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SECTION 221119 - DOMESTIC WATER PIPING SPECIALTIES

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes:

Backflow preventers.

Drain valves.

* + - * 1. Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 220500 "Common Work Results for Plumbing."

Section 221116 "Domestic Water Piping" for water meters.

Section 223200 "Domestic Water Filtration Equipment" for water filters in domestic water piping.

Section 224300 "Healthcare Plumbing Fixtures" for thermostatic mixing valves for sitz baths, thermostatic mixing-valve assemblies for hydrotherapy equipment, and outlet boxes for dialysis equipment.

Section 224500 "Emergency Plumbing Fixtures" for water tempering equipment.

Section 224700 "Drinking Fountains and Water Coolers."

Section 230923.18 "Leak Detection Instruments" for leak detection devices related to HVAC applications.

Section 331415 "Site Water Distribution Piping" for fire water-service backflow prevention devices.

* + - 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project. Include only essential definitions or acronyms not well understood by the affected industry or trade.

* + - * 1. AMI: Advanced Metering Infrastructure.
        2. AMR: Automatic Meter Reading.
        3. FKM: A family of fluoroelastomer materials defined by ASTM D1418.
      1. ACTION SUBMITTALS
         1. Product Data: For each type of product.
         2. Shop Drawings: For domestic water piping specialties.

Include diagrams for power, signal, and control wiring.

* + - 1. INFORMATIONAL SUBMITTALS
         1. Test and inspection reports.

Retain "Field quality-control reports" Paragraph below if Contractor is responsible for field-quality control testing and inspecting.

* + - * 1. Field quality-control reports.
      1. CLOSEOUT SUBMITTALS
         1. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

1. PRODUCTS
   * + 1. GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

Since January 2014, the U.S. Safe Drinking Water Act (SDWA) has required national compliance with less than or equal to 0.25 percent weighted average lead content at wetted surfaces for pipe, fittings, and devices intended to convey or dispense water for human consumption. The IPC and the UPC have the same requirements. Items in compliance with NSF 61 and NSF 372 also meet this requirement. Some manufacturers choose to meet this requirement through independent testing and have "Certified Lead-Free" products, which may or may not have NSF 61 or NSF 372 certification.

* + - * 1. Domestic water piping specialties intended to convey or dispense water for human consumption are to comply with the SDWA, requirements of authorities having jurisdiction, and NSF 61 and NSF 372, or to be certified in compliance with NSF 61 and NSF 372 by an American National Standards Institute (ANSI)-accredited third-party certification body that the weighted average lead content at wetted surfaces is less than or equal to 0.25 percent.
      1. PERFORMANCE REQUIREMENTS

Coordinate this article with Section 221116 "Domestic Water Piping."

* + - * 1. Minimum Working Pressure for Domestic Water Piping Specialties: [**125 psig**] <**Insert value**> unless otherwise indicated.
      1. BACKFLOW PREVENTERS

Copy "Backflow-Preventer Test Kits" Paragraph below and re-edit for each type of test kit required. If only one type is required, drawing designation may be omitted.

Backflow-preventer test kits below are suitable for pressure vacuum breakers; reduced-pressure-principle backflow preventers; double-check, backflow-prevention assemblies; and double-check, detector-assembly backflow preventers.

* + - * 1. Backflow-Preventer Test Kits:

Retain "Basis-of-Design Product" Subparagraph and list of manufacturers below to identify a specific product or a comparable product from manufacturers listed.

Basis-of-Design Product: Subject to compliance with requirements, provide **Zurn Industries, LLC; Model TG-5** or comparable product by one of the following:

<**Insert manufacturer's name**>

Description: Factory calibrated, with gauges, fittings, hoses, and carrying case with test-procedure instructions.

* + - 1. DRAIN VALVES

Insert drawing designation. Use these designations on Drawings to identify each product.

Copy "Ball-Valve-Type, Hose-End Drain Valves" Paragraph below and re-edit for each type of drain valve required. If only one type is required, drawing designation may be omitted.

