SECTION 40_05_64

BUTTERFLY VALVES

PART 1 GENERAL

1.01 DESCRIPTION

A. This section specifies AWWA C504 Class 250B butterfly valves for water service for sizes 3 inches through 72 inches.

B. Comply with the provisions of Section 40_05_60 - Valves in addition to the requirements specified herein. Valves shall be furnished compliant with Section 01_60_00 – Product Requirements.

C. Equipment List

Location	Tag	Pipe Size, inches	Pressure Rating	Actuator Type	Valve Orientation	Valve Seat Position
HSPS Discharge	WA3260-VLV-8100-7B WA3260-VLV-8100-8B WA3260-VLV-8100-9B	42	250 psig	Manual	Horizontal	Up-stream

1.02 REFERENCES

A. This section contains references to the following documents. They are a part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

B. Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

Reference	Title
ANSI B16.1	Cast Iron Pipe Flanges and Flanged Fittings Class 25, 125, 250 and 800
ANSI B16.5	Pipe Flanges and Flanged Fittings
ASTM A48	Gray Iron Castings

Reference	Title
ASTM A108	Steel Bars, Carbon, Cold-Finished, Standard Quality
ASTM A126	Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A216/A216M	Steel Castings, Carbon, Suitable for Fusion Welding, for High Temperature Service
ASTM A276	Stainless and Heat-Resisting Steel Bars and Shapes
ASTM A436	Austenitic Gray Iron Castings
ASTM A536	Ductile Iron Castings
AWWA C504	Rubber-Seated Butterfly Valves
NSF/ANSI/CAN 61	Drinking Water System Components

1.03 SUBMITTALS

A. Submittals as specified in Section 40_05_60 - Valves.

B. In addition to submittals specified in 40_05_60 - Valves, provide the following Action Submittal items:

1. Copy of this section: Check (✓) shall denote full compliance with a paragraph as a whole
2. Completed Certificate of Unit Responsibility attesting that the Contractor has assigned, and that the manufacturer accepts unit responsibility in accordance with the requirements of this Section and Section 43_05_11-1.02. No other submittal material will be reviewed until the certificate has been received and found to be in conformance with these requirements.
3. In addition to submittals specified in 40 05 60 - Valves, provide the following Informational Submittal items:
   a. Factory testing procedures.
   b. Factory Acceptance Test results and/or Certified Statement of Proof-of-Design testing results specified herein
   c. Number of turns to open and close for manual actuators.
   d. Component and assembled weight
   e. Cavitation coefficient
   f. Affidavits of compliance with AWWA C504 Class 250B.

1.04 QUALITY ASSURANCE

A. Factory Testing

1. Butterfly valves, 3-inch through 72-inch, and actuators shall be tested in accordance with AWWA C504.
2. The manufacturer shall perform thorough visual inspection and ultrasonic tests on all castings before assembly.
3. The manufacturer shall conduct ultrasonic testing of each valve disc and valve body in accordance with the following test procedures and certify there are no defects within the ductile iron material.
4. Perform testing using a hand-held ultrasonic velocity/thickness gage that uses pulse-echo techniques to measure material thickness and velocity. The gage will be used as a velocimeter by coupling the transducer to a ductile iron

sample of known thickness and performing a velocity calibration. The ductile iron sample will conform to ASTM A536, Grade 65-45-12.

5. Take a minimum of 16 measurements per body and disc, for valve sizes 42 through 96 inches. Take a minimum of eight measurements for valves sizes 24 through 36 inches. Valves less than 24 inches do not require ultrasonic testing. The points of measurement should be equally spaced and represent the entire body and disc casting and not be limited to one specific area
6. Read the velocity off the gage display, record, and include as a Certified Test Report. Components with measured velocities of less than 0.21 in/µS (5,300 m/S) will be rejected. The gage will also be used as an ultrasonic thickness gage to confirm the minimum body shell thickness meets the requirements of the latest revision of AWWA C504 for 3-inch through 72-inch valves.
7. Provide Certified Test Reports for factory testing.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Procedures: Section 40_05_60.

