maintenance procedures and recommendations, spare parts lists and suppliers and any interlocking control or wiring diagrams for all equipment. The information listed herein is to be bound in the following order:
 1. First sheet to list ARCHITECT, ENGINEER, CONTRACTOR and Sub-Contractors with addresses for each.
 2. Second sheet to list type of equipment with sequential number, the manufacturer, make, model and serial number of the actual equipment nameplate data rated horsepower, full load rated amps, voltage and phase.
 3. Next, actual copy of approved submittal data including all manufacturers published information on capacities, capacity curves or tables, accessory and control item lists, and other pertinent information as requested by ENGINEER. Cross-reference all equipment to Contract Documents.
 4. Next, copy of all spare parts list and suppliers' contact information.
 5. Next, include the manufacturer's published operating and maintenance procedures.
 - a. Include instructions to stop and start each piece of equipment including reference to controls and interlocks and an itemized maintenance schedule detailing procedure and interval of periodic maintenance items. Start this log of the maintenance list(s) by accomplishing the initial required maintenance procedure(s) for each and every maintenance item.

- recommended by each manufacturer's O&M manuals.
- d. All equipment and material suppliers will also be expected to participate. The CONTRACTOR shall schedule with the A/E and designated OWNER'S Representative(s).
 - e. Additional instruction and education sessions shall be provided subsequent to the initial session to provide additional instruction as required to fully educate the OWNER'S operators.
3. The CONTRACTOR shall submit to the PROFESSIONAL in draft form, an outline of the contents of this education, with agenda and list of pertinent personnel, a minimum of thirty (30) days prior to project completion date and scheduling said instruction with the OWNER and PROFESSIONAL.
 4. When the seminar and subsequent instruction periods are completed, CONTRACTOR shall furnish ARCHITECT a letter signed by the OWNER certifying that his representative(s) has received adequate instruction in operation of installed equipment and systems. This letter shall be furnished prior to final acceptance of this project.
- B. Some suggestions for pertinent subject matter to include in the administration of the education of OWNER'S operation and maintenance personnel, is as follows:
1. Nominal Split and Packaged Direct Expansion Cooling and Heating Systems:
 - a. Air filter size, monitoring and changeout (note that CONTRACTOR is to provide a schedule to OWNER, indicating all systems, filter grilles, etc., and matched sizes) and number of air filters.
 - b. Periodic bearing lubrication
 - c. Periodic belt monitoring and adjustment
 - d. Periodic evaporator and condenser coil inspection and cleaning
 - e. Periodic monitoring of refrigerant charge by (1) visual observation of site glass, and (2) discharge air temperature monitoring
 - f. Normal temperature and fan controls setpoints for occupied and unoccupied periods.
 - g. Normal indoor humidity setpoints for all periods
 - h. Condensate drain periodic inspection and maintenance; including algaecide
 - i. Smoke detection and fire alarm interaction
 2. HVAC Chemical Treatment:
 - a. Describe purpose
 - b. Periodic water quality and chemical concentration tests and reports
 3. Controls:
 - a. Describe Time Clock (MCP) scheduling in regards to staggering of HVAC systems to minimize electrical demand charges.
 - b. Describe functional zones and corresponding overrides.

- c. Describe setup and operation (including override functions) of programmable thermostats.
- d. Calibration of sensors (temperature, humidity, etc.)
- e. Describe purpose of duct smoke detection, HVAC unit shut-down, and remote smoke detector alarm panels and reset procedures.

4. General:

- a. Warranties: Explain the various warranties. Explain to OWNER his role during the warranty period(s), his limitations who he is to call when a problem tied to a warranty issue occurs, for both the one-year standard warranty and extended warranties, etc.
- b. Special tools and spare parts
- c. Air filter spares
- d. Purpose of O & M Manuals (spare parts, O & M manufacturer's recommendations, trouble-shooting, etc.)

3.4 CLOSEOUT DOCUMENTATION

- A. Seven (7) days prior to requesting a final inspection, the CONTRACTOR shall submit all O&M and closeout documentation to the ARCHITECT, to be turned over to the OWNER at the end of the project.
- B. The following checklist shall be utilized for compiling documentation and shall be included behind front cover of O&M manuals.
- C. CONTRACTOR shall initial and date each line item once completed and shall fax or email copy of the completed checklist to the PROFESSIONAL prior to final inspection request.

CLOSEOUT DOCUMENTATION CHECKLIST MECHANICAL		
PROJECT NAME:		
INITIALS OF PERSON COMPLETING TASK	DATE TASK COMPLETED	DESCRIPTION OF CONTRACTOR'S SUBMITTAL
		Final TAB Report (3 each required)
		Signed Letter Record of Owners Personnel O & M Education
		Mechanical HVAC Operation & Maintenance Manuals (3 ea)
		As-Built Drawings with Contractor's Stamp (3 each)
		Completed HVAC equipment factory start-up forms for each individual unit.
		Extended Warranties: (See Section <i>Mechanical Systems and Equipment Warranties</i>)
		Provide list of all spare air filter sets per Section <i>Air Cleaning/Treatment</i> . List number, size, type and location/equipment match-up.
		Pipe Test Log - Form in Section <i>Pipe and Pipe Fittings</i> to be comprehensively filled out.
		Copy of HVAC Water Chemical Treatment Test Results
		Keys to access doors per Section <i>Basic Mechanical Materials and Methods</i> (provide written receipts with Owner's acceptance).
		Keys to control panels and sensor/controller covers per Section <i>Basic Mechanical Materials and Methods</i> and Section <i>Controls and Instrumentation</i> (provide written receipts with Owner's acceptance).

END OF SECTION

SECTION 200050 - BASIC MECHANICAL MATERIALS AND METHODS

PART 1 – GENERAL

1.1 SCOPE

- A. Provide all material, equipment and labor, etc., required to complete installation specified herein and/or shown or scheduled on Contract Drawings.
- B. The requirements of this section apply to all sections of Division 20, 21, 22 and 23.
- C. Definitions:
 - 1. Exposed: Piping, ductwork, and equipment exposed to view in finished rooms, including mechanical and/or equipment rooms.
 - 2. Option or Optional: CONTRACTOR'S choice of an alternate material or method.

1.2 PRODUCTS CRITERIA

- A. Multiple Units: When two or more units of materials or equipment of the same type or class are required, these units shall be products of one manufacturer.
- B. Assembled Units: Manufacturers of equipment assemblies, which use components made by others, assume complete responsibility for the final assembled product.
- C. Nameplates: Nameplate bearing manufacturer's name or identifiable trademark shall be securely affixed in a conspicuous place on equipment, or otherwise permanently marked on each item of equipment.

1.3 FLAME SPREAD AND SMOKE DEVELOPED PROPERTIES OF MATERIALS

- A. Materials and adhesives used throughout the mechanical and electrical systems for insulation, and jackets or coverings of any kind, or for piping or conduit system components, shall have a flame spread rating not over 25 without evidence of continued combustion and with a smoke developed rating not higher than 50. If such materials are to be applied with adhesives, they shall be tested as applied with such adhesives, or the adhesives used shall have a flame spread rating not over 25 and a smoke developed rating not higher than 50. (Note: Materials need not meet these requirements where they are entirely located outside of a building and do not penetrate a wall or roof, and do not create an exposure hazard.)
- B. "Flame-Spread Rating" and "Smoke Developed Rating" shall be as determined by the "Method of Test of Surface Burning Characteristics of Building materials," NFPA No. 255, ASTM E84, Underwriter's Laboratories, Inc., Standard". Such materials are listed in the Underwriters' Laboratories, Inc., "Building Materials List" under the heading "Hazard Classification (Fire)".

1.4 HAZARDOUS MATERIALS

- A. No products shall be used that contain any known hazardous or carcinogenic materials. Products with asbestos or radioactive content shall not be used.
- B. Handling of any hazardous material is not covered in this specification Division.

1.5 EQUIPMENT FURNISHED BY OWNER

- A. The CONTRACTOR shall unload, uncrate, assemble, and connect any and all equipment shown on the Drawings or called out in the Specifications to be furnished by the OWNER for installation by the CONTRACTOR.

- B. The CONTRACTOR shall protect and take full charge of such equipment from the time the items are delivered to the job, set in place, connected, tested, adjusted, and placed into operation.

PART 2 – PRODUCTS

2.1 EQUIPMENT ACCESSORIES

- A. Provide removable guards to enclose all rotating or moving elements. Construct of galvanized steel to withstand 250 lbs. static load.
- B. Wall/Ceiling Access Doors
 - 1. Panels in non-rated applications shall be galvanized steel, 18-gauge frame, 16-gauge door with mounting accessories, piano hinges, screwdriver operated lock, and prime coat paint.
 - a. Acudor Model UF-5000 for acoustic tile or exposed masonry
 - b. Acudor Model PS-5030 for plaster finishes
 - c. Acudor Model UF-5000 (stainless steel) for ceramic or glazed structural tile.
 - 2. Panels in fire rated applications shall be painted steel type, 1 hour rated, piano hinged, exterior key lock, nominal size 24" x 36" at equipment installations as approved, Air Balance, Inc. - Model "F".

2.2 ROOF CURBS

- A. Curbs shall be constructed as required to hold top level. See detail on Drawings for more information on curb construction requirements.
- B. Auxiliary supports under curbs shall be constructed as approved by ARCHITECT.

2.3 FIRE, SMOKE AND SOUND STOPPING

- A. UL listed penetration sleeve assembly and/or firestop that meets ASTM E-814 E119, and E84, as "3M" systems for the intended applications.
- B. All fire, smoke and sound stopping to be done by a separate licensed and certified Subcontractor as approved by Professional.

2.4 PIPE SLEEVES

- A. Galvanized sheet metal sleeves shall have lock seam joints and comply with the following minimum thickness:
 - 1. 24 Gauge for 3 inches and smaller.
 - 2. 22 Gauge for 4 inches to 6 inches inclusive.
 - 3. 20 Gauge for sizes over 6 inches.
- B. Galvanized steel sleeves shall be constructed from schedule 40 grade A53 pipe.
- C. PVC sleeves shall be constructed from solid core Schedule 40 PVC pipe.
- D. Water tight sleeves/seals shall be equal to "Link-Seal".

2.5 WALL, FLOOR, AND CEILING PLATES

- A. Chrome plated brass or chrome plated steel, one piece or split type with concealed hinge, with set screw for fastening to pipe, or sleeve.

- B. The thickness shall conform to the following requirements:
 - 1. Not less than 3/32 inch for floor plates.
 - 2. For wall and ceiling plates, not less than 0.025" for up to 3 inch pipe and 0.035" for larger pipe.
- C. All escutcheons shall be equal to Beacon, Caldwell or approved equal.

2.6 PROTECTIVE DRIP PANS

- A. Fabricate pans of 20-gauge galvanized sheet metal, stainless steel (if shown) or PVC, minimum two inches deep with rolled top edges.
- B. Solder all seams watertight, and cross brace pans to prevent sagging and warping.
- C. Provide dielectric union at copper pipe/galvanized pan connection point. Water heater drain pans shall have minimum one inch (1") drain outlet.

2.7 PAINTING OF MECHANICAL WORK

- A. See Division 09 for more information.

PART 3 – EXECUTION

3.1 EQUIPMENT ACCESSORIES

- A. Provide access panels, or doors, at concealed dampers, valves, vents, equipment, inspection points, etc., and where noted. Where ceiling is "lift out" construction, ceiling access panels are not required. Panels shall be 15" square, or larger as approved for service intended.
- B. CONTRACTOR shall provide substantial metal angle frame and support at all ceiling access doors.

3.2 ROOF CURBS

- A. All roof mounted equipment shall be furnished with a roof curb compatible with both the equipment configuration and roofing system. Curbs shall be installed level by either shimming or sloped curb construction. See detail on Drawings for more information on curb construction requirements.
- B. Provide auxiliary support under all roof mounted equipment under curb base and at all penetrations as approved by ARCHITECT.

3.3 FIRE, SMOKE AND SOUND STOPPING

- A. Fire and smoke stopping shall be provided and installed at all locations where mechanical Work passes thru rated assemblies. This includes all ductwork, piping and controls related conduit.
- B. Penetrations in "sound" walls shall be similarly acoustically sealed, both sides of wall with caulk or other approved material. New and existing walls extending to the roof/floor structure above are considered sound walls.

3.4 PIPE SLEEVES

- A. Pipe sleeves shall be constructed of galvanized sheet steel except where noted below or in individual work sections.
- B. Pipe sleeves shall be constructed of galvanized steel or schedule 40 PVC pipe when pipes are located within or passing through the following:

1. concrete beams
 2. outside walls
 3. foundations
 4. footings
 5. waterproofed floors
 6. In locations where sleeve is extended above finished floor
- C. Where pipe motion due to expansion and contraction will occur, make sleeves of sufficient diameter to permit free movement of pipe.
- D. Where pipes are insulated, make sleeves of sufficient diameter to pass pipe insulations.
- E. Check floor and wall construction and finish to determine proper length of sleeves for various locations, make actual length to suit following:
1. Terminate sleeve flush with walls, partitions, and ceilings.
 2. In areas where pipes are concealed as in chases, terminate sleeves flush with floor.
 3. In finished areas where pipes are exposed, extend sleeves 1/4" above finished floor except in kitchen, toilets, equipment rooms, and other areas where water may accumulate on floor, extend 1 1/2".
- F. Interior openings shall be caulked tight with fire, smoke or sound stopping material and sealant to prevent the spread of fire, smoke, and sound. Contractor shall coordinate specific requirements to ensure fire, smoke or sound ratings are maintained.
- G. For drilled penetrations in existing floors provide one-inch angle rings set in silicone sealant and bolted to the floor in lieu of pipe sleeves with one inch extension above floor.
- H. Below grade exterior wall penetrations into habitable spaces, including crawlspaces shall include sleeves with water tight seals as "Link-Seal".
- 3.5 WALL, FLOOR, AND CEILING PLATES
- A. Exposed piping passing through walls, floors and ceilings, shall be fitted with escutcheons.
 - B. Inside diameter shall fit around insulation or around pipe when not insulated; outside diameter shall cover sleeve.
 - C. Use plates that fit tight around insulation or pipes when not insulated.
 - D. Plates shall cover openings around pipes/insulation and cover the entire pipe sleeve projection.
- 3.6 PROTECTIVE DRIP PANS
- A. Provide pitched drip pans where shown under all fluid conducting piping that is over electric switchgear, elevator controllers, busways or electric motor starters or as indicated. Pans shall extend minimum two inches beyond each side of the mechanical equipment, pipe or group of pipes being contained. Pans shall extend six inches beyond electrical equipment below.

- B. Pitch pans shall be routed to a drain connection with discharge piped utilizing ¾" or larger of copper tube to the nearest available open drain or outside as directed by PROFESSIONAL. Open-end slices discharging to intercepting pans are not acceptable.
- C. Provide drip/overflow pans under water heaters, air conditioning equipment, pumps, etc., and where shown.

3.7 PAINTING OF MECHANICAL WORK

- A. All equipment shall present a clean painted appearance; touch up or repair as required.
- B. All surfaces shall be properly prepared prior to painting. CONTRACTOR must contact PROFESSIONAL, such that all tests, installations etc., are approved prior to painting.
- C. The CONTRACTOR shall prime (where applicable) and paint the following mechanical related Work:
 - 1. All exposed ferrous metal non-galvanized hangers, auxiliary supports, braces, etc., in all locations.
 - 2. All exposed and exterior galvanized ductwork, plenums, access doors, and control conduit, fitting, boxes, etc.
 - 3. All insulated refrigerant piping, pumps, valve bodies, etc., where exposed to view outdoors.

3.8 WELDING

Before any welding is performed submit a copy of the Welding Procedure Specification (WPS) together with the Procedure Qualification Record as required by Section IX of the ASME Boiler and Pressure Vessel Code for each and every welder intended for use on this project and with qualifications and certifications suitable for work classification intended.

- A. Before any welder performs any welding, submit a copy of the Manufacturer's Record of Welder Operator Qualification Tests as required by Section IX of the ASME Boiler and Pressure Code. The letter or symbol (as shown on the qualification test form) shall be used to identify the work of that welder and shall be affixed, in accordance with appropriate construction code, to each completed weld. Submit certification according to Section *Mechanical Submittals and Shop Drawings* for each and every welder and welding associated with the project.
- B. The types and extent of non-destructive examinations required for pipe welds are shown in Table 146.4 of the Code of Pressure Piping ANSI/ASME B31.1.

3.9 TOOLS AND KEYS

- A. Furnish, and turn over to the OWNER, special tools not readily available commercially, that are required for disassembly or adjustment of equipment and machinery furnished.
- B. Provide OWNER, at end of project with spare keys to stops, hose bibbs, control cabinets, tamper-proof controls covers, etc. Provide the following spares, and label with function/locations:
 - 1. Plumbing Stops – 8 keys
 - 2. Hose Bibbs – 8 keys

3. Control Panels – 4 keys each panel
4. Tamper-proof Controls Cover – 2 keys per cover
5. Wall and Ceiling Access Doors – 2 keys per door

3.10 LUBRICATION

- A. During construction, all bearings and shafts shall be kept thoroughly greased and protected.
- B. After equipment has been operated seven days and before final acceptance, all bearings shall be inspected and filled to operating level with lubricant recommended by manufacturer. Tag each piece of equipment with cloth tag showing: proper type of lubricant, and period between lubrications, date of lubrication, and worker's initials. Have space for ten (10) lubrication notations.

3.11 WORK IN AND AT EXISTING BUILDING AND/OR BUILDING SITES

- A. Perform as described or shown on Contract Drawings, for relocation of existing equipment, alterations and restoration of existing building(s).
- B. As specified on Contract Drawings, make alterations to existing service piping at times that will least interfere with normal operation of the facility.
- C. It is important that CONTRACTOR thoroughly investigate existing conditions, utilities, services, finishes, sized, connections, etc., prior to bidding this project. The Designer's responsibility included only a cursory review of existing conditions and/or installations. It is the CONTRACTOR'S responsibility to coordinate a more thorough investigation and ascertain and confirm pertinent installation connections, etc., prior to his bid. This investigation shall be coordinated in a minimum seven (7) days advance of any published bid date such that the CONTRACTOR immediately thereafter can advise Designer in writing of any design discrepancies and/or changes required; otherwise, the CONTRACTOR shall be required to remedy any such peculiarities at his own expense and at no additional cost to the OWNER. It is the CONTRACTOR'S responsibility to verify existing size and/or location, etc., any time replacement and/or modifications to existing are included as a part of this project.
- D. Prior to excavation, investigation shall be made to the extent necessary to determine the location of existing underground services, structures and conflicts. Care should be exercised by the CONTRACTOR during excavation to avoid damage to existing structures.
- E. The CONTRACTOR shall be responsible for obtaining the services of an "Independent Locator" whose function shall include location and identification of all underground service wiring, piping, coax, fiber optics, etc. The CONTRACTOR shall make every effort to protect and avoid conflicts with existing installations. Damage caused to existing installation by CONTRACTOR, or his Sub-contractor, etc., shall be promptly remedied and put back into service, per serving utility requirements.
- F. When obstructions that are not shown on the Contract Drawings are encountered during the progress of work and interfere so that an alteration of the Drawings is required, the ENGINEER will alter the Drawings or order a deviation in line and grade or arrange for removal, relocation, or reconstruction of the obstructions.
- G. When crossing existing pipelines or other structures, alignment and grade shall be adjusted as necessary, with the approval of the PROFESSIONAL, to provide

clearance as required by federal, state or local regulations or as deemed necessary by the ENGINEER to prevent future damage or contamination of either structure.

3.12 PROTECTION AND CLEANING

- A. Equipment and materials shall be carefully handled, properly stored, and adequately protected to prevent damage before and during installation, in accordance with the manufacturer's recommendations and as approved by the PROFESSIONAL. Damaged or defective items, in the opinion of the PROFESSIONAL, shall be replaced.
- B. Protect all finished parts of equipment, such as shafts and bearings where accessible, from rust prior to operation by means of protective grease coating and wrapping. Close pipe openings with caps or plugs during installation. Tightly cover and protect fixtures and equipment against dirt, water chemical, or mechanical injury. At completion of all work thoroughly clean fixtures, exposed materials and equipment.
- C. Do not store insulation materials in building until it is enclosed and dry. Wet insulation shall not be installed.
- D. Fixtures, piping, ducts, equipment, etc., shall be cleaned per manufacturer's printed instructions and PROFESSIONAL'S instructions.
- E. Piping shall be: (1) flushed with clean water, (2) "blown out" with steam or compressed air, or (3) "swabbed out" as required, except where specified otherwise. All temporary connections required for flushing shall be provided and subsequently removed by the CONTRACTOR. See Section *Pipe and Pipe Fittings* for further instructions.
- F. Before final building interior finish is applied:
 - 1. Interior of air handling equipment shall be thoroughly cleaned.
 - 2. Drain pans shall be cleaned and then flushed with water after which all fans will run with air filters in place, etc., for 24 hours.

3.13 CUTTING AND PATCHING

- A. Do not cut into any major structural element without written approval of the ARCHITECT.
- B. Cut required openings through existing masonry or reinforced concrete with diamond core drills. Use of pneumatic hammer type drills, impact type electric drills, and hand or manual hammer type drills, will be permitted only with approval of the ARCHITECT. Locate openings that will least affect structural slabs, columns, ribs or beams. Refer to the ARCHITECT for determination of proper design for openings through structural sections and opening layouts for approval prior to cutting or drilling into structure. After ARCHITECT'S approval, carefully cut openings through construction no larger than absolutely necessary for the required installation.
- C. Patching shall be (1) of quality equal to, and of appearance matching existing construction, and (2) shall restore all services and construction that remains in use, to its condition prior to this contract, unless otherwise noted.

3.14 FLASHING

- A. Where pipes, ducts, etc., pass through roof or walls, flash and caulk.

