

DIVISION 23 HEATING, VENTILATING and AIR CONDITIONING

Section 23 21 13 – Hydronic Piping in Buildings

PART 1: GENERAL

1.01 Quality Assurance:

- A. Installer's qualifications: To be considered for this work, firms must have at least 3 years of successful installation experience on projects with hydronic piping work similar to that required for project. In addition, all welders performing installation of piping described in this Standard must be Certified Welders, and each weld must be stamped with the stamp of the welder performing the work.
- B. This design guidelines contained herein includes the requirements for systems, materials, fittings and valves utilized for hydronic piping systems at Texas State University. It is the intention of this document to provide a standard for piping systems at Texas State University to provide the highest level of quality and standardization possible; it is not intended to be a guide specification.
- C. Testing of the quality of the welds (x-ray or other testing method) may be required, and if so, shall be at the discretion and expense of the Owner.

1.02 Chilled Water System Design

- A. Use full reverse-return routing on all chilled water coil piping.
- B. Control chilled water flow through units with 2-way valves.
- C. Chilled water design supply water temperature should be 45F, with a minimum return water temperature of 58F to maximize the usable lifetime (optimize pipe size of existing piping) of water systems. This shall be accomplished without the use of blending stations.
- D. Modulate building chilled water pumps with variable frequency drives for pumps above 5 horsepower
- E. Codes and Standards:
 - 1. ASME Compliance: Fabricate and install hydronic piping in accordance with ASME B31.9 "Building Services Piping".

PART 2: PRODUCTS**2.01 Basic Identification:**

- A. Hydronic Piping: Mark all piping with plastic pipe markers. (equal to “W.H. Brady B-915 Brady snap-on” snap-on identification markers). Color and letter coding Standard is ANSI A13.1, “Scheme for Identification of Piping Systems.

2.02 Basic Pipe and Pipe Fittings:

- A. Hydronic Piping:
- B. Pipe Size ½” (connections to fan coil units): Type “L” copper w/ wrought copper fittings.
- C. Pipe Size 2” and Smaller: Black steel pipe; Schedule 40; Class 125 cast-iron fittings with threaded joints.
- D. Pipe Size 2-1/2” and Larger: Black steel pipe; Schedule 40; wrought-steel butt welding fittings with welded joints.
- E. Pipe Size 2-1/2” and Larger: Black steel pipe with grooved joints; Schedule 40; Mechanical/grooved fittings and couplings. (Can be used at contractor’s option).
- F. Avoid use of 3-1/2 and 5-inch pipe.
- G. Drains and vents on chilled water distribution piping shall consist of Schedule 80 thread-o-lets, stainless steel pipe nipples and bronze gate valves.
- H. Section valves and shut off valves on chilled water distribution. Provide with extended stem to facilitate insulation installation.
 - 1. 2” and smaller: Full Port Ball Valves.
 - 2. 2 ½” and Larger: Rising Stem Gate Valves or Lug Mounted Butterfly Valves.
 - 3. Plug Valves: Balancing only.

PART 3: EXECUTION**3.01 Installation of Hydronic Piping:**

- A. Install piping level with no pitch, and plumb and square whenever possible.
- B. Locate groups of pipes parallel to each other, spaced to permit applying full insulation and servicing of valves.

3.02 Installation of Valves:

- A. Sectional Valves: Required on each branch and riser, close to main, where branch or riser serves 2 or more hydronic terminals or equipment connections, and elsewhere as indicated on the drawings.

- B. Drain Valves: Required on each mechanical equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system, and elsewhere where indicated or required to completely drain hydronic-piping system.
- C. Check Valves: Required on discharge side of each pump, and elsewhere as indicated.

3.03 Standard Equipment Connections:

- A. General: Valve and union is required on supply and return, drain valve on drain connection.
- B. Hydronic Terminals: Install hydronic terminals with hydronic terminal outlet valve and union on outlet; union, shutoff valve on inlet. Install manual air vent valve on element in accordance with manufacturer's instruction. Where indicated, install automatic temperature control valve with unions between shut-off valve and element on supply line.

END OF SECTION 23 21 13