

SECTION 15010

MECHANICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provide labor, materials, accessories, and other related items as required to complete operations in connection with the complete installation of the HVAC and mechanical systems as shown on the drawings and as specified herein.

1.02 RELATED REQUIREMENTS

- A. Conditions of the contract apply to the work, including the work of this division. Examine contract documents for requirements affecting the work.

1.03 MECHANICAL PRE-CONSTRUCTION MEETING

- A. Conduct a mechanical conference at Project site to comply with requirements of Division 1 Section "Project Meetings" and the following:
 - 1. At least 14 days prior to beginning of mechanical work, conduct a meeting to review detailed requirements for mechanical systems installation and testing requirements. Review mechanical drawings and specifications, discuss project specific details and requirements, and review and discuss expectations for quality control. Establish preliminary work progress schedule and procedures for materials inspection, testing, and certifications. Require representatives of each entity directly concerned with mechanical systems installation to attend conference, including, but not limited to, the following:
 - a. General contractor's superintendent.
 - b. Mechanical contractor's project manager.
 - c. Mechanical contractor's job foreman.
 - d. Sheetmetal job foreman.
 - e. Plumbing job foreman.
 - f. Controls job foreman.
 - g. Project mechanical engineer/designer.
 - h. Job clerk.
 - i. Architect's construction administrator.

1.04 DRAWINGS

- A. The general location of the apparatus and the details of the work are shown on the Drawings. Exact locations not indicated shall be determined at the site as the work progresses and shall be subject to the Architect's approval.
- B. It is not intended that the drawings shall show every pipe, pipe rise, pipe drop, duct rise, duct drop, pipe fitting, duct fitting or appliance, but it shall be a requirement to furnish, without additional expense, material and labor necessary to complete the systems in accordance with the design intent and with the highest possible quality available.

1.05 ALTERATIONS

- A. Execute alterations, additions, removals, relocations, new work, and other related items as indicated or required to provide a complete installation in accordance with the intent of the contract documents, including changes required by building alterations.

- B. Existing work disturbed by the alterations or the new work shall be repaired to the Architect's satisfaction at no additional cost to the Owner.
- C. Existing ductwork, piping, and other systems indicated to be removed, shall be removed from the site. Cap off existing services remaining. The Owner retains the right to ownership of heating and ventilating equipment scheduled to be removed; store such equipment where requested by the Owner. Material not retained by the Owner shall be removed from the site.

1.06 CONTINUITY OF SERVICE

- A. Arrange to execute the work at such times and in such locations as may be required to provide uninterrupted service for the building or any of its locations. Any unavoidable conditions requiring reduced building capacity shall be arranged for by programming with the Owner's duly authorized representative at the building subject to the Architect's approval. If necessary, temporary work shall be installed to provide for the condition. Authorization for interrupting service shall be obtained in writing from the Owner. Any interruption of normal service shall be performed during an overtime period to be scheduled with the Owner. Costs for overtime work shall be included in the bid.

1.07 ELECTRIC WORK

- A. Provide motors, pilot lights, controllers, limit switches, and other related items for equipment provided under Division 15.
- B. Except as noted, required line switches, fused switches, and other related items and necessary wiring to properly connect equipment to motors and switches shall be furnished and installed under Division 16, Electric.
- C. Provide complete wiring system for automatic temperature controls as specified under Section 15975, Automatic Temperature Controls.
- D. Wiring shall conform to the requirements of the National Electrical Code.

1.08 REQUIREMENTS

- A. Installation Directions: Obtain manufacturer's printed installation directions to aid in properly executing work on major pieces of equipment.
- B. Objectionable Noise, Fumes and Vibration:
 - 1. Mechanical and electrical equipment shall operate without creating objectionable noise, fumes, or vibration, as determined by the Architect.
 - 2. If such objectionable noise, fumes, or vibration should be produced and transmitted to occupied portions of building by apparatus, piping, ducts, or any other part of mechanical and electrical work, make necessary changes and additions, as approved, without extra cost to Owner.
- C. Equipment Design and Installation:
 - 1. Uniformity: Unless otherwise specified, equipment or material of same type of classification, used for same purposes, shall be product of same manufacturer.
 - 2. Design: Equipment and accessories not specifically described or identified by manufacturer's catalog number shall be designed in conformity with ASME, IEEE, or other applicable technical standards, suitable for maximum working pressure and shall have neat and finished appearance.
 - 3. Installation: Erect equipment aligned, level and adjusted for satisfactory operation; install so that connecting and disconnecting of piping and accessories can be made readily and so that parts are easily accessible for inspection, operation, maintenance and repair. Minor deviation from indicated arrangements may be made, as approved.
- D. Hanging of Equipment, Ductwork and Piping:
 - 1. Support equipment, ductwork and piping from the top chord of bar joists at the "Panel Points" or

from the top flange of beams. Piping 2" (51 mm) and smaller may be supported from the bottom chord of the bar joists at the "Panel Points" or from the bottom flange of the beams.