- B. Provide flashing or caulking as required at each opening through outside walls or roof. Flashing through roof of same materials and methods as under Moisture Protection Division; through walls shall be aluminum unless noted otherwise.

END OF SECTION

SECTION 200060 - PIPES AND PIPE FITTINGS**PART 1 – GENERAL****1.1 SCOPE**

- A. Provide all material, equipment and labor, etc., required to complete installation specified and/or shown or scheduled on Contract Drawings.
- B. Work included: Pipes, fittings, unions, couplings, flanges, gaskets, and other materials and instructions.

1.2 PIPING SCHEDULE

Piping systems for this project shall include the following:

- A. Condensate Drain Piping.
- B. Refrigerant Piping.
- C. HVAC Piping

1.3 MANUFACTURER'S ASSISTANCE

Manufacturer shall provide, if required, to the CONTRACTOR a factory trained service man to properly train CONTRACTOR'S personnel in all phases of installation.

PART 2 – PRODUCTS**2.1 PIPING MATERIALS**

All piping installed on this project shall be new and of full weight and size indicated and of proper specification for service intended. Only domestic pipe may be used. Pipe and pipe fittings for the various systems shall be as follows:

- A. Condensate Drain Piping.
 - 1. Condensate drain piping routed indoors shall be solid core Schedule 40 PVC with solvent weld joints and DWV fittings.
- B. Refrigerant Piping
 - 1. Piping shall be Type "L" ACR copper with brazed joints. All joints, fittings and piping shall be brazed connection type. No flared or compression piping accessories allowed except at equipment connections.
- C. HVAC and Service Piping:
 - 1. 2" and smaller HVAC piping inside building shall be type "L" hard copper with 95/5 soldered joints/fittings.
 - 2. 2 ½" and larger HVAC piping inside building shall be Schedule 40 ASTM A53 steel pipe with welded joints and flanges at all valves, specialties, etc. or mechanical roll grooved joints and fittings as Victaulic.
 - 3. "T-drill", "pulled" taps/outlets or weld-o-let/saddle taps shall NOT be utilized, only full body fittings will be allowed.
 - 4. At CONTRACTOR's option, 4" and smaller HVAC piping may be Type "L" hard copper with specialty piping system connections such as "ProPress" by Viega.

2.2 PIPE FITTINGS, UNIONS, FLANGES, AND GASKETS

- A. All fittings shall conform to pipe as to black steel, galvanized steel, copper, PVC or cast iron, etc. or as indicated. Fittings and accessories shall have equal or greater pressure rating than piping specified for particular application.
- B. Malleable steel fittings shall be minimum 150 psi class.
- C. Steel pipe unions shall be malleable iron having bronze to iron ground joints.
- D. Steel nipples shall be extra heavy type. All thread nipples prohibited. Provide a minimum of 1" of bare pipe between threaded ends of nipples.
- E. Flange bolts: Galvanized Alloy steel, ASTM #A 196, Galvanized GR. B 7; nuts' ASTM #S 194, GR. 2 H; both hex head style.
- F. Flange gaskets serving piping below 250 degrees F shall be synthetic composition type; serving above 250 degrees F gaskets shall be corrugated metallic type. Utilize gasket suitable for service intended.
- G. Couplings, steel pipe malleable iron, Grade II.
- H. Provide factory made reducers and increasers, and nipples of comparable materials as the piping. The use of bushings is not acceptable to obtain reduction or increase in sizes.
- I. Galvanized steel pipe shall be assembled with galvanized screw fittings unless specifically indicated otherwise.

2.3 DIELECTRIC FITTINGS

Provide where copper and ferrous metal are joined.

- A. 2-inch and less: Threaded dielectric union.
- B. 2 ½-inch and larger: Flange union with dielectric gasket and bolt sleeves.
- C. Temperature Rating, degree F: 210 for water systems.

PART 3 – EXECUTION

3.1 PIPING INSTALLATION

- A. General
 - 1. Arrange and install piping approximately as indicated, straight, plumb and as direct as possible; form right angles or parallel lines with building walls. Keep pipes close to walls, partitions, ceilings, offset only where necessary to follow walls as directed. Locate groups of pipes parallel to each other; space them at distance to permit applying full insulation and to permit access for servicing valves. The PROFESSIONAL reserves the right to require this CONTRACTOR to make minor changes in pipe locations where conflicts occur with other trades or equipment. Such changes shall be made without extra cost to OWNER.
 - 2. Install horizontal piping as high as possible without sags or humps. Grade drainage piping at uniform slope of 1/8" per foot minimum and maximum 1/4" per foot, or as noted. Where this is impossible, maintain slope as directed, but in no case less than 1/16" per foot. Pitch piping in direction of flow.
 - 3. When piping is cut, it shall be reamed with pipe reamer and all burrs, scale,

trash and foreign matter removed. If any piping is found installed without being reamed, cleaned, deburred, etc., or in any way contrary to above, it shall be sufficient reason for related erected piping to be removed, inspected by the PROFESSIONAL, corrected and reinstalled, all at CONTRACTOR'S expense.

4. Where size changes on horizontal lines, use reducing fittings; bushings are prohibited. On liquid lines have eccentricity down, hold the top level. On gas or vapor lines have eccentricity up, hold the bottom level.
5. Sufficient space shall be allowed in erecting piping for proper application of thermal installations including fittings. In no case shall any insulation be cut or reduced thickness because of inadequate space.
6. Offset equipment connections to allow valving off for maintenance and repair with minimal removal of piping.
7. Locate valves for easy access and operation. Concealed valves shall be provided access doors. Do not locate any valves with stems below horizontal.
8. Install gauges, thermometers, valves and other devices with due regard for ease in reading or operating and maintaining said devices. Locate and position thermometers and gauges to be easily read by operator or staff standing on floor or walkway provided. Servicing shall not require dismantling adjacent equipment or pipe work.
9. Furnish and install unions or mating flanges at all connections to each piece of equipment conveniently located to facilitate quick and easy disconnecting of equipment. Flanges or union connections shall be used on both sides of traps, control valves, pressure reducing valves and meters and the like.

B. Steel Piping

1. Where piping is threaded, dies shall be clean and sharp. Threads shall conform to ANSUI B2.1; joint compound shall be applied to male threads only and joints made up so no more than three threads show. Coat exposed threads or steel pipe with joint compound and red lead paint for corrosion protection. The caulking of these joints will not be tolerated. Pipe joint compound must be approved by the PROFESSIONAL.
2. Where welding is specified or done, it shall be by electric arc by mechanics skilled in operation and holding a test certificate acceptable to the ENGINEER. All scale and flux shall be removed from piping after welding. Welding, beveling, spacing and other details shall conform to ANSI B31.1.

C. Plastic Piping

1. Install all fittings and joints as per manufacturer's recommendation.
2. Utilize purple pipe cleaning compound on all solvent weld joints.
3. Utilize manufacturer's recommended colored (non-purple) solvent glue on all solvent weld joints, unless manufacturer's installation instructions do not allow or if solvent glue is not rated for specific application.
4. Install all underground plastic and fiberglass glass piping outside building perimeter with tracer identification tape (per Section Mechanical

Identification) and minimum 12-gauge bare copper wire for future location reference.

D. Copper Piping

1. Copper tubing shall be thoroughly reamed, cleaned with steel wool or emery cloth and a non-corrosive flux used before soldering or bracing.
2. Copper tubing shall be thoroughly reamed and de-burred before joining with specialty piping systems such as Viega "Pro-Press".
3. Where solder joints are specified, use solder having 95% tin and 5% antimony. Each roll of solder shall be clearly stamped as to grade and content.
4. Where brazing joints are specified, use a brazing filler metals having a melting point above 1100 degrees F and containing at least 5% silver.
5. Where copper tubing extends through concrete slab on grade, tubing shall have an "Armaflex" or "Rubatex" type.
6. Provide PVC isolation wrap where copper pipe extends through masonry walls to connect plumbing fixtures or valves, etc.

E. Refrigerant Piping

1. Braze joints in the presence of an inert gas.
2. Verify pipe size and configuration and provide same based on HVAC equipment manufacturer's recommendation to provide scheduled capacity, performance and maximize equipment life.
3. Refrigerant piping systems shall be installed in accordance with applicable chapters of the ASHRAE "Applications" handbook. Particular attention shall be given to suction gas, velocities and requirements for liquid sub cooling.

3.2 PIPE EXPANSION

- A. In the installation of all pipe runs where shown or where necessary, install swing joints, flexible couplings, turns, expansion loop or long offsets to allow for expansion. Broken pipe or fittings due to rigid connections must be removed and replaced at no additional cost to the OWNER.
- B. All lines shall be securely anchored where required. Where such anchors occur, they shall be securely fastened to the steel or concrete structure of the building in a manner approved by the PROFESSIONAL. Drawings shall be submitted before installation.

3.3 ANCHORS

Plastic pipe shall be jointed to steel systems with flanges. Steel system shall be anchored within five (5') feet of connection point to eliminate any thrust, stress, or torque from steel system to fiberglass and/or plastic system.

3.4 TESTS

A. Cooperation/Scheduling:

The ARCHITECT shall be notified no less than ninety-six (96) hours prior to any pipe test. The ARCHITECT shall also be notified in adequate time for an inspection of the test before the test is completed. The PRIME CONTRACTOR'S

Superintendent shall be responsible for administering and witnessing all tests, log it for permanent record and transmit to ARCHITECT at completion of project. CONTRACTOR shall refer to and make additional copies of the "Pipe Test Log Form" at the end of this section to use as standard test log forms. The PRIME CONTRACTOR'S Superintendent shall keep this on-going log on jobsite and shall include the following:

1. Date of Test
 2. Duct/Piping Description (EX: "Sanitary Sewer")
 3. Location (EX: "Northwest Quadrant First Level")
 4. Results (EX: "Held 10 ft. of head for eight hours without leakage", etc.)
- B. Tests shall be as follows: (New and Existing Modified Piping shall be tested and all leaks repaired)
1. Gravity Flow Condensate Drain piping above and below slab: Minimum 10 feet static head and as required by ASA A40.8 or local code, for a minimum period of four (4) hours, without discernable loss. All below grade piping and joints shall be clearly visible during test.
 2. Refrigerant piping: 450 psig nitrogen for 8-hour period unless more stringent requirements are recommended by the equipment manufacturer. Test piping with all piping accessories such as charging valves and filter/driers in place, unless not recommended by equipment manufacturer's installation instructions. Refrigerant piping shall be left with minimum 60 psi pressure during all phases of construction such that leaks can be promptly identified and remedied.
 3. Water Piping: (HVAC) 125 psi hydrostatic or 100 psi air, in conjunction with manufacturer's recommendations, with no discernable pressure loss for a period of eight (8) hours. Potable water piping shall be pressurized with water or air during all phases of construction such that leaks can be promptly identified and remedied.

3.5 SYSTEM CLEANING, TREATMENT AND PROTECTION

- A. Potable Water System: All new and modified existing potable water lines shall be thoroughly flushed and sterilized with a solution containing not less than 50 ppm available chlorine for eight (8) hours. During sterilization, operate all valves, faucets, etc., so that all portions of the system are reached. Flush system with clear water until concentration drops to 0.5 ppm. CONTRACTOR shall furnish sample to State Health Department attesting to satisfactory condition of water. Submit copy of test reports to ARCHITECT near end of project and prior to OWNER'S use of potable water distribution system.
- B. All HVAC piping systems shall be cleaned as follows:
1. All piping shall be cleaned of iron cutting and other debris as installed into the system. Piping received with heavy mill scale shall not be installed in the system. Particular attention shall be given to coils, valve seats and glands, pump mechanical seals and packing glands, strainers, etc., such that surfaces are clean and free of all foreign materials.
 2. At completion of the piping hook-up, after pressure tests and prior to operation of any equipment, the CONTRACTOR shall thoroughly flush the

pipng system with clean water to remove any debris remaining in piping.

- a. Initial Flushing: Remove loose dirt, and scale, metal chips, weld beads, rust, and like deleterious substances without damage to any system component. Bypass factory cleaned equipment unless acceptable means of protection are provided and subsequent inspection of hide-out areas takes place. Isolate or protect clean system components, including pumps and pressure vessels, and remove any components, which may be damaged. Open all valves, drains, vents, and strainers at all system levels.
 - b. Remove plugs, caps, spool pieces, and components to facilitate early debris carrying velocity of six (6') feet per second, if possible.
 - c. Connect dead end supply and return headers as necessary. Flush bottoms of risers. Install temporary strainers where necessary to protect down-stream equipment. Supply and remove flushing water and drainage by various type hose, temporary and permanent piping and CONTRACTOR'S booster pumps. Flush until clean as approved by the PROFESSIONAL.
3. After the system has been thoroughly flushed with clean water, the system shall be filled and vented with clean water and a sufficient concentration of Anderson Chemical Company's detergent type system cleanser. Circulation shall be provided by the installed circulating pumps. System shall then be circulated for not less than 24 hours. During circulation of detergent, 2-way valves, etc., shall be operated such that solution shall reach all branches, bypasses, etc. After 24 hours detergent cleaning, system shall be drained and flushed with clean water until all detergent has been removed and water runs clear. Strainers shall be checked and cleaned.
- System shall then be filled with clear water, vented and pressurized such that 4 psig is obtained at the highest point of the system.
4. Cleaning: Using products specified in Section *Pipe and Pipe Fittings*, circulate systems as normal temperature to remove adherent organic soil, hydrocarbons, flux, pipe mill varnish, pipe joint compounds, iron oxide, and like deleterious substances not removed by initial flushing, without chemical or mechanical damage to any system component. Removal of tightly adherent mill scale is not required. Keep isolated equipment which is "clean" and where dead-end debris accumulation cannot occur. Sectionalize system is possible, to circulate at velocities not less than six (6') feet per second. Circulate each section for not less than 24 hours. Blow down all strainers, or remove and clean as frequently as necessary. Drain and prepare for final flushing.
5. See Section *Chemical Treatment* for more information.

SECTION 200100 - VALVES

PART 1 – GENERAL

1.1 SCOPE

Provide all material, equipment and labor, etc., required to complete installation as specified herein and/or shown or scheduled on Contract Drawings.

1.2 APPLICABLE STANDARDS

Insofar as possible, all valves of the same type shall be of the same manufacturer.

1.3 VALVE DESCRIPTION AND IDENTIFICATION

- A. Valves shall have name or trademark of manufacturer and working pressure cast or stamped on valve body.
- B. Valve hand wheels shall be oriented when installed to provide maximum accessibility for operation.
- C. Valve discs shall be the manufacturer's standard material for the service in which the valve is used unless otherwise indicated under the individual type valve specification.

PART 2 PRODUCTS (OTHER VALVES FROM THOSE LISTED MAY BE SUBMITTED FOR APPROVAL)

2.1 HVAC PIPING VALVES

- A. Ball Valves: (Utilized for all shutoff and isolation valves in 2" and smaller applications unless otherwise indicated).
 - 1. All valves shall be NSF 61 compliant and contain less than 0.25% lead (Pb) by weight.
 - 2. Valves 2" and smaller shall be two-piece brass or stainless-steel construction, 1-1/4" extended neck, chrome plated ball with full port, P.T.F.E. seals and seats. Heavy duty steel handle with vinyl grip, quarter turn operation. Valves shall have solder end connections. Valves shall be suitable for working pressure of 200 psig and maximum 250deg F.
- B. Butterfly Valves 2-1/2" to 12":
 - 1. Manual Operation Type:
 - a. Lug type with cast iron body, one-piece stainless-steel stem, with aluminum bronze disc. Valve shall be suitable for constant 200 psi positive shut-off and 225 degrees F temperature application. The valve liner design shall be such that it shall serve as a flange seal and no separate gasket shall be required. Provide valve with replaceable EPDM seat.
 - b. Provide gear operators with hand wheel on all HVAC piping 6" and larger when located within 6 feet of standing access height.
 - c. Provide gear operators with adjustable sprocket rim and chain on all HVAC piping 6" and larger when located more than 6 feet above standing access height. Chain length shall be provided to allow operation of valve at standing access height.

2. Automated Operation Type:
 - a. Lug type with cast iron body, one-piece stainless-steel stem, with aluminum bronze disc. Valve shall be suitable for constant 100 psi positive shut-off and 225 degrees F temperature application. The valve liner design shall be such that it shall serve as a flange seal and no separate gasket shall be required. Provide valve with replaceable EPDM seat.
 - b. All motorized valves shall have spring return feature upon loss of power.
 - c. Provide feedback position indicator and control voltage as required for sequence of operation in Section *Controls and Instrumentation*.
 - d. Valves shall be of either two-way or three-way design as indicated on Drawings.
 3. Valves shall be equal to the following:
 - a. Manual Operation Type
 - i. 4" and smaller – Nibco LD2000
 - ii. 6" and larger – Nibco LD2000-5 with memory stop and adjustable sprocket rim and chain where access is above 6-foot standing height.
 - b. Motorized butterfly – Valve Teck BF Series 42
- C. Silent Check Valves:
1. Silent check valves 2" and smaller shall be horizontal or vertical silent spring check type. Valves shall be rated for 200# WOG. Valves shall be NSF 61 compliant and contain less than 0.25% lead (Pb) by weight.
 2. Silent check valves 2-1/2" and larger shall be iron body, 125 lb. flanged connection ends, stainless steel spring, bronze trim, 200 psig working pressure, globe style valve body. Valves shall be equal to Mueller model 105MAP.
- D. Balancing Valves:
1. Manual Type:
 - a. Valves shall be NSF 61 compliant and contain less than 0.25% lead (Pb) by weight.
 - b. Combination balancing and positive shut-off valves shall incorporate a position indicator and memory stop or locking device so the valve can be closed without disturbing the setting, and be returned to the balanced position without further adjustment.
 - c. Balancing valves for sizes 3" and smaller shall be calibrated bronze balancing valves with provisions for connecting a portable differential pressure meter. Meter connections shall have built-in check valves and knurled caps. Valves shall have integral pointers to indicate the degree of valve opening.

2. Automatic Balancing Flow Restrictor Type:
 - a. Combination balancing, flow control and positive shut off valves shall incorporate a stainless-steel spring and plunger loaded flow control device to automatically provide flow setpoint within +/- 5% with a wide range of system pressure range fluctuation. Provide factory assembled packages with all devices connected to a common piping arrangement for simple two-point piping connection to each assembly. Water pressure drop through entire flow restrictor/shut-off valve assembly shall not exceed 8 feet.
 - b. Automatic balancing flow restrictor valves for sizes 2" and smaller for air terminal units shall be stainless steel spring/piston type with provisions for connecting a portable differential pressure meter to two (2) P/T ports and include an identification tag indicating g.p.m. setting. Meter connections shall have built in check valves and knurled caps. Valves shall have union connections at both ends, with full port ball shut-off valves. Body shall allow removal of flow control cartridge without disturbing piping connections. Valves shall be equal to:

Griswold - "Combo" Series CPP-2Y and CPP-3Y. See details on Drawings. Provide supply connection with full port ball valve, with 1-1/4" extended handle, two (2) P/T extended ports with union end connections. See detail on Drawings. Provide flow restrictor cartridge and metal I.D. tag assembly.
 - c. Balancing valves sized 2-1/2" to 6" for other AHU's and coils shall be of a similar automatic balancing flow restrictor type as specified herein as Griswold series 3860 and 3300. Provide separate P/T ports, etc., as detailed on Drawings.
 - d. All shut-off valves, strainers and flow control assemblies shall be pipe size (not necessarily control valve size) as indicated on Drawings to each unit. Balancing valve assemblies, with flow restrictor, shut-off valves and P/T ports, shall be factory assembled as a single unit for ease of field installation. See detail on Drawings.
 - e. Provide all supply and return connections to coils with 12" long full pipe size stainless steel flexible hose sets, rated for minimum 250 psi.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Installation shall be such that the valve can be fully opened and have at least 6" clearance beyond valve stem handle and sufficient clearance to remove stem for repair.
- B. Locate and orient valves to permit proper operation and access for maintenance of packing, seat and disc. Generally, locate valve stems in overhead piping in horizontal position. Provide a union adjacent to one end of all threaded end valves. Control valves usually require reducers to connect to pipe sizes shown on the drawings. Install butterfly valves with the valve open as recommended by the manufacturer to prevent binding of the disc in the seat.

3.2 DISCHARGE FROM SAFETY AND/OR RELIEF VALVES

Relief valves relieving steam, gas of any type, including compressed air, or liquid above 120 degrees F., shall be piped full size to outside building or as indicated so that discharge cannot hit any person or structure.

3.3 RELIEF VALVE CAPACITY

Valve relieving capacity shall meet all code requirements and also be equal to at least 1.25 of possible heat input to be relieved.

END OF SECTION

SECTION 200120 - PIPING SPECIALTIES

PART 1 – GENERAL

1.1 SCOPE

- A. Provide all labor, equipment, materials, etc., required to complete installation as specified herein and/or shown or scheduled on Contract Drawings.
- B. Work Included: Piping specialties to connect fire protection and plumbing equipment.

PART 2 – PRODUCTS

2.1 GAUGES, PRESSURE

- A. Type 1, (pressure for water), initial mid-scale accuracy one-percent of scale (Quality grade), metal or phenolic case, 4-1/2 inches in diameter, 1/4-inch NPT bottom connection, white dial with black graduations and pointer, clear glass or acrylic plastic window, suitable for board mounting. Provide red “set hand” to indicate normal working pressure.
- B. Provide brass, lever handle union cock. Provide brass/bronze pressure snubber for gauges in water service. Gauge cocks shall be Weksler Type A, Trecise No. 880 or Weiss Type LC.
- C. Range of Gauges: For services not listed provide range equal to at least 130 percent of normal operating range:
Domestic Water.....0 to 100 psig

2.2 THERMOMETERS

- A. Light powered, liquid crystal display, °F or °C selector switch and 6” brass stem with adjustable angle as required to read display from eyelevel.
- B. Separable Socket (Well): Brass, extension neck type to clear pipe insulation.
- C. Scale range may be slightly greater than shown to meet manufacturers' standard. Required ranges in degrees F:
Domestic Water.....30 to 180
- D. Equal to Weiss Instruments, Inc “Digital Vari-angle” or Weksler “AAD” series.

