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## 211100 - Facility Fire-Suppression Water-Service Piping

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## **SECTION 21 1100 - FACILITY FIRE-SUPPRESSION WATER-SERVICE PIPING**

### 1.1 SUMMARY

- A. Section includes fire-suppression water-service piping and related components outside the building and service entrance piping through wall into the building.
- B. Utility-furnished products include water meters that will be furnished to the site, ready for installation by the contractor.
- C. Building Services Identification Labeling – The University has adopted a comprehensive label identification for the distribution systems for all plumbing, fire protection, air, mechanical piping, electrical, fire alarm, controls, telecommunications, audio/visual, and security. The specific label colors, text, and directional flows for each component part are described in a single comprehensive table that is Chapter 5, Appendix A, Building Services Identification labeling. This labeling system must be part of any construction project, even those that are limited to a portion of a building or a single utility system.
- D. See Chapter 5, Division 01, Section 017700.1.1.B.1.i Closeout Procedures - Project Record Documents for equipment list requirements for all equipment provided in this section.

### 1.2 QUALITY ASSURANCE

- A. Regulatory Requirements:
  - 1. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
  - 2. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.
- B. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Comply with the "Approval Guide," published by FM Global, or UL's "Fire Protection Equipment Directory" for fire-service-main products.
- E. NFPA Compliance: Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-suppression water-service piping.



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1.3 COORDINATION

- A. Coordinate connection to water main with utility company.

1.4 DUCTILE-IRON PIPE AND FITTINGS

- A. Grooved-Joint, Ductile-Iron Pipe: with cut, rounded-grooved ends.
- B. Mechanical-Joint, Ductile-Iron Pipe: with mechanical-joint bell and plain spigot end.
- C. Push-on-Joint, Ductile-Iron Pipe: with push-on-joint bell and plain spigot end.
- D. Grooved-End, Ductile-Iron Pipe Appurtenances:
  - 1. Manufacturers:
    - a. Victaulic Company
    - b. Grinnell – but not Gruvlok products
  - 2. Grooved-End, Ductile Iron Fittings: ASTM A 47/A 47M, malleable-iron castings or ASTM A 536, ductile-iron castings with dimensions matching pipe.
  - 3. Grooved-End, Ductile iron-Piping Couplings: Include ferrous housing sections, gasket suitable for water, and bolts and nuts.
- E. Mechanical-Joint, Ductile-Iron Fittings: ductile or gray-iron standard pattern or ductile iron compact pattern.
  - 1. Glands, Gaskets, and Bolts: ductile or gray iron glands, rubber gaskets, and steel bolts.
- F. Push-on-Joint, Ductile-Iron Fittings: ductile iron compact pattern.
  - 1. Gaskets: rubber.
- G. Flanges: ASME B16.1, Class 125, cast iron.

1.5 SPECIAL PIPE FITTINGS

- A. Ductile Iron Flexible Expansion Joints:
  - 1. Description: Compound, ductile-iron fitting with combination of flanged and mechanical-joint ends complying with AWWA C110 or AWWA C153. Include two gasketed ball-joint sections and one or more gasketed sleeve sections. Assemble components for offset and expansion indicated. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.
  - 2. Pressure Rating: 250 psig (1725 kPa) minimum.



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1.6 ENCASEMENT FOR PIPING

- A. Standard: ASTM A 674
- B. Material: Linear low-density PE film of 0.008-inch (0.20-mm) or High-density, cross-laminated PE film of 0.004-inch (0.10-mm) minimum thickness.
- C. Form: Sheet or tube.
- D. Color: Black or natural.

1.7 JOINING MATERIALS

- A. Gaskets for Ferrous Piping and Copper-Alloy Tubing: ASME B16.21, asbestos free.
- B. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series.

1.8 PIPING SPECIALTIES

- A. Transition Fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
- B. Tubular-Sleeve Pipe Couplings:
  - 1. Description: Metal, bolted, sleeve-type, reducing or transition coupling, with center sleeve, gaskets, end rings, and bolt fasteners, and with ends of same sizes as piping to be joined.

1.9 CORPORATION VALVES AND CURB VALVES

- 1.
  - A. Corporation Valves: Include saddle and valve compatible with tapping machine and manifold.
    - 1. Service Saddle: Copper alloy with seal and threaded outlet for corporation valve.
    - 2. Corporation Valve: Bronze body and ground-key plug, with threaded inlet and outlet matching service piping material.
    - 3. Manifold: Copper fitting with two to four inlets as required, with ends matching corporation valves and outlet matching service piping material.
  - B. Curb Valves: Valve has bronze body, ground-key plug or ball, wide tee head, and inlet and outlet matching service piping material.
  - C. Service Boxes for Curb Valves: Include cast-iron telescoping top section of length required for depth of burial of valve, plug with lettering "WATER," and bottom section



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with base that fits over curb valve and with a barrel approximately 3 inches (75 mm) in diameter.

