

SECTION 15510  
HYDRONIC PIPING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Pipe and pipe fittings.
- B. Valves.
- C. Heating/Chilled water piping system.

1.02 RELATED WORK

- A. Section 15260 - Piping Insulation.

1.03 REFERENCES

- A. ANSI/ASME - Boiler and Pressure Vessel Code.
- B. ANSI/ASME Sec 9 - Welding and Brazing Qualifications.
- C. ANSI/ASME B16.3 - Malleable Iron Threaded Fittings Class 150 and 300.
- D. ANSI/ASME B31.9 - Building Services Piping.
- E. ANSI/ASTM D2466 - Poly Vinyl Chloride PVC Plastic Pipe Fittings, Schedule 40.
- F. ANSI/AWS A5.8 - Brazing Filler Metal.
- G. ANSI/AWS D1.1 - Structural Welding Code.
- H. ANSI/AWWA C105 - Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids.
- I. ANSI/AWWA C110 - Ductile - Iron and Gray - Iron Fittings 3 in. through 48 in., for Water and Other Liquids.
- J. ANSI/AWWA C111 - Rubber-Gasket Joints for Ductile Iron and Gray-Iron Pressure Pipe and Fittings.
- K. ANSI/AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
- L. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.
- M. ASTM A120 - Pipe, Steel, Black and Hot-Dipped Zinc Coated (Galvanized), Welded and Seamless, for Ordinary Uses.
- N. ASTM A234 - Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.

- O. ASTM B32 - Solder Metal.
- P. ASTM B88 - Seamless Copper Water Tube.
- Q. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
- R. ASTM D2235 - Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
- S. ASTM D2241 - Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).
- T. ASTM D2310 - Machine-Made Reinforced Thermosetting Resin Pipe.
- U. ASTM D2466 - Socket-Type PVC Plastic Type Fittings, Schedule 40.
- V. ASTM D2467 - Socket-Type PVC Plastic Type Fittings, Schedule 80.
- W. ASTM D2680 - Acrylonitrile-Butadiene-Styrene (ABS) Composite-Sewer Piping.
- X. ASTM D2683 - Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.

1.04 REGULATORY REQUIREMENTS

- A. Conform to ANSI/ASME B31.9.

1.05 QUALITY ASSURANCE

- A. Valves: Manufacturer's name and pressure rating marked on valve body.
- B. Welding Materials and Procedures: Conform to ANSI/ASME SEC 9 and applicable state labor regulations.
- C. Welders Certification: In accordance with ANSI/ASME SEC 9.

1.06 SUBMITTALS

- A. Submit product data under provisions of Section 01300.
- B. Include data on pipe materials, pipe fittings, valves, and accessories.
- C. Include welders certification of compliance with ANSI/ASME SEC 9.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site under provisions of Section 01600.
- B. Store and protect products under provisions of Section 01600.

- C. Deliver and store valves in shipping containers with labelling in place.

## PART 2 PRODUCTS

### 2.01 Heating/CHILLED WATER PIPING, ABOVE GRADE

- A. Steel Pipe: ASTM A53 or A120, Schedule 40, wall for sizes 12 inch (300 mm) and over,] black.
  - 1. Fittings: ANSI/ASTM B16.3, malleable iron or ASTM A234, forged steel welding type.
  - 2. Joints: Screwed for pipe 2 inch (50 mm) and under; ANSI/AWS D1.1 welded for pipe over 2 inch (50 mm).
- B. Copper Tubing: ASTM B88, Type K, hard drawn.
  - 1. Fittings: ANSI/ASME B16.23 cast brass or ANSI/ASME B16.29 solder wrought copper.
  - 2. Joints: ASTM B32, Solder, Grade 95TA
- C. PVC Pipe: ASTM D1785, and Schedule 80 for sizes 8 inch (200 mm) and larger, or ASTM D2241, SDR 21 or 26.
  - 1. Fittings: ASTM D2466 or D2467, PVC.
  - 2. Joints: ASTM D2855, solvent weld.
- D. RTR Pipe: ASTM D2310, fiberglass reinforced thermosetting resin plastic.  
Not Used

### 2.02 EQUIPMENT DRAINS AND OVERFLOWS

- A. Steel Pipe: ASTM A53 or A120, Schedule 40 galvanized.
  - 1. Fittings: Galvanized cast iron, or ANSI/ASTM B16.3 malleable iron.
  - 2. Joints: Screwed, or grooved mechanical couplings.
- B. Copper Tubing: ASTM B88, Type K, hard drawn.
  - 1. Fittings: ANSI/ASME B16.23 cast brass, or ANSI/ASME B16.29 solder wrought copper.
  - 2. Joints: ASTM B32, solder, Grade 95TA.
- C. PVC Pipe: ASTM D1785, [and Schedule 80 for sizes 8 inch (200 mm) and larger,] or ASTM D2241, SDR 21 or 26.
  - 1. Fittings: ASTM D2466 or D2467, PVC.
  - 2. Joints: ASTM D2855, solvent weld.
- D. ABS Pipe: ASTM D2680 or D2751.
  - 1. Fittings: ASTM D2751.
  - 2. Joints: ASTM D2235, solvent weld.