2.3 AIR VENTS

- A. Air vents shall be installed where shown on Drawings and/or on all high points of liquid piping mains to insure complete elimination of air. Air vents shall be Crane Company, Sarco, or approved equal. Air vents on top of main risers shall have the capacity to eliminate at least 12 CFM of air when operating at 20 psi. Other air vents shall have capacity to eliminate at least 3 CFM of air when operating at 20 psi.
- B. Automatic air vents shall be Spirotherm model Spirotop VTP.
- C. Wherever vents are installed over finished floors or ceilings, an emergency overflow connection to outside or to nearest accessible drain shall be provided. This drain shall be type "L" copper tubing.
- D. Provide air vents on liquid lines at top connection to coils and where shown. Provide manual 1/4" brass cock where vent point is concealed.

2.4 STRAINERS (Y OR BASKET TYPE)

- A. Circulating Liquid Services: Rated 125 PSIG saturated steam.
 - 1. 2 1/2-inch and larger: Flanged, iron body.
 - 2. 2-inch and smaller: Cast iron or bronze.
- B. Screens: Bronze, model metal or 18 8 stainless steel, free area not less than 2 1/2 times pipe area, with perforations as follows:
 - 1. Liquid service: 0.045-inch diameter perforations.
 - 2. On unit 4" and larger provide manufacturers standard Gusset plate and control rod, retaining ring and mating flange.
- C. Suction Diffusers: Specified in Section *HVAC Pumps*.
2-inch and smaller: Iron, ASTM A116 Grade B, or bronze, ASTM B-62 body with screwed connections.
- D. Provide valved blow down on all strainers, minimum 3/4" size, with capped hose thread end connection unless otherwise noted.

PART 3 – EXECUTION

3.1 INSTALLATION

All equipment shall be installed as per manufacturer's recommendation and applicable codes and standards. Provide appurtenances as required for a complete system. Provide all appurtenances as indicated on Contract Drawings, where specified or not.

END OF SECTION

SECTION 200140 - SUPPORTS AND ANCHORS**PART 1 – GENERAL****1.1 SCOPE**

Provide all labor, equipment, material, etc., required to complete installation as specified herein and/or shown or scheduled on Contract Drawings.

1.2 SUPPORT

Supports shall be installed in one of the following methods: (1) from wood using coach screw on open construction and hanger flanges on sheeting, (2) from concrete using inserts, (3) from steel using beam clamps, rivets or bolts, (4) from concrete blocks using toggle or through bolts. Fasten supports to building in following order of preference: (1) steel framing, (2) concrete, (3) wood framing, (4) masonry, (5) wood sheathing. Do not support from roof deck without approval. All hangers, rods, and inserts shall be Underwriters' Laboratories approved for the service intended and meet MSS #SP 58 and 69.

PART 2 – PRODUCTS**2.1 HANGERS, SUPPORTS, ANCHORS AND GUIDES**

- A. All hangers, fasteners and accessories exposed to view indoors shall be galvanized or zinc plated. Similar installations outdoors shall be hot dipped galvanized materials and fasteners.
- B. Supports, hangers, anchors and guides shall be provided for all horizontal and vertical piping. Selection and application shall be in accordance with ANSI/MSS SP-69.
- C. All pipe supports shall be of type and arrangement hereinafter specified. They shall be so arranged as to prevent excessive bending stresses between supports. Specifically designed hangers shall be fabricated and installed in accordance with ANSI/MSS SP-69.
- D. All bracket clamp and rod sizes indicated in this specification are minimum size only. The CONTRACTOR under this section shall be responsible for structural integrity of all supports. All structural hanging materials except variable spring units shall have a safety factor of 5 built in.
- E. All piping routed on trapeze hangers shall be attached rigidly to same unistrut hanger bar with clamps designed by unistrut manufacturer as approved by PROFESSIONAL. Insulated piping clamps shall encapsulate piping, insulation and saddle.

2.2 BASES AND PADS

- A. Concrete equipment pads shall be constructed of minimum 3000 psi reinforced concrete. Provide $\frac{3}{4}$ " chamfer on all exposed top perimeter edges of pads.
- B. Top of equipment pads outdoors shall be minimum 3" above and below worst case finished grade and be reinforced and of a strength suitable for application.
- C. Pads shall be provided in the following applications:
 - 1. Air conditioning equipment outside building. Size pads to extend from building perimeter and extend minimum eighteen (18) inches around equipment on remaining three sides, or as indicated.

2. Backflow preventer enclosures outside building. Size pads to extend minimum twelve (12) inches around equipment on all sides, or as indicated.
3. Floor mounted water heaters, air handling units, boilers, pumps, and where shown or specified on Drawings.
4. Provide similar concrete surrounds at cleanouts, grease interceptors, wet wells, etc., and as indicated.

PART 3 – EXECUTION

3.1 PIPING SUPPORT

- A. All hangers for insulated piping shall be sized to accommodate insulation and shield. No hangers for insulated piping may be installed directly below or onto pipe itself except domestic cold water, and condensate drain piping where insulation is for condensation and/or freeze protection only.
- B. Provide hanger spaced per International Plumbing Code, International Fuel Gas Code, and International Mechanical Code requirements for piping type and size.
- C. Support horizontal PVC pipe with hanger or pier, located close to hub; use one support for each pipe length, or every other joint, whichever is closer. Where maintenance requirements may impose torque, as at a cleanout, support on both sides of torque point.
- D. Provide hanger within 18" of each elbow, also provide hanger with 18" of connection to each piece of equipment.
- E. Support vertical pipe at base and at each floor. In addition, 1" or smaller copper pipe shall be supported at 5' intervals or midway between floors, whichever distance is shorter.
- F. Provide PVC or other approved coating for steel, cast iron or PVC pipe riser clamps. See applicable details.
- G. Pipes passing thru walls shall not bear on building construction. Provide sleeves and fire proofing sealant as per Section *Basic Mechanical Materials and Methods*.
- H. Maximum weights on hanger rods assuming a maximum operating temperature of 450 degrees F. shall be such that stress in tension shall not exceed 9000 psi, using root area of threaded portion.
- I. For copper pipe, supports shall follow schedule and specifications. Supports for uncovered lines shall be especially designed for copper tubing, and shall be of exact O.D. diameter of tubing and shall be copper plated.
- J. Shields at Hangers: Insulated pipe shall be protected at the point of support by a 180 degree insert of high density, 100 psi, waterproofed calcium silicate encased in a 180-degree galvanized sheet metal inverted saddle. Insert to be same thickness as gauges shown in chart below. Insulation insert to extend 1" beyond sheet metal on all insulated water lines. If pipe hanger spacing exceeds 12 feet, use double layer sheet metal shields. Check Section *Mechanical Insulation* for Alternatives.

PIPE SIZE	SHIELD LENGTH	MINIMUM GAUGE
1/2" - 2"	8"	24
2-1/2" - 4"	12"	20
6" - 8"	16"	16

- K. Provide all steel required for support of pipes and equipment other than steel shown on STRUCTURAL ENGINEER'S Drawings.
- L. All pipe supports shall be designed to avoid interferences with other piping, hangers, electrical conduits and supports, building structures and equipment.

3.2 OTHER MOUNTINGS

- A. Any piece of equipment installed in a finished ceiling or wall area shall be supported independently of the building finish. Ceiling mounted items shall be supported directly from the building structure.
- B. Support piping from structural steel members by malleable iron or formed steel beam clamps. Where suspended from concrete slabs, install inserts of malleable iron during building construction.
- C. Wire or perforated hangers will not be permitted. Provide adjustable split ring swivel malleable iron hangers for horizontal runs up to and including 3" pipe size. Provide adjustable steel clevis type hangers for pipes over 3".
- D. Provide malleable iron split ring hanger with copper finish and copper plated malleable iron adjuster for use with copper piping. For insulated piping, provide hangers sized to accommodate insulation.

END OF SECTION

SECTION 200170 - ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.1 MECHANICAL WORK

All work performed under this Contract shall be in accordance with Division Electrical.

PART 2 – PRODUCTS

2.1 STARTERS

- A. For each and every motor provided by CONTRACTOR, a new proper motor starter shall be furnished for installation, except that all starters for ½ horsepower single phase and smaller motors as specified and/or required shall be manual type.
- B. Heaters shall be of the melting alloy type, sized to the exact nameplate running current of the motor. Manually operated motors with magnetic controllers shall be provided with oil tight pushbutton stations and automatically controlled motors shall be provided with oil tight "hands off auto" automatic switches. All magnetic starters shall be provided with red bull's eye pilot light in cover. Energy for controlled circuits shall be taken from the load contacts from the starters. All power wiring and control wiring shall be run in rigid conduit in damp locations or electrical metallic tubing in dry locations, and shall conform to NEC Standards. Provide two sets each of normally open and normally closed auxiliary contacts for all magnetic starters.
- C. For all starters for three phase motors, provide both overload and under voltage and over-voltage protection in all phases and protection from phase loss and phase reversal.
- D. For manual and automatic controlled operation of 3/4 HP and larger motors, furnish magnetic motor starter with:
 - 1. Maintained contact starter with "hand off auto" switches.
 - 2. Trip free, thermal overload relays.
 - 3. Capable of accepting 3 external electric interlocks.
 - 4. "Red" run pilot bulb indicator.
- E. Where interlock or automatic operation is specified, regardless of HP, provide magnetic starter complete with "run off auto" switch so connected that in "run" or "auto" all safety controls shall stop the motor. Provide number and type of auxiliary normally open and/or closed contacts as required by specified control sequence.
- F. Size 2 and larger starters shall have control circuits individually fused from line side of starter, or lead side of breaker, on combination unit. Starters on service above 240 volts shall have 120 volts, built in control circuit transformer fused from line side.
- G. Each electrically operated item of equipment shall be suitable for proper operation on the electrical supply to which it is to be connected as directed on the Electrical Drawings. Prior to delivery on job site, it shall be the responsibility of the CONTRACTOR and any Sub-Contractors, equipment suppliers, etc. to determine from the Electrical Drawings the characteristics of the electrically operated item, and to furnish each item accordingly. CONTRACTOR shall pay the cost due to any modifications resulting from differences as compared to Basis of Design products.
- H. Provide soft start and soft stop magnetic motor starters for all motor three phase loads above 5 HP, as Magnetek Series RVS–DN with digital microprocessor

circuitry, and include the safeties as detailed above, with auto reset.

2.2 MOTORS

- A. All motors under this Contract shall be provided with thermal overload protection.
- B. Equipment shall operate properly under a 10% plus or minus voltage variation, and a 5% plus or minus frequency variation.
- C. Unless noted otherwise, motors shall be squirrel cage induction type with ball bearings. Motors ½ HP and smaller shall be 120 volts, single phase, with permanently lubricated bearings; ¾ HP and larger shall be 3-phase, Design "B" or "C", drip proof type, of minimum power factor and energy efficiency as listed herein.
- D. Motors shall be premium efficiency type as defined by energy policy act of 1992 (EPACT) and latest version of IEEE Standard 112, Test Method B.

HP	EFFICIENCY	POWER FACTOR
1	84	72
1.5	85.5	73.5
2	85.5	70.6
3	89.5	77.5
5	89.5	81
7.5	91.7	78.9
10	91.7	83
15	93	81
20	93.6	84
25	93.6	83.5
30	94	85.1
40	95.5	76
50	95.5	84.2
60	95.5	84.5
75	96	83.4
100	96	84.4

- E. Motors shall be rated for continuous, full load duty and capable of withstanding momentary overloads of 50%. Select motors so actual load does not exceed nameplate ratings, and does not use motor "service factor". All motor furnished for this project shall have minimum service rating factor of 1.15. All motors shall be highest energy efficient type for all mechanical applications.
- F. Except where interlock or automatic control is required, single speed single phase motors, ½ HP and smaller shall have manual motor switch with pilot light and thermal overload protection.
- G. Each motor to be installed outdoors shall be of the totally-enclosed fan-cooled type, or housed in a weatherproof housing. Motors for hazardous locations shall be properly furnished to suit application.
- H. Multi-speed motors shall, except as noted, be consequent pole, variable torque, single winding. When the speed ratios or the load characteristic dictates, the multispeed motors shall be separate winding types. Variable speed motors operating over an adjustable range of speeds shall be motors specifically designed

and rated for this duty.

2.3 ELECTRICAL FOR EQUIPMENT

- A. Motor controllers, protection devices, etc., for control and protection of equipment shall be furnished with the equipment, but installed and electrically connected to power source under Division Electrical.
- B. NEMA Standards shall be taken as minimum requirements for Electrical equipment.
- C. CONTRACTOR shall provide and install all disconnects for all MECHANICAL motors and loads unless equipment is provided with integral disconnect(s).
- D. All three phase motors in occupied areas shall be "quiet" rated and so marked.
- E. On all three phase motors, provide both overload and under voltage and over-voltage protection in all phases and protection from phase loss and phase reversal.
- F. Suitable enclosures for all electrical equipment shall be provided to suit environment as per NEMA and NFPA standards.
- G. Clearances of 36" shall be maintained around equipment less than 400V. Clearances of 48" shall be maintained around equipment greater than 400V.

PART 3 – EXECUTION

3.1 GENERAL

- A. Where electrical voltage and phase characteristics are specified hereinafter, verify them with the Electrical Drawings. In case of discrepancy between the Specifications and the Electrical Drawings, the Electrical Drawings shall govern.
- B. The CONTRACTOR shall provide power to all circuits, controls, and safety devices to every piece of mechanical equipment specified or shown on Drawings whether a power source is indicated or not on Electrical Drawings.
- C. The CONTRACTOR shall provide and extend fire alarm connections to all larger air handling equipment and provide code required smoke/heat detection sensors, etc., and automatic shutdown in the event of positive fire/smoke detection from any fire alarm sensor in same zone as served by same air system.
- D. Control wiring (120V. and less) shall be provided under *Division 20, 21, 22 and 23* and extended from the 120V. power circuits indicated on the Electrical Drawings. All wiring for voltages higher than 30 volts shall be done by a licensed electrician.

END OF SECTION

SECTION 200190 - MECHANICAL IDENTIFICATION

PART 1 – GENERAL

1.1 SCOPE

- A. Piping System Identification
- B. Valve Identification System
- C. Equipment Identification
- D. Miscellaneous Identification

1.2 REFERENCES

ANSI A13.1 – Scheme for the Identification of Piping Systems

PART 2 – PRODUCTS – SPECIFIED AS PER INDIVIDUAL APPLICATION IN PART 3

PART 3 – EXECUTION

3.1 IDENTIFICATION OF PIPING SYSTEMS

- A. Identify all pipe after final painting and/or insulation with manufacturer's preprinted labels at the following minimum locations:
 1. Straight runs of piping with a maximum spacing of twenty (20) feet.
 2. Adjacent to each valve.
 3. Adjacent to each branch takeoff point.
 4. On each side of where piping passes through walls/floors.
- B. Letter shall be sized in accordance with the following:

OUTSIDE DIAMETER OF PIPE COVERING	MINIMUM WEIGHT OF LEGEND LETTERS
Up to 3/4"	1/2"
1" to 1-1/4"	3/4"
1-1/2" to 2"	1"
2-1/2" to 6"	1-1/2"

- C. At each legend, include a manufacturer's label with an arrow to show normal flow.

3.2 IDENTIFICATION OF PIPING ABOVE GRADE

- A. All piping exposed to view or concealed shall include manufactured labels on pipe in a visible location. Label shall be attached to pipe every twenty feet (20'). Labels shall be installed after piping has been insulated.
- B. Labels to be utilized as follows.
 1. In exposed applications, CONTRACTOR shall utilize pre-coiled, snap in place type markers as Seton "Setmark". On 6" and larger pipe, CONTRACTOR shall utilize nylon ties to secure marker to piping.
 2. In concealed applications, CONTRACTOR shall utilize a pressure-sensitive tape manufactured legend on all installations. Tape shall be tamper resistant vinyl tape for indoor as Seton "Opti-Code" and outdoor installations as Seton "Ultra-mark."

3. Tape legend colors shall meet ANSI recommendations.
4. On piping where markers do not include directional arrows, CONTRACTOR shall include similar manufactured stick-on flow arrows on all pumped circulating systems as Seton "Arrows On A Roll" with colors to match pipe legend tape identification.

3.3 VALVE IDENTIFICATION

- A. All major and branch valves in the HVAC, plumbing or fire protection system (except check valves) shall be tagged and numbered. A complete system schematic and floor plan location drawing with all such valves referenced to the tag assigned to that valve shall be framed and mounted where directed by the Professional. A copy of this system schematic shall also be included in each of the Operations and Maintenance Manuals. Submit same to PROFESSIONAL for approval, prior to final mounting and inclusion in O & M Manual. Valve tags shall be brass, minimum 1¼" in diameter, engraved with white lettering on a colored background.
- B. Lettering shall be minimum ½" high, with sequential lettering designations distinct for each separate functional service, i.e. CW-1 for 1st cold water valve, etc. Submit proposed floor plan layout with valves to be tagged, schematic of valve chart and system, etc., to PROFESSIONAL for approval. Tags shall be as Seton Series 31490.

3.4 EQUIPMENT IDENTIFICATION

- A. All equipment, starters, controls panels, switches, thermostats, humidistats and other control devices shall be permanently labeled with equipment being served. Equipment labels shall correspond to those shown on the Contract Documents.
- B. Individual functions and equipment on indicators and controllers on control panels shall be clearly permanently identified. Color code of labels, marking and identification shall be approved by PROFESSIONAL. This applies to the HVAC system, override panel, microprocessor time clocks and specialty annunciation specified in Section Controls and Instrumentation.
 1. Labels for equipment, starters and control panels shall be phenolic type with minimum 3/4-inch tall engraved lettering.
 2. Identification for individual controls devices including thermostats, humidistats, relays, switches, etc. shall be labeled with either phenolic type with minimum 1/2-inch tall engraved lettering or stick-on type from lettering machine.
- C. A reduced scale floor plan drawing with all devices referenced to the equipment served shall be framed and mounted where directed. A copy of this reduced scale floor plan drawing shall also be included in each of the Operations and Maintenance Manuals. Submit same to PROFESSIONAL for approval, prior to final mounting and inclusion in O & M Manual.

END OF SECTION

SECTION 200250 - MECHANICAL INSULATION

PART 1 – GENERAL

1.1 SCOPE

- A. It is intended that all heating and/or air conditioning ductwork, all storm drain piping above slab on grade and all domestic water piping above slab on grade throughout this project be insulated, except as specifically stated otherwise hereafter.
- B. Insulation shall include all insulating materials their applications, bands, tie wire, and weather protection for all pipe, fittings, valves, and equipment as indicated and as specified herein.
- C. Piping systems requiring insulation, types of insulation required, and insulation thickness shall be as listed herein. All fittings, flanges, and valves (except valve stems, hand wheels, and operators) in piping systems requiring insulation shall be insulated unless otherwise specified. Fitting, flange, and valve insulation shall be premolded, precut, or job fabricated insulation of the same thickness and conductivity as used on adjacent piping. Insulation exterior shall be cleanable, grease resistant, non-flaking and non-peeling.

PART 2 – PRODUCTS

2.1 PIPING INSULATION

- A. Fiberglass pipe insulation (FG)
 - 1. Insulation shall have a thermal conductivity $k=0.23$ at 75 degrees F.
 - 2. Insulation shall include a white ASJ with self-sealing overlap joints and seams.
 - 3. Insulation shall be equal to Johns Manville "Micro-Lok" or approved equal.
- B. Flexible elastomeric pipe insulation (FU)
 - 1. Insulation shall have a thermal conductivity $k=0.25$ at 75 degrees F.
 - 2. Insulation shall be equal to Armacell "AP Armaflex".
- C. Cellular Glass (CG)
 - 1. Insulation shall have a thermal conductivity $k=0.35$ (density 8.5 pcf nominal).
 - 2. Insulation shall be equal to Foamglass
- D. Phenolic (P)
 - 1. Insulation shall have a thermal conductivity $k=0.15$ (density 10 pcf nominal)
 - 2. Insulation shall be equal to Insul-Phen.
- E. PVC pipe and fitting covers.
 - 1. Pipe and fitting covers shall be 20 mill thick flame retardant PVC. Fitting covers shall be neat, tight fitting radius type.
 - 2. Pipe and fitting covers shall be equal to Zeston type 300 or approved equal.
- F. Metal Protective Jacket
 - 1. Sheet Aluminum: ASTM B209, 3003 alloy, H 14 temper, 0.016 inch thick.

2. Fitting Covers: Factory fabricated from not lighter than 0.020-inch thick type 3003 sheet aluminum.
3. Bands: 3/4-inch wide .007 aluminum (or .005 stainless steel).

