SECTION 221119 - DOMESTIC WATER PIPING SPECIALTIES

Revise this Section by deleting and inserting text to meet Project-specific requirements.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
   * + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
      1. SUMMARY
         1. Section Includes:

Vacuum breakers.

Backflow preventers.

Water pressure-reducing valves.

Automatic water shutoff valve systems.

Balancing valves.

Temperature-actuated, water mixing valves.

Strainers for domestic water piping.

Outlet boxes.

Hose stations.

Hose bibbs.

Wall hydrants.

Ground hydrants.

Post hydrants.

Roof hydrants.

Drain valves.

Water-hammer arresters.

Trap-seal primer device.

Trap-seal primer systems.

Flexible connectors.

Water meters.

* + - 1. DEFINITIONS
         1. AMI: Advanced Metering Infrastructure.
         2. AMR: Automatic Meter Reading.
         3. FKM: A family of fluroelastomer materials defined by ASTM D1418.
      2. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are submitted and tabbed (for combined submittals).
         4. Product Data: For each type of product.
         5. Shop Drawings: For domestic water piping specialties.

Include diagrams for power, signal, and control wiring.

* + - * 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

Manufacturers and products listed in SpecAgent and MasterWorks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 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.
        2. Service Water Meters shall be provided in compliance with Utility Service provider’s specifications and requirements.
      1. PERFORMANCE REQUIREMENTS

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

* + - * 1. Minimum Working Pressure for Domestic Water Piping Specialties: **125 psig** unless otherwise indicated.
      1. VACUUM BREAKERS

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

Copy "Pipe-Applied, Atmospheric-Type Vacuum Breakers" paragraph below and re-edit for each type of vacuum breaker required. If only one type is required, drawing designation may be omitted.

Pipe-applied, atmospheric-type vacuum breakers below are for moderate to high hazard and are available in NPS 1/4 to NPS 3 (DN 8 to DN 80). They are unsuitable for continuous pressure or for protection from backflow.

* + - * 1. Pipe-Applied, Atmospheric-Type Vacuum Breakers:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2001) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159561).

[WATTS](http://www.specagent.com/Lookup?uid=123457159566).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159567).

Approved equivalent.

Standard: ASSE 1001.

Size: 1/4 inch to 3 inch, as required to match connected piping.

Body: Bronze.

Inlet and Outlet Connections: Threaded.

Finish: [**Rough bronze**] [**Chrome plated**].

Copy "Hose-Connection Vacuum Breakers" paragraph below and re-edit for each type of vacuum breaker required. If only one type is required, drawing designation may be omitted.

Hose-connection vacuum breakers below are for low hazard and are unsuitable for continuous pressure. Outlet size is garden-hose thread.

* + - * 1. Hose-Connection Vacuum Breakers:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2002) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159695).

[MIFAB, Inc](http://www.specagent.com/Lookup?uid=123457159697).

[WATTS](http://www.specagent.com/Lookup?uid=123457159701).

[Woodford Manufacturing Company](http://www.specagent.com/Lookup?uid=123457159699).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159702).

Approved equivalent.

Standard: ASSE 1011.

Body: Bronze, nonremovable, with manual drain.

Outlet Connection: Garden-hose threaded complying with ASME B1.20.7.

Finish: [**Chrome or nickel plated**] [**Rough bronze**].

Copy "Pressure Vacuum Breakers" paragraph below and re-edit for each type of vacuum breaker required. If only one type is required, drawing designation may be omitted.

Pressure vacuum breakers below are for moderate to high hazard and are available in NPS 1/2 to NPS 2 (DN 15 to DN 50).

* + - * 1. Pressure Vacuum Breakers:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2003) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159703).

[WATTS](http://www.specagent.com/Lookup?uid=123457159708).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159709).

Approved equivalent.

Standard: ASSE 1020.

Operation: Continuous-pressure applications.

Pressure Loss: **5 psig** maximum, through middle third of flow range.

Design Flow Rate: <**Insert gpm**>.

Selected Unit Flow Range Limits: <**Insert gpm**>.

Pressure Loss at Design Flow Rate: <**Insert psig**>.

Accessories:

Valves: Ball type, on inlet and outlet.

Copy "Laboratory-Faucet Vacuum Breakers" paragraph below and re-edit for each type of vacuum breaker required. If only one type is required, drawing designation may be omitted.

Laboratory-faucet vacuum breakers below are for moderate to low hazard and are available in NPS 1/4 and NPS 3/8 (DN 8 and DN 10).

* + - * 1. Laboratory-Faucet Vacuum Breakers <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2004) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159710).

[WATTS](http://www.specagent.com/Lookup?uid=123457159711).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159713).

Approved equivalent.

Standard: ASSE 1035.

Size: 1/4 inch or 3/8 inch matching faucet size.

Body: Bronze.

End Connections: Threaded.

Finish: Chrome plated.

Copy "Spill-Resistant Vacuum Breakers" paragraph below and re-edit for each type of vacuum breaker required. If only one type is required, drawing designation may be omitted.

Spill-resistant vacuum breakers below are for high hazard and are available in NPS 3/8 to NPS 1 (DN 10 to DN 25).

* + - * 1. Spill-Resistant Vacuum Breakers <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2006) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159714).

[WATTS](http://www.specagent.com/Lookup?uid=123457159715).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159716).

Approved equivalent.

Standard: ASSE 1056.

Operation: Continuous-pressure applications.

Size: [**3/8 inch**] [**1/2 inch**] [**3/4 inch**] [**1 inch**].

Accessories:

Valves: Ball type, on inlet and outlet.

* + - 1. BACKFLOW PREVENTERS

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

Copy "Intermediate Atmospheric-Vent Backflow Preventers" paragraph below and re-edit for each type of backflow preventer required. If only one type is required, drawing designation may be omitted.

Intermediate atmospheric-vent backflow preventers below are for moderate hazard and are available in NPS 1/2 and NPS 3/4 (DN 15 and DN 20).

* + - * 1. Intermediate Atmospheric-Vent Backflow Preventers <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2007) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159717).

[WATTS](http://www.specagent.com/Lookup?uid=123457159722).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159723).

Approved equivalent.

Standard: ASSE 1012.

Operation: Continuous-pressure applications.

Size: [**1/2 inch**] [**3/4 inch**].

Body: Bronze.

End Connections: [**Union, solder**] [**Solder**] joint.

Finish: [**Rough bronze**] <**Insert finish**>.

Copy "Reduced-Pressure-Principle Backflow Preventers" paragraph below and re-edit for each type of backflow preventer required. If only one type is required, drawing designation may be omitted.

Reduced-pressure-principle backflow preventers below are for high hazard and are available in NPS 3/4 to NPS 10 (DN 20 to DN 250).

* + - * 1. Reduced-Pressure-Principle Backflow Preventers <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2009) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159724).

[WATTS](http://www.specagent.com/Lookup?uid=123457159728).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159729).

Approved equivalent.

Standard: ASSE 1013.

Operation: Continuous-pressure applications.

Pressure Loss: [**12 psig**] <**Insert value**> maximum, through middle third of flow range.

Size: <**Insert**>.

Design Flow Rate: <**Insert gpm**>.

Selected Unit Flow Range Limits: <**Insert gpm**>.

Pressure Loss at Design Flow Rate: <**Insert psig**> for sizes 2 inch and smaller; <**Insert psig**> for 2-1/2 inch and larger.

In "Body" subparagraph below, not all manufacturers offer certified lead-free for "Bronze" option. If certified lead-free bronze is required, consult manufacturers.

Body: [**Bronze**] [**cast silicon copper alloy**] [**or**] [**stainless steel**] for 2 inch and smaller; [**ductile or cast iron with interior lining that complies with AWWA C550 or that is FDA approved**] [**or**] [**stainless steel**] for 2-1/2 inch and larger.

End Connections: Threaded for 2 inch and smaller; [**flanged**] <**Insert type**> for 2-1/2 inch and larger.

Configuration: Designed for [**horizontal, straight-through**] [**vertical-inlet, horizontal-center-section, and vertical-outlet**] [**vertical**] <**Insert configuration**> flow.

Accessories:

Valves 2 inch and Smaller: Ball type with threaded ends on inlet and outlet.

Valves 2-1/2 inch and Larger: Outside-screw and yoke-gate type with flanged ends on inlet and outlet.

Air-Gap Fitting: ASME A112.1.2, matching backflow-preventer connection.

Copy "Double-Check, Backflow-Prevention Assemblies" paragraph below and re-edit for each type of backflow-prevention assembly required. If only one type is required, drawing designation may be omitted.

Double-check, backflow-prevention assemblies below are for low hazard and are available in NPS 3/4 to NPS 10 (DN 20 to DN 250).

* + - * 1. Double-Check, Backflow-Prevention Assemblies <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2010) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159730).

[WATTS](http://www.specagent.com/Lookup?uid=123457159734).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159735).

Approved equivalent.

Standard: ASSE 1015.

Operation: Continuous-pressure applications unless otherwise indicated.

Pressure Loss: [**5 psig**] <**Insert value**> maximum, through middle third of flow range.

Size: <**Insert** >.

Design Flow Rate: <**Insert gpm** >.

Selected Unit Flow Range Limits: <**Insert gpm** >.

Pressure Loss at Design Flow Rate: <**Insert psig** > for sizes 2 inch and smaller; <**Insert psig** > for 2-1/2 inch and larger.

In "Body" subparagraph below, not all manufacturers offer certified lead-free for "Bronze" option. If certified lead-free bronze is required, consult manufacturers.

Body: [**Bronze**] [**cast silicon copper alloy**] [**or**] [**stainless steel**] for 2 inch and smaller; [**ductile or cast iron with interior lining that complies with AWWA C550 or that is FDA approved**] [**or**] [**stainless steel**] for 2-1/2 inch and larger.

End Connections: Threaded for 2 inch and smaller; [**flanged**] <**Insert type**> for 2-1/2 inch and larger.

Configuration: Designed for [**horizontal, straight-through**] <**Insert configuration**> flow.

Accessories:

Valves 2 inch and Smaller: Ball type with threaded ends on inlet and outlet.

Valves 2-1/2 inch and Larger: Outside-screw and yoke-gate type with flanged ends on inlet and outlet.

Copy "Beverage-Dispensing-Equipment Backflow Preventers" paragraph below and re-edit for each type of backflow preventer required. If only one type is required, drawing designation may be omitted.

