

**GENERAL:**

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The scope of this document is to provide instruction for the installation and testing of underground domestic water lines.

**DESIGN GUIDELINES:**

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## 1. Materials, Pipe and Pipe Fittings

1.1. Typical construction of underground water piping shall be PVC with ductile iron fittings.

1.1.1. EXCEPTION 1: Domestic water service lines 2" or less shall be Type K copper or high density polyethylene (HDPE) piping.

1.1.2. EXCEPTION 2: Lines passing directly over or under steam tunnels or within six feet of direct buried steam/condensate lines must be ductile iron or Type K copper (2" or less) with 4" R-5 extruded polystyrene insulation board between the pipe and steam lines.

1.2. PVC Pipe (Open Trench Construction)

1.2.1. 4 Inches to 12 Inches (Standard Pipe Sizes: 4,6,8,12): AWWA C900; Pressure Class 235 (DR 18); Cast Iron O.D. equivalent; with bell end and elastomeric gasket.

1.2.2. Gaskets: ASTM F 477, elastomeric seal.

1.3. Ductile-Iron Pipe

1.3.1. 4 Inches to 12 Inches (Standard Pipe Sizes: 4,6,8,12): AWWA C151; Mechanical Joint Pipe; Minimum Thickness Class 52 or Pressure Class 350; with integrally cast flanged bell, cast iron gland, and rubber gasket.

1.3.2. Lining: Standard cement lining with asphalt coating.

1.3.3. Encasement: AWWA C105, V-Bio polyethylene film.

1.4. High-Density Polyethylene (HDPE) Pipe and Fittings

1.4.1. 2 Inches and Less: SDR9 CTS Premium Grade Pipe, AWWA C901, ASTM D3035, NSF 14 and 61, 200 psi pressure rating. Pipe to be CenCore HDPE as manufactured by Centennial Plastics or approved equal.

1.4.2. Fittings and Joints: All molded fittings and fabricated fittings shall be fully pressure rated to match the pipe pressure rating. All fittings shall be molded or fabricated by the pipe manufacturer. Connections must be made by either the use of brass/stainless steel compression couplings with insert rings or by creating a fusion butt weld all in strict accordance with manufacturer's recommendations. All brass fittings shall be lead free.







- 2.4.3 Rough final grading of subgrade and the placement of final topsoil shall be detailed on the drawings.
- 2.4.4 All sidewalks, paving, etc. which are removed or damaged during construction shall be replaced and shall match existing.

### 2.5 Identification

- 2.5.1 Install continuous plastic underground warning tape during back-filling of trench for underground water piping. Tape shall be located twenty-four (24) inches above pipe, directly over each water line. **MS&T: Tape shall be located at least twelve (12) inches above the pipe, directly over each water line.**
- 2.5.2 Tape trace wire to the top of each water line with duct tape every five (5) feet. Wire splices shall be minimized. Terminate trace wires inside building and inside valve boxes. Drill ¼” hole in PVC valve box one inch below cast iron cover. Route wire up outside of valve box, through ¼” hole and knot. A tracer wire test station shall be installed at all fire hydrants and at all runs of piping without valves every 400 feet. Upon completion of installation and final grading, a continuity test on the wire shall be performed and all breaks shall be repaired.

### 3. Testing

#### 3.1. Field Quality Control

- 3.1.1. See section 331300 Disinfecting for cleaning and disinfection, and pressure test requirements.

### 4. Commissioning

- 4.1. System shall be placed in operation only after testing shows the absence of bacteriological contamination and approved by Owner’s Representative.
- 4.2. At MU: Only Campus Facilities - Energy Management Steam and Water personnel will be allowed to operate valves on new water systems.

## REFERENCES

Section 331015 Water Utility Distribution General (MU)  
Section 331114 Potable Water Horizontal Directional Drilling  
Section 331216 Water Utilities Distribution Valves  
Section 331219 Water Utilities Distribution Fire Hydrants  
Section 331233 Water Utilities Metering  
Section 331300 Disinfecting