PART 3 – EXECUTION

3.1 GENERAL INSULATION INSTALLATION REQUIREMENTS

- A. The insulation shall be applied by licensed insulation applicators and all work shall be performed in a neat and workmanlike manner.
- B. No insulation shall be applied over pipes, fittings, or other surfaces, which are not clean.
- C. Insulation shall be applied after pipes have been thoroughly tested and proven tight by the CONTRACTOR.
- D. Piping insulation thru rated walls shall be coordinated with Section *Basic Mechanical Materials and Methods* and approved pipe sleeve and fire stop with UL Listing.
- E. Insulation shall be clean and dry when installed and during the application of any finish.
- F. Install materials neatly with smooth and even surfaces with jackets drawn tight and smoothly cemented down on longitudinal and end laps.
- G. Scrap pieces shall not be used where a full-length section will fit.
- H. Pipe insulation shall be continuous through sleeves, wall and ceiling openings.
- I. A PVC grommet shall be utilized at metal stud penetrations of piping, and insulation shall be installed snug to both sides of penetration with ends of piping insulation vapor sealed if specified.
- J. Piping and ductwork shall be individually insulated.
- K. Chrome plated pipes and pipes used solely for fire protection shall not be insulated.
- L. Equipment nameplates, access plates in fan housings and ductwork and the like for ventilating and air heating systems, shall not be insulated but insulation must be carefully beveled and sealed around it.
- M. Ductwork insulation shall be continuous through sleeves, wall and ceiling openings except at fire dampers in ductwork systems.
- N. Vapor Barrier Installation
 1. A complete moisture and vapor seal shall be provided wherever insulation terminates against metal hangers, anchors and other projections through insulation on cold surfaces for which a vapor seal is specified as identified in Part 3 paragraph 3.03 of this specification section.
 2. Seam and fitting covers shall be sealed with two (2) generous brush coat of fire resistant vapor barrier coating, applied at all longitudinal and circumferential laps.
 3. Ends of sections of insulation that butt against flanges, unions, valves, and fittings, and joints at intervals of not more than 12 feet on continuous runs of pipe shall be coated with a vapor barrier coating.
 4. Breaks and punctures in the jacket material shall be patched by wrapping a

strip of jacket material around the pipe and cementing, coating as specified for butt strips. The patch shall extend not less than 1½" past the break in both directions.

5. At penetrations such as thermometers, valve stems, etc., the voids in the insulation shall be filled with vapor barrier coating and the penetration sealed with a brush coat of the same coating.
6. PVC fitting jackets in concealed applications shall be with a strip of insulation jacket and brush coat of vapor barrier sealant.
7. PVC fitting jackets in exposed applications shall be neatly covered with a PVC/vinyl tape neatly smoothed.

O. Installation at Hangers and Anchors

1. Pipe insulation shall be continuous through pipe hangers.
2. Where pipe is supported by the insulation, galvanized sheet metal shields or saddles 12 inches long shall be provided. Shields/saddles shall be 20-gauge galvanized sheet metal for pipes 6" and smaller and 18 gauge for pipes 8" and larger.
3. Where shields are used on pipes 2 inches and larger, insulation inserts shall be provided at points of hangers and supports.
 - a. Insulation inserts shall be of calcium silicate, cellular glass (minimum 8 pcf), molded glass fiber (minimum 8 pcf), or other approved material of the same thickness as adjacent insulation.
 - b. Inserts shall have sufficient compressive strength to adequately support the pipe without compressing the inserts to a thickness less than the adjacent insulation.
 - c. Insulation inserts shall cover the bottom half of the pipe circumference 180 degrees and be not less in length than the protection shield.
 - d. Vapor barrier facing of the insert shall be of the same material as the facing on the adjacent insulation.
 - e. Seal inserts into the insulation with vapor barrier coating.
4. Where protection saddles are used, fill all voids with the same insulation material as used on the adjacent pipe.
5. Insulate and vapor seal insulation at anchors same as piping for a distance not less than four times insulation thickness to prevent condensation.

3.2 PIPING INSULATION INSTALLATION

- A. Fiberglass pipe insulation (FG)
 1. Install insulation with longitudinal laps and butt strips additionally smoothly secured with Benjamin-Foster 85-20 adhesive.
 2. Fittings and valves on pipe shall be similarly insulated with thickness equal to the adjacent pipe.
- B. Flexible elastomeric pipe insulation (FU)

1. Miter 90 degree turns and elbows, tees, and valve insulation.
 2. Secure longitudinal joints with vinyl tape on 9-inch centers.
 3. Bond cuts, butt joints, ends, and longitudinal joints with adhesive. After adhesive cures, apply 2-inch wide pressure sensitive adhesive vinyl tape over bonded cuts, joints, and ends.
- C. PVC pipe and fitting covers.
1. PVC pipe and fitting covers shall be installed with a smooth appearance and no visible wrinkles.
 2. All longitudinal seams shall be installed such the joints facing up or to the back of the finished product.
 3. All longitudinal and circumferential PVC jacket joints and connections shall be spot welded every 12" with Perma Weld Adhesive and subsequently neatly sealed with tight fitting pressure sensitive vinyl tape, installed without wrinkles.
- D. Metal Jacket Installation
1. Metal jackets shall have side and end laps at least 2 inches wide with the cut edge of the side lap turned under one inch to provide a smooth edge.
 2. Secure jackets in place with aluminum or stainless-steel bands on 9 inch centers.
 3. Place laps to shed water.
 4. Seal laps with weatherproof coating.
 5. Where pipes penetrate exterior walls, continue the increased insulation thickness required for piping exposed to weather and the metal jackets through the sleeve to a point 2 inches beyond the interior surface of the wall.
 6. In outside locations protect fittings, flanges, and valves with a weatherproof coating prior to installation of metal covers. Secure metal covers for fittings, flanges, and valves in place with metal bands and seal with a weatherproof coating.

3.3 PIPING INSULATION APPLICATIONS

PIPING INSULATION MATERIAL TYPE, SERVICE JACKET, VAPOR BARRIER AND THICKNESS TABLE									
SERVICE	INSULATION MATERIAL (NOTE 'A')	TYPE OF SERVICE JACKET REQ' D (NOTE 'B')	VAPOR BARRIER REQ' D	INSULATION THICKNESS (INCHES)					NOTES
				½" – 1 ¼"	1 ½" – 3"	3 ½" – 6"	8" – 10"	11" – 36"	

A/C CONDENSATE DRAIN LOCATED INSIDE BUILDING	FG	A OR B	YES	1	1	1	1	1	4,5
	FU	C	NO	0.75	1	1	1	1	
REFRIGERANT PIPING	FU	C	NO	SEE NOTES	SEE NOTES	-	-	-	6, 8
HEATING WATER HVAC PIPING (SUPPLY AND RETURN)	CG	A	YES	2	2	2.5	2.5	2.5	2,3,4,8,9,10
	FU	C	NO	1	-	-	-	-	
	P	B	YES	0.5	1	1	1	1.5	
	FG	B	YES	1.5	1.5	2	2	2	

NOTE 'A' – INSULATION MATERIAL				
MATERIAL	SPEC	TYPE	CLASS / GRADE	
FU	FLEXIBLE UNICELLULAR	ASTM C 534	-	-
FG	FIBER GLASS	ASTM C 547	I	1
P	PHENOLIC	ASTM C 552	-	-
CG	CELLULAR GLASS	ASTM C 1126	III	1

NOTE 'B' – TYPE OF SERVICE JACKET REQUIRED	
A	FOIL BACKED ALL SERVICE JACKET (ASJ)
B	PAPER ASJ
C	NONE

TABLE NOTES:

1. Not used.
2. Note that higher density insulation inserts shall be utilized on all water piping larger than 1-1/2" size, at all hanger/saddle supports, etc.
3. Insulation located outside shall be one inch thicker than shown in table above.
4. A full coverage PVC jacket shall be required on insulated piping and fittings exposed in mechanical rooms, in crawlspace, and in interior exposed applications everywhere. See Section *Mechanical Identification* for color requirements.
5. Drain piping in concealed applications may be insulated with flexible unicellular or fiberglass.
6. Refrigerant piping shall be insulated as follows. Conventional heat pump or 2-pipe variable refrigerant systems shall have the larger pipe (hot gas line during heating operation) based upon the thickness corresponding to hot gas lines below and NOT the suction line thickness.
 - a. Suction lines - ¾" thick for pipes less than 1" in size, 1" thick for

- pipes equal to or greater than 1" in size.
- b. Liquid lines – 1" thick for pipes less than 1-1/2" in size, 1.5" thick for pipes equal to or greater than 1-1/2" in size.
 - c. Hot gas lines – 1.5" thick for pipes less than 1-1/2" in size, 2.0" thick for pipes equal to or greater than 1-1/2" in size.
- 7. Not used.
 - 8. Provide metal jackets over insulation on all insulated piping exposed to outdoor weather (including refrigerant piping).
 - 9. Flexible unicellular insulation may be utilized only on HVAC piping run outs, 1" or smaller, to individual terminal units, including fan coil or single duct air terminal units, small air handling and/or blower coil units, etc. This type insulation at run outs shall be limited to maximum 10' lineal feet per unit and is allowed only in concealed piping applications.
 - 10. All HVAC and potable water piping outside, exposed to view in finished spaces, in crawlspace, within mechanical/equipment rooms, etc., shall be insulated with phenolic or "Foamglas".

END OF SECTION

SECTION 230520 - CHEMICAL TREATMENT

PART 1 – GENERAL

1.1 SCOPE

- A. Provide all material, equipment and labor, etc., required to complete installation specified herein and/or shown or scheduled on Contract Drawings.
- B. Description:
 - 1. Cleaning and treatment of circulating HVAC water systems.
 - 2. Cleaning compounds.
 - 3. Chemical treatment (non-chromate and non-abrasive) for closed loop heat transfer systems.

1.2 APPLICABLE STANDARDS

- A. Technical Services: Provide the services of an experienced water treatment chemical engineer or technical representative to direct flushing, cleaning, pre-treatment, training, debugging, and acceptance testing operations; direct and perform chemical limit control during construction period and monitor systems for a period of 12 months after OWNER'S final acceptance of project, including not less than six (6) periodic service calls and written status reports. Minimum service during construction/start up shall be 8 hours. It is suggested that CONTRACTOR utilize the services of the vendor(s) already providing on-going services serving this campus and/or building.
- B. Field Quality Control and Certified Laboratory Reports: During the one year guarantee period, the water treatment laboratory shall provide not less than 4 reports based on on-site periodic visits, sample taking and testing, and review with OWNER personnel, of water treatment control for the previous period. In addition to field tests, the water treatment laboratory shall provide certified laboratory test reports. These monitoring reports shall assess chemical treatment accuracy, scale formation, fouling and corrosion control, and shall contain instructions for the correction of any out-of-control condition.
- C. Log Forms: Provide one year supply of preprinted water treatment test log forms.

1.3 APPLICABLE PUBLICATIONS

The publications listed below form a part of this Specification to the extent referenced. The publications are referenced in the text by the basic designation only.

National Fire Protection Association (NFPA):

NFPA 70.....National Electric Code.

PART 2 – PRODUCTS

2.1 CLEANING COMPOUNDS

- A. Alkaline phosphate or non-phosphate detergent/surfactant/specific to remove organic soil, hydrocarbons, flux, pipe mill varnish, pipe compounds, iron oxide, and like deleterious substances, with or without inhibitor, suitable for system wetted metals without deleterious effects.
- B. Refer to Section *Pipe and Pipe Fittings*, for flushing and cleaning procedures.

2.2 CHEMICAL TREATMENT FOR CLOSED LOOP SYSTEMS

- A. Inhibitor: Provide sodium silicate, except in high silica water, sodium nitrate/borate, molybdenum, or other approved proprietary compound suitable for make-up quality and make-up rate and which will not cause or enhance bacteria/corrosion problems or mechanical seal failure due to excessive total dissolved solids. Shot feed manually. Maintain inhibitor residual as determined by water treatment laboratory, taking into consideration residual and temperature effect on pump mechanical seals.
- B. pH Control: Inhibitor formulation shall include adequate buffer to maintain pH range of 8.0 to 10.0.
- C. Performance: Protect various wetted, coupled, materials of construction including ferrous, and red and yellow metals. Maintain system essentially free of scale, corrosion, and fouling. Corrosion rate of following metals shall not exceed specified mils per year penetration; ferrous, 0.5; brass, 0.2; copper, 0.15. Inhibitor shall be stable at equipment skin surface temperatures and bulk water temperatures of, respectively, not less than 250 and 125 degrees Fahrenheit. Heat exchanger fouling and capacity reduction shall not exceed that allowed by fouling factor 0.0005.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Delivery and Storage: Deliver all chemicals in manufacturer's sealed shipping containers. Store in designated space and protect from deleterious exposure and hazardous spills.
- B. Install equipment furnished by the chemical treatment supplier and charge systems according to the manufacturer's instructions and as directed by the Technical Representative.
- C. Perform test and report results in accordance with Section *Pipe and Pipe Fittings* and Section *Mechanical Close-out Requirements*.
- D. Instruct OWNERS personnel in system maintenance and operation in accordance with Section *Mechanical Close-out Requirements*.
- E. All chemicals shall be handled and disposed of in accordance with Local, State and Federal guidelines.

3.2 VERIFICATION

- A. CONTRACTOR shall coordinate installation of glycol into required systems prior to TAB and same shall be verified by TAB and included within his report.
- B. The CONTRACTOR shall furnish a copy of the Chemical Company report near the end of the project with the TAB report, indicating the Company has verified the manual chemical water treatment has been performed as specified, and automatic systems are functioning properly.

3.3 OWNER EDUCATION

The CONTRACTOR shall coordinate a minimum two (2) hour session between Chemical Company and Owner Representatives to provide training and instruction in operation, periodic maintenance, monitoring, troubleshooting, etc.

3.4 MAINTENANCE AGREEMENT

THE Chemical Company shall offer a long-term chemical maintenance and monitoring agreement beginning at the end of the one (1) year warranty period. Copy of same shall be submitted with closeout documents within seven (7) days prior to request for final inspection.

END OF SECTION

SECTION 230670 - PACKAGED AIR CONDITIONERS

PART 1 – GENERAL

1.1 SCOPE

- A. Provide all material, equipment and labor, etc., required to complete installation specified herein and/or shown or scheduled on Contract Drawings.
- B. Work Included: Self-contained units, rooftop units, window units, through-wall units, computer room units, and split systems.
- C. Warm air furnace/evaporator coil and condensing units.
- D. Definitions:
 - 1. Energy Efficiency Ratio (EER): A ratio calculated by dividing the cooling capacity in Btuh by the power input in watts at any given set of rating conditions, expressed in Btuh per watt (Btuh/watt).
 - 2. Unitary (ARI): Consists of one or more factory-made assemblies, which normally include an evaporator or cooling coil, a compressor and condenser combination, and may include a heating function.

1.2 APPLICABLE STANDARDS

- A. Refer to Section *Basic Mechanical Materials and Methods*.
- B. Safety Standards:
 - 1. Design, manufacture and installation of mechanical refrigeration equipment: ANSI B9.1.
 - 2. Machinery Guards: Provide guards as shown in AMCA 410 for belts, chains, couplings, pulleys, sheaves, shafts, gears and other moving parts regardless of height above the floor. Drive guards may be excluded where motors and drives are inside factory fabricated unit casings.
- C. Corrosion Prevention: Unless specified otherwise, equipment fabricated from ferrous metals that do not have a zinc-coating conforming to ASTM A386 or a duplex coating of zinc and paint shall be treated for prevention of rust with a factory coating or paint system that will withstand 125 hours in a salt-spray fog test, except that equipment located outdoors shall be tested for 500 hours. The salt-spray fog test shall be in accordance with ASTM B117 using a 20 percent sodium chloride solution. Immediately after completion of the test, the coating shall show no signs of blistering, wrinkling or cracking, no loss of adhesion, and the specimen shall show no signs of rust creepage beyond 1/8 inch on either side of the scratch mark. The film thickness of the factory coating or paint system applied on the equipment, shall be not less than film thickness used on the test specimen.
- D. ARI Standards:
 - 1. Capacity 135,000 BTU/HR and Greater: ARI 360.
 - 2. Capacity Below 135,000 BTU/HR: ARI 210. Units shall be listed in the ARI Directory of Certified Unitary Air Conditioners.

PART 2 – PRODUCTS

2.1 SPLIT DIRECT EXPANSION SYSTEMS

A. Multi-position Air Handler with DX Evaporator and Heating Water Coil

1. General:

- a. Air Handlers shall be of the up flow or horizontal type as indicated, complete with filters centrifugal blower and motor, coils, controls, and cabinet.
- b. Filters shall be of the high velocity replaceable pleated type to serve the airflow capacity indicated on Contract Drawings. The filter rack assembly shall be easily accessible, and shall include clips, spring and/or other suitable means to hold air filter secure. Filter rack shall also include a track or other suitable framework such that filter is set in place without adjustment. Filters shall be in accordance with *Section Air Cleaning/Treatment*.
- c. Blower shall have forward curved blades, statically and dynamically balanced. Motor shall be of the ECM direct driven type, for 5 ton units and smaller, complete with built-in overload protection.
- d. Controls shall consist of blower fan delay relay, transformer (120-24 volt) and room thermostat with heating and cooling functions to suit equipment characteristics.
- e. Unit cabinet shall be thermally and acoustically insulated with fiberglass coated to prevent erosion.
- f. Coils shall have copper tubes and aluminum fins.
- g. Capacity and characteristics shall be as indicated on Contract Drawings.
- h. Provide evaporator face mounted low temperature sensor and adjustable compressor timed delay/auto-restart controls where low ambient controls for condensing units are indicated.
- i. Warranty: See *Section Mechanical Systems and Equipment Warranties* for more information.

B. Condensing Unit:

1. Units shall be single or dual circuit type, as scheduled, and shall consist of scroll compressor(s) and, condenser coil(s), condenser fans, refrigerant receiver, charging valves, controls and holding charge, all enclosed in weatherproofed zinc-coated steel casing, phosphatized and coated in epoxy resin primer and finished with baked-on enamel.
2. Condenser Hail Coil Guards: Provide manufacturer approved heavy-duty louvered or approved expanded metal, factory primed and painted to match unit enclosure and mounted in a rigid frame with a minimum of 2" clearance to coils. See detail on Contract Drawings.
3. Compressor shall be of the scroll type and shall include high and low pressure cutouts, overloads, and inherent thermostat. Compressors shall include anti-slugging device, timed automatic restart delay and crankcase

heaters.

4. Condenser coils shall be constructed of copper tubes and aluminum fins, tested for 425 psi.
5. Condenser coils shall be coated with a cathodic epoxy type electrodisposition coating formulated to uniformly cover all condenser-coil surfaces, including the edges of the fins, coils, heads, and frame, with a .8 – 1.2 mil layer. The coating shall be selected to provide excellent resistance and durability to corrosive effects of alkalies, acids, alcohols, petroleum, seawater, salt air and corrosive environments. Coat shall be proven to withstand a 3,000-hour salt spray exposure test, with coil's heat transfer capacity reduced less than one percent.
6. Condenser fans shall be of the propeller type, statically and dynamically balanced, weatherproofed, and powered by heavy-duty permanently lubricated ball bearing motor with built-in thermal overload protection.
7. Controls shall include contactors, high-pressure outlet with thermostatic reset, low-pressure cutout and reset relay to prevent unit cycling on overloads when once the automatic resetting safety control trips. Where indicated or scheduled, provide units with low ambient controls with stable operation down to 0 degrees F including variable feed refrigerant head pressure controlled condenser fan operation. All wiring and devices shall be internal to cabinet. Exposed wiring is not acceptable.
8. Refer to Section *Pipes and Pipe Fittings* for refrigerant piping specifics. CONTRACTOR shall note that any piping, joint, fitting, etc. that comes in contact with the refrigerant system shall be brazed. Compression fittings are not acceptable.
9. Capacities and characteristics shall be as indicated on Contract Drawings.
10. Three-phase compressors shall be protected from over and under voltage and phase loss with automatic restart capability.

2.2 REFRIGERANT SPECIALTIES

- A. Refrigerant specialties shall be provided and include thermostatic type expansion valves, refrigerant strainers, liquid sight-flow fittings, moisture indicator, and other devices indicated by the drawings and diagrams. Thermostatic expansion valves shall have externally mounted thermostatic elements connected to valve through capillary tubing of suitable length with external equalizer and with super heat adjustment.
- B. Solenoid valves shall be suitable for a minimum of 250 lbs. working pressure fitted solder type or threaded connections and with seal-cap type manual lifting stem. Valves shall be suitable for operation with available current and provided with suitable solenoid coil protector. Specialties shall be Alco or Sporlan.
- C. Provide ahead of each expansion valve a sight glass. Provide ahead of each expansion valve and/or solenoid valve a filter-dryer and moisture indicator.

PART 3 – EXECUTION

3.1 INSTALLATION

Handle and install units and accessories in accordance with ARI 260 and the manufacturer's printed instructions. Unit shall be started up and checked out by a factory service representative. CONTRACTOR shall furnish PROFESSIONAL completed start-up report covering unit operation and start-up. A copy of same shall be included in Close-out Documents. See Section MECHANICAL CLOSE-OUT REQUIREMENTS.

3.2 TESTS

Perform tests and make reports in accordance with Sections *Basic Mechanical Materials and Methods* and *Testing, Adjusting, and Balancing*.

3.3 UNIT CAPACITY

Characteristics and capacity of systems shall be as indicated on Contract Drawings.

3.4 CONTROLS

All systems will be provided with automatic heating/cooling changeover controls; one or two stage heating and/or cooling as required. Provide auxiliary time clocks and thermostats and/or humidistats as indicated in Section *Controls and Instrumentation*.

3.5 AIR FILTRATION

See Section *Air Cleaning/Treatment* for specific requirements.

END OF SECTION

SECTION 230885 - AIR CLEANING/TREATMENT

PART 1 – GENERAL

1.1 SCOPE

- A. Provide all material, equipment and labor, etc., required to complete installation specified herein and/or shown or scheduled on Contract Drawings.
- B. Descriptions:
 - 1. Air filters for Heating, Ventilating and Air Conditioning.
 - 2. Definitions: Refer to newest edition of ASHRAE 52.2 for definitions of face velocity, net effective filtering area, media velocity, resistance (pressure drop), minimum efficiency reporting value (MERV), etc.

