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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 or wall into the building.
- B. Approved water meters will be furnished and installed 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.
- E. The height of ceiling grids must be carefully coordinated with all MEP, FP, and Telecom systems in the plenum above the ceiling. Maintain a minimum clearance of 3” to allow UNH staff to move all tiles after the full installation is completed. Avoid obstructions with equipment and distribution piping so that tiles can be easily pushed up and slid sideways. All subcontractors working in the ceiling plenum must understand this requirement.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Comply with requirements of University Water Department supplying water. Include tapping of water mains and backflow prevention.
 - 2. Backflow preventor testing must be coordinated with UNH operations prior to final inspection by State of New Hampshire Plumbing inspector.
 - 3. 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.

1.3 COORDINATION

- A. Coordinate connection to water main with University Water Department.

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.

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

- 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 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

- A. 175-psig (1200-kPa), UL /FM-Approved, Iron, Non-rising-Stem Gate Valves:
 - 1. Description: Ductile iron body and bonnet, resilient seating material, epoxy coated body and inside screw, 2" operating nut and Open-Left.
 - 2. Standards: UL 262 and "Approval Guide," published by FM Global, listing.
 - 3. Pressure Rating: 175 psig (1200-kPa) minimum.
 - 4. End Connections: Mechanical or push-on joint.
 - 5. Indicator-Post Flange: Include on valves used with indicator posts.
- B. 175-psig (1200-kPa), UL-Listed or FM-Approved, Iron, OS&Y, Gate Valves:
 - 1. Description: Ductile iron body and bonnet and resilient seating material and epoxy coated body.
 - 2. Standards: UL 262 and "Approval Guide," published by FM Global, listing.
 - 3. Pressure Rating: 175 psig (1200-kPa) minimum.
 - 4. 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:
 - 1. Indicator posts are not provided on new UNH projects and retired where existing

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: Wall-mounted 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. Inlet Alignment: Inline, horizontal or square.
- E. Finish Including Sleeve: Polished chrome plated, Rough chrome plated, or Polished bronze.
- F. 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.
- 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 1100