### 2.03 FLANGES, UNIONS, AND COUPLINGS

- A. Pipe Size 2 Inches (50 mm) and Under: 150 psig (1 034 kPa) malleable iron unions for threaded ferrous piping; bronze unions for copper pipe, soldered joints.

- B. Pipe Size Over 2 Inches (50 mm): 150 psig (1 034 kPa) forged steel slip-on flanges for ferrous piping; bronze flanges for copper piping; 1/16 inch (1.6 mm) thick preformed neoprene bonded to asbestos.
- C. Grooved and Shouldered Pipe End Couplings: Malleable iron housing clamps to engage and lock, designed to permit some angular deflection, contraction, and expansion; C-shape elastomer composition sealing gasket for operating temperature range from -30 degrees F (-34 degrees C) to 230 degrees F (110 degrees C); steel bolts, nuts, and washers; galvanized couplings for galvanized pipe.

#### 2.04 GATE VALVES

- A. Up to 2 Inches (50 mm): Bronze body, bronze trim, non-rising stem, hand-wheel, inside screw, single wedge or disc, threaded ends.
- B. Over 2 Inches (50 mm): Iron body, bronze trim, non-rising stem, hand-wheel, OS&Y, single wedge, flanged ends.

#### 2.05 GLOBE VALVES

- A. Up to 2 Inches (50 mm): Bronze body, bronze trim, rising stem and hand-wheel, inside screw, renewable composition disc, ends, with back seating capacity.
- B. Over 2 Inches (50 mm): Iron body, bronze trim, rising stem, hand-wheel, OS&Y, plug-type disc, flanged ends, renewable seat and disc.

#### 2.06 BALL VALVES

- A. Up to 2 Inches (50 mm): Bronze one piece body, stainless steel ball, Teflon seats and stuffing box ring, lever handle, and balancing stops.
- B. Over 2 Inches (50 mm): Cast steel body, chrome plated steel ball, Teflon seat and stuffing box seals, lever handle.

#### 2.07 BUTTERFLY VALVES

- A. Iron body, bronze disc, resilient replaceable seat for service to 250 degrees F (121 degrees C), wafer or lug ends, extended neck, 10 position lever handle.

### PART 3 EXECUTION

#### 3.01 INSTALLATION

- A. Route piping in orderly manner, plumb and parallel to building structure, and maintain gradient.
- B. Install piping to conserve building space, and not interfere with use of space and other work.
- C. Group piping whenever practical at common elevations.
- D. Install piping to allow for expansion and contraction without stressing pipe, joints, or

connected equipment. Refer to Section 15121.

- E. Provide clearance for installation of insulation, and access to valves and fittings.
- F. Provide access where valves and fittings are not exposed. Coordinate size and location of access doors with Section 08305.
- G. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- H. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- I. Prepare pipe, fittings, supports, and accessories for finish painting. Refer to Section 09900.
- J. Install valves with stems upright or horizontal, not inverted.

### 3.02 APPLICATION

- A. Use grooved mechanical couplings and fasteners only in accessible locations.
- B. Install unions downstream of valves and at equipment or apparatus connections.
- C. Install brass male adapters each side of valves in copper piped system. Sweat solder adapters to pipe.
- D. Install gate valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- E. Install butterfly valves for throttling, bypass, or manual flow control services.
- F. Provide spring loaded check valves on discharge of condenser water pumps.
- G. Use plug cocks for throttling service. Use non-lubricated plug cocks only when shut-off or isolating valves are also provided.
- H. Use butterfly valves in heating water systems in heating, chilled and condenser water systems interchangeably with gate and globe valves.
- I. Use only butterfly valves in chilled and condenser water systems for throttling and isolation service.
- J. Use lug end butterfly valves to isolate equipment.
- K. Provide 3/4-inch ball drain valves at main shut-off valves, low points of piping, bases of vertical risers, and at equipment. Pipe to nearest drain.

END OF SECTION