1.2 APPLICABLE STANDARDS

Air Filter Performance Report for Extended Surface Filters:

- A. Submit a test report for each type of filter being offered. The report shall be less than two years old and have been prepared by an independent testing laboratory using test equipment, method and duct section as specified by ASHRAE Standard 52.2-1999 for type filter under test and acceptable to ENGINEER, indicating that filters comply with the requirements of this specification. Test for 500 fpm will be accepted for lower velocity filters provided the test report of an independent testing laboratory complies with all the requirements of this specification.
 - 1. Selection procedures for manufacturer's standard products: All filters tested shall have been procured by the independent testing laboratory from the open market independent of manufacturer of these filters and a statement to this effect must accompany test report.
 - 2. Selection procedures for new products not available on open market: Testing laboratory will certify that filters are not available in areas remote from manufacturer's facilities. For each required test the independent Testing Laboratory shall select from the manufacturer's stock or production the number of samples required. The samples selected shall be representative of standard production considering media utilized and manufacturing locations. These test reports shall be less than six months old.
- B. Filter Supplier Warranty for Extended Surface Filters: Guarantee the filters against leaks, blow-outs, and other deficiencies during their normal useful life. Defective filters shall be replaced at no cost to the Owner.
- C. Identification: Each filter shall bear markings indicating manufacturer's name, filter size, and MERV & MERV-A ratings per ASHRAE Standard 52.2.
- D. Definitions and Abbreviations
 - 1. Spares: Filter(s) in sets to be turned over to the OWNER at the end of the project for the OWNER'S use after the project or any portion thereof, is complete.
 - 2. Construction Period: This term generally includes the time period beginning with the OWNER'S notice-to-proceed and ending with the OWNER'S final acceptance of a project, or any phase of a project.

3. Temporary: A term generally depicting the use of air filters for use during the construction period.
4. Filter Grille: An inlet device connected to an HVAC system where an air filter is to be installed and maintained during construction and permanently after project is completed.
5. Pleated Filters: An extended surface filter with folds of air filtration media.
6. Filter or Filter Set: Air filter(s) in sizes as recommended by equipment or supplier manufacturer to prevent air bypass and to provide the maximum face size and minimum velocity to promote longer filter life expectancy.
7. F/G: fiberglass

1.3 RESPONSIBILITY

- A. The CONTRACTOR is responsible for providing, monitoring and maintaining all air filtration specified provisions during the construction period.
- B. The CONTRACTOR is also responsible for providing spare sets of air filter(s) to the OWNER, labeled and in boxes for storage, for the OWNER'S use after the project is complete and at which time the OWNER assumes control of operation and maintenance functions for the systems. One of the filter spare sets shall be installed on the day of the final inspection by the PROFESSIONAL.

1.4 AIR FILTRATION PROTECTION REQUIRED

The following systems and installations shall be provided with proper air filtration prior to startup or use of the facilities new HVAC systems and existing or renovated HVAC systems in the area(s) affected by this project.

- A. All new air handling systems, including up-flow/horizontal furnaces, roof top packaged systems, outdoor air and heat recovery systems, blower coil, central station and built-up air handling system with water, or refrigerant coils.
- B. Filter grilles or registers.
- C. Ducted return air systems: Provide temporary air filtration over all return air grilles, registers and filter grilles (in addition to filters in frame of filter grille).

1.5 TYPE OF AIR FILTRATION REQUIRED

The following is a listing of generic equipment and installation air filtration requirements. The CONTRACTOR may submit alternate filter thickness(es) to match specific applications but shall not be less than that listed, for PROFESSIONAL'S approval. The CONTRACTOR shall verify size, including thickness matched to CONTRACTOR supplied equipment and air distribution device accessory.

AIR FILTRATION REQUIREMENTS					
GENERAL INFORMATION			CONSTRUCTION PERIOD FILTRATION	SPARES (PROJECT COMPLETION FILTRATION)	
FILTER FUNCTION/ LOCATION	FILTER TYPE	NOMINAL FILTER DEPTH/ THICKNESS	MINIMUM MERV & MERV-A RATINGS	MINIMUM MERV & MERV-A RATINGS	NUMBER OF SETS REQUIRED
RETURN AIR GRILLES/ REGISTERS	PLEATED	1"	11	N/A	N/A
AIR HANDLING UNITS	PLEATED	1"	8	8	3

PART 2 – PRODUCTS

2.1 EXTENDED SURFACE AIR FILTERS

- A. Filter shall be pleated, disposable type. Filter shall consist of non-woven cotton and synthetic fabric media, media support grid and enclosing frame.
- B. The filter shall be listed by Underwriters Laboratories as Class 2.
- C. The media support shall be a welded wire grid with an effective open area of not less than 96%. The welded wire grid shall be bonded to the filter media to eliminate the possibility of media oscillation and media pull away.
- D. The enclosing frame shall be constructed of a rigid, heavy-duty beverage board with diagonal support members bonded to each side of the filter to insure pleat stability. The inside periphery of the enclosing frame shall be bonded to the filter pack to eliminate possibility of air bypass.
- E. Filter Characteristics

MINIMUM EFFICIENCY REPORTING VALUE (MERV & MERV-A)	FILTER DEPTH/ THICKNESS	PRESSURE DROP (IN. W.G. @ 350 F.P.M.)		PRESSURE DROP (IN. W.G. @ 500 F.P.M.)	
		INITIAL	FINAL	INITIAL	FINAL
8	1"	0.23	0.5	-	-
8	2"	-	-	0.29	0.75
11	1"	0.30	0.50	-	-
11	2"	-	-	0.35	0.75

PART 3 – EXECUTION

3.1 INSTALLATION AND COORDINATION

- A. Install supports, filters and gages in accordance with manufacturer's instructions.
- B. At end of project, provide list of all HVAC air handling equipment and filter grilles, with size and quantity of air filters and MERV rating for each, and submit for Owner's future use and maintenance record. Furthermore, submit a letter signed by the OWNER acknowledging receipt of all spare sets of air filters outlined above. All boxes of air filters shall be labeled to match the individual HVAC system or return air filter grille location for which the filters are to be utilized.

3.2 START-UP AND TEMPORARY USE

- A. Clean and vacuum air handling units and plenums to the satisfaction of the ENGINEER prior to starting air-handling systems.
- B. Change out replaceable air filters, as filters are 60% loaded during construction use period and just prior to OWNER'S acceptance of project. Filters for use during construction period are in addition to OWNER'S spare sets, as specified herein.
- C. Thoroughly wash wall unit filters as filters are 40% loaded during construction period, and just prior to OWNER'S acceptance of project.

END OF SECTION

SECTION 230980 - CONTROLS AND INSTRUMENTATION

PART 1 – GENERAL

1.1 DESCRIPTION

- A. In general, new equipment shall be connected to existing campus energy management system (EMS).
 - 1. CONTRACTOR shall provide new web-based unitary controllers capable of communication with all existing and new devices via BACNet protocol as required.
- B. Provide complete HVAC controls and instrumentation for the following items:
 - 1. Air Handling Systems Including:
 - a. Direct Expansion Systems
- C. Definitions:
 - 1. Deviations: The difference between the controller set point and the value of the controlled variable (such as room temperature) at any instant.
 - 2. Dead band: A temperature range over which no heating or cooling energy is supplied, such as 72-78 degrees F, i.e., as opposed to single point changeover or overlap.
 - 3. Control Wiring: Includes conduit, wire and wiring devices to install complete HVAC control systems including motor control circuits, interlocks, thermostats, switches and like devices.

1.2 QUALITY ASSURANCE

- A. Criteria:
 - 1. The maximum deviation of occupied room conditions from the controller set point shall not exceed plus or minus one degree F for temperature, and plus or minus three percent for relative humidity unless the system is operating in the dead band range.
- B. Performance tests:
 - 1. Demonstrate to the Owner that all controls are installed, adjusted, and can perform all functions required by the contract drawings and specifications.

1.3 SUBMITTALS

- A. Manufacturer's Literature and Data for all components, including the following:
 - 1. Controllers.
 - 2. Relays and switches.
 - 3. Control dampers, control valves and operators.
 - 4. Instrumentation products.
- B. Certificates:
 - 1. Compliance with paragraph, QUALITY ASSURANCE.
 - 2. Name and address of a permanent service organization maintained or trained by the manufacturer that will render satisfactory service within eight

hours after notification that service is required.

- C. Control Drawings: Integrate with flow diagrams; show outlines of HVAC equipment with control devices, schematic one line control piping and wiring, and written sequence of operation and operation instructions. Equipment numbers shall correspond to those shown on the Contract Drawings. Provide three (3) complete sets of blue-line as-built drawings.
- D. Operation and Maintenance Manuals:
 - 1. Submit in accordance with Section *Mechanical Close-Out Requirements*.
 - 2. Include the following documentation:
 - a. General description and specification for all components.
 - b. Detailed illustrations and complete calibration procedures.
 - c. Complete trouble shooting procedures and guidelines.
 - d. Complete operating instructions for all systems.
 - e. Piping schematic/flow diagrams.

1.4 INSTRUCTIONS

- A. Instructions to OWNER Operations Personnel: Perform in accordance with Section *Mechanical Close-Out Requirements*.
- B. Training by independent or franchised dealers who are not direct employees of the temperature control company will not be acceptable.

1.5 GUARANTY

Any defects in workmanship or material during the guaranty period shall be corrected by the CONTRACTOR at no cost to the OWNER. Correction of defects shall be accomplished during regular working hours.

PART 2 – PRODUCTS

2.1 SENSORS AND CONTROLLERS

- A. Control Valves: (DDC Electronic Modulating Type)
 - 1. All water circulation control valves shall be full proportioning ball type with cage trim inner valve to facilitate modulation of flow as well as provide for replacing the inner valve without removing from the piping. Valve actuators shall be sized to ensure tight seating against the specified working pressure (all control valves on this project must be capable of seating against minimum 200 p.s.i.g.). Each valve shall be sized by the FMC and guaranteed to be of sufficient size to meet the heating and cooling requirements. Valves 2-1/2" and larger shall have flanged connections. Valves 1/2" thru 2" shall be Pro Press connections. Mixing valves shall have true mixing pattern bodies with 2 inlets and 1 outlet. Provide positive positioning devices where required for adequate seating pressure or for sequencing. Provide valves with turndown, flow characteristics and close-off pressure to suit specified range of use to yield stable and consistent operation.
 - 2. Maximum Pressure Drop Through Valves: Modulating Water Control: The greater of 8 feet of water or 50 percent of the drop through the

apparatus.

- B. Combination heating/cooling thermostat: This remote wall sensor/controller is to be utilized to control split and/or packaged HVAC equipment with heating and cooling capabilities. Thermostats shall be of the low voltage or electronic adjustable type and shall conform to requirements of UL 873. Thermostats for air conditioners shall be provided and shall be combination heating-cooling type with contacts hermetically sealed against moisture, corrosion, lint, dust and foreign materials. Thermostats shall be designed to operate on not more than 1.5 degrees Fahrenheit differential from setpoint to actual temperature, or as noted, and of suitable range calibrated in degrees Fahrenheit. Thermostats shall have adjustable heat anticipation and fixed cooling anticipation. Air conditioning heating/cooling thermostats shall contain two independent temperature sending elements electrically connected to control the heating and cooling operation(s), respectively. The electrical characteristics shall be 24V AC or less. The maximum differential between heating and cooling setpoints shall be 3 degrees Fahrenheit. Automatic switching for system changeover from heating to cooling or cooling to heating shall be accomplished through the use of a thermostat sub base. Provide all thermostats with visible temperature space read out in degrees Fahrenheit, and adjustable separate setpoint control for heating and cooling functions.

Provide the number of stages of control, with a nominal 3 to 5 degrees Fahrenheit between stages, for heating and cooling functions to match the number of stages scheduled and/or specified. Provide a type thermostat with emergency/auxiliary heat control capability matched to heat pump applications.

- C. Humidistat: Low voltage or electronic type sensor/controller capable of minimum 2% relative humidity accuracy, and no more than 1% drift per year temperature compensating, non-condensing, early field calibratable, sensor/controller shall energize humidity control equipment/capability on a rise in space above setpoint. Provide multistage or multiple setpoint humidity sensor/controllers to match equipment scheduled and/or specified capability and/or control.

Space wall mounted humidity sensor/controllers shall be as KELE Series HF/HW-20K-T81 or as approved. Calibration shall be guaranteed for minimum period of two (2) years.

- D. CO2 sensor/controller: non-dispersive infrared type with fully floating analog output in both 4-20 mA and 0-10 VDC over 0-2000 ppm CO2 range, with LCD display and control relay adjustable setpoint, as Kele model CD-A and CD-1W (wall) and CD-1D (duct mounted) with pilot tube sensor, self-calibrating.
- E. Provide specialty sensor/controllers to match specified sequence of operation as delineated hereafter,

Time clocks

1. Time-clock Based Energy Management System(s)

MCP: Existing energy management time clock electronic (microprocessor) based controller shall be connected to and control through new timed group equipment in this project.

2.2 RELAYS:

- A. Provide as required for system functions.

- B. Electrical Pilot Duty or Contactor Types: Provide inductive rated contacts for circuits with coils, motors or other inductive devices, minimum 120V, 15A. rating.

2.3 MOTORIZED CONTROL DAMPERS

- A. Dampers shall be of the airfoil, ultra low leakage, opposed blade design. Dampers shall be constructed of minimum 16 gauge galvanized steel. Side mounted linkage shall be out of airstream. Blades shall include rubber edge seals for tight seal.
- B. Modulating damper actuators shall be a minimum of 40:1 turndown ratio.
- C. Design and install control dampers to "fail safe" in either the normally open or normally closed position as required for freeze, moisture, smoke or fire protection.

2.4 FINAL CONTROL ELEMENTS AND OPERATORS

- A. Fail Safe Operation: Design and install control valves and dampers to "fail safe" in either the normally open or normally closed position as required for freeze, moisture, smoke or fire protection.
- B. Spring Ranges: As required for system sequencing and to provide tight close off.

2.5 WIRING MATERIALS

- A. Comply with applicable sections of *Division 26 and 28*. Provide wiring for control devices furnished under this Section, HVAC motor control conduits and interlocks. Color code and number all wires, whether individual or in cables, for identification.
- B. A complete wiring system shall be provided for all direct digital control (DDC) and electric controlled apparatus. All wiring shall be installed in a neat, workmanlike manner, of sufficient size and tested to be continuous and without unnecessary "short".

Wiring shall be as follows:

1. Exposed Areas and Mechanical Equipment Rooms: Wiring shall be routed in metallic conduit per *Division 26 and 28* requirements. Provide flexible conduit connections to rotating equipment.
2. Concealed, Accessible Areas: Wiring may be routed outside in above ceiling accessible spaces conduit, however wiring outside conduit shall be sheathed with plenum rated jacket with maximum rating of 50/25 smoke developed/fire rated per NFPA 90A.
 - a. All wiring will be routed in the bar joists and/or roof structure space and supported with tie-straps at maximum 6'-0" on center.
 - b. All drops and risers to HVAC equipment, fans, sensors, etc., will have a tie-strap installed directly above each device to insure a vertical support to the device.
 - c. Any open wiring that enters a conduit in the walls or drop/rise to connect equipment will have a minimum of 12" of wire looped outside the conduit above the ceiling and will be attached utilizing a tie-strap within 12" of the conduit end or connection.
3. Inaccessible Areas: Same as #1 above - includes wiring in walls, above hard ceilings, in chases, etc.
4. Inside Panels or Unit Enclosures: Wiring may be run outside conduit and

neatly tied in bundles for neatness and function.

5. Wiring in exterior and moist environments shall be routed in weatherproof liquid tight conduit with matching fittings and connections.
6. Minimum gauge for low voltage (24VAC or less) control wiring shall be 18 AWG copper solid conductor(s).

2.6 IDENTIFICATION/SIGNAGE

- A. Provide permanent phenolic labels for all operators, controllers, and sensors. Coordinate with ENGINEER on designations required. Submit Shop Drawing of installation indicating switch location(s) and identification. See Section *Mechanical Identification*.
- B. Provide operating instructions, mounted adjacent to equipment controller, as approved by Professional and TAB commissioner, for the following:
 1. Heat recovery units

2.7 CONTROL SEQUENCES

Control sequences shall be:

A. SPLIT-DX HEAT SYSTEMS

1. UNIT CONTROLS SHALL BE ENERGIZED FROM EXISTING CENTRAL TIME CLOCK BASED ENERGY MANAGEMENT SYSTEM "MCP" LOCATED IN JANITOR'S CLOSET, OR AS INDICATED ON DRAWINGS.
2. WHEN THE UNIT CONTROLS ARE ENERGIZED, EVAPORATOR FAN SHALL CYCLE WITH LOAD AND ZONE HEATING AND COOLING THERMOSTAT SHALL CONTROL THE HEATING FUNCTION AND CYCLE CONDENSING UNITS TO MAINTAIN ZONE ENVIRONMENT CONDITIONS.
3. UNITS WITH CAPACITIES 2000 CFM OR GREATER WILL INCLUDE AND BE DE-ENERGIZED BY EXISTING DUCT MOUNTED SMOKE DETECTOR(S) LOCATED IN THE RETURN AND SUPPLY AIR TRUNK DUCT IF PRODUCTS OF COMBUSTION ARE DETECTED.
4. PROVIDE INDIVIDUAL CIRCUIT EVAPORATOR COIL FACE MOUNTED FREEZESTAT AND AUTOMATIC TIME DELAY RESTART CONTROLS ON SYSTEMS SCHEDULED WITH LOW AMBIENT CONTROLS, AND WITH CAPACITY EXCEEDING FIVE (5) TONS COOLING (CAPACITY).
5. ON HOT WATER HEATING SYSTEMS, A NORMALLY OPEN (TO COIL) LOW VOLTAGE CONTROL VALVE SHALL BE OPERATED FOR HEATING CONTROL. CONTROL VALVES ON SYSTEMS WITH SCHEDULED COOLING CAPACITY LESS THAN TEN (10) TONS SHALL BE TWO-WAY TWO-POSITION TYPE. LARGER CAPACITY SYSTEMS SHALL BE TWO-WAY ELECTRIC/ELECTRONIC MODULATING TYPE.
6. EXISTING THERMOSTATS AND CONTROLLERS TO BE REPLACED WITH NEW IN SAME LOCATION.

PART 3 – EXECUTION

3.1 INSTALLATION AND ADJUSTMENT

- A. Install and adjust required control components and systems in accordance with instructions of the manufacturer. Work shall be performed by employees of the manufacturer or an authorized representative.
- B. All control wiring shall be routed in accordance with paragraph 2.05 herein. Install control wiring and connections in accordance with applicable Sections of *DIVISION 26 and 28*.
- C. Except for short apparatus connections run conduit parallel to or at right angles to the building structure. Conceal conduit in finished spaces.
- D. Do not run conduit concealed under insulation or inside ducts. Mount control devices and conduit located on ducts or apparatus with external insulation or stand-off support to avoid interference with insulation.
- E. Run wire connecting devices on or in control cabinets parallel with the sides of the cabinet neatly racked to permit tracing. Rack connections bridging a cabinet door along the hinge side and protect from damage. Provide grommets, sleeves or vinyl tape to protect plastic tubing or wires from sharp edges of panels, conduit, and other items.
- F. Provide all necessary factory and/or field labor for complete calibration and adjustment of the air flow control components, and be responsible for setting all control set points, operating sequences, and alarm systems contained within the control center to produce the system performance specified.
- G. Provide water heater controls, operating instructions, controls and piping schematic in neat laminated displays for mounting in water heater room.
- H. CONTRACTOR shall provide all power wiring and connect relays, time clocks, control panels, MCP, etc. which are furnished by CONTRACTOR.
- I. Provide permanent identification of panel MCP, time clock, and all controllers, by zone, etc. as per Section *Mechanical Identification* and PROFESSIONAL'S instruction. Submit details of proposed identification along with control schematics and device specifications for PROFESSIONAL'S approval. Submit Drawings, schematics, operating instructions, etc. to be posted, framed, laminated, etc. to PROFESSIONAL for approval.

3.2 FIRE ALARM/SMOKE DETECTION COORDINATION

- A. When an existing fire alarm system exists, or a new fire alarm system is being installed as a part of this project (see *DIVISION 26 and 28*), the CONTRACTOR shall provide and install all specified duct and/or plenum mounted smoke detectors as called for by code, specified, and on Mechanical Drawings, etc. and connect devices to fire alarm system.
- B. If no fire alarm system is involved with this project, the CONTRACTOR shall provide and install all specified duct and/or plenum mounted smoke detectors as called for by code, specified, and on Mechanical Drawings, etc. and interlock with individual HVAC systems for shut-down of equipment.
- C. In general, all smoke detectors shall annunciate to, and be compatible with the fire alarm system. All fire alarm wiring, annunciators, and adaptation to fire alarm

system by the CONTRACTOR. All shutdown and controls to automatically de-energize HVAC systems are by the CONTRACTOR.

- D. It is the CONTRACTOR's responsibility to coordinate these responsibilities for safety and operating controls, for complete and operative HVAC systems.
- E. Smoke detectors of proper size and type shall be furnished and properly installed per NFPA and International Electrical and Mechanical codes. The detectors shall be furnished with necessary N.C. and N.O. contacts to accomplish shutdown of HVAC systems.
- F. Each detector shall have a remote alarm and test station installed where directed by ARCHITECT or as shown on Drawings.
- G. See *Division 26 and 28* specifications for other requirements; coordination by this CONTRACTOR.
- H. In general, specified CONTRACTOR above shall furnish and install approved smoke detection and shutdown controls for the following HVAC equipment and accessories:
 - 1. HVAC air handling systems with air delivery capacity 2000 cfm or greater.
 - 2. This includes makeup air, exhaust, heat recovery, ventilation and similar HVAC support and auxiliary systems.
 - 3. All HVAC equipment with smoke detectors shall be additionally connected to the fire alarm system such that the equipment shall automatically be de-energized by any fire alarm annunciation from the same zone as is served by the same HVAC equipment.