* + - * 1. Ball-Valve-Type, Hose-End Drain Valves <**Insert drawing designation if any**>:

Standard: MSS SP-110 for standard-port, two-piece ball valves.

Pressure Rating: 400-psig minimum CWP.

Size: NPS 3/4.

Body: Copper alloy.

Ball: Chrome-plated brass.

Seats and Seals: Replaceable.

Handle: Vinyl-covered steel.

Inlet: Threaded or solder joint.

Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

Copy "Gate-Valve-Type, Hose-End Drain Valves" Paragraph below and re-edit for each type of drain valve required. If only one type is required, drawing designation may be omitted.

* + - * 1. Gate-Valve-Type, Hose-End Drain Valves <**Insert drawing designation if any**>:

Standard: MSS SP-80 for gate valves.

Pressure Rating: Class 125.

Size: NPS 3/4.

Body: ASTM B62 bronze.

Inlet: NPS 3/4 threaded or solder joint.

Outlet: Garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

Copy "Stop-and-Waste Drain Valves" Paragraph below and re-edit for each type of drain valve required. If only one type is required, drawing designation may be omitted.

* + - * 1. Stop-and-Waste Drain Valves <**Insert drawing designation if any**>:

Standard: MSS SP-110 for ball valves or MSS SP-80 for gate valves.

Pressure Rating: 200-psig minimum CWP or Class 125.

Size: NPS 3/4.

Body: Copper alloy or ASTM B62 bronze.

Drain: NPS 1/8 side outlet with cap.

1. EXECUTION
   * + 1. INSTALLATION OF PIPING SPECIALTIES
          1. Backflow Preventers: Install in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.

Locate backflow preventers in same room as connected equipment or system.

Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe-to-floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are unacceptable for this application.

Do not install bypass piping around backflow preventers.

* + - * 1. Water Regulators: Install with inlet and outlet shutoff valves[ **and bypass with memory-stop balancing valve**]. Install pressure gauges on inlet and outlet.
        2. Water Control Valves: Install with inlet and outlet shutoff valves[ **and bypass with globe valve**]. Install pressure gauges on inlet and outlet.
        3. Automatic Water Shutoff Valves: Test for signal strength before valve installation. Install automatic shutoff valve downstream from main domestic water shutoff valve. Install valve controller in an accessible location with sensors in areas where water is likely to accumulate.
        4. Balancing Valves: Install in locations where they can easily be adjusted. Set at indicated design flow rates.
        5. Temperature-Actuated, Water Mixing Valves: Install with check stops or shutoff valves on inlets and with shutoff valve on outlet.

Install cabinet-type units recessed in or surface mounted on wall as specified.

* + - * 1. Y-Pattern Strainers: For water, install on supply side of each [**control valve**] [**water pressure-reducing valve**] [**solenoid valve**] [**and**] [**pump**].
        2. Outlet Boxes: Install boxes recessed in wall or surface mounted on wall. Install 1-1/2-by-3-1/2-inch fire-retardant-treated-wood blocking, wall reinforcement between studs. Comply with requirements for fire-retardant-treated-wood blocking in Section 061000 "Rough Carpentry."
        3. Hose Stations: Install with check stops or shutoff valves on inlets and with thermometer on outlet.

Install cabinet-type units recessed in or surface mounted on wall as specified. Install 1-1/2-by-3-1/2-inch fire-retardant-treated-wood blocking, wall reinforcement between studs. Comply with requirements for fire-retardant-treated-wood blocking in Section 061000 "Rough Carpentry."

* + - * 1. Ground Hydrants: Install with [**1 cu. yd.**] <**Insert dimension**> of crushed gravel around drain hole. Set ground hydrants with box flush with grade.
        2. Nonfreeze, Draining-Type Post Hydrants: Install with [**1 cu. yd.**] <**Insert dimension**> of crushed gravel around drain hole. Set post hydrants in concrete paving or in [**1 cu. ft.**] <**Insert dimension**> of concrete block at grade.
        3. Nonfreeze, Nondraining-Type Post Hydrants: Set in concrete or pavement.
        4. Nonfreeze, Sanitary Yard Hydrants: Set with riser pipe in concrete or pavement. Do not encase canister in concrete.
        5. Nonfreeze, Draining-Type Roof Hydrants: Install with drain connection piped to nearest floor drain or to the exterior.

