SECTION 15104 - BUTTERFLY VALVES

City of San Diego, CWP Guidelines

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

A. The WORK of this Section includes providing butterfly valves with epoxy coating, operators, and accessories.

1.2 RELATED SECTIONS

A. The WORK of the following Section applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Section 09800 Protective Coating
2. Section 15100 Valves, General

1.3 FACTORY TESTING

A. Valves shall be tested in compliance with AWWA C 504 and Section 15100.

B. Proof-of-design tests reports shall be submitted in compliance with Section 15100 and AWWA C504

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PART 2 - PRODUCTS

2.1 BUTTERFLY VALVES (AWWA)

A. General: Butterfly valves shall conform to ANSI/AWWA C504 and shall be flanged, of the size and class indicated. Flanged valves shall have 125-lb flanges complying with ANSI B.16.5, or 250-lb where so indicated, and may be either short-bodied or long-bodied except as otherwise indicated. Shaft seals shall be designed for use with standard split-V type packing or other approved seals, and the interior passage shall not have any excessive obstructions or stops. Cartridge-type valve seats, or valve employing snap rings to retain the rubber seats, will not be acceptable. The rubber seat shall be mounted in the valve body.

On valves 30 inches and larger Class 150, the valve port diameter shall not be reduced more than 1-1/2 inches of the nominal pipe diameter.

B. **Coating:** Corrosive ferrous surfaces of valves, 4-inch and larger, which will be in contact with water (exclusive of flange faces) shall be epoxy-coated complying with Section 09800.

C. **Manual Operators:**

1. Operators shall conform to ANSI/AWWA C504. Except as otherwise indicated, manually-operated butterfly valves shall be equipped with a handwheel and 2-inch square operating nut and position indicator.

2. Valves 30 inches and larger and submerged or buried valves, shall be equipped with worm-gear operators, lubricated and sealed to prevent entry of dirt or water into the operator at a water

pressure of 20 feet of head. Screw-type operators shall not be installed for valves 30 inches in diameter and larger. Operators shall require a minimum of 40 turns to rotate the disc from fully open to fully closed position.

D. **Electric Operators**: Electric operators shall comply with Section 15100.

2.2 RECTANGULAR BUTTERFLY VALVES

A. **General:** Rectangular or square butterfly valves shall be leak-tight at rated pressures for flow in either direction. Valve discs shall rotate 90 degrees from the full-open position to the tight-shut position.

B. **Body:** The valve body shall be of carbon steel fabrication conforming to ASTM A 36, designed for channel mounting, or as indicated, with a pressure rating of 25 psi.

C. **Disc:** The valve disc shall be fabricated of carbon steel with a Type 316 stainless steel seating edge. Valves shall be designed to prevent leakage at corners under indicated conditions and when tested. The disc shall be streamlined and designed to prevent turbulence in the full-open position.

D. **Seat:** The valve seat shall be contained in the body of the valve. The retaining segment and screws shall be of Type 316 stainless steel. The seat shall be of a synthetic rubber compound with a durometer of 50. Seats shall be fully field-adjustable and replaceable without dismantling operator, disc, or shaft.

E. **Shaft:** The shaft shall be securely locked to the disc by means of stainless steel taper pins. Shaft material shall be of Type 316 stainless steel.

F. **Bearings:** Valve assemblies shall include a 2-way thrust bearing assembly designed to hold the disc centered in the valve seat with self-lubricated shaft bearings.

G. **Operator:** Operators shall be designed to hold the valve in any intermediate position between fully-open and fully-closed without creeping or fluttering. Except as otherwise indicated, operators shall be of the manual worm-gear type with handwheels. Operators shall be fully-enclosed and shall be designed to produce the required torque with a maximum pull of 60 lb on the handwheel. Operator components shall withstand input torque of 300 ft-lb at extreme operator positions without damage.

2.3 BUTTERFLY VALVES FOR AIR AND GAS SERVICE

A. **General:** Butterfly valves for air and gas systems shall be designed for this service and meet or exceed the design, strength, performance, and testing standards of ANSI/AWWA C 504. Butterfly valves shall be designed for pressures from vacuum to 125 psi, and temperatures from minus 40 degrees F to 250 degrees F.

B. **Body:** Valve bodies shall be fabricated with cast iron conforming to ASTM A126, class B, with either wafer, lug, or flanged design, where indicated, and drilled to comply with ANSI B 16.1, class 125.

C. **Disc:** The disc shall be fabricated with ductile iron conforming ASTM A536 with an edge of monel, Type 316 stainless steel, or nickel; it shall be designed with the air-profile or other proper shape. Sprayed or plated disc edges are not acceptable.

D. **Seat:** The elastomer seat shall be mounted in the valve body. The seat shall be field-replaceable without special tools. Except for use with petroleum-base fluids, the seat material shall be Ethylene-Propylene-Diene Monomer (EPDM), or other suitable material, to provide a tight shut-off at the indicated temperatures. The elastomer thickness shall be minimum 1/2-inch, exclusive of backing rings, or stiffeners.

E. **Shaft:** The valve shaft shall be fabricated with stainless steel, Type 316.

F. **Bearings:** Shaft bearings shall be of the self lubricating corrosion resistant sleeve type.

G. **Packing:** Packing shall be of the adjustable or self adjustable type, suitable for the temperature and service conditions.

H. **Operators:** Valve operators shall be in accordance with Section 15101 and shall be sized for air service applications and designed for 3 years of service. Manual actuators shall allow for positive throttling and locking in any position from open to closed.

2.4 MANUFACTURERS

A. Butterfly valves shall be manufactured by one of the following (or equal):

1. AWWA butterfly valves:

De Zurik Corporation
Henry Pratt Company

2. Rectangular butterfly valves: equal):

De Zurik Corporation
Henry Pratt Company

3. Butterfly valves designed for air and gas service: the following (or equal):

De Zurik Corporation
Keystone Valve - USA

PART 3 - EXECUTION

3.1 INSTALLATION

A. Exposed butterfly valves shall be installed to permit removal of valve assembly without dismantling the valve or operator.

B. Installation shall be in accordance with Section 15100.

** END OF SECTION **