END OF SECTION

SECTION 230990 - TESTING, ADJUSTING AND BALANCING

PART 1 – GENERAL

1.1 SCOPE

- A. The process of Testing, Adjusting and Balancing (TAB) for mechanical HVAC and Plumbing systems is a requirement for this project.
- B. Definitions and Abbreviations:
 - 1. TAB: Testing, Adjusting and Balancing. The process of checking and adjusting HVAC and plumbing systems to meet design objectives and performance intent.
 - 2. AABC: Associated Air Balance Council.
 - 3. NEBB: National Environmental Balancing Bureau.
 - 4. Plumbing Systems: Domestic hot water and re-circulating systems.
 - 5. Air Systems: Included all supply air, return air, exhaust air, transfer air and outside air systems.
- C. The CONTRACTOR shall provide the services of a qualified independent TAB Agency for testing, adjusting, and balancing as described herein and include same in his bid. CONTRACTOR shall submit TAB AGENCY experience, agenda and associated credentials to PROFESSIONAL for TAB AGENCY and agenda approval.

1.2 APPLICABLE STANDARDS

- A. TAB Agency Qualifications: Current membership in AABC or NEBB.
- B. Performance Criteria: Work shall be performed in accordance with the approved TAB agenda requirements.
- C. Test Equipment Criteria: The basic instrumentation requirements and accuracy/calibration required by AABC (Section Two) or Section II of the NEBB Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems.
- D. A factory air test hood, recently calibrated, shall be utilized for ceiling air device CFM measurement.

1.3 APPLICABLE PUBLICATIONS:

The following publications form a part of this Specification to the extent indicated by the reference thereto. In text the publications are referred to by the initials of the organization.

- A. Associated Air Balance Council (AABC):
 - 1. National Standards for Total System Balance, 2002 Edition
- B. National Environmental Balancing Bureau (NEBB):
 - 1. Procedural Standards for Testing, Adjusting, Balancing of Environmental Systems, 8th Edition, 2015
 - 2. Procedural Standards for Measuring Sound and Vibration, 2nd Edition, September 2006

1.4 CORRESPONDENCE

- A. Representative of TESTING, ADJUSTING and BALANCING Agency shall report to the CONTRACTOR, during all phases of the test and balance process, any deficiencies that will impair the proper balance and operation of the systems involved. This shall include, but not limited to, reporting balancing valves/dampers, controls, and safety sensors, etc. not installed as called for on the Plans or in the Specifications.
- B. The TAB Agency shall submit preliminary reports a minimum seven (7) days prior to scheduled substantial completion for this project or any phase thereof, and including a comprehensive narrative of problems, obstacles, recommendations, and remedial actions for PROFESSIONAL'S review and approval.
- C. TAB Agency shall not release any reports to other parties until such has been approved by the PROFESSIONAL.

PART 2 PRODUCTS NOT APPLICABLE

PART 3 – EXECUTION

3.1 GENERAL

- A. Coordinate TAB procedures with any phased construction requirements for the project so that usable increments of finished work may be accepted for beneficial occupancy. Systems serving partially occupied phases of the project may require balancing for each phase prior to final balancing and shall required separate TAB effort and reports for each phase and submittal prior to advancing to next phase of project.
- B. Allow sufficient time in construction schedule for TAB prior to substantial completion inspection for the project.
- C. Conduct final TAB after system has been completed and is in full working order. Put all HVAC systems into full operation and continue operation of the systems during each working day of TAB. Accomplish TAB in accordance with the CONTRACTOR provided Agenda approved by PROFESSIONAL.
- D. Substantial Completion: Substantial Completion of mechanical systems shall not be given without TAB Agency's written certification that the mechanical systems and controls have been thoroughly tested and are safely performing as intended. See certification required herein. No other certification will be acceptable.
- E. Preparation of Equipment and Systems for Testing and Balancing:
 - 1. The CONTRACTOR shall, upon completion of items or work required by this contract, thoroughly clean all dirt and debris from equipment, ducts, piping systems, strainers, accessories, etc. All bearings, gear boxes, wearing surfaces, or other equipment components requiring lubrication shall be properly serviced as recommended by the equipment manufacturer and shall be tagged with the date of service and type of lubricant used. All specified cleaning and protective devices shall then be installed in equipment, piping, plenums, ductwork, etc., and systems shall be placed in continuous operation. All fans shall have been in operation for at least twenty-four (24) hours prior to the start of testing and balancing so that initial stretch of drive belts will have taken place, and all other mechanical equipment including all temperature and operating control devices will have

been adjusted and calibrated for complete and functional operating service.

- F. System balancing and performance testing:
1. The CONTRACTOR shall secure copies of all report forms, data sheets, and instrumentation to be used by the agency in the performance of their services and submit the same for approval. This submittal data shall include a tabulation of instruments and devices to be utilized in the performance of testing and balancing operations and shall include the name of the manufacturer of the instrument of devices, model number, range, degree of accuracy, date of last calibration, or the other pertinent information that may be required to determine the utility of the instrument of device. As a minimum requirement, the following instrumentation shall be employed in the performance of balancing and testing of mechanical system: swinging vane or hot wire type anemometer, low range (0-0.25 in. water column) inclined tube manometer, high range (0-20 in. water column) U-tube manometer, pilot tube, ammeter, volt-meter, self-timing tachometer (maximum scale Division 2 rpm) pyrometer, powered psychrometer, vibration meter, other instruments, tools, and devices as required to accurately balance and test mechanical systems and components.
- G. It is the responsibility of this section to make certain that all the submitted and/or existing equipment has proper motor size, sheave size, belt size, etc.

3.2 AIR BALANCE

- A. Place all interactive systems in operation with all filters installed and automatic control systems completed and operating. Artificially load air filters by partial blanking or other means to provide air pressure drop midway between the clean and dirty condition. Set/reset room thermostats and humidistat, and/or equipment controls as necessary to check heating and cooling functions, and air flow rates for air distribution devices and adjust units if not within specified tolerances.
- B. Balance systems to design ratings. Adjust fan speeds to provide design flows, including system diversities, at actual system pressures. Belt drives, including sheaves, belts, etc. shall be adjusted and/or replaced as required to safely obtain specified performance.
- C. Make pitot tube traverses of all trunk lines and major branches when required to determine proper proportioning of air flows. Airflow measuring devices, where installed, may be utilized for this purpose. Seal duct access holes with snap in plugs.
- D. Record pressure drop readings across all major system components and significant drops within duct systems such as air filters, coils, heaters, etc.
- E. Make flow and pressure measurements at each terminal device, and each supply, return, or exhaust diffuser. Adjust each air outlet unit within plus or minus 10 percent of design requirements, but total air for each system shall be not less than shown unless otherwise approved by PROFESSIONAL. Adjust grilles and diffusers to minimize drafts in all areas. Mark permanently all damper quadrants at final set points. Total differentials between ventilation and exhaust for the purpose of proper pressurization, shall be maintained.
- F. Adjust exhaust systems to indicated CFM requirements (+/- 10%).

3.3 VIBRATION TESTING

Check for excessive vibration of rotating equipment.

3.4 SOUND TESTING

Check for excessive noise from equipment, air distribution devices, etc. and notify PROFESSIONAL of any objectionable noise levels. Perform noise/sound measurement and provide noise level calculations/results in rooms and areas requested by PROFESSIONAL.

3.5 MINIMUM TAB DATA REQUIRED

Approved TAB Agency shall furnish all labor and materials to balance the following new and/or modified equipment and systems: The following minimum information shall be provided:

A. Air Handling Units.

1. Total S/A CFM –
2. R/A CFM –
3. O/A CFM (Min/Max) –
4. R/A E.A.T. - Db/Wb (Cooling) –
5. O/A E.A.T. - Db/Wb (Cooling) –
6. S/A L.A.T. - Db/Wb (Cooling) –
7. R/A E.A.T. - (Heating) –
8. O/A E.A.T. (Heating) –
9. S/A L.A.T. - (Heating) –
10. G.P.M. (with heating control valve 100% open [where applicable]) –
11. A.P.D. All Coils - (at 100% capacity) -
12. W.P.D. All Coils - (at 100% capacity) -
13. External Static Pressure
14. Fan RPM
15. Fan Motor F.L.A. rated vs. actual
16. Fan Motor Horsepower and Service Factor (belt drive units)
17. Size, Type, Efficiency and Relative Condition of all Air Filters

B. Condensing Units:

1. E.A.T. –
2. L.A.T. –

3. Voltage –
 4. F.L.A. –
 5. Outdoor ambient (°F) –
- C. Mark all flow C.F.M., balance valve set points, etc. on an 11"x17" reduced scale set of working drawings and submit to PROFESSIONAL with TAB report prior to completion of work.
 - D. Submit list of equipment with excessive vibration.
 - E. Submit the Test and Balance report as indicated above, along with the working drawing to PROFESSIONAL for approval prior to completion and substantial completion inspection to job.
 - F. Verify that all mechanical system controls, safety and shutdown interlock and sequence of operation is as specified. TAB Agency shall provide written certification that he has verified same and/or note any and all discrepancies. See paragraph 3.11 for specific certification.

3.6 TAB SITE VISIT COORDINATION

- A. The TAB Agency shall inform the PROFESSIONAL, in writing seven (7) calendar days prior to his site visit for final TAB of systems such that PROFESSIONAL may be present to witness same, at PROFESSIONAL'S sole discretion. Changes to schedule shall be coordinated with and approved by PROFESSIONAL, with sufficient advance notice. TAB Agency shall be required to coordinate with PROFESSIONAL'S office representative, date of final inspection, and provide random tests and verification of TAB report information, at PROFESSIONAL'S selection.
- B. It shall also be the responsibility of the TAB agency to include the cost of any opposite season check-out of all system components which might be required and modify air distribution delivery and/or temperature to any room, area, or zone which may require adjustment during the first year of system operation.

3.7 SYSTEM CHANGES

- A. Final balancing changes shall be approved by the CONTRACTOR'S who installed the equipment. Changes may encompass, but not be restricted to, changing the pulleys, belts, dampers or adding dampers, balancing valves, etc.
- B. The TAB Agency shall coordinate with the CONTRACTOR any changes required including belts, sheaves, etc. to balance systems within specified tolerances. All cost of any modifications is the responsibility of the CONTRACTOR.

3.8 VERIFICATION / INSPECTION

- A. After the final TAB report is submitted and reviewed by the PROFESSIONAL, he will soon afterward schedule a verification inspection with the TAB Agency. At this inspection, the TAB Agency will test airflow flows, water flows, sound levels, control operation and sequence, for random air distribution grilles, fans, AHU's, equipment, piping, etc., as selected by PROFESSIONAL.
- B. This inspection will last no longer than four (4) hours for each completed phase of the project. Should this verification information exceed the specified tolerance, the TAB Agency may be required to retest and balance the entire system(s) to these tolerances, solely at the PROFESSIONAL's discretion. A follow-up verification

inspection shall then be required, and the procedure will begin again. The cost of these inspections, re-inspections, TAB and reports shall be borne by the CONTRACTOR.

3.9 CERTIFICATION

The TAB Agency shall provide the following written TAB certification within the final TAB report (see also Section *Mechanical Submittals and Shop Drawings*):

“The Testing, Adjusting and Balancing (TAB) Agency certifies that the HVAC air and plumbing water systems and controls have had a full range of tests and checks carried out by the TAB Agency, to determine if all components, sub-systems, systems and interfaces between systems operate in accordance with the Contract Documents. This includes all modes and sequences of control operation, interlocks and conditional and specified control responses to abnormal, safety and emergency conditions. The (TAB) Agency had provided to the OWNER the specified training and documentation on the operation of these systems such that these systems can be safely and efficiently operated in line with design requirements.”

3.10 OWNER EDUCATION REQUIREMENTS AND INVOLVEMENT

See Section *Mechanical Close-out Requirements* for Owner Education requirements.

END OF SECTION

SECTION 26 01 00
BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes:
 - 1. Basic electrical requirements.

1.02 BASIC ELECTRICAL REQUIREMENTS

- A. Quality Assurance:
 - 1. Workers possessing the skills and experience obtained in performing work of similar scope and complexity shall perform the Work of this Division.
 - 2. Refer to other sections of the Specifications for other qualification requirements.
- B. Drawings and Specifications Coordination:
 - 1. For purposes of clearness and legibility, Drawings are essentially diagrammatic and the size and location of equipment is indicated to scale whenever possible. Verify conditions, dimensions, indicated equipment sizes, and manufacturer's data and information as necessary to install the Work of this Division. Coordinate location and layout with other Work.
 - 2. Drawings indicate required size and points of termination of conduits, number and size of conductors, and diagrammatic routing of conduit. Install conduits with minimum number of bends to conform to structure, avoid obstructions, preserve headroom, keep openings and passageways clear, and comply with applicable code requirements.
 - 3. Routing of conduits may be changed provided that the length of any conduit run is not increased more than 10 percent of length indicated on the Drawings.
 - 4. Outlet locations shall be coordinated with architectural elements prior to start of construction. Locations indicated on the Drawings may be distorted for clarity.
 - 5. Coordinate electrical Work with all other Work.
 - 6. The scope of the electrical work includes furnishing, installing testing and warranty of all Electrical work and complete electrical systems shown on the electrical drawings and specified herein.
 - 7. The drawings and specifications complement each other and together complete the contract documents for the electrical work included in this project. Neither the drawings or the specifications are complete without the other. Any item mentioned in either document is binding. Where conflicts arise between the drawings and the specifications, the more stringent requirement shall prevail.
 - 8. The contractor shall provide and install all electrical systems to provide a complete package as indicated by the contract documents. The documents are intended to provide an outline for the required installations. The contractor shall ultimately provide a complete and operational system at the conclusion of the project.
 - 9. Details are provided as they relate to the installation. Contractor shall provide and install all miscellaneous components, parts, materials, fasteners, splices, and any other incidental items necessary to provide a complete installation.
- C. Terminology:
 - 1. Signal Systems: Applies to clock, bell, fire alarm, annunciator, sound, public address, telephone, television systems.

2. Low Voltage: Applies to signal systems operating at 120 volts and less, and power systems operating at less than 600 volts.
 3. UL: Underwriter's Laboratories Inc, Nationally Recognized Testing Laboratory (NRTL), or equal.
- D. Regulations: Work shall comply with the requirements of authorities having jurisdiction and the Electrical and Building Codes. Material shall conform to regulations of the National Board of Fire Underwriters for electrical wiring and apparatus. Materials shall be new and listed by UL, or another NRTL.
- E. Structural Considerations for Conduit Routing:
1. Where conduits pass through or interfere with any structural member, or where notching, boring or cutting of the structure is necessary, or where special openings are required through walls, floors, footings, or other buildings elements, contractor shall submit shop drawings to the architect for approval.
- F. Electrically Operated Equipment and Appliances:
1. Furnished Equipment and Appliances:
 - a. Work shall include furnishing and installing wiring enclosures for, and the complete connection of electrically operated equipment and appliances and electrical control devices which are specified to be furnished and installed in this or other sections of the Specifications, wiring enclosures shall be concealed except where exposed Work is indicated on the Drawings.
 - b. Connections shall be provided as necessary to install equipment ready for use. Equipment shall be tested for proper operation and, if motorized, for proper rotation. If outlets are of incorrect electrical characteristics or any specified equipment fails to operate properly, repair and/or replace the outlet and/or equipment.
 2. Equipment and Appliances Furnished by Others:
 - a. Equipment and appliances indicated on Drawings as "not in contract" (NIC), "furnished by others," or "furnished by the Owner," will be delivered to the Project site. Required electrical connections shall be performed for such equipment and appliances. Motorized equipment will be furnished factory-wired to a control panel or junction box unless otherwise indicated. Appliances will be furnished equipped with portable cord and cap. Provide disconnect switches where required.
 - b. Connections to equipment furnished under this Division shall be part of the Work of this section. Work shall include internal wiring, installation, connection and adjustment of bolted drive motors in which the motor is supplied as a separate unit, and connections only for equipment furnished with factory installed internal wiring, except as further limited by Drawings and this Specification. Work shall include furnishing and installing suitable outlets, disconnecting devices, starters, push-button stations, selector switches, conduit, junction boxes, and wiring necessary for a complete electrical installation. Work shall also include furnishing and installing conduit and boxes for HVAC control systems, furnished under Division 15. Devices and equipment furnished shall be of same type used elsewhere on the Work or as specified.
 - c. Electrical equipment furnished under other sections, for installation and connection under Work of this section, will be delivered to the Project site ready for installation.
 - d. Equipment furnished under other sections, and requiring electrical connection under this section, will be set in place as part of the Work of the section furnishing such equipment unless noted otherwise. If electrical connections exceed the requirements of the specified equipment, it shall be the responsibility of the contractor or vendor supplying the equipment to compensate the electrical

contractor for any and all work to make the electrical connections to the equipment being supplied. Any discrepancies shall immediately be brought to the engineers' attention for coordination between all other disciplines. All increased costs shall be the responsibility of the contractors, not the owner, architect, or engineer.

- e. Suitability and condition of equipment furnished under other sections shall be determined in advance of installation. Immediate notice of damage, unsuitability, or lack of parts shall be given to the entity providing such equipment.

G. Protection of Materials:

1. Protect materials and equipment from damage and provide adequate and proper storage facilities during progress of the Work. Damaged materials and/or equipment shall be replaced.

H. Cleaning:

1. Exposed parts of Work shall be left in a neat, clean, usable condition. Finished painted surfaces shall be unblemished and metal surfaces shall be polished.
2. Thoroughly clean parts of apparatus and equipment. Exposed parts to be painted shall be thoroughly cleaned of cement, plaster, and other materials. Remove grease and oil spots with solvent. Such surfaces shall be wiped and corners and cracks scraped out. Exposed rough metal shall be smooth, free of sharp edges, carefully steel brushed to remove rust and other spots, and left in proper condition to receive finish painting.
3. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

I. Permits and Regulations:

1. Include payment of all permit and inspection fees applicable the work in this Division.
2. Work must conform to the National Electric Code, National Electrical Safety Code, and other applicable local, state, and federal laws, ordinances, and regulations. Where drawings or specifications exceed code requirements, the drawings and specifications shall govern. No work shall be installed which is less than minimum legal standards.
3. All work performed under this Division shall be inspected and approved by the Local Authority having Jurisdiction.

J. Site Inspection:

1. Each and all bidders shall inspect the project site prior to bidding.
2. Existing site conditions shall be compared with the information shown on the drawings. Immediately report any discrepancies to the Architect. After project bid date, no allowances will be made for failure to have made inspections.
3. During construction, the contractor shall exercise care and take appropriate precautionary measures to prevent any damage to the existing structures, sidewalks, utilities, communications, etc. during the project. The Contractor shall correct all damage caused by or during the project. Contractor shall provide not less than (2) and not more than (10) working days advance written, electronic, or telephonic notice of the commencement, extent, location and duration of the excavation work to Mississippi One-Call System, Inc. (1-800-227-6477) and any nonmembers operator(s) of any underground utility lines or underground facilities in and near the excavation area, so that Mississippi One-Call System, Inc operator(s) and any non-member operator(s) may locate and mark the location of underground utility lines and underground facilities in the excavation area.

K. Utility Coordination:

1. Contractor shall inspect and verify the existing utilities at the project site prior to bidding.

L. Temporary Lighting and Power for Construction:

1. The electrical contractor shall provide and install temporary lighting during the period of construction. Temporary lighting shall be provided to meet all local ordinances, codes, and safety requirements. Lighting shall be installed in all open, general, and thoroughfare areas of construction. This shall not include any task lighting specifically required by any trade to complete their work or installations.
2. The electrical contractor shall provide and install temporary power during the construction period as required to complete the project installation. Contractor shall coordinate with the general contractor, utility company, and/or owner to provide 120/240 volt power for the project. All devices shall be provided with ground fault circuit protection. Power shall be provided in central work area(s). This shall not include any remote power needs for any specific trades. For power requirements at voltages other than those listed above, the contractor shall coordinate connection requirements with the local utility company.
3. All temporary lighting and power installations shall meet local and national codes and be approved by the local authority having jurisdiction.
4. Temporary services shall be removed at completion of the project. Permanent utilities shall not be used during the Project except with the written permission of the Owner.

1.03 SUBMITTALS

- A. Where indicated submit to architect, (1) electronic copy PDF of Shop Drawings including control diagrams, list of materials, catalog cuts, technical data, manufacturer's specifications, and applicable installation details.

1.04 RECORD DRAWINGS

- A. The Electrical Contractor shall maintain, at the project site, a separate set of prints of the contract documents and shall show all changes and variations, in a neat and clearly discernible manner, which are made during construction. Upon completion of the work, these drawings shall be turned over to the Architect. Provide the following as-built documents including all contract drawings regardless of whether corrections were necessary and include in the transmittal: "2 sets of CDs and prints for Owner's use, one set of CDs, prints for Architect / Engineers Records". Delivery of these as-built electronic files and prints are a condition of final acceptance.

1.05 OPERATION AND MAINTENANCE MANUALS

- A. The Electrical Contractor shall submit to architect (3) copies each of operating and maintenance manuals for each piece of equipment applicable to the project.
- B. All shop drawings, installation, operation, and maintenance manuals, wiring diagrams, parts lists, and other information including warranties and technical support, shall be obtained from each manufacturer.
- C. Assemble all information into three-ring binders or other suitable binding. Add an index and/or tabbed and labeled sections of all items submitted.
- D. The Electrical Contractor shall at all times, maintain a clean set of construction document plans on site. Any and all deviations from the construction documents shall be marked, and clearly noted in red ink. All changes shall exactly indicate the revisions or changes to the design documents. Upon completion of the project, (2) clean sets of "red-line" construction as-built documents shall be submitted to the architect. Unclear, illegible, or inaccurate plans will be returned to the contractor for correction and resubmission. As-built documents shall be corrected by the Electrical Contractor and resubmitted at no additional cost.

1.06 INSPECTIONS AND PUNCH LIST

- A. The Electrical Contractor shall survey and inspect his work and develop his own punch list to confirm that work is complete and finished. He shall then notify the General Contractor that work

is complete and ready for inspection by the Architect. It is not the Architects or Engineers obligation to perform a final inspection until the contractor states his work has been inspected and is complete and ready for final inspection.