1.06 WARRANTY

A. A warranty for the equipment specified under this Section shall be provided in accordance with the Section 01_78_36 – Warranties and Bonds.

PART 2 PRODUCTS

2.01 MATERIALS

A. Valves are specified according to size as follows:
   1. Valves Size 3 Through 24 Inches shall be constructed of the following materials unless otherwise specified:

Component	Material
Shaft	Stainless steel, ASTM A276, Type 304
Disc	Ductile iron, ASTM A536, or cast iron, ASTM A436, type 1 (Ni-Resist); or ASTM A48, Class 40, or ASTM A126, Class B
Seat mating surface	Stainless steel, ASTM A276, Type 304, mounted in body or on disc edge; or Ni-Chrome on the disc edge
Seat sealing surface	Neoprene, EPDM or Buna N
Body	Cast iron, ASTM A126, Class B

   a. Valves size 30 Through 72 Inches shall be constructed of the following materials unless otherwise specified:

Component	Material
Shaft	Type 17-4 pH stainless steel, ASTM A564
Disc	Ductile iron, ASTM A536 Grade 65-45-12 ductile iron

Component	Material
Seat mating surface	Stainless steel, ASTM A276, Type 304, mounted in body or on disc edge
Seat sealing surface	EPDM
Body	ASTM A536 Grade 65-45-12 ductile iron

2.02 MANUFACTURE

A. General:

1. Valves shall be the stub or through shaft design. Wafer type valves are not acceptable for buried service. Unless otherwise specified, valve flange drilling shall be per ANSI B16.1, Class 125 drilling.
2. Valve shall be manufactured provided by one of the following manufacturers:

Manufacturer
A. Dezurik
B. Mueller/Pratt
C. M&H/Kennedy Valve Co.
D. VAG GA Industries
E. Val-Matic

3. Butterfly valves shall be designed in accordance with AWWA C504. Shafts shall be turned, ground and polished. Shaft dimensions and operator torque shall be chosen for the pressure specified in Section 40_05_01 and Class B as specified in AWWA C504. When carbon steel shafts and stainless steel journals are used, static seals shall be provided to isolate the interior of the disc and the shaft from the process fluid.
4. Butterfly valves, size 3 through 24 inches, shall have seats that are vulcanized, bonded, mechanically secured, or clamped to the body or disc.
5. Butterfly valves, size 30 through 72 inches, valve seats shall utilize mechanically retained seats with 316SST hardware that are field adjustable and replaceable. Discs for valves shall be of the flow-through Type with a 360-degree seating design.
6. Valves shall be rated at 250 psig and provide driptight shutoff up to the full valve rating on dead-end or isolation service. Valve end joints shall be as specified in Section 40_05_01.

2.03 MANUAL OPERATORS

A. General:

1. Manual operators shall be designed in accordance with AWWA C504 and shall have a disc position indicator designating the opened and closed position of the valve.
2. Manual operators for butterfly valves shall be of the worm gear type. Operators shall be equipped with adjustable mechanical stop-limiting devices to prevent overtravel of the disc in the open and closed positions and shall be self-locking and designed to hold the valve in any intermediate position between full open

and full closed. Valve operator components shall withstand an input torque of 300 ft-lbs at the extreme operator positions without damage.

3. Operators for exposed service shall include a handwheel and be gasketed for weatherproof service.

B. Manual Operators shall be provided by one of the following manufacturers:

Manufacturer
A. AUMA GS-Series
B. Limitorque HBC-Series

PART 3 EXECUTION

3.01 INSTALLATION

A. Valves shall be installed in accordance with the manufacturer's recommendations.

B. Perform operational acceptance test (actuation and leakage) for each valve.

3.02 MANUFACTURER SERVICES

A. On-Site Inspections and Training: Provide a factory-trained manufacturer's representative at the Site for the following activities. Specified durations do not include travel time to or from the Site.

1. Valve and system installation and testing: 1 days (1 trip minimum)

END OF SECTION