

SECTION 232113 - HYDRONIC PIPING

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Pipe, fittings, and connections.

1.2 RELATED WORK

- A. Section 230523 - General-Duty Valves for HVAC Piping
- B. Section 230529 - Hangers and Supports for HVAC Piping and Equipment
- C. Section 230548 - Vibration and Seismic Controls for HVAC Piping and Equipment
- D. Section 230719 - HVAC Piping Insulation

1.3 REFERENCES

- A. ANSI/ASME B16.3 - Malleable-Iron Threaded Fittings.
- B. ANSI/ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
- C. ANSI/ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
- D. ANSI/ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV.
- E. ANSI/ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc-Coated, Welded and Seamless.
- F. ANSI/ASTM A153 - Zinc Coating (Hot Dip) on Iron and Steel Hardware.
- G. ASTM A234 - Wrought Carbon Steel and Alloy Steel.
- H. ASTM A536 - Ductile Iron Castings.
- I. ASTM D-1785 – PVC Piping
- J. ANSI/AWS D1.1 - Structural Welding Code.
- K. ASTM B88 - Seamless Copper Water Tube.
- L. ASTM B280 - Seamless Copper Tube for Air Conditioning.
- M. FS WW-P-521 - Pipe Fittings, Flange Fittings, and Flanges: Steel and Malleable Iron (Threaded and Butt Welding) Class 150.

1.4 QUALITY ASSURANCE

- A. Welding Materials and Procedures: Conform to ASME Code and applicable State Labor regulations.

- B. Employ certified welders in accordance with ASME Section 9 and ANSI/AWS D1.1.

1.5 SUBMITTALS

- A. Submit product data under provisions of Section 01330.
- B. Include product description, list of materials for each service and locations.
- C. Indicate pipe materials used, joining methods, supports, floor and wall penetration seals.

PART 2 PRODUCTS

2.1 PIPE AND TUBE

- A. Copper Water Tube: ASTM B88, type, grade and temper as scheduled; seamless.

2.2 PIPE AND TUBE JOINTS AND FITTINGS

- A. Copper Pipe Fittings: ANSI/ASME B16.22 or B16.18, pressure fittings.

2.3 UNIONS AND COUPLINGS

- A. Pipe Size 2-1/2 Inches and Under: Bronze, ground joint for copper or brass pipe, soldered ends.

PART 3 EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe, or groove where permitted by these specifications.
- B. Remove scale and dirt, inside and outside, before assembly.
- C. Remove welding slag or foreign material from pipe and fitting materials.
- D. Cut all pipes accurately to measurements established at structure. Work into place without springing or forcing, properly clearing all windows, doors or other openings. Cut pipe and nipples evenly; cut threads clean, remove burrs, ream ends to full inside bore. Install to permit free expansion and contraction without causing misalignment of piping or any damage to either building or piping. Grade all piping to low points to permit complete drainage of system. At bottom of water risers and at all low points provide a drain valve. Make all changes of direction with fittings except as otherwise noted. Make pipe connections to equipment in accordance with indicated sizes and details or as directed. Cap or plug all equipment and pipe line openings during installation to exclude dirt and foreign material.
- E. Provide unions at each piece of equipment, in bypasses around equipment and in long runs or piping to permit convenient disassembly for alteration or repairs. Unions must be accessible after building is completed. Mechanical pipe couplings may be used as unions where mechanical pipe couplings are allowed elsewhere in this specification.
- F. Provide test connections for thermometers and pressure gauges at each piece of equipment.

- G. Where changes in pipe sizes occur, use only reducing fittings. Use eccentric fittings where required to prevent pocketing of air and/or water.

3.2 COPPER PIPE CONNECTIONS

- A. Form hot soldered joints in copper, brass, or bronze fittings with non lead based solder. Solder shall be Worthington Silver Bearing Alloy Lead-Free (95%-Tin, 4.8%-Copper, 0.2%-Silver) or approved equal. Fittings shall be clean and deburred prior to making up joints.
- B. Make connections to equipment and branch mains with unions.

3.3 TESTS

- A. Test all piping and prove tight. Notify Architect when tests will take place and submit test results prior to covering or enclosing any piping. Before enclosing, test piping which will be concealed. Replace and re-test to Architect's satisfaction any pipe or fittings broken or damaged under test. Caulking or peening joints will not be permitted.
- B. Before testing piping systems, remove, or otherwise protect from damage, control devices, air vents, thermostatic traps and elements, other parts which are not designed to stand pressures use in testing piping.
- C. Test as follows:
 - 1. Condensate Drain 100 psig hydrostatic
- D. Hold indicated pressures constant without pumping for such period of time as directed by Architect. While under pressure, visually inspect each joint, weld or other connection to determine leakage. Apply soap suds test to all systems conveying gases under pressure.

3.4 SCHEDULE OF PIPE AND FITTINGS

A. AIR CONDITIONING CONDENSATE:

- 1. Pipe copper, type "L", hard drawn
- 2. Fittings sweat type, wrought copper
- 3. Couplings sweat type, wrought copper
- 4. Unions sweat type, wrought copper, ground joint 150 lb.
- 5. Joints Joints soldered per Paragraph 3.2A

END OF SECTION 232113