Beverage-dispensing-equipment backflow preventers below are for moderate hazard and are available in NPS 1/4 and NPS 3/8 (DN 8 and DN 10).

* + - * 1. Beverage-Dispensing-Equipment Backflow Preventers <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2011) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159736).

[WATTS](http://www.specagent.com/Lookup?uid=123457159737).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159738).

Approved equivalent.

Standard: ASSE 1022.

Operation: Continuous-pressure applications.

Size: 1/4 inch or 3/8 inch .

Not all manufacturers offer option in "Body" subparagraph below. Consult manufacturers.

Body: [**Stainless steel or non-metallic**] <**Insert material**>.

End Connections: Threaded or flare.

Copy "Dual-Check-Valve Backflow Preventers" paragraph below and re-edit for each type of backflow preventer required. If only one type is required, drawing designation may be omitted.

Dual-check-valve backflow preventers below are for low hazard and are available in NPS 1/2 to NPS 1-1/4 (DN 15 to DN 32).

* + - * 1. Dual-Check-Valve Backflow Preventers <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2012) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159740).

[Flomatic Corporation](http://www.specagent.com/Lookup?uid=123457159739).

[WATTS](http://www.specagent.com/Lookup?uid=123457159746).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159747).

Approved equivalent.

Standard: ASSE 1024.

Operation: Continuous-pressure applications.

Size: [**1/2 inch**] [**3/4 inch**] [**1 inch**] [**1-1/4 inch**].

Body: Bronze with union inlet.

Copy "Carbonated-Beverage-Dispenser, Dual-Check-Valve Backflow Preventers" paragraph below and re-edit for each type of backflow preventer required. If only one type is required, drawing designation may be omitted.

Carbonated-beverage-dispenser, dual-check-valve backflow preventers below are for moderate hazard and are available in NPS 1/4 and NPS 3/8 (DN 8 and DN 10).

* + - * 1. Carbonated-Beverage-Dispenser, Dual-Check-Valve Backflow Preventers <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2014) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[WATTS](http://www.specagent.com/Lookup?uid=123457159752).

Approved equivalent.

Standard: ASSE 1032.

Operation: Continuous-pressure applications.

Size: 1/4 inch or 3/8 inch.

Body: Stainless steel.

End Connections: Threaded or flare.

Copy "Hose-Connection Backflow Preventers" paragraph below and re-edit for each type of backflow preventer required. If only one type is required, drawing designation may be omitted.

Hose-connection backflow preventers below are for high hazard. Outlet size is garden-hose thread. Caution: Availability is limited.

* + - * 1. Hose-Connection Backflow Preventers <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2017) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159754).

[WATTS](http://www.specagent.com/Lookup?uid=123457159755).

[Woodford Manufacturing Company](http://www.specagent.com/Lookup?uid=123457159756).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159890).

Approved equivalent.

Standard: ASSE 1052.

Operation: Up to 10-foot head of water back pressure.

Inlet Size: 3/4 inch.

Outlet Size: Garden-hose thread complying with ASME B1.20.7.

Capacity: At least 3-gpm flow.

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 <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2018) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159757).

[WATTS](http://www.specagent.com/Lookup?uid=123457159760).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159761).

Approved equivalent.

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

* + - 1. WATER PRESSURE-REDUCING VALVES

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

Copy "Water Regulators" paragraph below and re-edit for each type of water regulator required. If only one type is required, drawing designation may be omitted.

Water regulators below are available in NPS 1/2 to NPS 3 (DN 15 to DN 80).

* + - * 1. Water Regulators <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2020) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159762).

[Cash Acme, A Division of Reliance Worldwide Corporation](http://www.specagent.com/Lookup?uid=123457159765).

[WATTS](http://www.specagent.com/Lookup?uid=123457159764).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159766).

Approved equivalent.

Standard: ASSE 1003.

Pressure Rating: Initial working pressure of 150 psig.

Size: <**Insert**>.

Design Flow Rate: <**Insert gpm** >.

Design Inlet Pressure: <**Insert psig** >.

Design Outlet Pressure Setting: <**Insert psig** >.

Body: Bronze[**with chrome-plated finish**] for 2 inch and smaller; [**bronze**] [**cast iron with interior lining that complies with AWWA C550 or that is FDA approved**] for 2-1/2 inch and 3 inch.

Valves for Booster Heater Water Supply: Include integral bypass.

End Connections: Threaded or solder for 2 inch and smaller; flanged or solder for 2-1/2 inch and 3 inch.

Copy "Water-Control Valves" paragraph below and re-edit for each type of water-control valve required. If only one type is required, drawing designation may be omitted.

Water-control valves below are available in NPS 1-1/4 (DN 32) and larger.

* + - * 1. Water-Control Valves <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2021) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457177818).

[CLA-VAL](http://www.specagent.com/Lookup?uid=123457177820).

[Flomatic Corporation](http://www.specagent.com/Lookup?uid=123457177821).

[OCV Control Valves](http://www.specagent.com/Lookup?uid=123457177822).

[WATTS](http://www.specagent.com/Lookup?uid=123457177825).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457177826).

Approved equivalent.

Description: Pilot-operated, diaphragm-type, single-seated, main water-control valve.

Pressure Rating: Initial working pressure of 150 psig minimum with AWWA C550 or FDA-approved, interior epoxy coating. Include small pilot-control valve, restrictor device, specialty fittings, and sensor piping.

Main Valve Body: Cast- or ductile-iron body with AWWA C550 or FDA-approved, interior epoxy coating; or stainless steel body.

Size: <**Insert**>.

Pattern: [**Angle**] [**Globe**]-valve design.

Trim: Stainless steel.

Design Flow: <**Insert gpm** >.

Design Inlet Pressure: <**Insert psig** >.

Design Outlet Pressure Setting: <**Insert psig** >.

End Connections: Threaded for 2 inch and smaller; [**flanged**] <**Insert type**> for 2-1/2 inch and larger.

* + - 1. AUTOMATIC WATER SHUTOFF VALVE SYSTEMS

Automatic water shutoff valve systems with actuators are generally available in NPS 3/4 to NPS 4 (DN 20 to DN 100); verify sizes with manufacturer. Automatic water shutoff valves are most commonly installed in domestic water piping, although they can be used for other applications where moisture detection is desired. Systems include remote water leak sensors to actuate the shutoff valve upon sensing water or possibly temperature. Some systems use a pipe-mounted flow sensor to detect unusual water flow. Variations of the valve are available for water mains, makeup supply branches, and appliances (clothes washers, water heaters, and icemakers). Multiple wired water leak sensors connected to a system allow for wider area coverage. Wireless water leak sensors allow more sensor connections than wired sensors. Relay contacts are used for secondary signaling, device control, and audible alarms. Valves must be paired with a wired or wireless leak detection system.

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=13376) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[FloLogic, Inc](http://www.specagent.com/Lookup?uid=123457159682).

[OnSite PRO Inc](http://www.specagent.com/Lookup?uid=123457159683).

[QMI Manufacturing Inc](http://www.specagent.com/Lookup?uid=123457159684).

[RectorSeal Plumbing; A CSW Industrials Company](http://www.specagent.com/Lookup?uid=123457166453).

[Reliance Detection Technologies](http://www.specagent.com/Lookup?uid=123457159685).

[WaterCop](http://www.specagent.com/Lookup?uid=123457159898).

Approved equivalent.

Retain "Shutoff Control Ball Valves and Actuators" paragraph below for ball valves NPS 1/2 through NPS 2 (DN 15 through DN 50).

Copy paragraph and re-edit for each type of shutoff control ball valve and actuator required. If only one type is required, drawing designation may be omitted.

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

* + - * 1. Shutoff Control Ball Valves and Actuators <**Insert drawing designation if any**>:

Size: [**NPS 1/2**] [**NPS 3/4**] [**NPS 1**] [**NPS 1-1/4**] [**NPS 1-1/2**] [**NPS 2**] <**Insert pipe size**>.

Design Flow Rate: <**Insert gpm**>.

Design Inlet Pressure: <**Insert psig**>.

Control Valve: Two-piece, full-port brass ball valve, MSS SP-110.

End Connections: Threaded, female.

Retain "Fittings" subparagraph below for hose-fed equipment application.

Fittings: One 3/8-by-1/2-inch male compression and one 3/8-by-1/2-inch female compression.

Seats: PTFE.

O-Rings: FKM.

Stem: Low-lead brass. Blowout proof.

CWP Rating: [**600 psig**] <**Insert value**>.

Manual-override control turn-knob for emergency operation of valve.

Valve Actuator: Motor operated, with or without gears, electric and electronic. Capable of closing valve against inlet pressure. Direct mount, fails closed.

Power Supply: [**Battery**] [**120 V ac**] [**120 V ac step-down transformer**][**with cord and plug**].

Manual Intervention: Allowed.

Position Indicator: Standard.

Retain "Actuator Enclosure" subparagraph below for actuator enclosures.

Actuator Enclosure: Suitable for ambient conditions encountered by application.

Pair each automatic water shutoff valve with a wireless or wired leak detection system to actuate the valve actuator. Select a detection system for each application.

Retain "Wireless Leak Detection System" subparagraph below for wireless leak detection system.

Wireless Leak Detection System:

Sensor-Water Flow Type: Pipe-mounted to detect water flow.

Sensor-Rope Type: Absorbent water sensing rope constructed from twisted metal conductor wires insulated from one another and surrounded by polyethylene mesh braid jacket to detect water presence.

Specific range may vary due to local structural conditions.

Wireless Signal Range: 100 feet minimum between sensors and receiver.

Self-monitoring enabled system; faults for lost communication between receiver and sensor(s).

Onboard Battery Backup: 48 hours of protection.[**Valve to close prior to backup failure.**]

LED Indicators: Wireless signal strength, communication loss, water fault, low-temperature fault, and low battery.

Retain "FCC-Approved Wireless Communication System" subparagraph below for systems with this capability.

FCC-Approved Wireless Communication System: Between sensors, repeaters, and receivers.

Output Contacts: Interface with home security or BAS, cellular text notification service, or auto dialer accessories.

Retain "Wireless Signal Repeater" subparagraph below for applications where sensor(s) and receiver exceed manufacturer's recommended distance.

Wireless Signal Repeater: Boosts signal performance between wireless sensors and receiver.

Push-button pairing and unpairing, into and out of the network.

Visual indication of wireless signal strength, low battery, and lost communication.

Standard wall outlet, 120 V ac, power.

Battery Backup: Two (2) AA batteries for battery backup to maintain system integrity during a power outage.

Wireless Water Switch: Allows manual override or wireless system functionality and closes the valve to shut off water flow.

Hard-Wired Water Switch: Allows manual override or wireless system functionality and closes the valve to shut off water flow.

Retain "Wired Leak Detection System" subparagraph below for wired leak detection system.

Wired Leak Detection System:

Power Supply: Class II transformer with cord and plug, 120 V ac, UL listed.

Power Cord Length: [**12 feet**] <**Insert dimension**>.

Control Panel: LED power and LED valves indicator.

Alarms: Audible alarm[**, with external output**].

Output Contacts: Interface with home security or BAS, cellular text notification service, or auto dialer accessories.

Wired Sensors:

Quantity Per Receiver: [**One**] [**Two**] [**Three**] [**Four**] [**Five**] [**Six**].

Cable Length: [**8 feet**] [**25 feet**] [**50 feet**] [**100 feet**] <**Insert dimension**>.

"Cable Adder" subparagraph below is for installations that require an additional distance between receiver and shutoff valve.

Cable Adder: [**10 feet**] [**25 feet**] [**50 feet**] [**100 feet**] <**Insert dimension**> in length.

Retain "Shutoff Control Butterfly Valve and Actuator" paragraph below for butterfly valves NPS 2-1/2 through NPS 4 (DN 65 through DN 100). Confirm availability of product with manufacturers.

Copy paragraph and re-edit for each type of shutoff control butterfly valve and actuator required. If only one type is required, drawing designation may be omitted.

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

A limited number of manufacturers offer shutoff control butterfly valves and Actuators. Consult manufacturers.

* + - * 1. Shutoff Control Butterfly Valve and Actuator <**Insert drawing designation if any**>:

Size: [**2-1/2 inch**] [**3 inch**] [**4 inch**] <**Insert pipe size**>.

Compliance: MSS SP-67.

Full-port, epoxy-coated, ductile-iron lug body.

Seat: EPDM, minus 30 deg F to plus 250 deg F.

Face-to-Face Flange: ASME B16.5 flanges.

Disc Design: Floating stainless steel dual shaft.

Disc Material: Coated ductile iron.

Locating Pin: Carbon steel.

Bushings: PTFE.

O-Rings: EPDM.

Ten-position stop.

Manual-override control turn-knob for emergency operation of valve.

Valve Actuator: Motor operated, with or without gears, electric and electronic. Capable of closing valve against inlet pressure. Direct mount, fails closed.

Power Supply: [**Battery**] [**120 V ac**] [**120 V ac step-down transformer**][**with cord and plug**].

Manual Intervention: Allowed.

Position Indicator: Standard.

Retain "Actuator Enclosure" subparagraph below for actuator enclosures.

Actuator Enclosure: Suitable for ambient conditions encountered by application.

Automatic water shutoff valves shall be paired with a wireless or wired leak detection system to actuate the valve actuator. Select one for each application.

Retain "Wireless Leak Detection System" subparagraph below for wireless leak detection system.

Wireless Leak Detection System:

Sensor-Water Flow Type: Pipe-mounted to detect water flow.

Sensor-Rope Type: Absorbent water sensing rope constructed from twisted metal conductor wires insulated from one another and surrounded by polyethylene mesh braid jacket to detect water presence.

Specific range may vary due to local structural conditions.

Wireless Signal Range: 100 feet minimum between sensors and receiver.

Self-monitoring enabled system; faults for lost communication between receiver and sensor(s).

Onboard Battery Backup: 48 hours of protection.[**Valve to close prior to backup failure.**]

LED Indicators: Wireless signal strength, communication loss, water fault, low-temperature fault, and low battery.

Retain "FCC-Approved Wireless Communication System" subparagraph below for systems with this capability.

FCC-Approved Wireless Communication System: Between sensors, repeaters, and receivers.

Output Contacts: Interface with home security or BAS, cellular text notification service, or auto dialer accessories.

Retain "Wireless Signal Repeater" subparagraph below for applications where sensor(s) and receiver exceed manufacturer's recommended distance.

Wireless Signal Repeater: Boosts signal performance between wireless sensors and receiver.

Push-button pairing and unpairing, into and out of the network.

Visual indication of wireless signal strength, low battery, and lost communication.

Standard wall outlet, 120 V ac, power.

Battery Backup: Two (2) AA batteries for battery backup to maintain system integrity during a power outage.

Wireless Water Switch: Allows manual override or wireless system functionality and closes the valve to shut off water flow.

Hard-Wired Water Switch: Allows manual override or wireless system functionality and closes the valve to shut off water flow.

Retain "Wired Leak Detection System" subparagraph below for wired leak detection system.

Wired Leak Detection System:

Power Supply: Class II transformer with cord and plug, 120 V ac, UL listed.

Power Cord Length: [**12 feet**] <**Insert dimension**>.

Control Panel: LED power and LED valves indicator.

Alarms: Audible alarm[**, with external output**].

Output Contacts: Interface with home security or BAS, cellular text notification service, or auto dialer accessories.

Wired Sensors:

Quantity Per Receiver: [**One**] [**Two**] [**Three**] [**Four**] [**Five**] [**Six**].

Cable Length: [**8 feet**] [**25 feet**] [**50 feet**] [**100 feet**] <**Insert dimension**>.

"Cable Adder" subparagraph below is for installations that require an additional distance between receiver and shutoff valve.

Cable Adder: [**10 feet**] [**25 feet**] [**50 feet**] [**100 feet**] <**Insert dimension**> in length.

Retain "Clothes Washer Shutoff Control Valve and Actuator" paragraph below for control valves for clothes washers, shutting off both hot- and cold-water supplies.

Copy paragraph and re-edit for each type of shutoff control valve required. If only one type is required, drawing designation may be omitted.

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

* + - * 1. Clothes Washer Shutoff Control Valve and Actuator <**Insert drawing designation if any**>:

Brass or stainless steel ball valve.

End Connections: Male hose connections, 3/4 inch.

Pressure Rating: 400 psi at 32 to 150 deg F.

Valve Actuator:

Enclosure: Suitable for ambient conditions encountered by application.

Power Supply: [**Battery**] [**120 V ac**] [**120 V ac step-down transformer**][**with cord and plug**].

Position Indicator: Standard.

Wired Leak Detection System:

Water sensor with minimum 6-foot length of wire.

120 V ac step-down transformer with cord and plug.

LED operation and leak notification.

Audible alarm.

Power failure or manual disconnection of power causes valves to close.

* + - * 1. Accessories:

Retain "Electrical Plug Interrupter," "Gas Flow Interrupter," or "Step-Down Transformer" subparagraph below for power-vented gas water heaters, requiring that electricity to the power venter is shut off when a water leak is detected.

Electrical Plug Interrupter: Plugs into standard 120 V ac wall outlet.

Gas Flow Interrupter: ECO connector with female spade connectors. Factory prewired, 8 feet.

Gas Interface Cable: Interface cable with male and female connectors.

Step-Down Transformer: [**120**] [**208**] [**240**] V ac to 24 V ac with mounting plate, 12-foot plenum wire to power, and 8-foot plenum wire to sensor.

Liquid Level Sensors: Monitor fluid levels in addition to detecting plumbing leaks.

In "Auto Dialer" subparagraph below, dialer requires a dedicated analog phone line.

Auto Dialer: Send and receive automatic alerts when a fault condition occurs. Standard output contacts trigger up to nine predetermined telephone number calls.

Prerecord message for future playback.

10-second recordable message.

Built-in tamper switch.

DC adaptor with battery backup.

Programmable as a silent (dialer only) or audible (siren and dialer) alarm.

Easy "Stop Call Sequence" - push "#" on phone to acknowledge the alarm and stop the dialing sequence.

In "Cellular Text Notification System" subparagraph below, system requires a mobile wireless network service provider.

Cellular Text Notification System:

Event SMS text notification to up to three cell phones.

Battery Backup: Four (4) AA batteries.

12-foot interface cable to leak detection system.

Customized messaging.

<**Insert wireless network service provider**>.

* + - 1. BALANCING VALVES

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

Copy "Copper-Alloy Calibrated Balancing Valves" paragraph below and re-edit for each type of balancing valve required. If only one type is required, drawing designation may be omitted.

* + - * 1. Copper-Alloy Calibrated Balancing Valves <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2022) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Bell & Gossett; a Xylem brand](http://www.specagent.com/Lookup?uid=123457159899).

[IMI Hydronic Engineering Inc](http://www.specagent.com/Lookup?uid=123457159901).

[Nexus Valve, Inc](http://www.specagent.com/Lookup?uid=123457159900).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457159769).

[WATTS](http://www.specagent.com/Lookup?uid=123457159774).

Approved equivalent.

Type: [**Ball**] [**or**] [**Y-pattern globe**] valve with two readout ports and memory-setting indicator.

Body: [**Brass**] [**or**] [**bronze**].

Size: Same as connected piping, but not larger than 2 inch .

Accessories: Meter hoses, fittings, valves, differential pressure meter, and carrying case.

Copy "Memory-Stop Balancing Valves" paragraph below and re-edit for each type of balancing valve required. If only one type is required, drawing designation may be omitted.

* + - * 1. Memory-Stop Balancing Valves <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2025) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457177827).

[Crane; a Crane Co. brand](http://www.specagent.com/Lookup?uid=123457177828).

[Hammond Valve](http://www.specagent.com/Lookup?uid=123457177829).

[Jenkins Valves; a Crane Co. brand](http://www.specagent.com/Lookup?uid=123457177830).

[Milwaukee Valve Company](http://www.specagent.com/Lookup?uid=123457177831).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457177833).

[Red-White Valve Corp](http://www.specagent.com/Lookup?uid=123457177834).

[Stockham; a Crane Co. brand](http://www.specagent.com/Lookup?uid=123457177835).

Approved equivalent.

Standard: MSS SP-110 for two-piece, copper-alloy ball valves.

Pressure Rating: 400-psig minimum CWP.

Size: 2 inch or smaller.

Body: Copper alloy.

Port: Standard or full port.

Ball: Chrome-plated brass or stainless steel.

Seats and Seals: Replaceable.

End Connections: Solder joint or threaded.

Handle: Vinyl-covered steel with memory-setting device.