- B. Request to the Architect, Engineer, or Owner for final inspection may be accompanied by a limited list of known deficiencies with a brief explanation or status of deficiencies and schedule for completion of each. Correction of these items shall be completed within (30) days of inspection or before final acceptance of occupancy.

1.07 WARRANTY

- A. The Electrical Contractor shall warrant all workmanship, equipment, and materials installed under this contract for a period of (1) year minimum from the date of final acceptance as agreed between the Contractor and the Architect, unless indicated by other sections of these specifications.
- B. Any equipment, materials, etc. proving to be defective during the warranty period shall be corrected or replaced without any expense to the Owner or other parties. This provision shall not be construed to include general maintenance items or luminaire lamps or correcting errors on the part of the owner, owner's personnel, or owner's representative.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and Equipment furnished under this contract shall be in strict accordance with the specifications and drawings and shall be new and of best grade and quality. When two or more items of equal and similar materials and construction are required, they shall be of the same manufacturer.
- B. All electrical equipment and materials shall bear the Underwriters Laboratories, Inc. label, and shall comply with the NEC and NFPA requirements as applicable.

2.02 MATERIALS AND EQUIPMENT SELECTION

- A. Selection of Materials and Equipment furnished under this contract shall be determined by the following:
 - 1. Where trade names, brands, and manufacturer's part numbers are listed, the exact equipment listed shall be furnished. Where more than one name is used, the contractor shall have the option of selecting between those specified. All products used shall be equal to that specified and shall be of best quality.
 - 2. When the words "or equal" appear, specific approval must be obtained from the Architect during the bidding period in sufficient time to be included in an addendum. The same shall apply for equipment and materials not named in the specifications, where approval is sought.
 - 3. Alternate materials and/or equipment must be submitted for approval a minimum 2 weeks prior to project bid date.
- B. Before bidding, when preparing shop drawings, and prior to rough-in for installation, the contractor shall verify that adequate space is available for entry and installation of the item including any accessories. Also that adequate space is available for servicing equipment and required code clearances are satisfied.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Advise the general contractor or architect before starting the Work of this Division.
- B. Exposed conduits shall be painted to match the surfaces adjacent to installation. Refer to painting and coating section of specifications.
- C. Salvaged materials, if applicable, removed from buildings shall be removed from the Project site as required by the general contractor.
- D. Trenches outside of barricade limits shall be backfilled and paved within 24 hours after being inspected. Provide traffic plates during the time that trenches are open in traffic areas and in areas accessible to nonconstruction personnel.
- E. Where structural walls are cored for new conduit runs, separation between cored holes shall be 3 inches edge to edge, unless otherwise required by the Architect. All coring to be laid out and reviewed by Architect prior to drilling. Contractor to verify location of structural steel, rebar, stress cabling, or similar prior to lay out.
- F. Electrical equipment shall be braced and anchored as indicated on the Drawings.

3.02 CLEANUP

- A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.03 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS

PART 1 - GENERAL

1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes: Low-voltage wire, splices, terminations and installation.

1.02 SUBMITTALS

- A. None.

PART 2 - PRODUCTS

2.01 WIRES

- A. Wires shall be single conductor type THHN or THWN insulated with polyvinyl chloride and covered with a protective sheath of nylon, rated at 600 volts. Wires may be operated at 90 degrees C. maximum continuous conductor temperature in dry locations, and 75 degrees C. in wet locations and shall be listed by UL Standard 83 for thermoplastic insulated wires, listed by Underwriter's Laboratories (UL) for installation in accordance with Article 310 of the National Electrical Code (NEC). Conductors shall be solid or stranded copper for 12 AWG and smaller conductors, and stranded copper for 10 AWG and larger conductors. Conductors shall be insulated with PVC and sheathed with nylon. Wires shall be identified by surface markings indicating manufacturer's identification, conductor size and metal, voltage rating, UL symbol, type designations and optional rating. Indentations for lettering is not permitted. Wires shall be tested in accordance with the requirements of UL standard for types THWN, or THHN.
- B. Conductors shall be solid Class B or stranded Class C, annealed uncoated copper in accordance with UL standards, or another Nationally Recognized Testing Laboratory (NRTL).

2.02 STANDARDS

- A. THWN/THHN wires shall comply with the following standards:
 - 1. UL 83 for thermoplastic insulated wires.
 - 2. UL 1063 for machine tool wires and cables.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Wires shall not be installed until debris and moisture is removed from conduits, boxes, and cabinets. Wires stored at site shall be protected from physical damage until they are installed and walls are completed.
- B. Wire-pulling compounds furnished as lubricants for installation of conductors in raceways shall be compounds approved and listed by UL, NRTL, or equal. Oil, grease, graphite, or similar substances are not permitted. Pulling of 2 AWG or larger conductors shall be performed with a cable pull machine. Any runs shorter than 50 feet are exempt. When pulling conductors, do not exceed manufacturer's recommended values.
- C. At outlets for power, and equipment, pigtail splices with 8-inch circuit conductor leads for connection to fixtures, equipment, and devices.
- D. Pressure cable connectors, pre-insulated Scotchlok, 3M, or equal, Y, R or B spring-loaded twist-on type, may be furnished in splicing number 8 AWG or smaller wires for wiring systems; except public address and telephone systems.

- E. All Joints, splices, taps, and connections to panelboard neutral, bonding or grounding conductors, conductors to ground busses, and transformer connections for wires 6 gauge and larger shall be performed with high-pressure cable connectors approved for installation with copper conductors. Connectors shall be insulated with heavy wall heat shrink WCSM, or cold-applied roll-on sleeve RVS. Insulation level shall be a minimum of 600V and joints, splices, and taps shall be qualified to ANSI C 119.2, UL, NRTL, or equal listed mechanical pressure connections.
- F. Connections to any bussing and high-press cable connectors shall be securely bolted together with corrosion-resistant plated carbon steel, minimum grade 5 machine screws secured with constant pressure-type locking devices.
- G. Connection of any bonding or grounding conductors shall be securely bolted together with corrosion-resistant plated carbon steel, minimum grade 5 machine screws secured with constant pressure-type locking devices.
- H. Wiring in panelboards, panel cabinets, pull boxes, and other cabinets, shall be neatly grouped and tied in bundles with nylon ties at 10-inch intervals. In switchboards, panels and terminal blocks, wires shall be fanned out to terminals. If bundles are longer than 24 inches, a maximum of 9 current carrying conductors may be bundled together.
- I. Install conductor lengths with a minimum length within the wiring space. Conductors must be long enough to reach the terminal location in a manner that avoids strain on the connecting lug.
- J. Maintain the conductor required bending radius.
- K. Neutral conductors larger than 6 gauge, which are not color identified throughout their entire length, shall be taped, painted white or natural gray, or taped white where they appear in panelboards, cabinet, gutters or pull boxes. Neutral conductors 6 gauge and smaller shall be white color identified throughout their entire length.
- L. Wiring systems shall be free from short circuits and grounds, other than required grounds.

3.02 COLOR CODES

A. General Wiring:

1. Color code conductor insulation as follows:

SYSTEM VOLTAGE		
Conductor	208Y/120	480Y/277
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White or Gray	White with colored stripe

Neutrals shall be colored-distinguished if circuits of two voltage systems are used in the same raceway.

2. For phase and neutral conductors 6 gauge or larger, permanent plastic-colored tape may be furnished to mark conductor end instead of coded insulation. Tape shall cover not less than 2 inches of conductor insulation within enclosure.

3.03 FEEDER IDENTIFICATION

- A. Feeder wires and cables shall be identified at each point the conduit run is broken by a cabinet, box, gutter, etc. Where terminal ends are available, identification shall be by means of heat shrink wire markers, which provide terminal strain relief. Markers shall be Brady Perma-Sleeve,

or equal. Identification in other areas shall be by means of wrap-around tape markers Brady Perma-Code or equal. Markers shall include feeder designation, size, and description.

3.04 TAPE AND SPLICE KITS

- A. Splices, joints, and connectors joining conductors in dry and wet locations shall be covered with insulation equivalent to that provided on conductors. Free ends of conductors connected to energized sources shall be taped. Voids in irregular connectors shall be filled with insulating compound before taping. Thermoplastic insulating tape approved by UL, NRTL, or equal for installation as sole insulation of splices shall be furnished and shall be installed according to manufacturer's printed specifications.

3.05 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.06 CLEANUP

- A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes: Provide and install grounding system as indicated or required.
- C. Related Sections:
 - 1. Refer to related sections for their system grounding requirements.
 - 2. Section 26 01 00: Basic Electrical Requirements.

1.02 QUALITY ASSURANCE

- A. Reference Standards:
 - 1. IEEE 142 Green Book.
 - 2. Underwriter's Laboratories (UL).
 - 3. National Electrical Code.
 - 4. Building Industry Consultant Services International (BICSI) (Signal).
 - 5. EIA/TIA (Signal and power).
 - 6. Nationally Recognized Testing Laboratory (NRTL) or equal.

1.03 SYSTEM DESCRIPTION

- A. Metallic objects on the Project site that enclose electrical conductors, or that are likely to be energized by electrical currents, shall be effectively grounded.
- B. Metal equipment parts, such as enclosures, raceways, and equipment grounding conductors, and earth grounding electrodes shall be solidly joined together into a continuous electrically conductive system.
- C. Metallic systems shall be effectively bonded to the main grounding electrode system.
- D. A separately derived AC source shall be grounded to the equipment grounding conductor, and to separate "made" electrode of building grounding electrode system.
- E. Electrical continuity to ground metal raceways and enclosures, isolated from equipment ground by installation of non-metallic conduit or fittings, shall be provided by a green insulated grounding conductor of required size within each raceway connected to isolated metallic raceways, or enclosures at each end. Each flexible conduit over 6 feet in length shall be provided with a green insulated grounding conductor of required size.
- F. Cold water, or other utility piping systems, shall not be utilized as grounding electrodes due to the installation of insulating couplings and non-metallic pipe in such installations.
- G. Non-current carrying metal parts of equipment enclosures, power conduits, panelboard enclosures, motor frames, equipment cabinets, and metal frames of buildings shall be permanently and effectively grounded. Provide a NEC sized grounding conductor in every raceway.
- H. Neutral of service conductors shall be grounded as follows:
 - 1. Neutral shall be grounded at only one point within the Project site for that particular service. Preferable location of grounding point shall be at the service panelboard, or main switch.
 - 2. Equipment and conduit grounding conductors shall be bonded to that grounding point.

3. Feeder neutrals shall be bonded at service entrance point only, neutrals of separately derived systems shall be bonded at the source only.

1.04 SUBMITTALS

- A. None.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Grounding conductors shall be copper, #12 minimum with green insulation, unless noted otherwise.
- B. Ground tails shall be copper, #12 minimum with green insulation, installed in all metallic junction boxes where devices are being installed. Branch circuit ground, junction box, and devices shall be bonded at each junction box.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All grounding shall be installed in accordance with details on drawings and per NEC 250.
- B. Bond panelboards and all electrical boxes and enclosures.
- C. All conduits shall have a grounding conductor, minimum #12 copper. Conductor size shall be increased based on ampacity and/or phase conductors of the circuit.
- D. Install grounding conductors at each panelboard location as noted on drawings.
- E. All branch circuit, device, and switch junction boxes shall contain a grounding conductor, minimum #12 copper with green insulation, to bond the one or more equipment grounding conductors and the metal box. Connections shall be made to splice the equipment grounding conductors, grounding pig-tail, and metal box by means of a grounding screw or listed grounding device.

3.02 TESTING

- A. Test grounding resistance of electrodes, ground rods, bonding of building steel, water pipes, gas pipes and other utility piping. Tests shall be performed as follows:
 1. Visually and mechanically examine ground system connections for completeness and adequacy.

3.03 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.04 CLEANUP

- A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 26 05 33
RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes:
 - 1. Raceways and wire ways
 - 2. Conduit installation.
 - 3. Underground requirements.
 - 4. Boxes, enclosures, keys and locks.
 - 5. Identifications and signs.
- C. Related Sections:
 - 1. Section 26 01 00: Basic Electrical Requirements.
- D. Applicable Standards and Codes
 - 1. EIA/TIA 569 Standards.
 - 2. National American Standards Institute (ANSI)
 - 3. National Electrical Manufacturer's Association (NEMA)
 - 4. Nationally Recognized Testing Laboratory (NRTL)
 - 5. National Electrical Code (NEC)
 - 6. Underwriters Laboratory (UL)

1.02 SUBMITTALS

- A. None.

PART 2 - PRODUCTS

2.01 RACEWAYS

- A. Conduit Materials:
 - 1. Metallic conduit, and tubing shall be manufactured under the supervision of an UL, or another NRTL factory inspection and label service program. Each 10-foot length of conduit and tubing shall bear the UL or another NRTL label and manufacturer's name.
 - 2. Rigid metallic conduit shall be rigid steel, heavy wall, mild steel, zinc-coated, with an inside and outside protective coating manufactured in accordance with ANSI C 80.1. Couplings, elbows, bends, condulets, bushings and other fittings shall be the same materials and finish as the rigid metallic conduit. Fittings, connectors, and couplings shall be threaded type, manufactured in accordance with ANSI C 80.1 and UL 6.
 - 3. Flexible metallic conduit shall be of flexible interlocking strip construction with continuous zinc coating on strips, manufactured in accordance with UL 1.
 - a. Connectors and couplings shall be required fittings of the type, which threads into convolutions of flexible conduit.

- b. Flexible non-metallic conduit is not allowed.
- 4. Liquid-tight flexible metal conduit shall be galvanized heavy wall, flexible locked metallic strip construction, UV rated, with smooth moisture and oil-proof, abrasion-resistant, extruded plastic jacket. Connectors shall be as required for installation with liquid-tight flexible conduit and shall be installed to provide a liquid-tight connection.
- 5. Non-metallic conduit shall be rigid PVC electrical conduit extruded to schedule 40 dimensions of Type II. Grade 1 high impact, polyvinyl chloride, sweeps, couplings, reducers and terminating fittings shall be listed under the UL, or another NRTL, and shall bear the manufacturer's listed marking.
- 6. Conduit size shall be 1/2" minimum for above grade installations and 3/4" minimum for below grade or in-slab installations.
- 7. Metal Clad (MC) cable system is not allowed.
- B. Sleeves for Conduits: Sleeves shall be adjustable type, of 26 gage galvanized iron, Adjust-to-Crete Co. Adjust-to-Crete, or Jet Line Products Inc. Jet-Line, or equal.
- C. Where conduit enters a building through a concrete foundation below grade, or ground water level, or where it is necessary to seal around a conduit where it passes through a concrete floor or wall, provide O-Z/Gedney Type FSK Thru Wall and Floor Seal, or equal.
- D. Wireways shall be 16 gage galvanized steel enclosed hinge/screw wiring troughs, surface metal raceway, wireway, and auxiliary gutter designed to enclose electrical wiring. Wireway fittings shall be furnished with removable covers and sides to permit complete installation of conductors throughout the entire wireway run. Cover shall be furnished with keyhole slots to accept captive screws locking the cover securely closed. Wireways shall be UL or another NRTL listed, and shall be Square D Type LDG NEMA-1 enclosure for interior applications, or Type RD NEMA-3R enclosure for exterior applications, or equal by Cooper B-line, Hoffman, Wire Guard, or Circle AW.
- E. Penetration in Fire-Rated Structures: Provide 3M, or equal, caulk and fire barriers for installing fire-rated seals around penetrations through floors, walls, and shafts. Fire stop system must be UL, or another NRTL listed, and classified for through-penetration applications of metallic conduits and busways.
- F. Pull Wires: Install 1/8 inch polypropylene cords in empty or spare conduits.

2.02 BOXES, ENCLOSURES, KEYS AND LOCKS

- A. Outlet Boxes and Fittings:
 - 1. Outlet boxes installed in concealed Work shall be galvanized steel, pressed, or welded type, with knockouts.
 - 2. In exposed Work, where conduit runs change direction or size, outlet boxes and conduit fittings shall be cast metal with threaded hubs cast integral with box or fitting.
 - 3. Fittings shall be cast metal and non-corrosive. Ferrous metal fittings shall be cadmium-plated or zinc galvanized. Castings shall be true to pattern, smooth, straight, with even edges and corners, of uniform thickness of metal, and shall be free of defects.
 - 4. Covers for fittings shall be galvanized steel or non-corrosive aluminum and shall be designed for particular fitting installed.
 - 5. Light fixture outlets shall be 4-inch octagon, 4-inch square, 2-1/8 inches deep or larger, depending upon number of conductors or conduits therein. Plaster or tile rings shall be furnished for suitable mounting of light fixture.

6. For local device outlets provide 4-inch square 2-1/8 inch deep, boxes for single gang, 4-11/16 inch square boxes for two-gang, and special solid gang boxes with gang plaster ring for more than 2 switches.
 7. Plaster or tile rings shall be provided on flush-mounted outlet boxes except where otherwise indicated or specified. Plaster or tile rings shall be same depth as finished surface. Install approved ring extension to obtain depth to finish surface.
 8. In plywood wall or drywall construction, and where flexible steel conduit is fished into walls, one-gang and 2-gang outlets for wiring devices may be sectional steel boxes with plaster ears. Boxes shall be fastened to plywood with flat-head screws in each plaster ear screw hole.
 9. Factory made knockout seals shall be installed to seal box knockouts, which are not intact.
 10. Where flexible conduit is extended from flush outlet boxes, provide and install weatherproof universal box extension adapters.
- B. Junction and Pull boxes:
1. Junction and pull boxes, in addition to those indicated, shall only be used in compliance with codes, recognized standards, and Contract Documents.
 2. Interior and non-weatherproof boxes shall be constructed of blue or galvanized steel with ample laps, spot welded, and shall be rigid under torsion and deflecting forces. Boxes shall be furnished with auxiliary angle iron framing where necessary to ensure rigidity.
 3. Covers shall be fastened to box with a sufficient number of brass machine screws to ensure continuous contact all around. Flush type boxes shall be drilled and tapped for cover screws if boxes are not installed plumb. Surfaces of pull and junction boxes and covers shall be labeled in black marker ink designating system, panelboard and circuit designation contained in box. In exposed Work, designation shall be installed on inside of pull box or junction box cover.
 4. Weatherproof NEMA 3R pull and junction boxes shall conform to foregoing for interior boxes with following modifications:
 - a. Cover of flush mounting boxes shall be furnished with a weather-tight gasket cemented to, and trimmed even with, cover all around.
 - b. Surface or semi-flush mounting pull and junction boxes shall be UL, or another Nationally Recognized Testing Laboratory (NRTL) listed as rain-tight and shall be furnished complete with threaded conduit hubs.
 - c. Exposed portions of boxes shall be galvanized and finished with one prime coat and one coat of baked-on gray enamel, unless already furnished with factory baked-on finish.
 5. Junction and pull boxes shall be rigidly fastened to structure and shall not depend on conduits for support.
 6. Polymer Concrete Boxes:
 - a. Polymer concrete boxes are to be made from aggregates in combination with polymer resin, combined and processed by mixing, molding, and curing, and reinforced with fiberglass.
 - b. Boxes are to be high strength, impact resistant, corrosion resistant, nonflammable, and noncorrosive.

- c. Enclosures, boxes and covers are required to conform to all test provisions of the most current ANSI/SCTE 77 "Specification For Underground Enclosure Integrity"
 - d. All components in an assembly (box & cover) are manufactured using matched surface tooling.
 - e. Covers shall be marked as electrical, power, communications, fiber, signal, etc. as required.
- C. Keys and Locks:
1. Provide 2 keys with furnished door locks, including cabinet door locks for all enclosures.

2.03 IDENTIFICATION AND SIGNS

- A. Identification Plates:
1. Provide identification plates for the following unless otherwise specified, for control panels, push-button stations, time switches, contactors, motor starters, motor switches, panelboards, and terminal cabinets.
 2. Identification plates shall be of plastic stock and shall adequately describe function, voltage and phase of identified equipment. Where identification plates are detailed or described on Drawings, inscription and size of letters shall be as indicated. For lighting and power panels, identification plates shall indicate panel designation, voltage, and phase of panel. For terminal cabinets, identification plates shall indicate system contained in terminal cabinet.
 3. Identification plates shall be black-and-white nameplate stock of bakelite with characters cut through black exposing white. Plates shall be furnished with beveled edges and shall be securely fastened in place with No. 4 Phillips-head, cadmium-plated steel, self-tapping screws. Characters shall be 3/16 inch high, unless otherwise indicated.
- B. Markings:
1. Install identification markings to surface-mounted starters, switches, disconnect switches, contactors, and other devices controlling motors and appliances. Provide abbreviations required along with an identifying number. Markings to be provided with locking type stencils using paint of a contrasting color. Figures shall be 3/8 inch high unless otherwise indicated. Self-sticking plastic labels, with embossed characters made with a typewriter may be installed instead of stencils and paint; self adhesive plastic, or self sticking laminated plastic labels may be installed.

PART 3 - EXECUTION

3.01 CONDUIT INSTALLATION

- A. General Requirements:
1. Provide complete and continuous systems of rigid metallic conduit, outlet boxes, junction boxes, fittings and cabinets for systems of electrical wiring including lighting, power, and systems, except as otherwise specified.
 2. EMT is not allowed.
 3. Within buildings, flexible metallic conduit may be installed instead of rigid steel conduit where permitted by code. Flexible metallic conduit shall not be installed for conduit

installations longer than 6 feet (inclusive of fittings and boxes), in concealed ceilings or walls, and where conduit size is 1-1/2 inches or greater.