Water-hammer arresters in first paragraph below are best shown on water risers and details. Specifying number, size, and location here is difficult.

* + - * 1. Water-Hammer Arresters: Install in water piping in accordance with PDI-WH 201.
        2. Supply-Type, Trap-Seal Primer Device: Install with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.
        3. Drainage-Type, Trap-Seal Primer Device: Install as lavatory trap with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting.
        4. Trap-Seal Primer Systems: Install with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust system for proper flow.
      1. PIPING CONNECTIONS

Coordinate piping installations and specialty arrangements with Drawings and with requirements specified in piping systems. If Drawings are explicit enough, these requirements may be reduced or omitted.

* + - * 1. Drawings indicate general arrangement of piping, fittings, and specialties.
        2. When installing piping specialties adjacent to equipment and machines, allow space for service and maintenance.
      1. ELECTRICAL CONNECTIONS
         1. Connect wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
         2. Ground equipment in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."
         3. Install electrical devices furnished by manufacturer, but not factory mounted, in accordance with NFPA 70 and NECA 1.
      2. CONTROL CONNECTIONS
         1. Connect control wiring in accordance with Section 260523 "Control-Voltage Electrical Power Cables."
      3. IDENTIFICATION
         1. Plastic Labels for Equipment: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:

Coordinate list below with products retained in Part 2.

Vacuum breakers.

Backflow preventers.

Water pressure-reducing valves.

Automatic water shutoff valve systems.

Balancing valves.

Temperature-actuated, water mixing valves.

Outlet boxes.

Hose stations.

Wall hydrants.

Ground hydrants.

Post hydrants.

Roof hydrants.

Trap-seal primer device.

Trap-seal primer systems.

Water meters.

* + - * 1. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 220553 "Identification for Plumbing Piping and Equipment."
      1. ADJUSTING
         1. Set field-adjustable pressure set points of water pressure-reducing valves.
         2. Set field-adjustable flow set points of balancing valves.
         3. Set field-adjustable temperature set points of temperature-actuated, water mixing valves.
         4. Adjust each [**pressure vacuum breaker**] [**reduced-pressure-principle backflow preventer**] [**double-check, backflow-prevention assembly**] [**and**] [**double-check, detector-assembly backflow preventer**] <**Insert type**> in accordance with manufacturer's written instructions, authorities having jurisdiction and the device's reference standard.
      2. FIELD QUALITY CONTROL

Retain "Testing Agency," "Manufacturer's Field Service," and "Perform the following tests and inspections" paragraphs below to identify who performs tests and inspections. If retaining second option in "Testing Agency" Paragraph or if retaining "Manufacturer's Field Service" or "Perform the following tests and inspections" Paragraph, retain "Field quality-control reports" Paragraph in "Informational Submittals" Article.

* + - * 1. Testing Agency: [**Owner will engage**] [**Engage**] a qualified testing agency to perform tests and inspections.

Retain "Manufacturer's Field Service" Paragraph below to require a factory-authorized service representative to perform tests and inspections.

* + - * 1. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

Retain "Perform the following tests and inspections" Paragraph below to require Contractor to perform tests and inspections.

* + - * 1. Perform the following tests and inspections[ **with the assistance of a factory-authorized service representative**].

Test each [**pressure vacuum breaker**] [**reduced-pressure-principle backflow preventer**] [**double-check, backflow-prevention assembly**] [**and**] [**double-check, detector-assembly backflow preventer**] <**Insert type**> according to authorities having jurisdiction and the device's reference standard.

Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

Operational Test: After electrical circuitry has been energized, start units to confirm unit operation.

Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

See Section 014000 "Quality Requirements" for retesting and reinspection requirements and Section 017300 "Execution" for requirements for correcting the Work.

* + - * 1. Domestic water piping specialties will be considered defective if they do not pass tests and inspections.
        2. Prepare test and inspection reports.

END OF SECTION 221119