

## SECTION 23 00 10 - MECHANICAL SCOPE OF WORK

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS:

- A. The Conditions of the Contract and applicable requirements of Division 1, "General Requirements", and Section 23 01 00, "Mechanical General Provisions", govern this Section.

#### 1.2 DESCRIPTION OF WORK:

- A. General: Provide labor, materials, tools, machinery, equipment, appliances, and services necessary to complete the specified mechanical work of this Division. Coordinate Work with other trades to prevent conflicts without impeding job progress.
- B. **[Project Schedule/Milestones: The scope of the project will require certain construction work to be completed by intermediate milestone dates. Refer to Division 1 for additional information on project schedule and milestone dates.]**
- C. Utility Charges: The Contractor shall pay fees, tap charges, meter charges, and special fees assessed by the local utilities or local authorities.
- D. Work Included: The Work includes, but is not limited to, the following systems, equipment, and services:

#### [EDIT TO SUIT PROJECT]

- 1. **[A Complete] [Modification] [An Extension]** of the **[Campus] [Building]** Chilled Water Cooling System including, but not limited to:
  - a. **[Centrifugal] [Reciprocating] [Air-cooled]** water chilling units.
  - b. Chilled water pumps.
  - c. Chilled water piping and coils.
  - d. Insulation, controls, accessories and chemical treatment.
  - e. Refrigerant leak detection.
  - f. Refrigerant purge exhaust system.
  - g. Additional items specified, indicated or implied on the Drawings.

#### [OR]

- 2. A complete Roof-Top Package Air Conditioning Systems Consisting of:
  - a. Manufacturer's roof curb.]
  - b. Refrigerant compressors, condenser fan motors and supply fan motors.]
  - c. Vibration isolation, refrigerant piping, drains and coils.]
  - d. Insulation, controls, accessories and filters.]
  - e. Additional items specified, indicated or implied on the Drawings.]
- 3. A complete Condenser Water System including, but not limited to:
  - a. Cooling towers.
  - b. Condenser water pumps.
  - c. Condenser water piping.

- d. Controls, chemical treatment and accessories.
  - e. Insulation and accessories.
  - f. Additional items specified, indicated or implied on the Drawings.
4. **[A complete] [An Extension of the [Campus] [Building]** Steam System including, but not limited to:
- a. Steam boilers.
  - b. Boiler feed deaerators.
  - c. Condensate return units.
  - d. Steam and condensate piping.
  - e. Pressure reducing valves, steam traps, pressure relief valves and steam accessories.
  - f. Additional items specified, indicated or implied on the drawings.
5. A complete Hot Water Heating System including, but not limited to:
- a. **[Hot water boilers] [Steam to hot water converters]**
  - b. Hot water piping.
  - c. Hot water heating coils.
  - d. Hot water pumps.
  - e. Controls, chemical treatment and accessories.
  - f. Insulation and vibration isolation.
  - g. Additional items specified, indicated or implied on the Drawings.
6. A complete Electric Heating System Including, but not limited to:
- a. Electric heaters in HVAC terminal units.
  - b. Electric duct heaters.
  - c. Controls.
  - d. Insulation and vibration isolation.
  - e. Additional items specified, indicated or implied on the Drawings.
7. Air Handling Units **[and Fan Coil Units]** including, but not limited to:
- a. Fan section with motor.
  - b. Chilled water cooling coils.
  - c. **[Hot water] [Electric]** heating coils.
  - d. Filters.
  - e. Controls **[and variable air volume modulation]**.
  - f. Vibration isolation, insulation and drains.
  - g. Additional items as specified, indicated or implied on the Drawings.
8. Energy Recovery System:
- a. Water Piping and Coils
  - b. Circulation pumps
  - c. Insulation, controls, accessories and chemical treatment

- d. Filters
  - e. Motors
  - f. Additional items, indicated or implied on the drawings.
9. Complete Air Distribution Systems including, but not limited to:
- a. Sheet metal ductwork.
  - b. HVAC terminal units.
  - c. Fire, fire/smoke, and smoke dampers, balancing dampers and accessories.
  - d. Grilles, registers and ceiling outlets.
  - e. Insulation.
  - f. Acoustical treatment of ducts.
  - g. Sound attenuating equipment, lined elbows and transfer ducts.
  - h. Additional items as specified, indicated or implied on the Drawings.

