Section 15101 - BUTTERFLY VALVES

1. SCOPE. This section covers AWWA butterfly valves for cold water service. Butterfly valves shall be furnished complete with actuators and accessories as specified herein. Butterfly valves shall be used for 14 inch and greater line valves.

2. GENERAL.

2.01. Acceptable Products. Butterfly valves furnished under this section shall be manufactured by American Flow Control, DeZurik, M&H, Mueller, Pratt, Clow, or Kennedy.

2.02. Governing Standard. Except as modified or supplemented herein, all butterfly valves, including actuators, shall conform to the applicable requirements of ANSI/AWWA C504.

2.03. General Equipment Stipulations. The General Equipment Stipulations shall apply to all equipment furnished under this section.

2.04. Marking. Supplementing the requirements of Section 6.1 of the governing standard, the country of origin shall be cast on the outside of the body and on the disc of each valve. An identifying serial number shall be stamped on a corrosion-resistant plate attached to the valve body.

2.05. Shop Painting. All interior and exterior ferrous metal surfaces, except finished surfaces, bearing surfaces, and stainless steel components, of valves and accessories shall be shop painted for corrosion protection. The valve manufacturer's standard coating will be acceptable provided it is functionally equivalent to the specified coating and is compatible with the specified field painting.

The following surfaces shall be painted:

Unfinished Surfaces	
Interior Surfaces	Epoxy.
Exterior Surfaces of Valves	Coal tar or epoxy.
Polished or Machined Surfaces	Rust-preventive compound.
Actuators and Accessories	Rust-inhibitive primer.

Interior coatings shall comply with AWWA C550 and shall be free of holidays. The total dry film thickness of shop-applied coatings shall be not less than:

Type of Coating	Minimum Dry Film Thickness
Coal Tar	6 mils
Epoxy	10 mils
Rust-Inhibitive Primer	3 mils

2.06. Temporary Number Plates. Each butterfly valve shall be factory tagged or marked in such a manner as to identify the valve by number or service.

2.07. Serial Numbers. Each valve must be identifiable by a separate serial number permanently attached to the valve.

3. MATERIALS. Except as modified or supplemented herein, materials used in the manufacture of butterfly valves and actuators shall conform to the requirements of ANSI/AWWA C504.

Shop Coatings

Coal Tar	Kop-Coat "Bitumastic Super Service Black", Tnemec "46-449 Heavy Duty Black", or Valspar "35-J-10 Hi-Build Bituminous Coating".
Epoxy	Manufacturer's standard fusion- bonded or liquid epoxy.
Rust-Inhibitive Primer	Cook "391-N-167 Barrier Coat", Kop-Coat "340 Gold Primer", Tnemec "37-77 Chem-Prime", or Valspar "13-R-28 Chromox Primer".
Rust-Preventive Compound	Houghton "Rust Veto 344", Rust-Oleum "R-9", or approved equal.

4. VALVE CONSTRUCTION.

4.01. Valve Bodies. Valves shall be short-body type except where wafer type is specified.

a. Body Stops. The use of a stop or lug cast integrally with or mechanically secured to the body for the purpose of limiting disc travel by means of direct contact or interference with the valve disc (in either the open or closed position) will not be acceptable.

b. Flanges. Flanges shall be finished to true plane surfaces within a tolerance limit of 0.005 inch. The finished face shall be normal to the longitudinal valve axis within a maximum angular variation tolerance of 0.002 inch per foot of flange diameter.

c. Mechanical Joint Ends. Where mechanical joint ends are specified, either mechanical joint or push-on ends conforming to ANSI/AWWA C111/A21.11 will be acceptable.

4.02. Valve Shafts. Valve shafts shall be fabricated of AISI Type 304 or 316 stainless steel. The use of shafts having a hexagonal cross section will not be acceptable.

4.03. Valve Discs. Valve discs shall be secured to shafts by means of solid, smooth sided, stainless steel or Monel taper pins or dowel pins. Each taper pin or dowel pin shall extend through or shall wedge against the side of the shaft and shall be mechanically secured in place. The use of bolts, setscrews, knurled or fluted dowel pins, expansion pins, roll pins, tension pins, spring pins, or other devices in lieu of the pins specified herein will not be acceptable.

4.04. Valve Seats. Acceptable seating surfaces mating with rubber are AISI Type 304 or 316 stainless steel, Monel, or plasma-applied nickelchrome overlay for all valves; bronze for 20 inch and smaller valves; and alloy cast iron for 20 inch and smaller manually operated valves.

Valve seat configurations which rely on the mating pipe flange to hold the seat in position in the valve body will not be acceptable.

4.05. Shaft Seals. Shaft seals shall be of the chevron or O-ring type.

4.06. Thrust Bearings. Each valve shall be provided with one or more thrust bearings in accordance with the governing standard. Thrust bearings which are directly exposed to line liquid and which consist of a metal bearing surface in rubbing contact with an opposing metal bearing surface will not be acceptable.

5. VALVE ACTUATORS. Valve actuators shall be provided, installed, and adjusted by the valve manufacturer. Actuator mounting arrangements and handwheel or chainwheel positions shall be as indicated on the drawings or as directed by the Engineer.

5.01. Manual Actuators. Unless otherwise required by the Owner, the direction of rotation of the wheel or wrench nut to open each valve shall be to the left (counterclockwise). Each valve body or actuator shall have cast thereon the word "Open" and an arrow indicating the direction to open.