4. Flexible metallic conduit shall be installed for final connection of motor terminal boxes, shop equipment, mechanical equipment, HVAC equipment and other equipment, or for frequent interchange, and shall be of sufficient length, not exceeding 36 inches, to permit full travel or adjustment of motor on its base. Flexible metallic conduit shall not be used for equipment not requiring adjustment or frequent interchange.
5. Liquid-tight flexible metallic conduit shall be installed at exterior locations or where subject to liquid or oil exposure, except where otherwise specified, for final connection of equipment and as listed above.
6. Connectors for flexible metal conduit and liquid-tight flexible metallic conduit shall be compatible with the conduit, and of the types which threads into convolutions of conduit. Connectors for watertight flexible metal conduit shall be as required for installation and shall be installed to provide a watertight connection.
7. Exposed conduit shall be installed vertically and horizontally following the general configuration of the equipment, using cast threaded hub conduit fittings where required and shall be clamped to equipment with suitable iron brackets and one hole pipe strap.
8. If connection is from a flush wall-mounted junction box, install an approved extension box.
9. Underground feeder distribution conduits for systems may be non-metallic conduit instead of rigid conduit except where otherwise specified or indicated.
10. Conduit shall be concealed unless otherwise indicated. Conduits exposed to view, except those in attic spaces and under buildings, shall be installed parallel or at right angles to structural members, walls, or lines of building. Conduits shall be installed to clear access openings.
11. Bends or offsets will not be permitted unless absolutely necessary. Radius of each conduit bend or offset shall be as required by ordinance. Bends and offsets shall be performed with standard industry tools and equipment or may be factory fabricated bends or elbows complying with requirements for radius of bend specified. Heating of metallic conduit to facilitate bending is not permitted. Public telephone conduit bends and offsets shall be provided with a radius which is not less than 10 times trade size of conduit unless otherwise permitted. Refer to underground installation, specified in this section, for radius of bends and offsets required for underground installations.
12. Running threads are not permitted. Provide conduit unions where union joints are necessary. Conduit shall be maintained at least 6 inches from covering of hot water and steam pipes and 18 inches from flues and breechings. Open ends of conduits shall be sealed with permitted conduit seals during construction of buildings and during installation of underground systems.
13. Where conduits are terminated in groups at panelboards, and cabinets, etc., provide templates or spacers to fasten conduits in proper position and to preserve alignment.
14. Where auxiliary supports, saddles, brackets, etc., are required to meet special conditions, they shall be fastened rigid and secure before conduit is attached.
15. Factory fabricated pipe straps shall be one or 2-hole formed galvanized clamps, heavy-duty type, except where otherwise specified.
16. Conduits shall be supported at intervals required by code, but not to exceed 10 feet. One inch and smaller exposed conduits shall be fastened with one-hole malleable iron straps. Perforated straps and plumber's tape is not permitted for the support of conduits.

17. Conduits stubbed up through a roof or facade shall be flashed with a waterproof flashing. Refer to roofing specification for additional requirements.
 18. Bushings and locknuts for rigid steel conduit shall be steel threaded insulating type. Setscrew bushings are not permitted.
 19. Flex conduits shall be cut square and not at an angle.
 20. Routing of conduits may be changed providing length of any conduit run is not increased more than 10 percent of the length indicated on Drawings.
- B. Underground Requirements:
1. Underground conduits and raceways shall be buried to a depth of not less than 24 inches below finished grade to top of the conduit envelope, unless otherwise specified.
 2. Assemble sections of conduit with required fittings. Cut ends of conduit shall be reamed to remove rough edges. Joints in conduits shall be provided liquid-tight. Bends at risers shall be completely below surface where possible.
 3. The architect or engineer will observe underground installations before and during conduit placement. A mandrel shall be drawn through each run of conduit in presence of the architect or engineer before and after placement. Mandrel shall be 6 inches in length minimum, and have a diameter that is within 1/4 inches of diameter of conduit to be tested.
 4. Non-metallic conduit installations shall comply with following additional requirements. Joints in PVC conduit shall be sealed by means of required solvent-weld cement supplied by conduit manufacturer. Non-metallic conduit bends and deflections shall comply with requirements of applicable electrical code, except that minimum radius of any bend or offset for conduits sized from 1/2 inch to 1-1/2 inches inclusive shall not be less than 24 inches. Bends at risers and risers shall be galvanized, rigid steel conduit. Conduits below slab shall be painted with epoxy, resin paint.
 5. All below grade non-metallic conduits shall have galvanized, rigid steel 90's painted epoxy, resin paint.
 6. Protect inside of conduit and raceway from dirt and rubbish during construction by capping openings.
 7. Add bell-end bushings for conduit stub-up including underground entries to pull boxes, and manholes. Under floor standing switchboards and motor control centers provide a 4" galvanized nipple with ground bushing.
 8. All underground conduits and raceways shall be swabbed prior to wire pull.
- C. Concrete Walls, Beams, and Floors: Provide sleeves where conduits pierce concrete walls, beams, and floors, except floor slabs on grade. Sleeves shall provide 1/2 inch clearance around conduits. Sleeves shall not extend beyond exposed surfaces of concrete and shall be securely fastened to forms. Provide fire caulk materials as required. Where conduits pass through walls below grade, caulk with required sealant and backer materials between conduit and sleeve to provide a watertight joint.

3.02 INSTALLATION AND SUPPORT OF BOXES

- A. Do not install junction boxes back-to-back in walls. Maintain a minimum of 4" separation measured edge-to-edge between boxes. Where separation is not possible, install sound proofing material in boxes to minimize noise transfer between rooms. In fire rated walls, boxes may be no larger than 4" x 4" and are to be separated 24" minimum, measured edge-to-edge.

- B. Heights of outlets and equipment indicated on Drawings shall govern. In absence of such indications and if applicable to the project, the following heights shall be maintained with heights measured to centerline unless otherwise noted:

1. Install switches, 48 inches above finished floor. Refer to other Division 16 Sections.
2. Install panelboards and cabinets 6 feet-6 inches from finish floor to top of cabinet.

3.03 COVER PLATES

- A. Provide a plate on each outlet device as indicated or required. Plates shall be of stainless steel or raised cover as required.

3.04 IDENTIFICATION OF CIRCUITS AND EQUIPMENT

- A. Provide descriptive nameplates or tags permanently attached to transformers, panelboards, circuit breakers, disconnect switches, starters, pushbutton control stations and other apparatus installed for operation or control of circuits, appliances, power supplies, terminal cabinets, energy management control units, and Information technology system backbone and distribution equipment points.
- B. Provide nameplates of engraved laminated plastic, or etched metal. Submit Shop Drawings denoting dimensions and format to Architect before installation. Fasten to equipment with escutcheon pins, rivets, self-tapping screws, or machine screws. Self-adhering or adhesive backed nameplates are not permitted.
- C. Fasten tags to feeder wiring in conduits at every point where runs are broken or terminated, including pull wires in empty conduits. Indicate circuit, phase, and function. Tag branch circuits in panel boards. Tags may be manufactured of pressure-sensitive plastic or embossed self-attached stainless steel or brass ribbon.
- D. Provide circuit identification cards and cardholders in all panel boards. Cardholders shall consist of metal frame retaining a clear plastic cover permanently attached to inside of panel door. List of circuits shall be typewritten on a card. Circuit description shall include name or number of circuit, area and connected load.
- E. Junction and pull boxes shall have covers stenciled with box number when indicated on Drawings, or circuit numbers according to panel schedules. Data shall be lettered in a visible manner with a color contrasting with finish.
- F. Name shall be correctly engraved, with a legend indicating function or areas, when required by codes or indicated on Drawings.
- G. Provide wire marker indicating circuit number for each conductor located within each electrical panel, disconnect, large junction box or trough, etc.

3.05 PROTECTION

- A. Protect Work of this section until Substantial Completion.

3.06 CLEANUP

- A. Remove rubbish, debris, and waste materials and legally dispose of off Project site.

END OF SECTION

SECTION 26 24 16
PANELBOARDS

PART 1 - GENERAL

1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes: Power distribution facilities, including panelboards.
- C. Related Sections:
 - 1. Section 26 01 00: Basic Electrical Requirements.

1.02 SUBMITTALS

- A. Provide in accordance with Division 01.
- B. Shop Drawings: Include a front elevation indicating cabinet dimensions, make, location and capacity of equipment, size of gutters, type of mounting, finish, and catalog number. General layout of internal devices, wiring drawings with wire numbers and device connections, vendor cut sheets of devices in enclosure and bill of materials listing description, manufacturer, part number, and quantity of items shall be included.
- C. Installation Instructions: Submit manufacturer's written installation instructions.

1.03 DESIGN REQUIREMENTS

- A. Panelboards:
 - 1. Panelboards shall be wall-mounted, enclosed safety type with 277/480 volt, 4-wire 120/240V, 4-wire, or 120/208 volt, 4-wire solid neutral mains as indicated on Drawings or specified. First panelboard of each building shall be provided with main or sub-feeder circuit breakers where indicated.
 - 2. Single pole branches shall be molded case, thermal magnetic circuit breakers with inverse time delay, trip free, quick-make, quick-break mechanism and silver alloy contacts. Circuit breakers shall be fully rated, with ampere rating marked on handle and shall indicate on/off and tripped positions. Ground fault interrupters shall be incorporated into circuit breakers where indicated. They shall be listed by UL, or other NRTL as ground fault devices. Provide appropriate lug kit of sufficient size to accommodate the feeders.
 - 3. Two- and 3-pole branches shall be enclosed, and shall be thermal magnetic circuit breakers with inverse time delay, tamper-proof, ambient compensated, single handle, internal common trip, and quick-make, quick-break mechanism with silver alloy contacts. Circuit breakers shall be fully rated or as otherwise indicated on the Drawings.
 - 4. Main and subfeeder circuit breakers shall be enclosed, thermal magnetic type with inverse time delay, single handle common trip, quick-make, quick-break mechanism, corrosion-resistant bearings and silver alloy contacts. Ampere frame size and trip rating shall be as indicated on Drawings. Voltage rating shall be as indicated on Drawings. Branch mounted mains are not acceptable.
 - 5. Circuit breakers shall be fully rated and of one-piece, bolt-on type and shall meet short-circuit interrupting capacity requirements indicated on Drawings.
 - 6. Internal connections shall be fabricated with plated copper bus bars and the busses shall extend for full length of space available for branch circuit breakers. Feeder cable connectors shall be installed at point of feeder entrance. Terminals shall be furnished

with copper conductors. Panelboards fed by conductors having over-current protection greater than 200 amperes shall be protected on supply side by over-current devices having a rating not greater than that of panelboards. Copper bussing shall be fully rated. Heat rated bussing is not acceptable

7. Except where otherwise indicated, circuit breakers shall be in 2 vertical rows connected to bus bars in a distributed phase arrangement. Two-pole branches shall be balanced on busses. Single pole branches shall be numbered adjacent to its circuit breaker, with odd numbers on left and even numbers on right.
 8. Specified circuit breaker spaces shall be furnished with hardware required for future installation of circuit breakers.
- B. Surge Suppressors: None required.
- C. Panelboard Cabinets:
1. Panelboard cabinets shall be code gage galvanized steel or blue steel; fronts, doors, and trims shall be code gage furniture steel. Cabinets shall be furnished with at least 6-inch high gutters at top and bottom where feeder cable size exceeds 4 gage or where feeder cable passes through cabinet vertically. Cabinets shall be furnished with top and bottom gutters sized as required by inspection department having jurisdiction, but never less than 6 inches where more than one feeder enters top or bottom of cabinets. Side gutters shall not be less than 4 inches wide. Width of cabinets shall be 20 inches, unless otherwise indicated on Drawings.
 2. Doors shall be cut true, shall accurately fit opening and finish smooth across joints. Hinges shall be entirely concealed except for barrels and pins. Hinge flanges shall be welded to door and trim.
 3. Outdoor cabinets shall be NEMA Type 3R. Construction shall be formed from code gage galvanized steel with ANSI No. 61 gray enamel finish. Provide heavy-duty, 3-point latching, vault type door handles with padlocking provisions. Provide stainless steel or galvanized butt hinges on doors.
 4. Self-tapping screws and bolts not permitted.
- D. Panelboard Schedule: Provide a neatly typewritten schedule with number or name of room or area, or load served by each panelboard circuit. Room numbers or names shall be determined at the Project site and shall not necessarily be those indicated on the Drawings. Schedule shall also indicate panel designation, voltage and phase, building and distribution panel or switchboard from which it is fed. Schedule shall be installed in a frame under transparent plastic on inside of each panelboard door.
- E. Panelboard Standards: Panelboards shall be UL, or other NRTL listed and labeled. Panelboards shall meet latest revisions of following standards:
1. National Electric Code, Article 408.
 2. UL 67, Panelboards.
 3. UL 50, Cabinets and Boxes.
 4. UL 943, GFCI.
 5. UL 489, Molded Case Circuit Breakers.
 6. NEMA PB1.
 7. Federal Specifications W-P- 115C and WC-375B.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Panelboards shall be manufactured by General Electric, Eaton, Square D, Siemens, or equal.
- B. Existing equipment is Eaton / Cutler Hammer where noted.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Panelboards shall be located so they are readily accessible and not exposed to physical damage.
- B. Panelboards installed outdoors shall be specifically listed for wet locations and shall be weatherproof in NEMA Type 3R cabinets.
- C. Panelboard locations shall provide sufficient working space around panels to comply with the National Electrical Code.
- D. Panelboards shall be securely fastened to structure and mounted on surface by at least 4 points.
- E. Unused openings in cabinets and disconnects shall be effectively closed as required by the manufacturer.
- F. Cabinets shall be grounded as specified in Article 250 of the National Electrical Code.
- G. Conduits shall be installed so as to prevent moisture or water from entering and accumulating within the enclosure.
- H. Lugs shall be suitable and listed for installation with the conductor being connected.
- I. Conductor lengths shall be maintained to a minimum within the wiring gutter space. Conductors shall be long enough to reach the terminal location in a manner that avoids strain on the connecting lugs.
- J. Maintain the required bending radius of conductors inside the cabinet.
- K. Clean the cabinet of foreign material such as cement, plaster, and paint. Repaint to manufacturers original finish any blemishes that occur during construction.
- L. Distribute and arrange conductors neatly in the wiring gutters.
- M. Use the manufacturer's torque values to tighten lugs.
- N. Before energizing panelboards, the following steps shall be taken:
 - 1. Retighten connections to the manufacturer's torque specifications. Verify that required connections have been provided.
 - 2. Remove shipping blocks, dirt, and debris from component devices and panelboard interiors.
 - 3. Manually exercise circuit breakers to verify they operate freely.
- O. Follow manufacturer's instructions for installation.
- P. Do not install in highly corrosive environments, unless rated for the application.

3.02 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.03 CLEANUP

- A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes:
 - 1. Switches
 - 2. Coverplates
- C. Related Sections:
 - 1. Section 26 01 00: Basic Electrical Requirements.

1.02 SUBMITTALS

- A. Provide in accordance with Division 01.
- B. Shop Drawings:
 - a. Include manufacturer's cut sheets for each type device being installed listing description, manufacturer, and part number.
 - b. Include manufacturer's cut sheets for each device coverplate being installed listing description, manufacturer, and part number.
- C. Installation Instructions: Submit manufacturer's written installation instructions including any warning labels and instruction manuals.

1.03 QUALITY ASSURANCE

- A. Switches shall comply with NEMA WD 1 and UL 20.

PART 2 - PRODUCTS

2.01 RECEPTACLES AND SWITCHES

- A. Switches:
 - 1. Color: Coordinate with architect
 - 2. Local Switches:
 - a. Provide local switches, high strength thermoplastic toggle, specification grade, rated 20 amps at 120-277 volts AC only, with plaster ears, external screw pressure plate back and side wired, and standard size composition cups which fully enclose mechanism. Switches shall be approved for installation as motor loads up to 1 HP. Provide switches as single pole.

PART 3 - EXECUTION

3.01 INSTALLATION OF DEVICES

- A. Installation shall be in accordance with the NEC and as shown as on the drawings.

- B. Ground terminal of each receptacle shall be bonded to the outlet box with an approved green bonding jumper, and also connected to the green equipment grounding conductor.
- C. Ensure that devices and their boxes are protected until completion of project.
- D. Keep outlet boxes free of plaster, drywall compounds, mortar, cement, paint, dust, or other materials that may contaminate the devices, conduits, wiring, cables, etc.
- E. Do not install wiring devices until all wall preparation, painting, finishing, is complete.
- F. Do not strip insulation from wiring until devices are being installed.
- G. Replace any devices that have been damaged or show signs of use during construction phase of project before finishes were complete.
- H. Keep devices in their package or protected until time of installation.
- I. Connect devices using pigtail connections of not less than 6". Where conductors larger than #12 AWG have been installed, use #12 AWG for pigtail connections to devices.
- J. Remove fiber or plastic washers prior to installation to ensure metal-to-metal contact.
- K. Coordinate with other work, including painting, electrical boxes and wiring installations, as necessary to interface installation of wiring devices with other work. Coordinate the electrical work with the work of other trades to ensure that wiring device flush outlets are positioned with box openings aligned with the face of the surrounding finish material. Pay special attention to installations in cabinet work, and in connection with laboratory equipment.
- L. Exact field locations of floors, walls, partitions, doors, windows, and equipment may vary from locations shown on the drawings. Prior to locating sleeves, boxes and chases for roughing-in of conduit and equipment, the Contractor shall coordinate exact field location of the above items with other trades. In addition, check for exact direction of door swings so that local switches are properly located on the strike side.
- M. Test wiring devices for damaged conductors, high circuit resistance, poor connections, inadequate fault current path, defective devices, or similar problems using a portable receptacle tester. Correct circuit conditions, remove malfunctioning units and replace with new, and retest as specified above.
- N. Heights of outlets and equipment indicated on Drawings shall govern. In absence of such indications and if applicable to the project, the following heights shall be maintained with heights measured to centerline unless otherwise noted:
 - 1. Install wall-mounted switches, 48 inches above finished floor. Refer to other Division 26 Sections.

3.02 COVER PLATES

- A. Provide a plate on each outlet device as indicated or required. Plates shall be of stainless steel or raised covers unless otherwise specified.

3.03 PROTECTION

- A. Protect Work of this section until Substantial Completion.

3.04 CLEANUP

- A. Remove rubbish, debris, and waste materials and legally dispose of off Project site.

END OF SECTION

SECTION 26 28 16
DISCONNECT SWITCHES

PART 1 - GENERAL

1.01 SUMMARY

- A. Provisions of Division 01 apply to this section
- B. Section Includes: Disconnect switches.
- C. Related Sections:
 - 1. Section 26 01 00: Basic Electrical Requirements.
 - 2. Section 26 24 16: Panelboards.

1.02 SUBMITTALS

- A. Provide in accordance with Division 01.
- B. Shop Drawings: Include dimensions, make, capacity of equipment, size, rating, and catalog number. Vendor cut sheets of devices in enclosure and bill of materials listing description, manufacturer, part number, and quantity of items shall be included.
- C. Installation Instructions: Submit manufacturer's written installation instructions.

1.03 DESIGN REQUIREMENTS

- A. Disconnect Switches:
 - 1. In accordance with UL 98, NEMA KS1, and NEC.
 - 2. Shall be HP rated.
 - 3. Fusible Switch, 600 amp and smaller: NEMA KS 1, Type HD, with clips or bolt pads to accommodate specified fuses or recommended fuses, lockable handle; interlocked with cover in closed position.
 - 4. Non-Fusible Switch, 600 amp and smaller: NEMA KS 1, Type HD, lockable handle; interlocked with cover in closed position.
 - 5. Shall have the following features:
 - a. Switch mechanism shall be the quick-make, quick-break type.
 - b. Copper blades, visible in the OFF position.
 - c. An arc chute for each pole.
 - d. External operating handle shall indicate ON and OFF position and have lock-open padlocking provisions.
 - e. Mechanical interlock shall permit opening of the door only when the switch is in the OFF position, defeatable to permit inspection.
 - f. Fuse holders for the sizes and types of fuses specified.
 - g. Electrically operated switches shall only be installed where shown on the drawings.
 - h. Solid neutral for each switch being installed in a circuit which includes a neutral conductor.
 - i. Ground lugs for each ground conductor.
 - j. Enclosures:
 - i. Shall be the NEMA types shown on the drawings for the switches.
 - ii. Where the types of switch enclosures are not shown, they shall be the NEMA types most suitable for the ambient environmental conditions. Unless otherwise indicated on the plans, all outdoor switches shall be NEMA 3R.

- iii. Shall be finished with manufacturer's standard gray baked enamel paint over pretreated steel (for the type of enclosure required).

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Disconnect switches shall be manufactured by General Electric, Eaton, Square D, Siemens, or equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Disconnects/Safety switches shall be installed in the vertical position with "ON" at the up position and top of the switch.
- B. Disconnects/Safety Switches shall be securely fastened to wall or structural member by at least 4 points. Where structural support is not present, uni-strut shall be installed for additional support and points-of-contact.
- C. Unused openings in cabinets and disconnects shall be effectively closed as required by the manufacturer.
- D. Cabinets shall be grounded as specified in Article 250 of the National Electrical Code.
- E. Conduits shall be installed so as to prevent moisture or water from entering and accumulating within the enclosure.
- F. Lugs shall be suitable and listed for installation with the conductor being connected.
- G. Conductor lengths shall be maintained to a minimum within the wiring gutter space. Conductors shall be long enough to reach the terminal location in a manner that avoids strain on the connecting lugs.
- H. Maintain the required bending radius of conductors inside the cabinet.
- I. Clean the cabinet of foreign material such as cement, plaster, and paint. Repaint to manufacturers original finish any blemishes that occur during construction.
- J. Distribute and arrange conductors neatly in the wiring gutters.
- K. Use the manufacturer's torque values to tighten lugs.
- L. Before energizing disconnect switches, the following steps shall be taken:
 1. Retighten connections to the manufacturer's torque specifications. Verify that required connections have been provided.
 2. Remove shipping blocks from component devices and panelboard interiors.
 3. Remove debris from switch interior.
- M. Follow manufacturer's instructions for installation.
- N. Do not install in highly corrosive environments, unless rated for the application.

3.02 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.03 CLEANUP

- A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION