

## SECTION 15410 - DOMESTIC WATER

## PART 1 – GENERAL

## 1.01 SCOPE

- A. Section Includes:
  - 1. The domestic water system shall consist of all hot and cold water piping required for each fixture or equipment item, needing same, installed or connected under this contract from a point 5'-0" outside of the building unless otherwise indicated.
  - 2. Provide heat tracing where indicated.
- B. Related Sections:
  - 1. See Other Sections for basic pipe and pipe fitting requirements, valves, pipe specialties, hangers, insulation, etc.

## 1.02 QUALITY ASSURANCE

- A. This system shall be installed in accordance with State and Local Codes, these Specifications and the Drawings. Contractor shall call to the attention of the Architect-Engineer any changes required by codes that will affect the design of the building.
- B. Solder and flux shall not contain more than 0.2% lead. Pipes and fittings shall not contain more than 8% lead.
- C. Pipe and fittings shall conform to National Sanitation Foundation (NSF) Standard 61 or the health effects portion of NSF Standard 14.

## PART 2 – PRODUCTS

## 2.01 PIPE

- A. Above Ground: Type L Copper, hard-drawn and conforming to ASTM B-88, with wrought copper fittings conforming to ASA B16.22 or cast bronze conforming to ASA B16.18.
- B. Under Ground (below floor slab and within building): Type K Copper, hard- or soft-drawn. All piping 2" and smaller shall be looped with soft copper with no joints beneath slab. All piping larger than 2" shall have SIL-FOS brazed joints and wrought copper fittings.
- C. Water lines 3" and larger outside of building or permanent structures and as indicated shall be AWWA C900 Class 150 PVC and Class 150 PVC bell end with gasket and spigot end. The piping shall be Iron Pipe Size (IPS) and shall comply with ASTM D-1785 and ASTM D-2466 for PVC fittings.
- D. Water lines 2-1/2" and under outside of building or permanent structure shall be PVC pipe Schedule 40 complying with ASTM D 1785 and ASTM D2466 for PVC fittings. Solvent welding joints shall comply with ASTM D 2564. All materials shall bear National Sanitation Foundation (NSF) seal on pipe and cement container.

## 2.02 PIPE HEAT TRACING

- A. Furnish a complete UL Listed System of pipe heating cable for freeze prevention complete with components, installation accessories, thermostats, and controls installed in strict accordance with Article 427 of the National Electric Code.

- B. The heating cable shall consist of two (2) 16 AGW Nickel-coated-copper bus wires embedded in a radiation-crosslinked polymer capable of regulating its power output in response to temperature changes all along its length with a self-regulating index of no less than 90% between 50° and 140°F. The heating cable shall be covered with a radiation-crosslinked modified polyolefin dielectric jacket (2,000 PSI Minimum) which in turn shall be covered with a tinned copper braid (3.0 Ohms/1,000' Maximum electrical resistance) and an outer modified polyolefin jacket. Voltage ratings shall be 120, 208, 220, 240, or 277. See Electrical Drawings for requirements.
- C. INSTALLATION
1. The heating cable shall be installed under the pipe's thermal insulation without spiraling and with sufficient heat output to maintain the pipe temperature of no less than 40°F when outside ambient is -20°F and the average wind speed is 15 MPH.
  2. When used on non-conductive pipe, the heater shall be attached to the pipe with a solid aluminum tape.
  3. All power, splice, and tee connections must be made up using reusable, NEMA 4X, 6P, quick-connect components, requiring no stripping of the core insulator. No heat shrink components will be allowed in making these connections.
  4. After cable installation and before and after installation of THERMAL pipe insulation, the heating cable shall be tested using a 2,500-volt megger. Minimum ELECTRICAL insulation resistance shall be 20 megohms regardless of circuit length. Both bus wires and braid shall be tested to verify the connection of all splices and tees. A copy of the meggering report shall be supplied to the engineer. All material shall be installed in accordance with the manufacturer's recommendations.
- D. Quality Control: Subject to requirements, furnish heat tracing as manufactured by Raychem XL-Trace as distributed by INDUSTRIAL HEATER, 8400 Wolf Lake Drive, Suite 116, Bartlett, Tennessee, 38133.