Copy "Automatic Flow Control Balancing Valves" paragraph below and re-edit for each type of balancing valve required. If only one type is required, drawing designation may be omitted.

* + - * 1. Automatic Flow Control Balancing Valves <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=13735) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Caleffi North America](http://www.specagent.com/Lookup?uid=123457159908).

[IMI Hydronic Engineering Inc](http://www.specagent.com/Lookup?uid=123457159909).

[ThermOmegaTech](http://www.specagent.com/Lookup?uid=123457159910).

Approved equivalent.

Flow Regulation: Plus or minus 5 percent over 95 percent of the working range.

Pressure Rating: 200 psig.

Size: 2 inch or smaller.

Body: Stainless steel or brass.

Flow Cartridge: Stainless steel or antiscale polymer.

End Connections: Threaded or solder joint.

* + - 1. TEMPERATURE-ACTUATED, WATER MIXING VALVES

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

Copy "Water-Temperature Limiting Devices" paragraph below and re-edit for each type of limiting device required. If only one type is required, drawing designation may be omitted.

Water-temperature limiting devices below are not intended for service as master thermostatic mixing valves. Their primary function is to thermostatically regulate the temperature of water at a single fixture. Devices below are available in NPS 1/2 to NPS 1 (DN 15 to DN 25) and comply with ASSE 1070. They may additionally comply with ASSE 1016, ASSE 1017, or both.

* + - * 1. Water-Temperature Limiting Devices <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2027) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Acorn Engineering Company; a Division of Morris Group International](http://www.specagent.com/Lookup?uid=123457160114).

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159782).

[Cash Acme, A Division of Reliance Worldwide Corporation](http://www.specagent.com/Lookup?uid=123457159789).

[Leonard Valve Company](http://www.specagent.com/Lookup?uid=123457159785).

[Symmons Industries, Inc](http://www.specagent.com/Lookup?uid=123457159786).

[Taco Comfort Solutions](http://www.specagent.com/Lookup?uid=123457159784).

[WATTS](http://www.specagent.com/Lookup?uid=123457159788).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159791).

Approved equivalent.

Standard: ASSE 1070.

Pressure Rating: 125 psig.

Type: Thermostatically controlled, water mixing valve.

Material: Bronze body with corrosion-resistant interior components.

Connections: Threaded[**union**] inlets and outlet.

Accessories: Check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.

Tempered-Water Setting: <**Insert deg F**>.

Retain "Tempered-Water Design Flow Rate" subparagraph below only if flow rate is not indicated on Drawings.

Tempered-Water Design Flow Rate: <**Insert gpm** >.

Valve Finish: [**Chrome plated**] [**Rough bronze**].

Copy "Primary, Thermostatic, Water Mixing Valves" paragraph below and re-edit for each type of water mixing valve required. If only one type is required, drawing designation may be omitted.

Primary, thermostatic, water mixing valves below are available in NPS 3/4 to NPS 3 and possibly NPS 4 (DN 20 to DN 80 and possibly DN 100), but they are usually NPS 2 (DN 50) or smaller.

* + - * 1. Primary, Thermostatic, Water Mixing Valves <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2028) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Acorn Engineering Company; a Division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159588).

[Apollo Valves; a part of Aalberts Integrated Piping Systems](http://www.specagent.com/Lookup?uid=123457159589).

[Cash Acme, A Division of Reliance Worldwide Corporation](http://www.specagent.com/Lookup?uid=123457159590).

[Lawler Manufacturing Company, Inc](http://www.specagent.com/Lookup?uid=123457159581).

[Leonard Valve Company](http://www.specagent.com/Lookup?uid=123457159582).

[Symmons Industries, Inc](http://www.specagent.com/Lookup?uid=123457159583).

[WATTS](http://www.specagent.com/Lookup?uid=123457178453).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159587).

Approved equivalent.

Standard: ASSE 1017.

Pressure Rating: 125 psig minimum unless otherwise indicated.

Type: [**Exposed-mounted**] [**Cabinet-type**], thermostatically controlled, water mixing valve.

Material: Bronze body with corrosion-resistant interior components.

Connections: Threaded[**union**] inlets and outlet.

Accessories: Manual temperature control, check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.

Tempered-Water Setting: <**Insert deg F**>.

Retain "Tempered-Water Design Flow Rate" subparagraph below only if flow rate is not indicated on Drawings.

Tempered-Water Design Flow Rate: <**Insert gpm** >.

Selected Valve Flow Rate at 45-psig Pressure Drop: <**Insert gpm** >.

Pressure Drop at Design Flow Rate: <**Insert psig** >.

Valve Finish: [**Chrome plated**] [**Polished, chrome plated**] [**Rough bronze**].

Piping Finish: [**Chrome plated**] [**Copper**].

Retain "Cabinet" subparagraph below if required.

Cabinet: Factory fabricated, stainless steel, for [**recessed**] [**surface**] mounting and with hinged, stainless steel door.

Copy "Primary, Electronic, Water Mixing Valve Assemblies" paragraph below and re-edit for each type of water mixing valve assembly required. If only one type is required, drawing designation may be omitted.

Primary, electronic, water mixing valve assemblies below are available in NPS 1 to NPS 8 (DN 25 to DN 200).

* + - * 1. Primary, Electronic, Water Mixing Valve Assemblies <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=13736) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Acorn Engineering Company; a Division of Morris Group International](http://www.specagent.com/Lookup?uid=123457160115).

Armstrong

[Caleffi North America](http://www.specagent.com/Lookup?uid=123457160116).

[Leonard Valve Company](http://www.specagent.com/Lookup?uid=123457160117).

[POWERS; A WATTS Brand](http://www.specagent.com/Lookup?uid=123457160118).

Approved equivalent.

Standard: ASSE 1017.

Pressure Rating: 125 psig minimum unless otherwise indicated.

Type: Exposed, electronically controlled, water mixing valve.

Material: Bronze body with corrosion-resistant interior components.

Connections: Threaded or solder joint inlets and outlet.

Accessories: Manual temperature override control, check stops on hot- and cold-water supplies, and automatic hot- and cold-water shutoff upon inlet supply failure.

Tempered-Water Setting: <**Insert deg F**>.

Retain "Tempered-Water Design Flow Rate" subparagraph below only if flow rate is not indicated on Drawings.

Tempered-Water Design Flow Rate: <**Insert gpm** >.

Selected Valve Flow Rate at 45-psig Pressure Drop: <**Insert gpm** >.

Pressure Drop at Design Flow Rate: <**Insert psig** >.

Valve Finish: Bronze.

Digital temperature control and monitoring module.

Controls temperature within plus or minus 2 deg F.

User programmable at module or through BAS.

ASHRAE 188 compliance.

Local and remote monitoring.

[**BACNet**] [**Modbus**] [**Metasys**] [**Ethernet**] protocol language(s).

[**115**] [**230**] V ac, 60 Hz.

Battery backup.

Copy "Manifold, Thermostatic, Water Mixing Valve Assemblies" paragraph below and re-edit for each type of water mixing valve assembly required. If only one type is required, drawing designation may be omitted.

Several manufacturers of thermostatic mixing valves promote single "high-low" valves to be used instead of manifold valve assemblies below. If single valves are required for high and low systems, specify them in "Primary, Thermostatic, Water Mixing Valves" paragraph.

* + - * 1. Manifold, Thermostatic, Water Mixing Valve Assemblies <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2029) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Acorn Engineering Company; a Division of Morris Group International](http://www.specagent.com/Lookup?uid=123457160119).

[Leonard Valve Company](http://www.specagent.com/Lookup?uid=123457159793).

[POWERS; A WATTS Brand](http://www.specagent.com/Lookup?uid=123457159794).

[Symmons Industries, Inc](http://www.specagent.com/Lookup?uid=123457159795).

Approved equivalent.

Description: Factory-fabricated, [**cabinet-type**] [**exposed-mounted**], thermostatically controlled, water mixing valve assembly in [**two**] [**three**]-valve parallel arrangement.

Large-Flow Parallel: Thermostatic, water mixing valve and downstream-pressure regulator with pressure gauges on inlet and outlet.

Retain "Intermediate-Flow Parallel" subparagraph below for three-valve assemblies.

Intermediate-Flow Parallel: Thermostatic, water mixing valve and downstream-pressure regulator with pressure gauges on inlet and outlet.

Small-Flow Parallel: Thermostatic, water mixing valve.

Thermostatic Mixing Valves: Comply with ASSE 1017. Include check stops on hot- and cold-water inlets and shutoff valve on outlet.

Water Regulator(s): Comply with ASSE 1003. Include pressure gauge on inlet and outlet.

Pressure Rating: 125 psig minimum unless otherwise indicated.

Retain "Cabinet" subparagraph below if required.

Cabinet: Factory fabricated, stainless steel, for [**recessed**] [**surface**] mounting and with hinged, stainless steel door.

Selected Large-Flow, Tempered-Water Valve Size: <**Insert size**>.

Tempered-Water Setting: <**Insert deg F**>.

Unit Tempered-Water Design Flow Rate: <**Insert gpm** >.

Unit Minimum Tempered-Water Design Flow Rate: <**Insert gpm** >.

Selected Unit Flow Rate at 45-psig Pressure Drop: <**Insert gpm** >.

Unit Pressure Drop at Design Flow Rate: <**Insert psig** >.

Unit Tempered-Water Outlet Size: <**Insert**> end connection.

Unit Hot- and Cold-Water Inlet Size: <**Insert**> end connections.

Thermostatic Mixing Valve and Water Regulator Finish: [**Chrome plated**] [**Polished, chrome plated**] [**Rough bronze**].

Piping Finish: [**Chrome plated**] [**Copper**].

Copy "Photographic-Process, Thermostatic, Water Mixing Valve Assemblies" paragraph below and re-edit for each type of water mixing valve assembly required. If only one type is required, drawing designation may be omitted.

* + - * 1. Photographic-Process, Thermostatic, Water Mixing Valve Assemblies <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2030) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[WATTS](http://www.specagent.com/Lookup?uid=123457178452).

Approved equivalent.

Standard: ASSE 1017, thermostatically controlled, water mixing valve made for precise, process-water temperature control.

Pressure Rating: 125 psig minimum unless otherwise indicated.

Material: Bronze body with corrosion-resistant interior components.

Connections: Threaded inlets and outlet.

Accessories: Manual temperature control, check stops on hot- and cold-water supplies, thermometer, shutoff valve, and adjustable, temperature-control handle.