1. Shutoff Rods: Steel; with tee-handle with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve.

D. Meter Valves: Include angle- or straight-through-pattern bronze body, ground-key plug or ball, and wide tee head, with inlet and outlet matching service piping material.

### 1.10 GATE VALVES

1. 175-psig (1200-kPa), UL /FM-Approved, Iron, Non-rising-Stem Gate Valves:

- a. Description: Ductile iron body and bonnet, resilient seating material, epoxy coated body and inside screw, 2" operating nut and Open-Left.
- b. Standards: UL 262 and "Approval Guide," published by FM Global, listing.
- c. Pressure Rating: 175 psig (1200) minimum.
- d. End Connections: Mechanical or push-on joint.
- e. Indicator-Post Flange: Include on valves used with indicator posts.

2. 175-psig (1200-kPa), UL-Listed or FM-Approved, Iron, OS&Y, Gate Valves:

- a. Description: Ductile iron body and bonnet and resilient seating material and epoxy coated body.
- b. Standards: UL 262 and "Approval Guide," published by FM Global, listing.
- c. Pressure Rating: 175 psig (1200 kPa) minimum.
- d. End Connections: Flanged or grooved.

### 1.11 GATE VALVE ACCESSORIES AND SPECIALTIES

A. Tapping-Sleeve Assemblies:

1. Description: Sleeve and valve compatible with drilling machine.
2. Standard: MSS SP-60.
3. Tapping Sleeve: Ductile iron, or stainless-steel, two-piece bolted sleeve with flanged outlet for new branch connection. Sleeve shall match size and type of pipe material being tapped and have recessed flange for branch valve.
4. Valve: Ductile iron, non-rising-stem, resilient-seated gate valve with one raised-face flange mating tapping-sleeve flange, 2" operating nut and Open-Left.

B. Valve Boxes: Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over valve and with a barrel approximately 5 inches (125 mm) in diameter.

C. Indicator Posts:



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1. Description: Vertical-type, ductile iron body, resilient seat, epoxy coated with operating wrench, extension rod, and adjustable cast-iron barrel of length required for depth of burial of valve. Open-Left.
2. Standards: UL 789 and "Approval Guide," published by FM Global, listing.

1.12 WATER METERS

- a. No Pro-Press fittings are to be installed before the water meters and backflow preventers,
- b. Reference Section 224000 2.1.C.1.c

1.13 FIRE HYDRANTS – Refer to section 22 1113 1.15

1.14 FIRE-DEPARTMENT CONNECTIONS

- A. Description: Freestanding, with cast-bronze body, thread inlets according to NFPA 1963 and matching local fire-department hose threads, and threaded bottom outlet. Include lugged caps, gaskets, and chains; lugged swivel connection and drop clapper for each hose-connection inlet; 18-inch- (460-mm-) high brass sleeve; and round escutcheon plate.
- B. Standard: UL 405.
- C. Connections: Two NPS 2-1/2 (DN 65) inlets and one NPS 4 (DN 100) or NPS 6 (DN 150) outlet.
- D. Connections: Three or Four NPS 2-1/2 (DN 65) inlets and one NPS 6 (DN 150) outlet.
- E. Connections: Six NPS 2-1/2 (DN 65) inlets and one NPS 6 (DN 150) outlet.
- F. Inlet Alignment: Inline, horizontal or square.
- G. Finish Including Sleeve: Polished chrome plated, Rough chrome plated, or Polished bronze.
- H. Escutcheon Plate Marking: "AUTO SPKR & STANDPIPE."

1.15 ALARM DEVICES

- A. General: UL 753 and "Approval Guide," published by FM Global, listing, of types and sizes to mate and match piping and equipment.



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- B. Water-Flow Indicators: Vane-type water-flow detector, rated for 250-psig (1725-kPa) working pressure; designed for horizontal or vertical installation; with two single-pole, double-throw circuit switches to provide isolated alarm and auxiliary contacts, 7 A, 125-V ac and 0.25 A, 24-V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal when cover is removed.
- C. Supervisory Switches: Single pole, double throw; designed to signal valve in other than fully open position.
- D. Pressure Switches: Single pole, double throw; designed to signal increase in pressure.

END OF SECTION 21 1113