

**SECTION 22 11 00
FACILITY WATER DISTRIBUTION**

PART 1 - GENERAL

1.1 DESCRIPTION

Domestic water systems, including piping, equipment and all necessary accessories as designated in this section.

1.2 RELATED WORK

- A. Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING.

1.3 SUBMITTALS

- A. Manufacturer's Literature and Data:
1. Piping.
 2. Strainers.
 3. All items listed in Part 2 - Products.

1.4 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. Federal Specifications (Fed. Spec.):
- A-A-1427C Sodium Hypochlorite Solution
- A-A-59617 Unions, Brass or Bronze Threaded, Pipe Connections and
Solder-Joint Tube Connections
- C. American National Standards Institute (ANSI):
- American Society of Mechanical Engineers (ASME): (Copyrighted Society)
- A13.1-96..... Scheme for Identification of Piping Systems
- B16.3-98..... Malleable Iron Threaded Fittings ANSI/ASME
- B16.4-98..... Cast Iron Threaded Fittings Classes 125 and 250 ANSI/ASME
- B16.9-01..... Factory-Made Wrought Steel Buttwelding Fittings ANSI/ASME
- B16.11-01..... Forged Steel Fittings, Socket-Welding and Threaded
ANSI/ASME
- B16.12-98..... Cast Iron Threaded Drainage Fittings ANSI/ASME
- B16.15-85(R 1994)..... Cast Bronze Threaded Fittings ANSI/ASME
- B16.18-01..... Cast Copper Alloy Solder-Joint Pressure Fittings ANSI/ASME
- B16.22-01..... Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
ANSI/ASME
Element ANSI/ASME
- D. American Society for Testing and Materials (ASTM):
- A47-99..... Ferritic Malleable Iron Castings Revision 1989

- A53-02.....Pipe, Steel, Black And Hot-Dipped, Zinc-coated Welded and Seamless
- A74-03.....Cast Iron Soil Pipe and Fittings
- A183-83(R1998).....Carbon Steel Track Bolts and Nuts
- A312-03.....Seamless and Welded Austenitic Stainless Steel Pipe
- A536-84(R1999) E1Ductile Iron Castings
- A733-03.....Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples
- B32-03.....Solder Metal
- B61-02.....Steam or Bronze Castings
- B62-02.....Composition Bronze or Ounce Metal Castings
- B75-99(Rev A)Seamless Copper Tube
- B88-03.....Seamless Copper Water Tube
- B584-00.....Copper Alloy Sand Castings for General Applications Revision A
- B687-99.....Brass, Copper, and Chromium-Plated Pipe Nipples
- C564-03Rubber Gaskets for Cast Iron Soil Pipe and Fittings
- D2000-01Rubber Products in Automotive Applications
- D4101-03b Propylene Plastic Injection and Extrusion Materials
- D2447-93Polyethylene (PE) Plastic Pipe, Schedule 40 and 80, Based on Outside Diameter
- D2564-94Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
- D2665-94 Revision APoly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
- D4101-03bPropylene Plastic Injection and Extrusion Materials
- E1120.....Standard Specification For Liquid Chlorine
- E1229.....Standard Specification For Calcium Hypochlorite
- E. American Water Works Association (AWWA):
- C110-03/ A21.10-03.....Ductile Iron and Gray Iron Fittings - 75 mm thru 1200 mm (3 inch thru 48 inches) for Water and other liquids AWWA/ ANSI
- C151-00/ A21.51-02.....Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids AWWA/ ANSI
- C203-02Coal-Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot Applied AWWA/ ANSI
- C651-99Disinfecting Water Mains
- F. American Welding Society (AWS):
- A5.8-92.....Filler Metals for Brazing