Cabinet: Factory fabricated, stainless steel, for surface mounting; with controls and thermometer mounted on front.

Tempered-Water Setting: <**Insert deg F**>.

Tempered-Water Design Flow Rate: <**Insert gpm** >.

Tempered-Water Outlet Size: <**Insert** > end connection.

Hot- and Cold-Water Inlet Size: <**Insert** > end connections.

Copy "Individual-Fixture, Water Tempering Valves" paragraph below and re-edit for each type of water tempering valve required. If only one type is required, drawing designation may be omitted.

Individual-fixture, water tempering valves below are unsuitable for service as primary water tempering valves. Valves below are available in NPS 1/2 (DN 15) and larger; however, devices in "Water-Temperature Limiting Devices" paragraph should be used instead.

* + - * 1. Individual-Fixture, Water Tempering Valves <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2031) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Acorn Engineering Company; a Division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159601).

[Lawler Manufacturing Company, Inc](http://www.specagent.com/Lookup?uid=123457159594).

[Leonard Valve Company](http://www.specagent.com/Lookup?uid=123457159592).

[POWERS; A WATTS Brand](http://www.specagent.com/Lookup?uid=123457159599).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159598).

Approved equivalent.

Standard: ASSE 1016, thermostatically controlled, water tempering valve.

Pressure Rating: 125 psig minimum unless otherwise indicated.

Material: Bronze body with corrosion-resistant interior components.

Temperature Control: Adjustable.

Connections: Threaded inlets and outlet.

Finish: Chrome plated.

Tempered-Water Setting: <**Insert deg F**>.

Retain "Tempered-Water Design Flow Rate" subparagraph below only if required.

Tempered-Water Design Flow Rate: <**Insert gpm**>.

Copy "Primary Water Tempering Valves" paragraph below and re-edit for each type of water tempering valve required. If only one type is required, drawing designation may be omitted.

Primary water tempering valves below are available in NPS 1/2 to NPS 4 (DN 15 to DN 100).

* + - * 1. Primary Water Tempering Valves <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2032) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Heat-Timer Corporation](http://www.specagent.com/Lookup?uid=123457159603).

[Holby Valve Inc](http://www.specagent.com/Lookup?uid=123457159604).

[WATTS](http://www.specagent.com/Lookup?uid=123457178358).

Approved equivalent.

Standard: ASSE 1017, thermostatically controlled, water tempering valve, listed as tempering valve.

Pressure Rating: 125 psig minimum unless otherwise indicated.

Material: Bronze body.

Temperature Control: Manual.

Connections: Threaded inlets and outlet.

Selected Primary Water Tempering Valve Size: <**Insert size**>.

Tempered-Water Setting: <**Insert deg F**>.

Tempered-Water Design Flow Rate: <**Insert gpm**>.

Pressure Drop at Design Flow Rate: <**Insert psig**>.

Tempered-Water Outlet Size: <**Insert** > end connection.

Cold-Water Inlet Size: <**Insert** > end connection.

Hot-Water Inlet Size: <**Insert** > end connection.

Valve Finish: [**Rough bronze**] <**Insert finish**>.

* + - 1. STRAINERS FOR DOMESTIC WATER PIPING

Copy "Y-Pattern Strainers" paragraph below and re-edit for each type of Y-pattern strainer required. If only one type is required, drawing designation may be omitted.

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

* + - * 1. Y-Pattern Strainers <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=13838) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Keckley Company](http://www.specagent.com/Lookup?uid=123457165773).

[Titan Flow Control, Inc](http://www.specagent.com/Lookup?uid=123457165774).

[WATTS](http://www.specagent.com/Lookup?uid=123457165771).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457165772).

Approved equivalent.

Pressure Rating: 125 psig minimum unless otherwise indicated.

Body: Bronze for 2 inch and smaller; cast iron[**with interior lining that complies with AWWA C550 or that is FDA approved, epoxy coated and**] for 2-1/2 inch and larger.

End Connections: Threaded for 2 inch and smaller; flanged for 2-1/2 inch and larger.

Screen: Stainless steel with round perforations unless otherwise indicated.

If retaining more than one screen size, indicate size on Drawings.

Perforation Size:

Strainers 2 inch and Smaller: [**1/50 inch**] [**33/1000 inch**] [**31/500 inch**] <**Insert dimension**>.

Strainers 2-1/2 inch to 4 inch: [**9/200 inch**] [**31/500 inch**] [**1/8 inch**] <**Insert dimension**>.

Strainers 5 inch and Larger: [**1/10 inch**] [**1/8 inch**] [**1/4 inch**] <**Insert dimension**>.

Drain: [**Pipe plug**] [**Factory-installed, hose-end drain valve**].

* + - 1. OUTLET BOXES

Authorities having jurisdiction may require backflow preventers in water-supply piping or on hose-thread outlets.

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

Copy "Clothes Washer Outlet Boxes" paragraph below and re-edit for each type of outlet box required. If only one type is required, drawing designation may be omitted.

* + - * 1. Clothes Washer Outlet Boxes <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2033) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Acorn Engineering Company; a Division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159611).

[Guy Gray, IPS Corporation](http://www.specagent.com/Lookup?uid=123457159607).

[LSP Products Group](http://www.specagent.com/Lookup?uid=123457159612).

[Oatey](http://www.specagent.com/Lookup?uid=123457159609).

[Sioux Chief Manufacturing Company, Inc](http://www.specagent.com/Lookup?uid=123457159618).

[Symmons Industries, Inc](http://www.specagent.com/Lookup?uid=123457159613).

[Water-Tite, IPS Corporation](http://www.specagent.com/Lookup?uid=123457160124).

Approved equivalent.

Mounting: Recessed.[**Fire rated.**]

Material and Finish: [**Enameled-steel or epoxy-painted-steel**] [**Enameled-steel, epoxy-painted-steel, or plastic**] [**Plastic**] [**Stainless steel**] box and faceplate.

Faucet: Combination valved fitting or separate hot- and cold-water valved fittings complying with ASME A112.18.1. Include garden-hose thread complying with ASME B1.20.7 on outlets.

Drain Outlet Connection: [**1-1/2 inch**] [**2 inch**].

Accessory: Water hammer arresters.

Retain "Supply Shutoff Fittings" or "Drain" subparagraph below, or both, if required. These items are usually not included with box.

Supply Shutoff Fittings: 1/2 inch gate, globe, or ball valves and 1/2 inch copper, water tubing.

Drain: [**1-1/2 inch**] [**2 inch**] standpipe and P-trap for direct waste connection to drainage piping.

Retain "Inlet Hoses" or "Drain Hose" subparagraph below, or both, if required. Hoses are usually included with clothes washers.

Inlet Hoses: Two 60-inch- long, rubber, household clothes washer inlet hoses with female, garden-hose-thread couplings. Include rubber washers.

Drain Hose: One 48-inch- long, rubber, household clothes washer drain hose with hooked end.

Copy "Icemaker Outlet Boxes" paragraph below and re-edit for each type of outlet box required. If only one type is required, drawing designation may be omitted.

* + - * 1. Icemaker Outlet Boxes <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2035) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Guy Gray, IPS Corporation](http://www.specagent.com/Lookup?uid=123457160125).

[LSP Products Group](http://www.specagent.com/Lookup?uid=123457159619).

[Oatey](http://www.specagent.com/Lookup?uid=123457159620).

[Sioux Chief Manufacturing Company, Inc](http://www.specagent.com/Lookup?uid=123457159624).

[Water-Tite, IPS Corporation](http://www.specagent.com/Lookup?uid=123457160127).

Approved equivalent.

Mounting: Recessed.[**Fire rated.**]

Material and Finish: [**Enameled-steel or epoxy-painted-steel**] [**Enameled-steel, epoxy-painted-steel, or plastic**] [**Plastic**] [**Stainless steel**] box and faceplate.

Faucet: Valved fitting complying with ASME A112.18.1. Include 1/2 inch or smaller copper tube outlet.

Accessory: Water hammer arrestor.

Retain "Supply Shutoff Fitting" subparagraph below if required. This item is usually not included with box.

Supply Shutoff Fitting: 1/2 inch gate, globe, or ball valve and 1/2 inch copper, water tubing.

* + - 1. HOSE STATIONS

Authorities having jurisdiction may require backflow preventers in water-supply piping or on hose-thread outlets. Revise this article to suit Project.

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

Copy "Single-Temperature-Water Hose Stations" paragraph below and re-edit for each type of hose station required. If only one type is required, drawing designation may be omitted.

* + - * 1. Single-Temperature-Water Hose Stations <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=13373) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[ARCHON Industries, Inc](http://www.specagent.com/Lookup?uid=123457159806).

[Armstrong International, Inc](http://www.specagent.com/Lookup?uid=123457159800).

[DynaFluid Ltd](http://www.specagent.com/Lookup?uid=123457159802).

[Leonard Valve Company](http://www.specagent.com/Lookup?uid=123457159803).

[Strahman Valves, Inc](http://www.specagent.com/Lookup?uid=123457159804).

[T&S Brass and Bronze Works, Inc](http://www.specagent.com/Lookup?uid=123457159805).

Approved equivalent.

Standard: ASME A112.18.1.

Retain "Cabinet" subparagraph below if required.

Cabinet: Stainless steel enclosure with exposed valve handle, hose connection, and hose rack. Include thermometer in front.

Hose-Rack Material: Stainless steel.

Body Material: Bronze[**with stainless steel wetted parts**].

Body Finish: Rough bronze[**, chrome plated**].

Mounting: [**Wall, with reinforcement**] [**Floor, with stainless steel pedestal**].

Supply Fittings: [**1/2 inch**] [**3/4 inch**] gate, globe, or ball valve and check valve and [**1/2 inch**] [**3/4 inch**] copper, water tubing. Omit check valve if check stop is included with fitting.

Hose: Manufacturer's standard, for service fluid, temperature, and pressure; [**25 feet**] [**50 feet**] <**Insert dimension**> long.

Nozzle: With hand-squeeze, on-off control.

Vacuum Breaker:

Integral or factory-installed, nonremovable, manual-drain-type, hose-connection vacuum breaker complying with ASSE 1011 or backflow preventer complying with ASSE 1052.

Garden-hose thread complying with ASME B1.20.7 on outlet.

Copy "Hot- and Cold-Water Hose Stations" paragraph below and re-edit for each type of hose station required. If only one type is required, drawing designation may be omitted.

