SECTION 15112

BUTTERFLY VALVES

PART 1 – GENERAL

1.01 SUMMARY

A. All butterfly valves shall be of the tight closing, rubber seated type and fully comply with the latest revision of AWWA Standard C504, Class as required, and NSF61 where applicable. Valves shall be bubble-tight at rated pressure class in either direction, and shall be satisfactory for applications involving throttling service and for applications requiring valve actuation after long periods of inactivity. Valve discs shall rotate 90º from the full open position to the tight shut position. Regardless of valve size, angular disposition of disc can be up to 1˝ off center without leakage.

The manufacturer shall have manufactured tight closing, rubber-seated butterfly valves for a period of at least ten years. All valves shall be manufactured by:

The Henry Pratt Company
The Mueller Company
or an approved equal.

1.02 RELATED SECTIONS

A. The following specification sections are referenced herein:

Section 01300	SUBMITTALS
Section 01730	OPERATION AND MAINTENANCE INSTRUCTIONS
Section 15180	VALVE OPERATORS AND VALVE APPURTENANCES
Section 15100	VALVES

1.03 REFERENCES

A. American National Standards Institute (ANSI) standards, most recent editions:

1. ANSI B16.1 – Cast Iron Pipe Flanges and Flanged Fittings
2. ANSI B93.10 – Static Pressure Rating Methods of Square Head Fluid Power Cylinders
3. NSF/ANSI 61 – Drinking Water System Components – Health Effects

B. American Society for Testing and Materials (ASTM) standards, most recent editions:

1. ASTM A48 – Standard Specification for Gray Iron Castings
2. ASTM A126 – Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
3. ASTM A240 – Standard Specification for Heat-Resisting Chromium and Chromium Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels
4. ASTM A536 – Standard Specification for Ductile Iron Castings

C. American Water Works Association (AWWA) standards, most recent editions:

1. AWWA C504 – Rubber Seated Butterfly Valves
2. AWWA C550 – Protective Epoxy Interior Coatings for Valves and Hydrants

1.04 DESIGN REQUIREMENTS

A. Meet or exceed the requirements of AWWA C504, NSF/ANSI 61, and the requirements of these specifications.

1.05 SUBMITTALS

A. The following information shall be submitted for review in accordance with Section 01300.

1. Submit valve manufacturers catalog data, descriptive literature and assembly drawings. Show dimensions, materials of construction by specification reference and grade, linings, and coatings.
2. Submit manufacturer’s affidavit of compliance with referenced standards.
3. Submit coating application factory test records for measuring coating thickness and holiday detection for the valve interior linings and exterior coatings and repair procedure.
4. Submit manufacturer’s proof-of-design per AWWA C504.

1.06 QUALITY ASSURANCE

A. Provide records of test performed on valves or component parts thereof that are required by AWWA Valve Standard specified in these Specifications if requested by Engineer within one year period after acceptance of work.

B. Provide Affidavit of Compliance with specified AWWA Valve Standard or Section 1.4 of AWWA C550 for each lot of valve size furnished for work.
C. Provide affidavit of compliance for an ISO 9001 quality control program and certification.
D. Install and test valves furnished in conformance with Drawings and Specifications.
E. Test each valve body under test pressure equal to twice its design water-working pressure, unless specified otherwise. Leak test each valve at 150 psi for class 150B Valves.

1.07 OPERATION & MAINTENANCE MANUALS

A. Submit operation and maintenance (O&M) instructions in accordance with Section 01730 with a copy of Section 01730 with each paragraph check marked to show compliance. O&M instructions shall be submitted after all submittals specified in paragraph 1.03 above have been returned “NO EXCEPTIONS TAKEN” or “MAKE CORRECTIONS AS NOTED.” O&M instructions shall reflect the approved materials and equipment.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Butterfly valves, butterfly valve operators, and component parts as manufactured by:

1. Henry Pratt
2. Mueller
3. Engineer pre-approved equal

2.02 COMPONENTS

A. Bodies: All valve bodies shall be cast iron ASTM A126, Class B, narrow body design and rated for 150 psi., unless otherwise specified for the bodies to be Ductile Iron and rated at 250 psi. Flange drilling shall be in accordance with ANSI B16.1 standard for cast iron flanges. Body thickness shall be in strict accordance with AWWA C504 where applicable.