2.2 EXPOSED WATER PIPING

- A. Finished Room: Use full iron pipe size chrome plated brass piping for exposed water piping connecting fixtures, casework, cabinets, equipment and reagent racks when not concealed by apron including those furnished by the Government or specified in other sections.
1. Pipe: Fed. Spec. WW-P-351, standard weight.
 2. Fittings: ANSI B16.15 cast bronze threaded fittings with chrome finish, (125 and 250).
 3. Nipples: ASTM B 687, Chromium-plated.
 4. Unions: Mss SP-72, SP-110, Brass or Bronze with chrome finish. Unions 65 mm (2-1/2 inches) and larger shall be flange type with approved gaskets.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with the PHCC National Standard Plumbing Code and the following:
1. Install branch piping for water from the piping system and connect to all fixtures, valves, cocks, outlets, casework, cabinets and equipment, including those furnished by the Government or specified in other sections.
 2. Pipe shall be round and straight. Cutting shall be done with proper tools. Pipe, except for plastic and glass, shall be reamed to full size after cutting.
 3. All pipe runs shall be laid out to avoid interference with other work.
 4. Install union and shut-off valve on pressure piping at connections to equipment.
 5. Pipe Hangers, Supports and Accessories:
 - a. All piping shall be supported per of the National Standard Plumbing Code, Chapter No. 8.
 - b. Shop Painting and Plating: Hangers, supports, rods, inserts and accessories used for Pipe supports shall be shop coated with red lead or zinc Chromate primer paint. Electroplated copper hanger rods, hangers and accessories may be used with copper tubing.
 - c. Floor, Wall and Ceiling Plates, Supports, Hangers:
 - 1) Solid or split unplated cast iron.
 - 2) All plates shall be provided with set screws.
 - 3) Pipe Hangers: Height adjustable clevis type.
 - 4) Adjustable Floor Rests and Base Flanges: Steel.
 - 5) Concrete Inserts: "Universal" or continuous slotted type.
 - 6) Hanger Rods: Mild, low carbon steel, fully threaded or Threaded at each end with two removable nuts at each end for positioning rod and hanger and locking each in place.
 - 7) Riser Clamps: Malleable iron or steel.
 - 8) Rollers: Cast iron.

- 9) Self-drilling type expansion shields shall be "Phillips" type, with case hardened steel expander plugs.
 - 10) Hangers and supports utilized with insulated pipe and tubing shall have 180 degree (min.) metal protection shield centered on and welded to the hanger and support. The shield shall be 4 inches in length and be 16 gauge steel. The shield shall be sized for the insulation.
 - 11) Miscellaneous Materials: As specified, required, directed or as noted on the drawings for proper installation of hangers, supports and accessories. If the vertical distance exceeds 6 m (20 feet) for cast iron pipe additional support shall be provided in the center of that span. Provide all necessary auxiliary steel to provide that support.
6. Install cast escutcheon with set screw at each wall, floor and ceiling penetration in exposed finished locations and within cabinets and millwork.
- B. Piping shall conform to the following:
- 1. Domestic Water:
 - a. Where possible, grade all lines to facilitate drainage. Provide drain valves at bottom of risers. All unnecessary traps in circulating lines shall be avoided.
 - b. Connect branch lines at bottom of main serving fixtures below and pitch down so that main may be drained through fixture. Connect branch lines to top of main serving only fixtures located on floor above.

3.2 TESTS

- A. General: Test system either in its entirety or in sections.
- B. Potable Water System: Test after installation of piping and domestic water heaters, but before piping is concealed, before covering is applied, and before plumbing fixtures are connected. Fill systems with water and maintain hydrostatic pressure of 690 kPa (100 psi) gage for two hours. No decrease in pressure is allowed. Provide a pressure gage with a shutoff and bleeder valve at the highest point of the piping being tested.
- C. Reagent Grade Water Systems: Fill system with water and maintain hydrostatic pressure of 690 kPa (100 psi) gage during inspection and prove tight.
- D. All Other Piping Tests: Test new installed piping under 1 1/2 times actual operating conditions and prove tight.

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