

DIVISION 15A  
HEATING, COOLING, VENTILATING

I. GENERAL

Contractor shall provide all items of labor and materials required to make a complete installation of mechanical work shown on drawings, specified, or as required for properly operating systems, which shall include but shall not be limited to:

- A. Ventilating, heating and cooling equipment.
- B. Ductwork.
- C. Insulation.
- D. Temperature Control(s).

3. DEMOLITION AND RELOCATION

- A. Modify, remove or relocate materials and items indicated on the Drawings or required by the installation of new facilities.
- B. Remove demolition materials from the site.
- C. Repair and restore to good functional condition, equipment, materials, and items scheduled for relocation, which are damaged during dismantling or reassembly operations.

4. TEMPORARY AIR FILTRATION

- A. All return, transfer and exhaust air grilles and openings shall be covered with 1/2" thick (min.) foam temporary filter media during the entire course of construction to protect ductwork, plenums, and air handling devices from construction dust and debris.
- B. Filter media shall be changed regularly during the course of construction to prevent filter loading and to maintain the efficiency of filtration.
- C. Filter media shall be attached in such a manner to prevent leakage and by-pass.

5. HVAC EQUIPMENT & DUCTWORK

- A. Furnish and install heating, cooling and ventilating equipment as shown and as scheduled on drawings, complete with thermostat(s), firestat(s), smoke detector(s) and controls as scheduled or shown on the drawings.
- B. Furnish, install and connect complete ductwork system of supply, return, exhaust, and related items of connection as shown on drawings. Ductwork shall be galvanized steel sheet formed and fitted according to the standards of the latest editions of the ASHRAE Guide and S.M.A.C.N.A. Manual for duct systems, and shall be insulated as specified under "Acoustic Duct Linings and Insulation." At the contractor's option, Round Snap-Lock ductwork can be installed in lieu of rectangular. The contractor shall seal all joints and seams. The contractor shall submit sheet metal shop drawings, Double Line, for review before fabrication.

- C. Exhaust ductwork shall be unlined code-gauge steel.

- E. Flexible ductwork for connection between ceiling diffusers and air supply duct shall be a factory fabricated assembly consisting of an inner sleeve insulation and a moisture barrier jacket. The duct shall be non-collapsing flat spiral steel re-inforced and shall meet UL-181 Standards as Class I Duct and shall comply with NFPA Standard #90A. Duct shall be the product of Flexmaster or equal. Lengths of flexible duct shall not exceed 5'-0" and shall be installed with a minimum of turns or bending. Flexible duct shall be secured using locking steel screw-type clamps.

6. INSULATION

- A. Pipe Insulation: (cold and hot water piping): Johns-Manville Flame-Safe glass fiber pipe insulation with ASJ pre-sized glass cloth vapor barrier jacket. VB reinforced foil-kraft vapor barrier jacket in concealed areas.
- B. All liquid piping where exposed to weather, furnish and install MLK jacket - metal locking jacket consisting of 0.016 inch thick embossed aluminum with 3 mil high density polyethylene vapor barrier film. Furnished pre-rolled and pre-cut with self locking longitudinal joint, requiring no screws, rivets or bands for installation. Fittings shall be covered with two pieces of 0.028 or 0.024 inch thick stamped fitting covers. Installation shall be made with vapor barrier cement to result in waterproof, weatherproof finish. Pipe shall be wrapped with thermostatically controlled electric heat tape as shown to prevent freezing to 0° F.
- C. Condensate Drain Pipe and Refrigerant Pipe Insulation: Armstrong Cork Company fire-retardant Armaflex foamed plastic insulation. Joints sealed with 520 adhesive. Coat insulation with UV resistant paint per manufacturer's recommendation when exposed to sunlight.
- D. Duct insulation - external: Certainteed-St.Gobain Standard Duct Wraptype IV 2" thick glass fiber insulation with heavy duty foil-scrim kraft facing, 1.5 P.C.F. density. Knaf acceptable manufacturer.
- E. Duct and equipment insulation - internal: Manville Schuller PERMACOTE Density Glass Fiber Duct Liner 1-1/2" thick with a C factory of 0.25 max., 3.0 P.C.F. bonded with thermo-resin

exterior binder and an acrylic coating with an anti-microbial growth agent. Option-Imoca Polyethylene close cell foam insulation sheets of the same thickness.

- F. Vapor Barrier Adhesive: Benjamin Foster 30-35 or approved equal.
- G. Insulation and Finishing Cement: Johns-Manville 375.
- H. Adhesive for Pipe Insulation Jackets: Johns-Manville VBT or U-Glue Vapor barrier adhesive.
- I. Installation shall be in accordance with manufacturer's recommendations. Vapor-seal all butts, joints & laps.

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7. AIR DISTRIBUTION DEVICES

Grilles, registers, and ceiling diffusers shall be TITUS, METALAIR, OR PRICE as scheduled on the drawings and shall be furnished with sponge rubber or soft felt gaskets. If equipment of other manufacturer than that scheduled is submitted, the substitute equipment shall be checked for equal performance, equal or lower noise level, suitable face velocity, throw and pressure drop.