* + - * 1. Hot- and Cold-Water Hose Stations <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=13374) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[ARCHON Industries, Inc](http://www.specagent.com/Lookup?uid=123457159813).

[Armstrong International, Inc](http://www.specagent.com/Lookup?uid=123457159807).

[Cooney Brothers, Inc](http://www.specagent.com/Lookup?uid=123457159808).

[DynaFluid Ltd](http://www.specagent.com/Lookup?uid=123457159809).

[Leonard Valve Company](http://www.specagent.com/Lookup?uid=123457159810).

[Strahman Valves, Inc](http://www.specagent.com/Lookup?uid=123457159811).

[T&S Brass and Bronze Works, Inc](http://www.specagent.com/Lookup?uid=123457159812).

Approved equivalent.

Standard: ASME A112.18.1.

Faucet Type: [**Blending**] [**Thermostatic mixing**] valve.

Retain "Cabinet" subparagraph below if required.

Cabinet: Stainless steel enclosure with exposed valve handles, hose connection, and hose rack. Include thermometer in front.

Hose-Rack Material: Stainless steel.

Body Material: Bronze[**with stainless steel wetted parts**].

Body Finish: Rough bronze[**or chrome plated**].

Mounting: [**Wall, with reinforcement**] [**Floor, with stainless steel pedestal**].

Supply Fittings: Two [**1/2 inch**] [**3/4 inch**] gate, globe, or ball valves and check valves and [**1/2 inch**] [**3/4 inch**] copper, water tubing. Omit check valves if check stops are included with fitting.

Hose: Manufacturer's standard, for service fluid, temperature, and pressure; [**25 feet**] [**50 feet**] <**Insert dimension**> long.

Nozzle: With hand-squeeze, on-off control.

Vacuum Breaker: Integral or factory-installed, nonremovable, manual-drain-type, hose-connection vacuum breaker complying with ASSE 1011 or backflow preventer complying with ASSE 1052; and garden-hose thread complying with ASME B1.20.7 on outlet.

Copy "Cold-Water and Steam Hose Stations" paragraph below and re-edit for each type of hose station required. If only one type is required, drawing designation may be omitted.

* + - * 1. Cold-Water and Steam Hose Stations <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=13375) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[ARCHON Industries, Inc](http://www.specagent.com/Lookup?uid=123457159820).

[Armstrong International, Inc](http://www.specagent.com/Lookup?uid=123457159814).

[DynaFluid Ltd](http://www.specagent.com/Lookup?uid=123457159816).

[Leonard Valve Company](http://www.specagent.com/Lookup?uid=123457159817).

[Strahman Valves, Inc](http://www.specagent.com/Lookup?uid=123457159818).

Approved equivalent.

Standard: ASME A112.18.1.

Faucet Type: [**Blending**] [**Thermostatic mixing**] valve.

Retain "Cabinet" subparagraph below if required.

Cabinet: Stainless steel enclosure with exposed valve handles, hose connection, and hose rack. Include thermometer in front.

Hose-Rack Material: Stainless steel.

Body Material: Bronze[**with stainless steel wetted parts**].

Body Finish: Rough bronze[**or chrome plated**].

Mounting: [**Wall, with reinforcement**] [**Floor, with stainless steel pedestal**].

Supply Fittings: Two [**1/2 inch**] [**3/4 inch**] gate, globe, or ball valves and check valves and [**1/2 inch**] [**3/4 inch**] copper, water tubing. Omit check valves if check stops are included with fitting.

Hose: Manufacturer's standard, for service fluid, temperature, and pressure; [**25 feet**] [**50 feet**] <**Insert dimension**> long.

Nozzle: With hand-squeeze, on-off control.

Vacuum Breaker:

Integral or factory-installed, nonremovable, manual-drain-type, hose-connection vacuum breaker complying with ASSE 1011 or backflow preventer complying with ASSE 1052.

Garden-hose thread complying with ASME B1.20.7 on outlet.

* + - 1. HOSE BIBBS

Copy "Hose Bibbs" paragraph below for each type of hose bibb required. If only one type is required, drawing designation may be omitted.

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

* + - * 1. Hose Bibbs <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=13377) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Jay R. Smith Mfg Co; a division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159686).

[MIFAB, Inc](http://www.specagent.com/Lookup?uid=123457159688).

[Prier Products, Inc](http://www.specagent.com/Lookup?uid=123457159689).

[WATTS](http://www.specagent.com/Lookup?uid=123457159691).

[Woodford Manufacturing Company](http://www.specagent.com/Lookup?uid=123457159692).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159693).

Approved equivalent.

Standard: ASME A112.18.1 for sediment faucets.

Body Material: Bronze.

Seat: Bronze, replaceable.

Supply Connections: 1/2 inch or 3/4 inch threaded or solder-joint inlet.

Outlet Connection: Garden-hose thread complying with ASME B1.20.7.

Pressure Rating: 125 psig.

Vacuum Breaker: Integral[**or field-installation,**] nonremovable, drainable, hose-connection vacuum breaker complying with ASSE 1011.

Finish for Equipment Rooms: Rough bronze, or chrome or nickel plated.

Finish for Service Areas: [**Rough bronze**] [**Chrome or nickel plated**].

Finish for Finished Rooms: Chrome or nickel plated.

Operation for Equipment Rooms: Wheel handle or operating key.

Operation for Service Areas: [**Wheel handle**] [**Operating key**].

Operation for Finished Rooms: [**Wheel handle**] [**Operating key**].

Include operating key with each operating-key hose bibb.

Include[**integral**] wall flange with each chrome- or nickel-plated hose bibb.

* + - 1. WALL HYDRANTS

Wall hydrants without integral vacuum breakers or backflow preventers are available but not recommended. Wall hydrants are not generally considered devices to convey or dispense water for human consumption; therefore, some manufacturers do not comply with lead-free construction/certification. If Project application requires lead-free construction, confirm availability of product with manufacturers.

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

Copy "Nonfreeze Wall Hydrants" paragraph below for each type of wall hydrant required. If only one type is required, drawing designation may be omitted.

* + - * 1. Nonfreeze Wall Hydrants <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2038) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Jay R. Smith Mfg Co; a division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159631).

[Josam Company](http://www.specagent.com/Lookup?uid=123457159625).

[MIFAB, Inc](http://www.specagent.com/Lookup?uid=123457159626).

[Prier Products, Inc](http://www.specagent.com/Lookup?uid=123457159627).

[WATTS](http://www.specagent.com/Lookup?uid=123457159628).

[Woodford Manufacturing Company](http://www.specagent.com/Lookup?uid=123457159632).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159630).

Approved equivalent.

Standard: ASME A112.21.3M for [**concealed**] [**exposed**]-outlet, self-draining wall hydrants.

Pressure Rating: 125 psig.

Operation: Loose key.

Casing and Operating Rod: Of length required to match wall thickness. Include wall clamp.

Inlet: 3/4 inch or 1 inch.

Retain "Outlet, Concealed"; "Box"; and "Box and Cover Finish" subparagraphs below for concealed-outlet-type wall hydrants.

Outlet, Concealed: With integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.

Box: Deep, flush mounted with cover.

Box and Cover Finish: [**Polished nickel bronze**] [**Rough bronze**] <**Insert finish**>.

Retain "Outlet, Exposed" and "Nozzle and Wall-Plate Finish" subparagraphs below for exposed-outlet-type wall hydrants.

Outlet, Exposed: With integral vacuum breaker and garden-hose thread complying with ASME B1.20.7.

Nozzle and Wall-Plate Finish: [**Polished nickel bronze**] [**Rough bronze**] [**Chrome plated**] <**Insert finish**>.

Operating Keys(s): [**One**] [**Two**] with each wall hydrant.

Copy "Nonfreeze, Hot- and Cold-Water Wall Hydrants" paragraph below and re-edit for each type of wall hydrant required. If only one type is required, drawing designation may be omitted.

* + - * 1. Nonfreeze, Hot- and Cold-Water Wall Hydrants <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2039) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Jay R. Smith Mfg Co; a division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159824).

[Josam Company](http://www.specagent.com/Lookup?uid=123457159821).

[MIFAB, Inc](http://www.specagent.com/Lookup?uid=123457160129).

[Prier Products, Inc](http://www.specagent.com/Lookup?uid=123457159822).

[WATTS](http://www.specagent.com/Lookup?uid=123457159823).

[Woodford Manufacturing Company](http://www.specagent.com/Lookup?uid=123457159826).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159827).

Approved equivalent.

Standard: ASME A112.21.3M for [**concealed**] [**exposed**]-outlet, self-draining wall hydrants.

Pressure Rating: 125 psig.

Operation: Loose key.

Casing and Operating Rods: Of length required to match wall thickness. Include wall clamps.

Inlet: 3/4 inch or 1 inch.

Outlet: Concealed.

Box: Deep, flush mounted with cover.

Box and Cover Finish: [**Polished nickel bronze**] [**Chrome plated**] <**Insert finish**>.

Vacuum Breaker:

Nonremovable, manual-drain-type, hose-connection vacuum breaker complying with ASSE 1011 or backflow preventer complying with ASSE 1052.

Garden-hose thread complying with ASME B1.20.7 on outlet.

Operating Key(s): [**One**] [**Two**] with each wall hydrant.

Copy "Moderate-Climate Wall Hydrants" paragraph below and re-edit for each type of wall hydrant required. If only one type is required, drawing designation may be omitted.

* + - * 1. Moderate-Climate Wall Hydrants <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2040) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Jay R. Smith Mfg Co; a division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159638).

[MIFAB, Inc](http://www.specagent.com/Lookup?uid=123457159635).

[Prier Products, Inc](http://www.specagent.com/Lookup?uid=123457159637).

[WATTS](http://www.specagent.com/Lookup?uid=123457159636).

[Woodford Manufacturing Company](http://www.specagent.com/Lookup?uid=123457159640).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159641).

Approved equivalent.

Standard: ASME A112.21.3M for [**concealed**] [**exposed**]-outlet, self-draining wall hydrants.

Pressure Rating: 125 psig.

Operation: Loose key.

Inlet: 3/4 inch or 1 inch.

Retain "Outlet, Concealed"; "Box"; and "Box and Cover Finish" subparagraphs below for concealed-outlet-type wall hydrants.

Outlet, Concealed:

With integral vacuum breaker or nonremovable hose-connection vacuum breaker complying with ASSE 1011 or backflow preventer complying with ASSE 1052.

