SECTION 230000 - HVAC SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work covered by this Section of the specifications includes the furnishing of labor, materials, equipment, transportation, permits, inspections and incidentals and the performing of operations required to install the heating and ventilating systems indicated.

1.2 RELATED DOCUMENTS

A. The drawings and the specifications including SECTION 230500 "SUPPLEMENTAL MECHANICAL GENERAL REQUIREMENTS" are hereby made a part of the work of this section.

1.3 SUBMITTALS

A. Substitutions: Your attention is directed to Section 230500-"Substitutions", relative to competition and the (ONLY) notation. Familiarity with this section should be achieved before reading the PRODUCTS section of this specification.

B. The items for which the submittals paragraph in Section 230500, Supplemental Mechanical General Requirements, apply are as follows:

1. Equipment identification.
2. Split system air conditioning unit.
3. Exhaust fan.
4. Refrigerant piping.
5. Automatic temperature controls.

PART 2 - PRODUCTS

2.1 EQUIPMENT IDENTIFICATION

A. Equipment Identification:

1. Provide laminated plastic nameplates for air handling units. Laminated plastic shall be 0.125-inch thick melamine plastic conforming to Fed. Spec. L-P-387, black with white center core. Surface shall be a matte finish, corners shall be square. Accurately align lettering and engrave into the white core. Minimum size of nameplates shall be 1.0 inch by 2.5 inches. Lettering shall be minimum of 0.25-inch high normal block lettering.

2.2 SPLIT SYSTEM AIR CONDITIONING UNIT (SAC/SCU)

A. The split system air conditioning unit shall be Daikin wall mounted indoor units with vertical outdoor units, or approved equal by Sanyo. Cooling capacity shall be as scheduled. The indoor and outdoor units shall operate on 208V-1 phase power. Furnish with refrigerant piping, wiring and condensate piping as recommended by the manufacturer. The air

conditioning units shall be suitable for operation at 0°F outside ambient. Units must be suitable for use with the refrigerant line lengths required by the unit placement as shown on the plans with no reduction in capacity.

2.3 REFRIGERANT PIPING

A. Refrigerant Piping:

1. Refrigerant Piping: Dimensions and material requirements for pipe, pipe fittings and components shall conform to ASHRAE 15 and ANSI B31.5 and shall be compatible with fluids used and capable of withstanding the pressures and temperatures of the service.

2. Tubing used for refrigerant service shall be cleaned, sealed, capped, or plugged prior to shipment from the manufacturer's plant.

3. Copper Pipe and Fittings: Provide seamless copper tubing, hard drawn, Type K for underground use, Type L for exposed above ground use, ASTM B 88, or ASTM B 280.

a. Fittings for copper tubing shall be wrought copper, brazing, or solder-joint type, ANSI B16.22.

b. Flared, soft copper tubing shall be annealed ASTM B 280 and may be used only in nominal sizes smaller than one inch for connection to equipment and no larger than 1-3/8 inches outside diameter for other connections.

c. Flanges shall be of bronze, ANSI B16.24.

4. Brazing Materials: Provide AWS A5.8 brazing filler metal Type BAg-5 with AWS Type 3 flux, except Type BCuP-5 or BCuP-6 may be used for brazing copper-to-copper joints.

5. Soldering Materials: Provide ASTM B 32, Grade Sb5, tin-antimony alloy. Soldering flux shall consist of petrolatum base impregnated with zinc and ammonium chlorides.

6. Gaskets: Provide ASTM D 2000, fluorinated elastomers compatible in form with grooves in the flange faces.

2.4 EXHAUST FANS (EF)

A. Shall be model indicated. Fan manufacturers shall be Greenheck, Cook, Nutone or Broan. The fans shall include housing, fan wheel, shaft, bearings, inlet shroud, motor, mounting support and mounting frame as a factory-assembled unit. An OSHA-approved belt guard for each fan shall be included. The fan drive shall have a 1.5 service factor for the maximum rated horsepower. Provide a disconnect switch for each fan. Roof fans shall have a factory-applied epoxy coating with color selection by the Architect. Provide gravity-operated, gasketed backdraft dampers for all exhaust fans.

B. Submit sound power data for inlet and discharge sound.

C. Submit fan curves for each fan with the design operating point clearly marked.

D. Roof fans and duct penetrations thru the roof shall have 12" high insulated pre-fabricated and self-flashing insulated curbs by Greenheck, or approved equal. Provide a suitable foam gasket seal between the curb and fan base to seal airtight.

2.5 AUTOMATIC TEMPERATURE CONTROLS

A. Air Handling Units: Provide 7-day programmable thermostat compatible with rooftop manufacturer. Thermostats shall provide “Occupied/Unoccupied” setpoints, ventilation capabilities, battery backup, LCD display and have lockable guard.

B. Exhaust Fan: Provide 7-day programmable time clock for “Occupied/Unoccupied” setpoints.

C. Split System Air Conditioner: Unit shall be provided with remote control.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection:

1. Prior to work of this Section, carefully inspect the installed work of other trades and verify that such work is complete to the point where this installation may properly commence.

2. Verify that the heating system may be installed in accordance with pertinent codes and regulations and the reviewed Submittals.

3.2 CLOSING IN WORK

A. Cover up or enclose work after it has been properly and completely tested and reviewed.

B. No additional cost to the Owner will be allowed for uncovering or recovering any work that is covered or enclosed prior to required test and review.

3.3 TEST AND ADJUST

A. Piping Systems: Test with water to a pressure of 75 psi and hold for a period of two hours. Repair any leaks and retest the piping system; repeat process until systems are leak-free. Test piping before it is insulated.

B. Before operating any system, flush the piping to remove oil and foreign materials.

C. After the installation is complete and ready for operation, test the system under normal operating conditions in the presence of the Architect and demonstrate that the system functions as designed.

D. Demonstrate that the HVAC systems have free and noiseless circulation of water, that all air

has been purged and that systems are watertight.

E. Correct defects which develop in operational testing, conduct additional testing until defect free operation is achieved.

F. Provide balancing and adjusting of terminal devices in accordance with Specification Section 230593.

3.4 CLEANUP AND CORROSION PREVENTION

A. Equipment shall be thoroughly cleaned. Dirt, dust, and debris shall be removed and the premises left in a clean and neat condition.

3.5 INSTRUCTIONS

A. On completion of the project, instruct the Owner's representative in the care and operation of the system. The total period of instruction shall not exceed one (1) hour. The time of instruction shall be arranged with the Owner. In addition to the prime Mechanical Contractor, the control system Contractor, Balancing Contractor, and Owner's representative shall be present and participate in the Owner's instruction.

* END OF SECTION *