- E. Protection of Equipment and Materials: Responsibility for care and protection of materials and mechanical work rests with the Contractor until the entire project has been completed, tested and the project is accepted by the Owner.
- F. Foundations:
 - 1. Ceiling Mounting: Where ceiling mounting is indicated or specified, use suspended platform or strap hangers, bracket or shelf, whichever is most suitable for equipment and its location. Construct of structural steel members, steel plates, rods, as required; brace and fasten to building structure or to inserts as approved, or as detailed.
 - 2. Where floor mounting is indicated, locate equipment on 4" (102 mm) high reinforced concrete pad of adequate size with anchors and base plates as required, on pressure-treated sleepers, or on structural steel frame as detailed. The corners of pads shall be chamfered 1/2" (13 mm). Pad and steel sizes and location shall be coordinated with the approved equipment.

1.09 ADJUSTMENTS AND OWNER'S INSTRUCTIONS

- A. After completion of the installation work called for in this Specification, furnish necessary Mechanics or Engineers for the adjustment and operation of the systems, to the end that the systems are perfectly adjusted and turned over to the Owners in perfect working order. Further instruct the Owner's authorized representative in the care and operation of the installation, providing framed instruction charts, directions, and other related items.

1.10 TESTING

- A. After the entire installation is completed and ready for operation, test the systems as outlined in Section 15990 - Testing, Adjusting and Balancing. These tests are supplementary to detailed tests specified herein or directed. The Owner will provide water and electric current for the test. Provide necessary labor, test pump, gauges, meters, other instruments and materials. Perform tests in the presence of the Architect or his representative.

1.11 FIRESTOPPING

- A. Firestopping for penetrations of ductwork, piping and equipment through fire rated and smoke rated partitions, walls, floors, ceilings, and roofs shall be furnished and installed under this section. Selection of firestopping materials and installation of firestopping materials shall be in accordance with Specification Section 07841 - Through Penetration Firestop Systems.
- B. Refer to Architectural Drawings for locations of fire rated and smoke rated partitions, walls, floors, ceilings, and roofs.

1.12 ACCESS PANELS

- A. Access panels required for items furnished under Division 15 shall be provided under this Division.
- B. Manufacturer and Model: Inryco, Inc. "Inryco/Milcor," style M, Miami-Carey Model "HM," or approved equal.
- C. Access panels shall be standard panels, 12" x 16" unless indicated otherwise. Door shall be flush type of 14-gauge steel hinged to 16-gauge frame. Panels installed in areas of high moisture concentration, such as exterior, shall be fabricated of paintable stainless steel or aluminum for corrosion resistance. Provide fire-rated access panels where required.
- D. Doors and frames shall be factory primed. Latches shall be operated by tumbler lock, keyed alike, furnish 3 keys to the Owner.

- E. Access panels in fire-rated construction shall have the same UL rating as the building assembly in which they are installed.
- F. Provide access panels in building construction where required for access to duct access doors or other components such as valves, air vents, actuators, volume dampers, motorized dampers in ductwork, duct smoke detectors, and other related items.

1.13 SUBMITTALS

- A. After award of Contract and before installation, submit for approval Shop Drawings, bulletins, Product Data, and other related items.
- B. Submit Shop Drawings and Product Data as required in each section. Submittal shall include physical data and performance data required to verify compliance with the Contract Documents.

1.14 OPERATING AND MAINTENANCE MANUALS

- A. Furnish two (2) bound operating and maintenance manuals and forward to the Architect for review and transmittal to the Owner.
- B. For maintenance purposes, provide approved Submittals, parts lists, specifications and manufacturer's maintenance bulletins for each piece of equipment. For materials used which have been submitted to the Architect for approval but do not require regular maintenance, such as piping, ductwork, and insulation, provide one copy of approved Submittals.
- C. Provide name, address and telephone number of the manufacturer's representative and service company, for each piece of equipment or material so that service or spare parts can be readily obtained.