The housing of traveling-nut type actuators shall be fitted with a removable cover which shall permit inspection and maintenance of the operating mechanism without removing the actuator from the valve. Travel limiting devices shall be provided inside the actuator for the open and closed positions. Travel limiting stop nuts or collars installed on the reach rod of traveling-nut type operating mechanisms shall be field adjustable and shall be locked in position by means of a removable roll pin, cotter pin, or other positive locking device. The use of stop nuts or adjustable shaft collars which rely on clamping force or setscrews to prevent rotation of the nut or collar on the reach rod will not be acceptable.

The valve and actuator shall be designed so that shaft seal leakage cannot enter the actuator housing.

5.01.01. Wrench Nuts. Wrench nuts shall be provided on all buried valves, on all valves that are to be operated through floor boxes, and where indicated on the drawings. Unless otherwise directed by the Owner, all wrench nuts shall comply with Section 3.16 of AWWA C500. At least two operating keys shall be furnished for operation of the wrench nut operated valves.

6. EXTENSION STEMS. Extension stems shall be furnished and installed where specified, indicated on the drawings, or otherwise required for proper valve operation. Extension stems shall be of solid steel and shall be not smaller in diameter than the stem of the valve actuator shaft. Extension stems shall be connected to the valve actuator by means of a Lovejoy "Type D" single universal joint with grease-filled protective boot. All stem connections shall be pinned.

Extension stems shall be provided for buried valves when the valve actuator is 4 feet or more below finished grade. Each extension stem for a buried valve shall extend to within 6 inches of the ground surface, shall be provided with spacers which will center the stem in the valve box, and shall be equipped with a wrench nut.

7. FLOOR BOXES. Where openings through concrete slabs are provided for key operation of valves with the operating nut being in or below the slab, such openings shall be provided with a cast iron floor box complete with cover. Each floor box shall be of the depth required for installation in the slab indicated on the drawings. Where the

operating nut is in the slab, the stem shall have a guide to maintain the nut in the center of the box; where below the slab, the opening in the bottom of the box shall permit passage of the operating key.

Each floor box and cover shall be shop coated by dipping in asphalt varnish.

8. VALVE BOXES. Each valve buried to a depth of 4 feet or less shall be provided with a slide type valve box. Valve boxes shall be cast iron, extension sleeve type, suitable for the depth of cover required by the drawings. Not more than one extension will be allowed with each slide type valve box. Valve boxes shall be not less than 5 inches in inside diameter, shall have a minimum thickness at any point of 3/16 inch, and shall be provided with suitable cast iron bases and covers. Valve boxes shall be Charlotte Standard, or approved equal.

Each valve buried to a depth greater than 4 feet shall be provided with a valve box consisting of a cast iron cover and a 6 inch cast iron pipe section. The cover shall be a Clay & Bailey "No. 2193" or Tyler "Series 6890-A". The pipe shaft shall be sized to extend from the valve to 5 inches inside the valve box cover.

All parts of valve boxes, bases, and covers shall be shop coated by dipping in asphalt varnish.

Valves and valve boxes shall be set plumb. Each valve box shall be placed directly over the valve it serves, with the top of the box brought flush with the finished grade. After being placed in proper position, earth shall be filled in around each valve box and thoroughly tamped on each side of the box.

9. ENDS. Valve ends shall be mechanical joint unless otherwise indicated on the drawings.

All valves shall be restrained utilizing flanges, tie rods, or restrained push-on joints as specified in the ductile iron pipe section.

10. INSTALLATION. Unless otherwise necessary for proper operation or as permitted by the Engineer, all butterfly valves shall be installed with the shaft horizontal and the operator vertical.

Whenever an actuator must be removed to permit installation of a butterfly valve, the actuator shall be promptly reinstalled and shall be inspected and readjusted by a representative of the valve manufacturer. Prior to acceptance of the valve by the Owner, the manufacturer's representative shall submit a written report to the Engineer certifying that the valve and actuator have been inspected and adjusted and are suitable for the service conditions set forth herein.

11. BUTTERFLY VALVE SCHEDULE.

Size inches	AWWA Class[1]	Minimum Actuator Torque Capability[2] inch-pounds
14	150A-MJ	7,861
16	150A-MJ	11,236
18	150A-MJ	14,856
20	150A-MJ	19,866
24	150A-MJ	31,966

[1] Suffix letters define valve ends as follows:

MJ - Mechanical joint

[2] The manufacturer's rated torque capacity for each butterfly valve actuator shall be at least equal to the actuator torque capability specified herein. If valves with an AWWA class designation higher than listed above are furnished, actuator torque capabilities shall be increased accordingly and to the satisfaction of the Engineer.

12. DRAWINGS AND DATA. Complete drawings, details, and specifications covering the valves and their appurtenances shall be submitted in accordance with the submittals section. Submittal drawings shall clearly indicate the country of origin of all cast gray iron and ductile iron valve components.

Shop drawings shall indicate date of testing, such that Owner or Engineer may witness testing, at his discretion.

When requested by the Engineer, certified copies of physical and chemical test results shall be submitted for the materials of construction of valve components.

Certified copies of the results of all tests as required by Section 3.8 and Section 5 of ANSI/AWWA C504, together with an affidavit of compliance as indicated in Section 1.7, shall be furnished to the Engineer before the valves are shipped.

End of Section