- A. Locations of ceiling outlets on drawings are approximate and shall be coordinated with other trades to make symmetrical patterns, or pattern established by the Architect's reflected ceiling plan. The outlets shall be furnished with frame styles, deflecting device, dampers, and other accessories as shown on the schedule.
- B. Each supply air ceiling diffuser shall be equipped with an adjustable air extractor, adjustable splitter damper, or "ThermaAir" Type TD bell mouth top and a locking type butterfly damper. Provide a manual opposed blade balancing damper in duct at fan unit outlet, or each outlet if multizone.

8. FILTERS

Filters shall be 2" throw-away Fann 30/30, or equal, or as scheduled on drawings. Factory filters shall be used during construction and testing. Just prior to final inspection, replace factory filters with new filters. Installation of equipment shall be made in a manner that will not impede access to filters.

9. AUTOMATIC TEMPERATURE CONTROLS

The Mechanical Contractor shall furnish complete controls system consisting of mounted programmable thermostats having 7-days capability and CO2 sensors. The Electrical Contractor shall furnish and install, as part of the electrical contract, all labor, wire and other material and equipment required to complete the installation of the temperature control system in exact accordance, physically and electrically, with wiring diagrams, and instructions furnished by the temperature control supplier. Wiring shall also conform to the applicable requirements of the electrical division of these specifications as to quality of workmanship, materials, and other requirements.

10. BALANCING & ADJUSTING

Contractor shall retain an 'NEBB' certified agency and acceptable to the A/E and owner and shall balance the air and water side of new systems (and existing systems if affected) to design quantities and shall perform additional balancing that may be required to adjust system performance to the peculiarities of occupancy, use and construction. All necessary adjustments to automatic temperature and control systems, heating and air conditioning equipment and other such devices or equipment, shall be made and systems left in first class operating condition.

- A. Air and Water balance all systems and furnish the Architect/Owner with four copies of a certified Test and Balance Report.

DIVISION 15B  
PLUMBING

I. GENERAL

A. Contractor shall furnish all labor and materials required for the complete installation of all plumbing work shown on the drawings, specified, or as required for properly operating systems. Work shall include, but shall not be limited to the following:

- 1. Systems of sanitary, waste, vent, and drain piping.
- 2. Cold and hot water systems.

2. SANITARY WASTE & VENT SYSTEM

- A. Furnish and install complete system of waste and vent piping. Connect waste and vent lines to existing sanitary drain. Extend vent stack to building exterior.
- B. All waste and vent lines shall be cast iron, standard weight. Waste lines and traps not concealed in wall shall be chrome plated brass or copper.
- C. Joints shall be made using Tyler Pipe "TYSEAL" composition joint seals for cast iron.
- D. Floor drains, cleanouts and traps shall be Josam 30000A with nickel chrome top and deep seal P-trap or equal (Nade, Smith, Zurn). Cleanouts shall be floor type complete with access cover equal to Josam Y-320-FK. Provide a trap primer equal to Precision Plumbing Products or Sluex Chief at all floor drains.

3. COLD & HOT WATER SYSTEMS

- A. Furnish and install complete systems of cold and hot water piping to serve each and every plumbing item, including equipment, using cold or hot water. Provide stop valve and riser drain valve near riser into premises.
- B. Pipe materials shall be Type "L" copper tubing with solder joint fittings, using 5% silver solder (Silver-Bright) and non-corrosive soldering flux for joint material. Exposed fixture branch piping shall be chrome plated brass or copper.
- C. Plumbing fixtures, complete with trim as scheduled on the plumbing equipment schedule.

DIVISION 15C  
FIRE PROTECTION SYSTEM

- 1. Sprinkler Contractor shall furnish and install all materials, equipment, and services required for the modifications to and extension of the existing wet pipe automatic fire sprinkler system.
- 2. Contractor shall provide complete design and drawings in accordance with Pamphlet #13, NFPA, with approvals by the Architect, and all appropriate governing insurance rating boards and other ruling authorities.
- 3. Contractor shall furnish and install chrome finish sprinkler heads, schedule 40 black steel pipe to A.S.T.M. # A.S.A. standards, valves, and drains as required for complete system.
- 4. Contractor shall submit required sepias or prints of drawings to Owner and obtain written approval before installation.
- 5. System shall be thoroughly cleaned and pressure tested in accordance with the criteria established by Factory Mutual Engineering and the Industry Standards.
- 6. Include latching flow switch with manual reset in riser and connect to electric alarm.

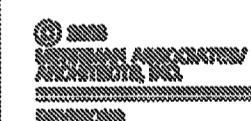


The seal on this document was authorized by Samuel G. Toub, P.E. 36988 on the date shown below.

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SHEET NUMBER  
NOTES, SYMBOLS  
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