Garden-hose thread complying with ASME B1.20.7.

Box: Deep, flush mounted with cover.

Box and Cover Finish: [**Polished nickel bronze**] [**Chrome plated**] <**Insert finish**>.

Retain "Outlet, Exposed" and "Nozzle and Wall-Plate Finish" subparagraphs below for exposed-outlet-type wall hydrants.

Outlet, Exposed:

With integral vacuum breaker or nonremovable hose-connection vacuum breaker complying with ASSE 1011 or backflow preventer complying with ASSE 1052.

Garden-hose thread complying with ASME B1.20.7.

Nozzle and Wall-Plate Finish: [**Polished nickel bronze**] [**Rough bronze**] <**Insert finish**>.

Operating Key(s): [**One**] [**Two**] with each wall hydrant.

Copy "Nonfreeze Vacuum Breaker Wall Hydrants" paragraph below and re-edit for each type of wall hydrant required. If only one type is required, drawing designation may be omitted.

* + - * 1. Nonfreeze Vacuum Breaker Wall Hydrants <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=3261) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[A.Y. McDonald Mfg. Co](http://www.specagent.com/Lookup?uid=123457159828).

[Champion - Arrowhead](http://www.specagent.com/Lookup?uid=123457159829).

[Jay R. Smith Mfg Co; a division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159835).

[Prier Products, Inc](http://www.specagent.com/Lookup?uid=123457159831).

[WATTS](http://www.specagent.com/Lookup?uid=123457159832).

[Woodford Manufacturing Company](http://www.specagent.com/Lookup?uid=123457159833).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159834).

Approved equivalent.

Standard: ASSE 1019, Type A or Type B.

Type: Automatic draining with integral air-inlet valve.

Retain only Type B in "Classification" subparagraph below if hose remains attached.

Classification: [**Type A, for automatic draining with hose removed or**]Type B, for automatic draining with hose removed or with hose attached and nozzle closed.

Pressure Rating: 125 psig.

Operation: [**Loose key**] [**or**] [**wheel handle**].

Casing and Operating Rod: Of length required to match wall thickness. Include wall clamp.

Inlet: 1/2 inch or 3/4 inch.

Outlet: Exposed with garden-hose thread complying with ASME B1.20.7.

* + - 1. GROUND HYDRANTS

Retain this article only if ground hydrants are required and are not specified in Section 221113 "Facility Water Distribution Piping." Vacuum breakers are ineffective on this type of hydrant. If using ground hydrants, a backflow preventer in supply piping is recommended.

Ground hydrants are not generally considered devices to convey or dispense water for human consumption; therefore, some manufacturers do not comply with lead-free construction/certification. If Project application requires lead-free construction, confirm availability of product with manufacturers.

Copy "Nonfreeze Ground Hydrants" paragraph below and re-edit for each type of ground hydrant required. If only one type is required, drawing designation may be omitted.

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

* + - * 1. Nonfreeze Ground Hydrants <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2043) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Jay R. Smith Mfg Co; a division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159649).

[Josam Company](http://www.specagent.com/Lookup?uid=123457159643).

[MIFAB, Inc](http://www.specagent.com/Lookup?uid=123457159646).

[Murdock Manufacturing; A Division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159647).

[Prier Products, Inc](http://www.specagent.com/Lookup?uid=123457159644).

[WATTS](http://www.specagent.com/Lookup?uid=123457159645).

[Woodford Manufacturing Company](http://www.specagent.com/Lookup?uid=123457159648).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159651).

Approved equivalent.

Standard: ASME A112.21.3M.

Type: Nonfreeze, concealed-outlet ground hydrant with box.

Operation: Loose key.

Casing and Operating Rod: Of at least length required for burial of valve below frost line.

Inlet sizes in "Inlet" subparagraph below are available up to and including NPS 2 (DN 50) for some manufacturers.

Inlet: [**3/4 inch**] <**Insert pipe size**>.

Outlet: Garden-hose thread complying with ASME B1.20.7.

Drain: Designed with hole to drain into ground when shut off.

Box: [**Standard**] [**Deep**] pattern with cover.

Box and Cover Finish: [**Rough**] [**Polished nickel**] <**Insert finish**> bronze.

Operating Key(s): [**One**] [**Two**] with each ground hydrant.

Vacuum breaker in "Vacuum Breaker" subparagraph below is ineffectual because of ground-level location. If required, include a deep box. Some manufacturers discourage their use and void product warranty against damage if used.

Vacuum Breaker: ASSE 1011.

* + - 1. POST HYDRANTS

Retain this article only if post hydrants are required and are not specified in Section 221113 "Facility Water Distribution Piping."

Post hydrants are not generally considered devices to convey or dispense water for human consumption; therefore, some manufacturers do not comply with lead-free construction/certification. If Project application requires lead-free construction, confirm availability of product with manufacturers.

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

Copy "Nonfreeze, Draining-Type Post Hydrants" paragraph below and re-edit for each type of post hydrant required. If only one type is required, drawing designation may be omitted.

Hydrants below are not recommended. Nonfreeze, sanitary yard hydrants are preferred.

* + - * 1. Nonfreeze, Draining-Type Post Hydrants <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2045) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Jay R. Smith Mfg Co; a division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159843).

[MIFAB, Inc](http://www.specagent.com/Lookup?uid=123457159837).

[Prier Products, Inc](http://www.specagent.com/Lookup?uid=123457159836).

[WATTS](http://www.specagent.com/Lookup?uid=123457159839).

[Woodford Manufacturing Company](http://www.specagent.com/Lookup?uid=123457159841).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159842).

Approved equivalent.

Standard: ASME A112.21.3M.

Type: Nonfreeze, exposed-outlet post hydrant.

Operation: Loose key.

Casing and Operating Rod: Of at least length required for burial of valve below frost line.

Casing: Bronze with casing guard.

Inlet sizes in "Inlet" subparagraph below are available up to and including NPS 2 (DN 50) for some manufacturers.

Inlet: [**3/4 inch**] <**Insert pipe size**>.

Outlet: Garden-hose thread complying with ASME B1.20.7.

Drain: Designed with hole to drain into ground when shut off.

Vacuum Breaker:

Nonremovable, drainable, hose-connection vacuum breaker complying with ASSE 1011 or backflow preventer complying with ASSE 1052.

Garden-hose thread complying with ASME B1.20.7 on outlet.

Operating Key(s): [**One**] [**Two**] with each loose-key-operation wall hydrant.

Copy "Nonfreeze Sanitary Yard Hydrants" paragraph below and re-edit for each type of sanitary yard hydrant required. If only one type is required, drawing designation may be omitted.

* + - * 1. Nonfreeze Sanitary Yard Hydrants <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2048) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Hoeptner Products](http://www.specagent.com/Lookup?uid=123457159844).

[Jay R. Smith Mfg Co; a division of Morris Group International](http://www.specagent.com/Lookup?uid=123457160130).

[Murdock Manufacturing; A Division of Morris Group International](http://www.specagent.com/Lookup?uid=123457160131).

[Woodford Manufacturing Company](http://www.specagent.com/Lookup?uid=123457160132).

Approved equivalent.

Standard: ASSE 1057.

Operation: Wheel handle or lever.

Head: Cast iron or brass, with pail hook.

Inlet: 3/4 inch or 1 inch threaded.

Length: As required for burial of valve and canister below frost line.

Canister: [**Stainless steel**] <**Insert material**>.

Retain "Vacuum Breaker" subparagraph below if required. Manufacturers caution that leaving the vacuum breaker installed during freezing temperatures can result in possible improper drainage and can damage hydrant.

Vacuum Breaker:

Removable hose-connection backflow preventer complying with ASSE 1052.

Garden-hose thread complying with ASME B1.20.7 on outlet for field installation.

* + - 1. ROOF HYDRANTS

Retain this article only if roof hydrants are required.

Copy "Nonfreeze, Draining-Type Roof Hydrants" paragraph below and re-edit for each type of roof hydrant required. If only one type is required, drawing designation may be omitted.

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

Roof hydrants are not generally considered devices to convey or dispense water for human consumption; therefore, some manufacturers do not comply with lead-free construction/certification. If Project application requires lead-free construction, confirm availability of product with manufacturers.

* + - * 1. Nonfreeze, Draining-Type Roof Hydrants <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=13738) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Jay R. Smith Mfg Co; a division of Morris Group International](http://www.specagent.com/Lookup?uid=123457160149).

[MIFAB, Inc](http://www.specagent.com/Lookup?uid=123457160150).

[Prier Products, Inc](http://www.specagent.com/Lookup?uid=123457187701).

[WATTS](http://www.specagent.com/Lookup?uid=123457160151).

[Woodford Manufacturing Company](http://www.specagent.com/Lookup?uid=123457160152).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457160153).

Approved equivalent.

Standard: ASME A112.21.3M.

Type: Nonfreeze, exposed-outlet roof hydrant with coated cast-iron head and lift handle with lock option. Provide with deck flange and under deck clamp.

Casing and Operating Rod: Bronze interior parts, galvanized-steel casing, and bronze valve housing designed with hole to drain.

Inlet: [**3/4 inch**] <**Insert pipe size**>.

Outlet: Garden-hose thread complying with ASME B1.20.7.

Vacuum Breaker:

Nonremovable, drainable, hose-connection vacuum breaker complying with ASSE 1011 or backflow preventer complying with ASSE 1052.

Garden-hose thread complying with ASME B1.20.7 on outlet.

* + - 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: 3/4 inch.

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: 3/4 inch.

Body: ASTM B62 bronze.

Inlet: 3/4 inch 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: 3/4 inch.

Body: Copper alloy or ASTM B62 bronze.

Drain: 1/8 inch side outlet with cap.

* + - 1. WATER-HAMMER ARRESTERS

Copy "Water-Hammer Arresters" paragraph below and re-edit for each type of water-hammer arrester required. If only one type is required, drawing designation may be omitted.

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

* + - * 1. Water-Hammer Arresters <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2049) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[AMTROL, Inc](http://www.specagent.com/Lookup?uid=123457159853).

[Jay R. Smith Mfg Co; a division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159850).

[Josam Company](http://www.specagent.com/Lookup?uid=123457159845).

[MIFAB, Inc](http://www.specagent.com/Lookup?uid=123457159846).

[Precision Plumbing Products](http://www.specagent.com/Lookup?uid=123457159849).

[Sioux Chief Manufacturing Company, Inc](http://www.specagent.com/Lookup?uid=123457159847).

[WATTS](http://www.specagent.com/Lookup?uid=123457159848).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159852).

Approved equivalent.

Standard: ASSE 1010 or PDI-WH 201.

Type: [**Metal bellows**] [**Piston**] [**Diaphragm**].

Size: ASSE 1010, Sizes AA and A through F, or PDI-WH 201, Sizes A through F.

* + - 1. TRAP-SEAL PRIMER DEVICE

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

Copy "Supply-Type, Trap-Seal Primer Device" paragraph below and re-edit for each type of primer device required. If only one type is required, drawing designation may be omitted.

* + - * 1. Supply-Type, Trap-Seal Primer Device <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2051) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Jay R. Smith Mfg Co; a division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159656).

[Josam Company](http://www.specagent.com/Lookup?uid=123457160133).

[MIFAB, Inc](http://www.specagent.com/Lookup?uid=123457159653).

[Precision Plumbing Products](http://www.specagent.com/Lookup?uid=123457159655).

[Sioux Chief Manufacturing Company, Inc](http://www.specagent.com/Lookup?uid=123457159654).

[WATTS](http://www.specagent.com/Lookup?uid=123457159657).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159660).

Approved equivalent.

Standard: ASSE 1018.

Pressure Rating: 125 psig minimum.

Body: Bronze.

Inlet and Outlet Connections: 1/2 inch threaded, union, or solder joint.

Gravity Drain Outlet Connection: 1/2 inch threaded or solder joint.

Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

Copy "Drainage-Type, Trap-Seal Primer Device" paragraph below and re-edit for each type of primer device required. If only one type is required, drawing designation may be omitted.

* + - * 1. Drainage-Type, Trap-Seal Primer Device <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2052) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Jay R. Smith Mfg Co; a division of Morris Group International](http://www.specagent.com/Lookup?uid=123457159662).

[MIFAB, Inc](http://www.specagent.com/Lookup?uid=123457160134).

[Precision Plumbing Products](http://www.specagent.com/Lookup?uid=123457160135).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457160136).

Approved equivalent.

Standard: ASSE 1044, lavatory P-trap with 3/8 inch minimum, trap makeup connection.

Size: 1-1/4 inch minimum.

Material: Chrome-plated, cast brass.

* + - 1. TRAP-SEAL PRIMER SYSTEMS

Copy "Trap-Seal Primer Systems" paragraph below and re-edit for each type of primer system required. If only one type is required, drawing designation may be omitted.

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

* + - * 1. Trap-Seal Primer Systems <**Insert drawing designation if any**>:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2053) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Precision Plumbing Products](http://www.specagent.com/Lookup?uid=123457159665).

[Sioux Chief Manufacturing Company, Inc](http://www.specagent.com/Lookup?uid=123457159668).

[Zurn Industries, LLC](http://www.specagent.com/Lookup?uid=123457159667).

Approved equivalent.

Standard: ASSE 1044.

Inlet Size: 3/4 inch, ASTM B88, Type L; copper, water tubing.

Cabinet: [**Recessed**] [**Surface**]-mounted steel box with stainless steel cover.

Electric Controls: 24-hour timer, solenoid valve, and manual switch for 120 V ac power.

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.

Vacuum Breaker: ASSE 1001.

Number Outlets: [**Four**] [**Six**] [**Eight**] <**Insert number**>.

Size Outlets: [**1/2 inch**] [**5/8 inch**].

* + - 1. FLEXIBLE CONNECTORS

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=2065) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Flex-Hose Co., Inc](http://www.specagent.com/Lookup?uid=123457159677).

[Mason Industries, Inc](http://www.specagent.com/Lookup?uid=123457160138).

[Metraflex Company (The)](http://www.specagent.com/Lookup?uid=123457159669).

Approved equivalent.

* + - * 1. Bronze-Hose Flexible Connectors: Corrugated-bronze tubing with bronze wire-braid covering and ends brazed to inner tubing.

Working-Pressure Rating: Minimum [**200 psig**] [**250 psig**].

End Connections 2 inch and Smaller: Threaded copper pipe or plain-end copper tube.

End Connections 2-1/2 inch and Larger: Flanged copper alloy.

* + - * 1. Stainless Steel-Hose Flexible Connectors: Corrugated-stainless steel tubing with stainless steel wire-braid covering and ends welded to inner tubing.

Working-Pressure Rating: Minimum [**200 psig**] [**250 psig**].

End Connections 2 inch and Smaller: Threaded steel-pipe nipple.

End Connections 2-1/2 inch and Larger: Flanged steel nipple.

* + - 1. WATER METERS

Retain this article if Contractor is to furnish water meters and water meters are to be installed inside the building. Verify type of water meter required by the utility company and authorities having jurisdiction.

Review ASHRAE 189.1 requirements incorporated into IgCC for "water consumption measurement" requirements, which may require installation of water meters for submetering.

Sustainable design requirements may require provisions for water meters to measure fixture use separate from irrigation.

Retain "Displacement-Type Water Meters" paragraph below for water meters NPS 2 (DN 50) and smaller. Displacement-type meters with plastic cases that comply with AWWA C710 are also available.

* + - * 1. Displacement-Type Water Meters:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=2066) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Badger Meter, Inc](http://www.specagent.com/Lookup?uid=123457160139).

[Carlon Meter](http://www.specagent.com/Lookup?uid=123457212645).

[Master Meter, Inc](http://www.specagent.com/Lookup?uid=123457160140).

[Mueller Systems, LLC; a subsidiary of Mueller Water Products, Inc](http://www.specagent.com/Lookup?uid=123457212646).

[Neptune Technology Group Inc](http://www.specagent.com/Lookup?uid=123457160141).

[Niagara Meters](http://www.specagent.com/Lookup?uid=123457159860).

[Sensus; a Xylem brand](http://www.specagent.com/Lookup?uid=123457212647).

Approved equivalent.

Standard: AWWA C700.

Pressure Rating: 150-psig working pressure.

Body Design: Nutating disc; totalization meter.

Registration: In gallons or cubic feet as required by utility company.

Retain "Remote Registration System" subparagraph below if required.

Remote Registration System: Encoder type complying with AWWA C707; modified with signal-transmitting assembly, low-voltage connecting wiring, and remote register assembly as required by utility company.

System shall be capable of transmitting data using AMR/AMI technology.

Case: [**Bronze**] [**Stainless steel**].

End Connections: Threaded or flanged.

Retain "Turbine-Type Water Meters" paragraph below for water meters NPS 1-1/2 to NPS 10 (DN 40 to DN 250).

* + - * 1. Turbine-Type Water Meters:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=5553) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Badger Meter, Inc](http://www.specagent.com/Lookup?uid=123457160142).

[Carlon Meter](http://www.specagent.com/Lookup?uid=123457212648).

[Mueller Systems, LLC; a subsidiary of Mueller Water Products, Inc](http://www.specagent.com/Lookup?uid=123457212649).

[Neptune Technology Group Inc](http://www.specagent.com/Lookup?uid=123457160143).

[Niagara Meters](http://www.specagent.com/Lookup?uid=123457159869).

Approved equivalent.

Standard: AWWA C701.

Pressure Rating: [**150 psig**] <**Insert value**> working pressure.

Body Design: Turbine; totalization meter.

Registration: In gallons or cubic feet as required by utility company.

Retain "Remote Registration System" subparagraph below if required.

Remote Registration System: Encoder type complying with AWWA C707; modified with signal-transmitting assembly, low-voltage connecting wiring, and remote register assembly as required by utility company.

System shall be capable of transmitting data using AMR/AMI technology.

Case: [**Bronze**] [**Epoxy-coated cast iron**].

End Connections: Threaded or flanged.

Retain "Compound-Type Water Meters" paragraph below for water meters NPS 3 (DN 80) and larger. NPS 2 (DN 50) meters are also available.

* + - * 1. Compound-Type Water Meters:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=5554) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Badger Meter, Inc](http://www.specagent.com/Lookup?uid=123457160144).

[Mueller Systems, LLC; a subsidiary of Mueller Water Products, Inc](http://www.specagent.com/Lookup?uid=123457212650).

[Neptune Technology Group Inc](http://www.specagent.com/Lookup?uid=123457160145).

[Sensus; a Xylem brand](http://www.specagent.com/Lookup?uid=123457159875).

Approved equivalent.

Standard: AWWA C702.

Pressure Rating: 150-psig working pressure.

Body Design: With integral mainline and bypass meters; totalization meter.

Registration: In gallons or cubic feet as required by utility company.

Retain "Remote Registration System" subparagraph below if required.

Remote Registration System: Encoder type complying with AWWA C707; modified with signal-transmitting assembly, low-voltage connecting wiring, and remote register assembly as required by utility company.

System shall be capable of transmitting data using AMR/AMI technology.

Case: [**Bronze**] [**Coated ductile iron**].

End Connections: Flanged.

Retain "Ultrasonic-Type Water Meters" paragraph below for water meters NPS 12 (DN 400) and smaller. Currently, no AWWA standard exists that specifically addresses ultrasonic meters.

* + - * 1. Ultrasonic-Type Water Meters:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=13737) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Badger Meter, Inc](http://www.specagent.com/Lookup?uid=123457160146).

[Master Meter, Inc](http://www.specagent.com/Lookup?uid=123457160147).

[Neptune Technology Group Inc](http://www.specagent.com/Lookup?uid=123457160148).

Approved equivalent.

Standard: Applicable portions of AWWA C700.

Pressure Rating: [**150 psig**] <**Insert value**> working pressure.

Body Design: Ultrasonic open flow tube; totalization meter.

Registration: In gallons or cubic feet as required by utility company.

Retain "Remote Registration System" subparagraph below if required.

Remote Registration System: Encoder type complying with AWWA C707; modified with signal-transmitting assembly, low-voltage connecting wiring, and remote register assembly as required by utility company.

System shall be capable of transmitting data using AMR/AMI technology.

Case: [**Bronze**] [**Stainless steel**] [**Engineered polymer**] [**Epoxy-coated ductile iron**].

End Connections: Threaded or flanged.

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.
        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.

* + - * 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. CONTROL CONNECTIONS
         1. Connect control wiring.
      2. 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.
      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 shall perform 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: 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 Company Service Advisor 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 Company Service Advisor**].

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.

* + - * 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