

STANDARD SPECIFICATION
SECTION 15101 RESILIENT SEATED GATE VALVES

PART 1 - GENERAL

1.01 DESCRIPTION

This section includes materials, installation, and testing of manually operated, resilient seated gate valves including accessories, linings, coatings, valve boxes, extension stems, anchors, and marker posts. Size range is 3 inches through 24 inches.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Standard Drawings.
- B. Record Drawings and Submittals: STD SPEC 01300.
- C. Trenching, Backfilling, and Compacting: STD SPEC 02223.
- D. General Concrete Construction: STD SPEC 03000.
- E. Painting and Coating: STD SPEC 09900.
- F. Polyethylene Sheet or Tube Encasement: STD SPEC 09954.
- G. Fusion-Bonded Epoxy Lining and Coating: STD SPEC 09961.
- H. Corrosion Control for Buried Piping: STD SPEC 13110.
- I. General Piping Requirements: STD SPEC 15050.
- J. Disinfection of Piping: STD SPEC 15141.
- K. Pressure Testing of Piping: STD SPEC 15144.

1.03 SUBMITTALS

- A. Submit submittal packages in accordance with Standard Specification Section 01300.
- B. Submit valve manufacturer's catalog data, descriptive literature, and assembly drawings. Show dimensions, materials of construction by specification reference and grade, linings, and coatings.
- C. Submit manufacturer's affidavit of compliance with referenced standards.
- D. Submit coating application test records for measuring coating thickness and holiday detection for the valve interior linings and exterior coatings. Describe repair procedures used.
- E. Submit valve box manufacturer's catalog data. Show dimensions and materials of construction.

PART 2 - MATERIALS

2.01 GENERAL

- A. Provide valves complete with operating handwheel or operating nut, linings, coatings, valve box, extension stem, anchor, and marker post.
- B. Cast or mold onto the valve body or bonnet the name of the manufacturer and the valve size. Do not attach identification plates to the valve body or bonnet.
- C. Provide valves with the same type ends as the pipe or fittings, or with ends that have been designed for use on the pipe being installed.
- D. Unless otherwise indicated, valves shall be the same size as the pipe in which they are installed.
- E. Unless otherwise indicated, valves shall have a working pressure rating not less than the pipe in which they are installed.

2.02 RESILIENT SEATED GATE VALVES, 3 INCHES THROUGH 12 INCHES

For working pressures from zero to 250 psi, valves shall be resilient seated, non-rising stem and conform to the requirements of AWWA C515. Provide valves with resilient wedge disc, unobstructed waterway, counter-clockwise opening and designed for a working pressure of 250 psi. Construct valves of ductile iron conforming to ASTM A 395 or A 536. Bronze for internal working parts, including stems, shall not contain more than 2% aluminum nor more than 7% zinc, bronze shall be ASTM B 763 Alloy C99500, except that stem bronze shall have a minimum tensile strength of 60,000 psi, a minimum yield strength of 30,000 psi, and a minimum of 12% elongation in 2-inches. Provide O-ring seals. Provide Type 304 or 316 stainless steel body bolts conforming to ASTM F 593. Provide 2-inch AWWA operating nut for buried installations. Provide handwheel for aboveground or in vault installations. Gate valves shall be American Flow Control Series 2500, U.S. Pipe Metroseal 250, or District approved equal.

2.03 RESILIENT SEATED GATE VALVES, 14 INCHES THROUGH 24 INCHES

For working pressures from zero to 250 psi, valves shall be resilient seated, non-rising stem and conform to the requirements of AWWA C515. Provide valves with resilient wedge disc, unobstructed waterway, counter-clockwise opening and designed for a working pressure of 250 psi. Construct and provide valves as described in paragraph 2.02. Provide bevel or worm gear operator. Gate valves shall be American Flow Control Series 2500, U.S. Pipe Metroseal 250, or District approved equal.

2.04 LINING AND COATING FOR VALVES

Coat interior and exterior ferrous surfaces of the valves with fusion-bonded epoxy per Standard Specification Section 09961. Do not coat bronze, rubber, or stainless steel items. Coating shall be holiday free on interior surfaces in contact with water.

2.05 PACKING, O-RINGS, AND GASKETS

Unless otherwise stated; packing, O-rings, and gaskets shall be one of the following nonasbestos materials.

- A. Teflon.
- B. Kevlar aramid fiber.
- C. Acrylic or aramid fiber bound by nitrile. Provide Garlock "Bluegard," Klinger "Klingersil C4400," or District approved equal.
- D. Buna-N (Nitrile).

2.06 BOLTS, NUTS AND GASKETS FOR FLANGES

See Standard Specification Section 15050.

2.07 VALVE BOXES

- A. Provide a valve box for each buried potable water valve consisting of a frame, cover, and one-piece extension pipe. Construct frame and cover of cast iron and design for traffic loading. Castings shall be smooth, clean, and free from blisters, blowholes, and shrinkage. Machine bearing surfaces of frame and cover to provide a close fit without rocking. Cast on the cover the words "OMWD" and "WATER". Frame and cover shall be South Bay Foundry SBF 1208-N, or District approved equal. Extension pipe shall be 8-inch diameter, polyvinyl chloride (PVC), plastic irrigation pipe (PIP) conforming to Soil Conservation Service specification SCS 430DD with a pressure rating of 100 psi, a pipe stiffness dimension ratio (SDR) of 41, and an outside diameter of 8.160 inches.
- B. Provide a valve box for each buried recycled water valve consisting of a frame, cover, and one-piece extension pipe. Construct triangular shaped frame and cover of cast iron and design for traffic loading. Castings shall be smooth, clean, and free from blisters, blowholes, and shrinkage. Machine bearing surfaces of frame and cover to provide a close fit without rocking. Cast frame into a circular precast concrete body section. Cast on the cover the words "OMWD" and "RW". Frame and cover shall be J&R Concrete Products, Inc. No. V4-T or District approved equal. Extension pipe shall be 8-inch diameter, polyvinyl chloride (PVC), conforming to AWWA C900, Class 150, and an outside diameter of 9.05 inches.

2.08 EXTENSION STEMS

Where the valve operating nut is more than 2 feet below the valve box cover, provide an extension stem to bring the operating nut to a point 6 inches below the surface of the cover. Construct stem of steel using pipe, bar stock, and plates to the dimensions shown on the Standard Drawings. Field verify required stem length prior to fabrication. Hot dip galvanize completed stem after fabrication.

2.09 POLYETHYLENE ENCASEMENT

See Standard Specification Section 09954.

2.10 CORROSION CONTROL COMPONENTS

See Standard Specification Section 13110.

2.11 ANCHORS

Provide anchors on valves that have non-restrained joints or that are installed with pipe having non-restrained joints. Anchor type depends on valve size and working pressure as shown in the Standard Drawings and shall be one of the following installations.

- A. Provide steel anchor straps and bolts, or reinforcing steel. Hot dip galvanize steel straps and bolts after fabrication. Completely encase in concrete after placing on valve.
- B. Provide reinforced concrete anchor and adapter with thrust collar. Design and sizing of the anchor will be based on the highest pressure the main will be subjected to, such as test or surge.

2.12 MARKER POSTS

Provide a marker post for each buried valve except where valve is located in a paved street. Use construction heart garden grade redwood per Standard Specifications for Grades of California Redwood Lumber issued by the Redwood Inspection Service. Provide seasoned redwood, 4 inches by 4 inches, and surfaced on four sides.

PART 3 - EXECUTION

3.01 INSPECTION BEFORE INSTALLATION

- A. Operate the valve from closed to fully open, then close again before installing. Check for broken, cracked, or missing parts; malfunctioning stem; scored surfaces on interior lining; and faulty operation.
- B. The District's Representative will conduct in the field an independent inspection of the lining and coating for compliance with the criteria in Standard Specification Section 09961. Coated items failing his inspection will be cause for rejection.

3.02 INSTALLATION

- A. Prior to installing the valve in its final location, clean the interior of the valve of all contaminants and place valve in a closed position.
- B. Check all body bolts on the valve for tightness. Handle valve carefully and do not damage linings and coatings. Repair any or all damage to the satisfaction of the District's Representative.
- C. Install the valve per the piping instructions contained in the appropriate Standard Specification for the material used. Do not use valve to force the pipeline into position. Support piping to avoid line stresses on the valve. Do not deflect valve pipe joints.
- D. Install flanged joints per the installation instructions in Standard Specification Section 15050.

3.03 INSTALLING POLYETHYLENE ENCASEMENT

Wrap buried valves, flanged joints, mechanical joints, flanged pipe spools with thrust collars, and adapters with polyethylene material per Standard Specification Section 09954. Complete the wrap prior to placing concrete anchor blocks. Repair polyethylene material damaged during construction.

3.04 INSTALLING ANCHORS

Install concrete anchors over valves or around thrust collars after completion of the polyethylene encasement. Place concrete per Standard Specification Section 02223.

3.05 INSTALLING VALVE BOXES

- A. Place and compact trench backfill to the height of the valve stem. Set the one piece extension pipe over the operating nut and center in place. Maintain the extension pipe in a vertical position during backfilling. Slip the valve box frame over the extension pipe and adjust both to finish grade. Pour a concrete ring around the valve box frame. Concrete shall be Class C per Standard Specification Section 03000. In paved areas, top of concrete ring shall be 1-inch below finish grade of adjacent surfaces. In non-paved areas, top of valve box frame and concrete ring shall be flush with the natural or finish grade. Where paved, overlay the concrete ring with 1-inch compacted thickness of asphalt concrete pavement. Valve box frame and cover shall be flush with the finish surface of the pavement.
- B. Terminate tracer wire where installed in valve boxes as shown in the Standard Drawings. Secure tracer wire to the exterior surface of the extension pipe with plastic adhesive tape. Drill a hole at the top of the extension pipe for wire entry and provide 24 inches of coiled wire.

3.06 SETTING MARKER POSTS

Locate marker post as directed by the District's Representative. Cut redwood post to a 5-foot length and chamfer the top. Paint post per Standard Specification Section 09900, System No. 60. Use white paint for the finish coats and blue or purple paint for the top 4 inches of the chamfered end. Excavate a hole 16 inches in diameter by 2 feet deep. Set the redwood post plumb, fill hole with concrete to 2 inches above finish grade, and crown to slope away from post. On the side facing the valve box, stencil on the post in 2-inch-high blue or purple letters the word "WATER" or the abbreviation "RW" and the distance in feet from the marker post to the valve box. Concrete shall be Class C per Standard Specification Section 03000.

3.07 PAINTING AND COATING

- A. Coat valves located aboveground, or in vaults and structures, the same as the adjacent pipes and per Standard Specification Section 09900. Do not apply flame spray coating to fusion-bonded epoxy coated valves. Apply finish coats in the field. Color of finish coat shall match the color of the adjacent piping. Coat handwheels the same as the valves.
- B. Paint top side of valve box covers per Standard Specification Section 09900, System No. 20. Color of finish coat shall be as follows:

1. Normally open inline or branch valve is OSHA Blue for potable water or purple for reclaimed water.
2. Branch valve to a fire hydrant assembly is OSHA Yellow.
3. Branch valve to one or more water service assemblies is OSHA White.
4. Normally closed inline or branch valve is OSHA Red.

3.08 FIELD TESTING

Operate gate valves through 10 full cycles of opening and closing. Valves shall operate from full open to full close without sticking or binding. If valves stick or bind, repair or replace the valve and repeat the tests.

3.09 PRESSURE TESTING

Test gate valves at the same time that the connecting pipelines are pressure tested. See Standard Specification Section 15144 for pressure testing requirements. Repair leaks in the gate valves and joints of the interconnecting piping and retest.

3.10 DISINFECTION

See Standard Specification Section 15141 for chlorination requirements.

END OF SECTION