

## **PART 1 - GENERAL**

### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this and all Division 23 Sections.
- B. Refer to Specification Section 019113 – General Commissioning Requirements for additional requirements.

### **1.2 PLANS AND SPECIFICATIONS**

- A. All work under this title, on drawings or specified, is subject to the general and special contract conditions for the entire project, and the contractor for this portion of the work is required to refer especially thereto, and to the architectural drawings.
- B. Drawings are diagrammatic and specifications are complementary and must be so interpreted to determine the full scope of work under this heading. Wherever any material, article, operation, or method is either specified or shown on the drawings, this contractor is required to provide each item and perform each prescribed operation according to the designate quality, qualification or condition, furnishing all necessary labor, equipment or incidentals.
- C. Wherever the designation "Architect" appears, it shall imply Architect or Engineer. Wherever the term "Contractor" or "MC" appears, it shall imply the Contractor responsible for Division 23, Mechanical Work.

### **1.3 CONFLICTS**

- A. If, in the interpretation of contract documents, it appears that the drawings and specifications are not in agreement, the Contractor is to contact the Engineer. The Engineer shall be the final authority. Addenda supersede the provisions which they amend.
- B. In the absence of a written clarification by the engineer, the Contractor must install his work in accordance with the more stringent and/or costly condition. Contractor assumes full responsibility for any and all items furnished and installed without the written approval by the Architect or Engineer. Under no circumstances will a change order be approved for work installed that was not approved by the Architect or Engineer.

### **1.4 DIMENSIONS, LAYOUTS AND OBSTACLES**

- A. Verify dimensions and elevations from actual field measurements after building construction has sufficiently progressed.
- B. Assume full and final responsibility for the accuracy of any or all work performed under this Division and make repairs and corrections as required or directed at no extra cost to the Owner.
- C. Layouts of piping, ductwork, and equipment shown on drawings are diagrammatic. Contractor shall verify dimensions and layouts for specific project conditions, field verify any existing conditions, and coordinate with all other trades prior to procurement, fabrication and installation of equipment and material. Existing Conditions shall be field verified by contractor prior to bid submissions. Unknown conditions during construction due to omission of contractor field verification prior to bid shall be resolved by the contractor at no cost to the owner or project. Contractor assumes full responsibility for completeness of installation including coordination of work with other trades.
- D. Make actual installations in accord with design layouts, but with necessary adjustments as determined by trade coordination, actual material and equipment procured, field verifications, and other project conditions in order to provide a fully functional and complete system, save and maintainable in all aspects. Any such required adjustments and deviations shall require specific approval of the Engineer/Architect prior to procurement, fabrication, and installation.
- E. Take particular care to coordinate all piping, ductwork, and equipment under this Division to prevent conflict and remove and relocate work as may be made necessary by such conflict at no extra cost to the Owner or project.

- F. Unless expressly permitted by the Engineer/Architect or shown otherwise on the Drawings, all piping, ducts and similar items shall be installed so that they are concealed except as permitted by the Engineer/Architect in service rooms noted on the Drawings.
- G. The Owner or Owner's Representative reserves the right to relocate terminal equipment six (6) feet in any direction from locations indicated on plans, before roughing-in, with no extra cost to the Owner or project.

#### **1.5 REVIEW OF PROPOSED EQUIPMENT AND MATERIALS**

- A. Submittals:
  - 1. Contractor shall submit a complete list and schedule, including all proposed equipment and materials to the Construction Manager and Engineer for review and approval within 10 business days of contract award.
  - 2. Submit all proposed material, equipment, and fabrication shop drawings to the Engineer for approval prior to procurement, fabrication, and installation.
- B. Substitution Requests:
  - 1. Substitutions are defined as any manufacturer and/or model not indicated in drawings or specifications as the "basis of design". Requests for substitutions must be made in writing ten (10) days prior to bid date so that an addendum may reach all contractors.
  - 2. In addition to other contract provisions regarding substitution requests, Contractor must certify by letter that he has checked the proposed substitution products or materials for conformance to applicable codes, standards, and regulations, specifications, and space limitations and assumes full responsibility thereafter.
  - 3. Approval of substitution requests is at the sole discretion of the Engineer and Owner.
  - 4. If substitutions are proposed after the bids are received, the Contractor shall state amount of credit to the Owner for substitution. Substitutions that are considered equal by the Contractor and carried in bid without approval by Engineer shall be the responsibility of the Contractor. The Engineer and/or Owner shall not be made liable or responsible for losses incurred by the Contractor, due to the rejection of said items for installation.
  - 5. Where equipment requiring different arrangement or connections other than as indicated is acceptable, it shall be the responsibility of this Contractor to furnish revised layouts, and install the equipment to operate properly and in harmony with the intent of the drawings and specifications. All changes in the work required by the different arrangement shall be done at no additional cost to the Owner or Project, including but not limited to structural steel modifications. Control and power wiring modifications required by Contractor, imposed modifications, and the additional cost of these modifications, shall be the responsibility of this Contractor.
  - 6. Where "basis of design" equipment manufacturer and model number is indicated on the drawings, any proposed substitution must match the "basis of design" product performance, efficiencies, ratings, materials of construction, dimensions, and weight, whether or not this information is included in the written specifications.