1.15 CLEANING

- A. Remove debris from site daily.
- B. Material and pieces of equipment shall be turned over to the Owner free of dust and dirt, both inside and out.
- C. At the completion of the Project, equipment shall have a clean, neat appearance of factory finish by cleaning or repainting as required.

1.16 SUBSTITUTIONS

- A. Comply with provisions of the Instructions to Bidders and General Conditions.
- B. The first item listed under "Acceptable Manufacturers" is the design basis. Other manufacturers listed may be used in the base bid, but conformance with details of the Specifications, as well as dimensional and electrical data, must be verified by the Contractor. Modifications required as a result of differences between the design basis item and the submitted and approved item shall be approved by the Architect and made at the Contractor's expense. As an example, if a rooftop HVAC unit is submitted and approved and if the unit's dimensions and weight are different than those of the unit which was used as the design basis, the Contractor shall be responsible for building structural modifications required to accommodate the submitted and approved unit, at no additional cost to the owner. For items that have no manufacturers listed, any item conforming with the Contract Documents is acceptable.

1.17 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

- B. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Divisions having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and clean-up of work of separate Sections in preparation for Substantial Completion.
- F. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.18 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect/Engineer seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.
- D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of responsible manufacturer's representative in accordance with manufacturer's instructions.
- G. When specified in individual Specification sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

1.19 FACTORY START-UP AND START-UP REPORTS

- A. Provide factory start-up of mechanical equipment listed below. Factory start-up shall be performed by a factory authorized representative of the equipment manufacturer. When factory start-up is successfully completed for each piece of mechanical equipment listed below, submit a formal start-up report to the architect for approval. Start-up report shall be formatted in accordance with equipment manufacturer's recommendations. Start-up report shall be typed, not hand written, and shall be submitted in a clean and legible form.
- B. Equipment requiring factory start-up
 1. Packaged Rooftop Units.
 2. Duct furnace.
 3. Ductless Air Conditioning Unit.

4. Ductless Heat Pump Unit.

1.20 COMPLETION OF SYSTEMS

- A. The following mechanical systems shall not be complete until the following conditions are satisfied:
1. Ductwork Systems:
 - a. All ductwork and related components and accessories shall be completely installed and insulated as specified.
 - b. All ductwork leakage testing shall be completed and leakage testing reports shall be submitted and approved.
 - c. All ductwork shall be balanced and a balancing report shall be submitted and approved.
 - d. Commissioning shall be completed.
 2. Piping Systems:
 - a. All piping, valves and accessories shall be completely installed, insulated and labeled as specified.
 - b. All piping pressure testing be completed and pressure testing reports shall be submitted and approved.
 - c. All piping systems shall be balanced and a balancing report shall be submitted and approved.
 - d. Commissioning shall be completed.
 3. Equipment:
 - a. All equipment, including but not limited to boilers, heat exchangers, terminal heat transfer units, pumps, air handling units, condensing units, chillers, split system air conditioning equipment, and exhaust fans, shall be completely installed.
 - b. Equipment start-up reports shall be completed, submitted and approved.
 - c. Equipment balancing shall be completed and the balancing report shall be submitted and approved.
 - d. Commissioning shall be completed.
 4. Automatic Temperature Controls (ATC):
 - a. ATC system shall be completely installed.
 - b. Commissioning shall be completed.
 - c. ATC system shall operate in an automatic mode for a minimum of four (4) months during owner occupancy without substantial deficiencies.

1.21 WARRANTY

- A. Provide guarantees and warranties for work under this Contract as indicated in the General Requirements of the Contract.
- B. Provide manufacturer's standard warranties and guarantees for work by the Mechanical trades. However, such warranties and guarantees shall be in addition to and not in lieu of other liabilities which the manufacturer and the Mechanical Contractor may have by law or by other provisions of the Contract Documents.
- C. Guarantee that elements of the systems provided under this Contract are of sufficient capacity to meet the specified performance requirements as set forth in these Specifications or as indicated on the Drawings.
- D. Upon receipt of notice from the Owner of failure of any part of the Mechanical systems or equipment during the warranty period, the Mechanical Subcontractor shall replace the affected part or parts.
- E. Furnish a written guarantee covering the above requirements before submitting the application for final payment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION