

SECTION C-2 - VALVES

C2.00 Work Included

The Contractor shall furnish gate valves, butterfly valves and valve boxes complete where required by the City. The valves shall conform to the following specifications:

C2.01 Gate Valves

Gate valves shall be iron body, inside screw, fully bronze mounted, conforming to ANSI/AWWA C509-01 Resilient Seated Gate Valves for Water Supply Service, of latest revision. The gate shall be of cast/ ductile iron completely encapsulated with resilient material. The resilient sealing material shall be permanently bonded to the cast iron gate with a rubber tearing bond to meet ASTM D 429. All internal parts shall be accessible without removing the body from the line. The water way in the seat area shall be smooth, unobstructed and free of cavities.

The valve body and bonnet shall be coated externally and internally with fusion bonded thermosetting plastic conforming to ANSI/AWWA C550 Protective Interior Coating for Valves and Hydrants, of latest revision.

Non-rising type stem shall be cast bronze with internal collars in compliance with two O ring seals above the thrust collar and one O ring seal below the thrust collar. Stuffing box shall be attached to the bonnet and bonnet to the body with bolts and nuts. The operation nut shall be a 2-inch square wrench nut. An arrow showing the direction of opening and the word "OPEN" shall be cast on the flange of the operating nut. Valves in sizes 3-inch to 12-inch shall be suitable for water working pressures to 250 psi (Valves shall open right -clockwise).

Each valve shall be hydrostatically tested in the factory at 500 psi.

Valves in sizes 3-inch to 16-inch shall be vertical and shall be provided with mechanical joint ends and retainer glands. All bolts, nuts and studs shall be Type 304 stainless steel.

Retainer glands shall be ductile iron and Underwriters Laboratory approved, as manufactured by EBAA Iron, Inc.

Lubrication instructions and parts lists shall be furnished in triplicate for each type and manufacture.

Valves shall be Ken-Seal Resilient Wedge Valves as manufactured by the Kennedy Valve Co. or approved equal.

C2.02 Butterfly Valves

All butterfly valves shall be manufactured in accordance with the latest revision of AWWA C504 for Class 150B service.

Butterfly valves shall be of the rubber seated, tight closing type suitable for two way flow. Valve designs that seat at an angle to the axis of the pipeline other than 90 degrees will not be acceptable. Butterfly valves shall be provided with cast-iron body, cast or ductile-iron disc, stainless steel shaft, self-lubricating sleeve type bearings and replaceable rubber seats.

All valves shall open right (clockwise). An arrow showing the opening and the word "OPEN" shall be cast on the flange of the operating nut.

All butterfly valves shall be suitable for 150 psi working pressure and shall be subjected to factory hydrostatic, factory leakage and performance tests as specified in Section 5 of AWWA Standard C504.

Butterfly valve shall be manufactured by Henry Pratt Company, or equal.

Buried butterfly valves shall be Groundhog type (mechanical joints with Megalug retainer glands) unless otherwise noted on the Drawings.

Valve bodies shall be high strength cast iron ASTM A126 Class B. Valve disc shall be high-strength cast iron ASTM A 48 Class 40 in sizes 24" and smaller. Sizes 30" and larger shall be built from ductile iron in conformance to ASTM A-536. Disc shall be furnished with 316 Stainless Steel seating edge. Suitable rubber seats shall be provided on the body.

Valve shafts shall be constructed of 18-8 Type 304 stainless steel. Shaft diameters must meet minimum requirements established by AWWA Standard C504 for Class 150B.

Valve operator shall be of the traveling-nut type, sealed, gasketed, and lubricated for underground service. Operators shall be designed to hold the valve in any intermediate position between fully open and fully closed without creeping or fluttering. Operators shall be equipped with mechanical stop limiting devices to prevent over travel of the disc in the open and closed position. Operators shall be equipped with a 2-inch square operating nut and shall be fully gasketed and grease packed for buried service. Operator components shall withstand an input torque of 450 ft. lbs. at the extreme operator positions without damage.

Valve shall be capable of easy closure by one man using standard valve key, even under emergency break conditions as severe as those that would cause a valve maximum opening torque requirements of as much as two times AWWA Class 150B.

Butterfly valve internal waterway surfaces shall have a heat-cured epoxy coating holiday-free in the waterway. Valve vane shall have a 100% holiday-free epoxy coating. Coatings shall be in accordance with AWWA C550. The external surfaces of valves to be buried shall be shop coated with two coats of asphalt varnish.

All valves shall be factory tested for leakage at rated pressure, and tested hydrostatically at two times rated pressure-all in conformance with AWWA Standard C-504, latest revision, unless otherwise noted. Certified test results shall be furnished.

C2.03 Valve Boxes

Each buried valve shall be provided with a cast iron, two piece, slide type valve box. Valve boxes shall be 5-1/4 inch shaft with a round base and shall be provided with extra deep covers with the word "WATER" cast on and an arrow indicating clockwise opening.

Length of valve boxes and size of base shall be to suit each particular installation and shall have about eight inches of adjustment up and down available after setting to grade.

Valve boxes shall be as manufactured by Bingham & Taylor, Tyler Company or equal.

C2.04 Installation

Valves shall be set truly plumb with valve boxes directly over the valves. After being correctly positioned for line and grade, bank run sand or gravel shall be carefully tamped around the valve box and a concrete support shall be placed as detailed on the Drawings.

Top of box shall be flush with pavement surface in paved areas and shall be one inch above ground surface in grassed or earth areas.

C2.05 Testing

Upon completion of the installation and restraint of the new underground gate valve, the line shall be completely filled with water at a controlled slow rate.

No visible leakage shall be permitted. In the event that the section of reconstructed main and valve has visible leaks, the Contractor shall make all necessary repairs and repeat the test. The test shall be repeated as many times as necessary until there is no visible leakage.

C2.06 Disinfection

All new valves and appurtenants installed on existing water mains shall be flushed and sterilized in accordance with the recommendation of Standard for Disinfecting Water Mains, ANSI/AWWA C651-05.

All work of flushing and sterilizing shall be the responsibility of the Contractor. The Contractor shall provide at least 24 hours prior notice to the Manager of Water Quality Laboratory for arranging water sampling and testing. The Contractor shall assist the Water Quality Laboratory personnel in collecting water samples for tests. The cost of the laboratory testing shall be borne by the City.

C2.09 Tapping Sleeves and Valves

Tapping sleeves shall be caulk type or mechanical joint type, depending on the pipe material being tapped, suitable for 200 psi working pressure. The Contractor shall have on hand spare gaskets to suit Class A, B, C, or D pipe.

Valves shall comply with the pertinent provisions of Section C2.01 with the exception that tapping valves shall be provided with flanged inlet-mechanical joint outlet ends. Mechanical joint outlet shall be provided with Ductile Iron Retainer Glands, as manufactured by EBAA Iron Company.

Tapping valves and sleeves shall be as manufactured by the Mueller Company or approved equal.

Work shall be carried out by personnel thoroughly experienced in the construction of wet taps, using approved methods and equipment. The tapping sleeves and valves shall be securely supported and restrained.

Before ordering tapping sleeves, the Contractor shall excavate by test pit and determine the exact location and outside diameter of the existing pipe.