

SECTION 22 00 00 | 23 00 00 – HVAC AND PLUMBING STANDARDS

15.1 BASIC MECHANICAL METHODS AND MATERIALS

The contractor shall be responsible for replacing the air filters in any new or existing air handling equipment affected by construction. All filters shall be new at the time of project acceptance.

The contractor shall provide a list of air filters required for each piece of air handling equipment, including fan coil units and fan terminal units where applicable. The list shall include equipment designation, equipment location, filter sizes, and quantity of each size filter.

The contractor shall provide a list of belts required for all equipment provided on the project. The list shall include equipment designation, equipment location, belt sizes, and quantity of belts.

Provide isolation valves on each floor where piping branches off of the main risers. Review the piping isolation scheme with the owner to verify that it will meet the needs of the Maintenance Department.

Vibration isolators shall be mounted between the manual isolation valve and the equipment they serve so that the vibration isolator can be isolated from the system for service.

Grooved piping systems shall not be allowed except on fire protection systems unless an exception is granted in writing.

15.2 WASTE AND VENT PIPING

Cast iron is the preferred material for all waste and vent piping unless effluent being handled dictates that another material is more suitable.

Below grade waste and vent piping shall be service weight hub and spigot with service weight cast iron fittings and neoprene compression gasket joining system such as "Ty-Seal" or equal.

Above grade waste and vent piping shall be service weight hubless cast iron with hubless service weight cast iron fittings and neoprene gasket couplings with 4band stainless steel clamp and shield assemblies.

15.3 PLUMBING SYSTEMS

Watts 909QTS are preferred where reduced pressure principle backflow preventers are required. All backflow preventers shall be provided with quarter turn ball valves on the inlet and outlet and an air gap fitting piped to a drain.

Floor drains that are located in floors below grade shall be provided with an integral backwater valve. Where possible, a group of drains may be piped so that a single backwater valve can serve multiple drains. All backwater valves shall be installed so that they are accessible for service.

All elevator shafts that are below grade shall be equipped with a sump pump.

All sump pumps shall be equipped with a high water alarm. The high water alarm shall be connected to the facility management system.

Provide a hose bibb adjacent to all exterior equipment to facilitate cleaning (cooling towers, condensing units, air cooled chillers, etc.)

15.4 DUCTWORK, PIPING, AND EQUIPMENT INSULATION

Where system operating temperatures allow, use flexible elastomeric cellular pipe insulation on all hydronic piping, domestic water piping, refrigerant piping, pumps, storage tanks, chillers, and similar equipment.

Subject to minimum insulation thickness as outlined below, insulation thickness shall be determined in accordance with the insulation manufacturer's recommendations. For cold surfaces the designer shall

base the thickness of the insulation on a maximum surface temperature of 350 F. and a minimum ambient or 900 F. temperature and 80% relative humidity.

15.5 VALVES

Do not allow gate valves on domestic water or hydronic heating and cooling systems.

All ball valves 2.5" and below in size shall be full port ball valves with stainless steel ball and stem and threaded ends. Apollo series 77-14X-01, Watts B6080SS, or approved equivalent.

Do not allow any valves 2.5" and below with sweat connections. Use sweat adaptors when using copper pipe.

Valves 3" and above shall be butterfly valves with bronze disk, 316 stainless steel stem, and latch lock lever operator. If valves are larger than 6" they shall have a hand wheel type operator.

Balancing valves shall not be used as isolation valves. Provide a separate manual isolation valve at locations where balancing and isolation are required such as fan coil units, air handling units, VAV terminal units, etc.

15.6 METERS AND GAUGES

Do not provide test ports ("Pete's Plugs"). Provide permanently installed thermometers with wells and pressure gauges with gauge cocks in each location where required.

Provide pressure gauges and thermometers on the inlet and outlet of all heat exchangers, chillers, and boilers.

Pressure gauges shall be liquid filled with stainless steel case.

All pressure gauges shall be provided with a gauge cock and snubber. Provide pigtailed for pressure gauges for steam service.

15.7 VARIABLE FREQUENCY DRIVES

Provide variable frequency drives that include the capability to record the last 15 faults. The read out shall be a minimum two row, 16 character alphanumeric display that includes the date, time, and description of the fault in English without the use of program codes. Read outs that supply codes that must be looked up in an instruction manual are not acceptable. Provide drives with a manual bypass switch so the equipment can be operated if the drive malfunctions. A sample specification can be provided by the MSU Maintenance Department.

Variable frequency drives shall not be mounted inside the motor compartment of any air handling unit or rooftop unit. Variable frequency drives shall be installed inside the building and shall be provided with the proper environment as specified by the equipment manufacturer.

15.8 COOLING TOWERS

Cooling towers shall be winterized so cooling systems are available for year round use. Where a remote sump cannot be provided, provide an electric basin heater. "Magnetrol" or approved equal floats are preferred over probes for water level control.

15.9 HYDRONIC SYSTEMS

Hydronic systems shall be provided with DowFrost or approved equal inhibited propylene glycol based heat transfer fluid, 30% by volume minimum concentration. Do not substitute without prior approval.

A factory representative shall be present at the startup of each chiller and boiler and a startup log completed for each piece of equipment. The MSU Maintenance Department shall be given 72 hours advance notice of the startup date and time so they can attend if they so desire.

All hydronic heating and cooling coils located in rooftop air handling equipment shall be equipped with a drain valve at the roof level to allow the coil to be drained from the roof without draining the entire system.

Expansion tanks shall be bladder type tanks that isolate the water from the air in the tank. Do not allow bladderless tanks.

All hydronic heating and cooling systems shall be equipped with a contacting meter located in the make-up water line. The contacting meter shall be connected to the facility management system and shall send a water usage signal to the system.

The water volume of each hydronic heating and chilled water system shall be recorded when the system is filled and included in the "As-Built" documents.

All hydronic heating and cooling systems shall have automatic air vents located at all high points in the system that might trap air. The discharge from all air vents shall be piped to a drain.

All heat exchangers, boilers, and similar equipment shall be equipped with a properly sized and installed pressure and temperature relief valve.

END OF SECTION 22 00 00 & 23 00 00

TEMPLATE