

**SECTION 221113 - BASIC PIPING MATERIALS AND METHODS**

PART 1-GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions Specification Sections, apply to this Section.

1.2 DESCRIPTION:

- A. This section specifies the basic materials and methods to be used in Division 15.
- B. All materials shall be new and undamaged. Protect all materials to keep free from foreign materials.
- C. All materials shall be made in the United States, with a UL label. No foreign materials will be accepted.

1.3 PIPE IDENTIFICATION:

- A. All piping is to be identified as described in Section 230500.

1.4 CUTTING AND PATCHING

- A. Any cutting, patching, or filling necessary for the proper execution of this work, except as noted on drawings, shall be done by this contractor. Where any other part of the building is involved, it shall be done by a competent workman in a neat and workmanlike manner. No rough or unsightly work will be allowed, and cutting of structural members shall be done only on approval of the Owner's Representative.
- B. The attention of the contractor is directed to the requirements of running pipe through concrete slabs, walls, and beams. These conditions are to be anticipated and sleeves installed as provided for under "Sleeves". Sleeves shall be placed in structural members only where approved by the Owner's Representative.

1.5 PIPE SLEEVES AND COLLARS:

- A. Pack sleeves in sound and fire partitions with Fire Marshal approved fireproofing material and provide cover flange each side.

1.6 PIPE LOCATION AND ARRANGEMENT:

- A. All piping shall be properly racked and supported to run straight and true. All changes in direction shall be made with approved fittings.

1.7 PIPE JOINING:

- A. All joints shall be made to assure liquid-tight connections. Pipe shall be reamed at ends and free of all burrs. Clean the ends to be soldered with abrasive cloth, and apply non-corrosive flux. Solder with lead-free solder, "Silvabrite 100" or approved alternate. Underground copper pipe connections shall be brazed.

1.8 SCREWED CONNECTIONS:

- A. All pipe shall be reamed at the ends and free of all inside scale or burrs. Threads shall be cut clean and sharp, and to a length equal to 1-1/8 the length of the female thread receiving the pipe. The pipe shall be screwed in full length of the female thread.

1.9 PIPE GRADING AND SLOPE:

- A. Piping shall be uniformly graded in direction of flow as noted below:

<u>Piping</u>	<u>Fall/Rise</u>	<u>Direction</u>	<u>Per/Run</u>
Water	1"	Up	40'
Waste	1/4"	Down	1'
Roof Drains	1/4"	Down	1'

PART 2 - PRODUCTS

2.1 PIPING AND FITTINGS:

- A. Culinary cold water piping above grade shall be ASTM B88-78 Type "L" copper with soldered wrought copper fittings. Solder fittings with lead-free solder.

The same piping below grade shall be schedule 40 PVC with solvent weld joints.

- B. Waste and vent piping and roof drain piping above grade shall be ASTM A74-82 no-hub cast iron. Roof drain coupling shall be extra-heavy duty type with four bands. (Do not use plastic pipe in ceiling plenums.)

The same piping below grade shall be ASTM F 1488 ABS or PVC for DWV service.

- C. Gas piping above grade shall be shall be ASTM A120-74 black steel piping. Below grade shall be plastic polyethylene PE-2406 medium density for maximum 60 psi, and PE-3408 for 60 psi and above.

2.2 HANGERS AND SUPPORTS:

- A. Vertical Piping:

- 1. Attachment - Vertical piping shall be secured at sufficiently close intervals to keep the pipe in alignment and to carry the weight of the pipe and contents. Stacks shall be supported at their bases.

- B. Horizontal Piping:

- 1. Supports - Horizontal piping shall be supported at sufficiently close intervals to keep it in alignment and prevent sagging. Screwed pipe (IPS) shall be supported at approximately 8-foot intervals. Where piping is run adjacent to walls or steel columns, it shall be supported from steel brackets or vertical channel hangers.

2. Use unistrut brackets where clevis hangers are impractical.
- C. Furnish all hangers, inserts, brackets, anchors, etc., and all auxiliary steel necessary for the installation. All supports shall be designed in accordance with the AISC Steel Handbook and painted with one with one coat of primer and two coats enamel.
- D. Plumbers' tape, chain, or wire will not be permitted.

2.3 VALVES:

- A. Ball Valves (MSS SP-110) for use in domestic water applications (copper pipe) shall be rated for 125 PSIG WOG at 220° F, with bronze construction, threaded ends, bubble tight teflon seats (at 100 PSIG under water), with a hard chrome plated brass or stainless steel ball. The valve shall operate with flow in either direction, suitable for both throttling and tight shut off. Watts B-6001, Nibco S-580-70, or Jomar Model S-100 SS with solder ends.

2.4 EQUIPMENT BACKFLOW PREVENTER:

- A. For 3/4" to 1" pipe size: Integral body unions, strainer clean and check, quarter-turn ball valve shutoffs, bronze strainer. Bronze construction, integral body unions, Celcon check seats, bronze body test cocks. Complete with funnel underneath to catch drips.
- B. Approved manufacturer: Watts model U909QT.

2.5 PRESSURE REDUCING VALVES:

- A. Watts Series U5, model U5B LP, bronze construction, complying with ASSE Standard No. 1003.

2.6 GAUGES:

- A. Gauges shall be by Ashcroft, Marsh, Terrice, Marshalltown, or Weiss.

2.7 SPECIALTIES

- A. Fire Hydrants: AWWA C502, dry-barrel fire hydrants, cast-iron body, compression-type valve opening against pressure and closing with pressure; 150-psig minimum working-pressure design, with NPS 6 mechanical-joint inlet and with external hose thread used by local fire department. Include cast-iron caps with steel chains.
- B. Backflow Prevention Devices: ASSE standard backflow preventers, bronze body, 150-psig working pressure, of size indicated for maximum flow rate and maximum pressure loss indicated.
- C. Plastic Underground Warning Tapes: Polyethylene plastic tape, 6 inches wide by 4 mils thick, solid blue in color with metallic core and continuously printed black-letter caption "CAUTION--WATER LINE BURIED BELOW."

PART 3 - EXECUTION

3.1 TESTING:

- A. All piping shall be tested prior to applying insulation or concealing in partitions, wall, etc.

3.2 ACCESS:

- A. All valves and equipment shall be located to allow easy access for inspection, test and balance, and operation.
- B. Locate piping, valves, etc., to allow easy access to and maintenance of equipment.
- C. Provide drain funnel and piping to nearest floor drain for backflow preventers.

END OF SECTION 221113