## 2.03 REDUCED PRESSURE BACKFLOW PREVENTERS:

- A. Backflow preventers shall be reduced pressure principle type ANSI/ASSE 1013 with stainless steel springs, reversible seat disc, two independently operating spring loaded check valves, non-threaded vent outlet, air gap fitting, entering side strainer and four test cocks. ¾-inch through 2-inch backflow preventers shall have bronze body, bronze, plastic internal parts and full port ball valves. 2-½-inch through 10-inch backflow preventers shall have ductile iron body, stainless steel internal parts and non-rising gate valves and shall be FDA approved.
- B. Backflow assemblies shall be tested and certified under the following standards.
1. ASSE No. 1013
  2. AWWA C511-89
  3. CSA B64.4.
  4. FCCCHR of USC Manual Section 10.
- C. Backflow assemblies shall be listed by the following standards.
1. IAPMO (UPC)
  2. SBCCI (Standard Plumbing Code)
- D. Furnish and install an additional valve on the inlet side of the strainer of each backflow preventer.
- E. Furnish and install backflow preventer with equivalent attributes to those scheduled on the drawing.

**2.04 PRESSURE REDUCING VALVES:**

- A. Pressure reducing valves 1-inch and smaller shall be Watts Regulator series 25AUB-DU-GG or approved equal with bronze bodies, renewable stainless steel seat, thermoplastic internal parts, reinforced diaphragm, stainless steel integral strainer, pressure gauge and threaded double union ends.
- B. Pressure reducing valves 1¼-inch and larger shall be equal to Watts Regulator series 115-7 with bronze strainer, cast iron bodies, renewable stainless steel seat, bronze internal parts, rubber disc, equalizer line and flanged ends.
- C. Provide pressure reducing valves in water service entrance when required to limit building water pressure to 70 PSI maximum. Install PRV on house side of the reduced pressure backflow preventer. Provide a pressure gauge on the house side of each PRV.

**2.05 WATER HAMMER ARRESTORS**

- A. Water Hammer Arrestors shall be Wade Shokstops of all stainless steel construction with welded nested bellows or equivalent.

**PART 3 – EXECUTION****3.01 GENERAL**

- A. Provide service ball valves in the hot and cold water at each fixture group, major equipment, and water heaters.
- B. Disinfect potable water piping by filling with a solution containing 50 parts per million of available chlorine or as required by the local Utility. This solution shall be allowed to stand six hours. Flush all piping and equipment thoroughly.
- C. Water Hammer Arrestors shall be sized and located in accordance with Plumbing and Drainage Institute Standard PDI-WH201 and as shown on plans
- D. Test water system with water to a pressure of 125 PSI for a period of two hours. Prove tight by maintaining pressure without adding water. Results of the tests, signed by the Contractor, shall be furnished to the Architect-Engineer.
- E. All water heaters and storage tanks shall have properly sized temperature and pressure relief valves, piped to within 6" of floor, and shall be set in drain pans with sight drains per building code.
- F. Avoid installing piping in outside walls; when unavoidable, insulate the pipe, and install the piping between the wall insulation and the inside finished surface.
- G. Solvent cement joints shall be made in a two step process with primer manufactured for thermoplastic piping systems and solvent cement conforming to ASTM D 2564. The system shall be protected from chemical agents, fire stopping materials, thread sealant, plasticized vinyl products, or other aggressive chemical agents not compatible with PVC compounds. Systems shall be hydrostatically tested after installation. Testing with compressed air gas is not approved.

**3.02 INSPECTION OF SITE:**

- A. Visit the proposed construction site and investigate all existing utilities, and working conditions to be encountered prior to bidding.

END OF SECTION 15410