

## SECTION C2

### VALVES AND APPURTENANCES

#### GENERAL

The Contractor shall furnish and install all valves and appurtenances where indicated on the drawings and in accordance with all specifications contained herein.

Unless otherwise stated in the Special Conditions or on the drawings, all valves 3 inch through 20 inch in diameter shall be resilient seated gate valves, and all valves 24 inches in diameter and larger shall be butterfly valves.

#### MATERIALS

##### All Valves

All operating nuts shall be 2 inches square at the base, tapering to 1 15/16 inches square at the top.

All valves shall open to the right (clockwise).

All valves shall have mechanical joint ends, complete with all accessories. Bolts shall be CorTen or approved equal.

The interior of all valve bodies and other ferrous metal parts, which will come in contact with water, shall be epoxy coated in accordance with Section C7 contained herein.

All bonnet bolts, seal plate bolts, stuffing box bolts, and other bolts in contact with soil (except for MJ bolts) shall be 18-8 Type 304 stainless steel or Everdur bronze.

##### Resilient Seated Gate Valves

All RSGV's shall meet or exceed the requirements of AWWA C509-01 or latest revision thereof unless otherwise stated herein. Valves constructed in accordance with AWWA 515-99 are also acceptable.

All RSV's shall be rated at least for 200 psi.

The torque required to open a fully closed valve under 100 PSI pressure on one side shall not exceed 100 foot pounds and the torque required to fully close a valve under the flow conditions of 10 FPS shall not exceed 100 foot pounds.

Rubber for valve seats shall be new, natural or synthetic, of a compound designated for water service applications. Reclaimed rubber is unacceptable.

Rubber seats shall be either bonded to or mechanically attached to the gate. When mechanically attached, all exposed hardware shall be 18 - 8 Type 304 stainless steel.

Stem shall be of the non-rising type.

Stem seals shall consist of two (2) o-rings, one as a dirt seal and one as a pressure seal.

A thrust washer of Teflon or approved equal shall be used directly above the stem collar.

The valve shall be able to withstand an input torque of 300 foot pounds with no distortion of the stem or other damage to the valve.

The Commission at its option may also require the submittal of:

- i.) One set of certified drawings.
- ii) A notarized affidavit stating that the valve meets all criteria set forth in this specification.
- iii) A notarized affidavit stating compliance with coating specifications AWWA C-550-81.

The Commission has undertaken a program to test and review the performance of resilient seated gate valves. No resilient seated valves shall be considered for purchase or installation prior to the review of all test results. At the time of the issuance of this specification only the following manufacturers have submitted said testing reports, and therefore only the following manufacturers valves shall be considered for use:

1. Clow Valve Company
2. Kennedy Valve Company Kenseal II
3. M & H 4067-01
4. Mueller A-2360
5. Stockham Valve and Fitting Co
6. United States Pipe and Foundry Metroseal 250
7. American Flow Controls (AFC 2500)
8. American AVK series 25

#### Butterfly Valves

All butterfly valves shall conform to AWWA C504-94 or latest revision thereof unless otherwise stated herein.

All butterfly valves shall be Class 150-B and suitable for direct burial. The mating seat surface shall be Type 304 or 316 stainless steel.

All butterfly valves shall be bubble tight at their rated pressure in either direction.

All butterfly valves shall be designed for satisfactory performance involving frequent operation after long periods of inactivity.

All butterfly valve operators shall be either the traveling-nut or gear-type and shall be furnished with the valve.

All butterfly valve operators shall be able to sustain an input torque of 300 foot-lb. measured at the operating stem.

#### Valve Boxes and Standpipes

All 4-inch and 6-inch gate valves shall be provided with a valve box and cover.

- a. Valve boxes shall be of the adjustable, telescoping, heavy-pattern type with the lower part of cast iron and the upper part of steel or cast iron.
- b. Valve boxes shall be designed to prevent the direct transmission of traffic loads to the pipe or valve.
- c. Upper portions of valve boxes shall be provided with a flange having sufficient bearing area to prevent settlement.
- d. The lower section shall be designed to enclose the stuffing box and rest on the bonnet.
- e. The inside diameter of valve boxes shall be a minimum of 4 1/2 inches.
- f. Valve boxes shall be capable of vertical adjustment of a minimum of 6 inches while maintaining a minimum of 4 inches overlap between the sections.

All valves 8 inches and larger shall be provided with a roadway frame and cover, unless plans call for chamber.

- a. Roadway frames and covers shall be BWSC Standard, 16 inches by 18 inches.
- b. Valves requiring a roadway frame and cover shall be fitted with a standpipe at least 12 inches in diameter.
- c. Standpipes shall be Class 52 ductile iron pipe.
- d. Standpipes shall be cut to a length to enable them to fit inside the roadway frame and cover so they do not transmit loads to the pipe or valve.
- e. All roadway covers shall be cast with the appropriate markings to signify the type of valve installed.

- f. The valve-operating nut shall be centered in the valve tube and visible upon installation.

#### CONSTRUCTION METHODS

All material shall be inspected for defects prior to installation. Defective materials shall be immediately removed from the site.

All foreign matter shall be removed from valve openings and seat faces.

All nuts and bolts shall be checked for tightness.

Blocking shall be placed under each valve to insure against settlement.

#### MEASUREMENT AND PAYMENT

Item C2-4	Set 4 inch Gate Valve	each
Item C2-6	Set 6 inch Gate Valve	each
Item C2-8	Set 8 inch Gate Valve	each
Item C2-10	Set 10 inch Gate Valve	each
Item C2-12	Set 12 inch Gate Valve	each
Item C2-16	Set 16 inch Gate Valve	each
Item C2-20	Set 20 inch Gate Valve	each
Item C2-24	Set 24 inch Butterfly Valve	each
Item C2-30	Set 30 inch Butterfly Valve	each
Item C2-36	Set 36 inch Butterfly Valve	each

The quantity of valves to be paid for shall be the actual count, in place and complete, installed by the Contractor in accordance with the plans and these specifications.

The unit price paid under the above items shall be full compensation for earth excavation (as detailed in Section A1); removal of existing valve; removal of existing masonry valve chamber if found; returning of removed valve to the Commission's storage yard; furnishing and setting valve; furnishing and setting access tube, frame and cover; and/or roadway box as required; and furnishing and setting pipe nipples needed to set the valve, including couplings. For cleaning and cement lining projects the pipe nipples necessary to install the valve will be paid for under the appropriate item for cleaning and cement lining of that size pipe.