**[SELECT ONE OF THE FOLLOWING]**

10. A complete Automatic Temperature Control System including, but not limited to:]
- a. Building Controls and Automation as specified and required including all the necessary controls, wiring and installation. System to be installed shall be as specified in this Division providing a complete system of pneumatic, electronic, and computer devices to perform the sequences and programs outlined herein.
  - b. Pneumatic, electric, and electronic control for all equipment to provide the specified Sequence of Controls, and as specified hereinafter including thermostats, sensors, relays and motors.
  - c. Pneumatic damper operators and control valves furnished to the appropriate trade as specified under the Work of other Sections.
  - d. Control panels as specified hereinafter and as required.
  - e. Complete instrument air system including air compressors and receivers, refrigerated air dryers, appropriate accessories and distribution piping.
  - f. PC based central computer and associated peripherals and software as specified in the subsequent sections of this Division functioning as the primary operator interface for the BCAS. All hardware and software required for interface to the communications network and peripheral devices shall be included.
  - g. Other miscellaneous control system and components as shown on the Drawings and/or specified herein.
  - h. Additional items as shown on the Drawings as specified or required to provide the specified controls and sequences.

**[OR]**

11. **[A] [Provisions for a] complete Building Control and Automation System (BCAS) as [specified] [furnished] in Division 23. [Division 23 shall be included in the work of Division 23.]** Division 23 provisions for BCAS system installation shall include, but not be limited to:
- a. Install immersion wells, pressure taps and any associated shut-off cocks.
  - b. Install flow switches.
  - c. Install automatic control valves.

- d. Install level switches.
  - e. Furnish and install venturi flanges.
  - f. Install venturis and flow sensors.
  - g. Furnish automatic valve flanges and flange gaskets, increasers, reducers, nuts and bolts as required.
  - h. Furnish flare nuts for unitary valves.
  - i. Furnish union fittings where required in unitary equipment for service of automatic valves, including necessary transitions.
  - j. Install automatic control dampers.
  - k. Provide necessary transitions and blank-off plates required to install dampers that are different than duct size.
  - l. Assemble multiple section dampers with required interconnecting linkages and extend required number of shafts through duct for external mounting of damper motors.
  - m. Provide necessary sheet metal baffle plates to eliminate stratification and provide air volumes specified. Locate baffles by experimentation and affix and seal permanently in place only after stratification problem has been eliminated.
  - n. Provide access doors or other approved means of access through ducts for service to control equipment.
  - o. Include necessary duct transitions to provide velocities as recommended by air flow measurement station manufacturers.
  - p. Install air flow measurement stations as indicated on the Drawing, specified or required.
  - q. The centrifugal chillers furnished under Division 23 shall include all factory-furnished control devices, transformers, relays and other appurtenances as required per the chiller manufacturers wiring diagram. All wiring and pneumatic piping on the chiller shall be the responsibility of the chiller manufacturer. The control interface module for each chiller shall be furnished and factory-installed by the chiller manufacturer and shall accept a **[3 to 15 psi] [4-20 mA] [0-10 volts dc]** input.]
  - r. HVAC terminal units provided by Division 23 shall have velocity sensors, DDC controllers and damper actuators provided under Division 23, factory-installed and wired ready for field control connections by Division 23.
12. Complete Ventilating Systems including, but not limited to:
- a. Exhaust fans.
  - b. Supply fans.
  - c. Ductwork, grilles, air devices, dampers, controls and similar items.
  - d. Additional items specified, indicated or implied on the Drawings.
13. A complete CPU Chilled Water Cooling System including, but not limited to:
- a. Packaged **[glycol-cooled] [air-cooled]** CPU chillers.
  - b. Hose kits.]
  - c. Insulation, controls, accessories and chemical treatment.
  - d. Additional items specified, indicated or implied on the Drawings.
14. A complete Glycol Water System including, but not limited to:
- a. Dry coolers.