B. Seats: All seats shall be constructed of synthetic rubber compound such as Buna N or EPDM and suitable for bi-directional shutoff at rated pressure. Seats shall be retained in the valve body by mechanical means without retaining rings, segments, screws or hardware of any kind in the flow stream. If mechanical means are

used to retain seats, all fasteners threaded in cast or ductile iron should be supplied with Monel inserts. (Prior to seat test, the manufacturer shall provide a torque test with individual fastener torque setting.) Seats shall be a full 360º without interruption and have a plurality of grooves mating with a spherical disc edge seating surface. Valve seats shall be field adjustable around the full 360º circumference and replaceable without dismantling the actuator, disc or shaft and without removing the valve from the line.

C. Bearings: All butterfly valves shall be fitted with sleeve-type bearings. Bearings shall be corrosion resistant and self-lubricating. Bearing load shall not exceed 1/5 of the compressible strength of the bearing or shaft material.

D. Disc: All valve discs shall be constructed ductile iron ASTM A536 with a stainless steel seating edge. The disc shall not have any hollow chambers that can entrap water. On the 30˝ and larger disc designs, the disc must be of a flow-through design. All surfaces shall be visually inspected and measurable to assure all structural members are at full disc strength. Disc and shaft connection shall be made with stainless steel through pins. On the 30˝ and larger valves, the disc and shaft connection shall made with removable stainless steel taper pins.

E. Shafts: All shafts shall be turned, ground, polished and constructed of 18-8 Type 304 or Type 316 stainless steel. Shafts shall be two-piece, stub type and keyed for actuator connection. Shaft diameters shall meet minimum requirements established by the latest revision of AWWA Standard C504 for their class, where applicable.

F. Painting: All surfaces of the valve shall be clean, dry and free from grease before applying paint or coating. The valve interior and exterior surfaces, except for the seating surfaces, shall be provided with the manufacturer’s standard unless otherwise specified by contract.

2.03 OPERATORS

A. Operators and component parts: AWWA C504, unless otherwise specified in these Specifications.

B. Provide with open left (counter-clockwise) opening manual operators.
   1. Compute operation torque of each valve and operator in accordance with Appendix of AWWA Standard C504 for velocity of 16 fps and applicable pressure drop across valve.

2. Operators: Sized for bi-directional flow and 450 ft-lb input torque.

C. Required input torque with maximum handwheel pull of:
1. 80 lbs. for hand wheels and chain wheels, or
2. 150 ft.-lbs. for operating nuts.

D. Hand wheels: Conform to detail drawings and provide adequate operating space.

F. Totally enclosed, permanently lubricated and sealed gear reducers.

1. Self-locking with open and close stops provided to limit valve disc travel.
2. Traveling nut type or worm gear.
3. Submit calculations for valve torque requirements to Engineer as part of Shop Drawing submittal package. Velocity for dynamic torque must be 16 fps unless addressed elsewhere within the specification.
4. Valve operators, as manufactured by:
    a. Henry Pratt Company
    b. Mueller

F. Provide butterfly valves 24 inches in diameter and larger, and butterfly valves which are not directly buried or submerged, with manual hand wheels and position indicators. Install valves with valve shaft in horizontal position unless otherwise specified.

G. Provide butterfly valves which are directly buried or submerged with 2-inch square operating nut and do not equip with position indicator unless otherwise specified.

H. Valves located in vaults: Provide adequate clearance for handwheel operation.
1. Orientate handwheel as shown in Drawings.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install valves as shown on drawings and in accordance with manufacturers' and District's requirements.

END OF SECTION