#### **1.6 PERMITS, CODES AND ORDINANCES**

- A. The Contractor shall arrange and pay for all permits, inspections, etc., as required by local utilities or applicable agencies.
- B. All work and material shall be in complete accordance with the ordinances, regulations, codes, etc., of all political entities exercising jurisdictions.

#### **1.7 QUALITY ASSURANCE**

- A. Install HVAC Systems in accordance with applicable industry standards.
- B. Install HVAC Systems in accordance with manufacturer's installation, operations and maintenance instructions.

### **1.8 COORDINATION WITH OTHER TRADES**

- A. Check mechanical drawings with all other trades including electrical, plumbing, fire protection and general construction.
- B. Anticipate, avoid, and resolve interferences with other trades.
- C. Take particular care to coordinate all piping, ductwork, plumbing and major electrical components above ceiling, to prevent conflict. Remove and relocate work as may be made necessary by such conflict, at no extra cost to the Owner. The use of coordination drawings is recommended but may not be required (refer to Division 1 for additional requirements). Lack of coordination drawings assumes contractor has verified and coordinated all work associated with installation.
- D. Obtain decision for approval from project Engineer for proposed grouped installations before proceeding, and for clearance in structure and finish of the building.
- E. Verify with drawings all ductwork and equipment layout in concealed areas.
- F. The Contractor to coordinate with, receive and install, Owner furnished equipment where indicated.
- G. Coordinate location of controls and instrumentation devices, including but not limited to control valves, control dampers, thermowells, pressure probes, flow switches, insertion flow meters, and ultrasonic flow meters, with Building Automation System (BAS) requirements.

### **1.9 DELIVERY, STORAGE, AND HANDLING**

- A. Delivery of Materials: Make provisions for delivery and safe storage of all materials. Check and properly receipt material to be "furnished by others" to contractor, and assume full responsibility for all materials while in storage with full visible identification and information.

### **1.10 PROJECT CONDITIONS**

- A. Existing Conditions: Field verify existing conditions that will determine exact locations, distances, levels, dimensions, elevations, etc. Review all drawings of other trades and report any conflicts to the Architect/Engineer which will affect the project cost. Lack of field verification does not constitute a basis for change orders and additional costs incurred by the owner or project. Contractor assumes full responsibility for completeness of installation including coordination of work with other trades.
- B. Existing facilities shall be considered occupied and functioning during the entire duration of construction. Care shall be taken when working in or around occupied spaces. There will be no interruption in mechanical systems or utilities without written approval from the Owner.

### **1.11 SUPPORTS**

- A. Mechanical Contractor is responsible for providing all support components necessary for properly supporting HVAC Systems including hangers, rods, anchors, steel, and bases.

## **PART 2 - PRODUCTS (not used)**

## **PART 3 - EXECUTION**

### **3.1 COMMON HVAC SYSTEMS INSTALLATION REQUIREMENTS**

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of HVAC systems.
- B. Indicated locations and arrangements were used to size systems and address other design considerations. Install systems as indicated unless deviations to layout are approved by Architect and Engineer.

- C. Install systems in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- D. Install systems indicated to be exposed and in equipment rooms and service areas at right angles or parallel to building walls.
- E. Install equipment level and plumb, parallel and perpendicular to other building systems and components, unless otherwise indicated.
- F. Install equipment to allow maximum possible headroom unless specific mounting heights are indicated.
- G. Diagonal runs of piping and ductwork are prohibited unless specifically indicated otherwise.
- H. Install systems above accessible ceilings to allow sufficient space for ceiling panel removal.
- I. Install systems and equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations
- J. Install equipment with all required manufacturer's service clearances maintained.
- K. Install systems at indicated slopes.
- L. Install systems free of sags and bends.
- M. Install fittings for changes in direction and branch connections.
- N. Install systems to allow application of insulation.
- O. Select system components with pressure rating equal to or greater than system operating pressure.
- P. Install escutcheons for penetrations of walls, ceilings, and floors.
- Q. Running pipe and ductwork over electrical equipment and in elevator machine rooms is prohibited.
- R. Running piping and ductwork into or through interior exit stairways, other than systems serving such stairwells as permitted by the International Building Code, is prohibited.
- S. Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe and duct penetrations. Such Penetrations shall be sealed with firestop materials and required fire and smoke rated dampers shall be provided.
- T. Install HVAC systems on required supports and bases meeting maximum allowable spans and sized for the specific loads.
- U. Install controls and instrumentation devices for HVAC systems required for system operations and as indicated.

**END OF SECTION 230100**