- b. Primary and secondary glycol pumps.
  - c. Glycol piping.
  - d. Controls, chemical treatment, insulation and accessories.
  - e. Additional items specified, indicated or implied on the Drawings.
15. A complete **[Computer] [Telephone]** Room Air Conditioning System including, but not limited to:
- a. Packaged **[glycol-cooled] [chilled water] [air-cooled]** air conditioning units.
  - b. Floor stands.
  - c. **[Glycol] [Chilled water]** piping connections.
  - d. Controls, accessories and filters.
  - e. Additional items specified, indicated or implied on the Drawings.
16. A complete Plumbing System including, but not limited to:
- a. Plumbing fixtures and trim.
  - b. Domestic hot water supply piping.
  - c. Domestic cold water supply piping, including connections to the water service.
  - d. Domestic water heaters.
  - e. Electric drinking fountains.
  - f. Sanitary waste piping, including connection to sanitary sewer system.
  - g. Storm drain piping, including connection to storm sewer system.
  - h. Vent piping.
  - i. Domestic water pumps and controls.
  - j. Roof and floor drains.
  - k. Sewer and water main extensions.
  - l. House\break tank(s).
  - m. Water softeners.
  - n. Insulation, controls, safety devices, vibration isolation and similar items.
  - o. Gas piping, including connection to local gas service.
  - p. Fuel oil tank(s), pumps, piping and controls.
  - q. [Laboratory] [Medical] pumping systems.]**
  - r. [Laboratory] [Medical] gas delivery system.]**
  - s. Additional items specified, indicated or implied on the Drawings.
17. A complete Fire Protection System including, but not limited to:
- a. Fire Department connections.
  - b. Fire pumps, jockey pumps and pump controllers.
  - c. **[Wet-pipe, dry-pipe, and pre-action]** automatic sprinkler systems.
  - d. Alarms and flow switches.
  - e. Standpipes and hose valves.

- f. Connection to water mains.
  - g. House/break tank(s).
  - h. [Clean Agent fire suppression systems.]**
  - i. Additional items specified, indicated, or implied on the Drawings.
- 18. Connections to equipment furnished by the General Contractor or other Divisions.
  - 19. Connections for Owner-furnished equipment where shown on the Drawings or specified.
  - 20. All water services.
  - 21. All sewer services.
  - 22. All water treatment.
  - 23. Testing[,] **[and provisions for]** balancing and adjusting of mechanical systems as specified.
  - 24. Additional items as shown on the Drawings or specified.
  - 25. Structural Openings:

**[EDIT TO SUIT PROJECT]**

- a. **[The Mechanical Contractor shall cut or provide and locate all forms for holes through the roof for his equipment, provide counterflashing for all duct openings in roof and provide roof jackets or pitch pockets for pipe and conduit passing through the roof. Provide reinforcement of all holes through roof, where required, in a manner approved by the Structural Engineer.]**

**[OR]**

- b. **[The Mechanical Contractor shall be responsible for coordinating all required openings in new construction with the General Contractor and furnishing and locating forms where appropriate.]**
- c. **[The Mechanical Contractor shall provide the Structural Engineer with locations, dimensions, and weights of his equipment to be supported by the floor and roof structural systems immediately following the awarding of the Contract. The final locations of his equipment shall be subject to the approval of the Structural Engineer. The Mechanical Contractor shall provide accessories necessary to hang his equipment from structure at locations and in a manner approved by the Structural Engineer.]**

**[or]**

- d. **[The Mechanical Contractor shall be responsible for coordinating all required openings in existing construction with the General Contractor and [Landlord] [Owner] and shall be responsible for cutting or drilling required openings in a manner which is acceptable to the [Landlord] [Owner]. Cutting and drilling operations shall be performed at times which are acceptable to the [Landlord] [Owner].]**
- e. **[Roof curbs and skids for mechanical equipment will be furnished by the Mechanical Contractor who shall locate, install, and provide the counterflashing. Factory curbs may be used pending approval of installation and location by the Structural Engineer.]**
- f. **[Except as otherwise indicated on the Drawings, all holes of area less than 150 square inches required through concrete floors, precast concrete, masonry, and similar items, shall be provided by the Mechanical Contractor. All holes required through post-tensioned concrete floors and roof and all other holes that proper**

**mechanical installation require to be of a larger area than 150 square inches will be provided by the Contractor for precast construction at locations determined by this Contractor. Any cutting and patching for holes required for proper mechanical installation where information on sizes and locations is not provided to the Construction Manager in sufficient time shall be the responsibility of the Mechanical Contractor. All cutting and patching shall be subject to the direction and approval of the Architect.]**

**PART 2 - PRODUCTS**

2.1 GENERAL:

- A. Refer to specific Sections of the Specifications for equipment.

**PART 3 - EXECUTION**

3.1 GENERAL:

- A. Installation shall be in accordance with the Specification section pertaining to the individual equipment.

**END OF SECTION 23 00 10**