

The following standard specification is intended to be edited according to the specifics of the project. Brackets [] and areas shaded in gray [e.g. format] indicate requirements that are optional depending upon the type of system being provided or per instructions associated with the [] and project requirements. Consult with University's Representative and campus stakeholders.

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SECTION 33 12 16 WATER DISTRIBUTION VALVES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Water distribution valves and appurtenances.

1.2 RELATED SECTIONS

- A. Section 01 33 23 Shop Drawings, Product Data and Samples
- B. Section 01 43 00 Quality Assurance
- C. Section 09 90 00 Painting and Coating
- D. Section 33 11 00 Water Utility Distribution Piping

1.3 REFERENCES

- A. American Society of Mechanical Engineers (ASME) B16.5 - Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24 Metric/Inch Standard
- B. American Society for Testing and Materials (ASTM) A126 - Gray Iron Castings for Valves, Flanges, and Pipe Fittings
- C. ASTM A276 - Stainless and Heat Resisting Steel Bars and Shapes
- D. ASTM A536 - Ductile Iron Castings
- E. ASTM B148 - Aluminum-Bronze Sand Castings
- F. ASTM B61 - Standard Specification for Steam or Valve Bronze Castings
- G. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings – (Reinstated)
- H. American Water Works Association (AWWA) C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
- I. AWWA C504 – Rubber-Seated Butterfly Valves
- J. AWWA C508 - Swing-Check Valves for Waterworks Service, 2 In. Through 24 In. NPS
- K. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service
- L. AWWA C550 - Protective Interior Coatings for Valves and Hydrants
- M. AWWA C800 - Underground Service Line Valves and Fitting.

1.4 SUBMITTALS

- A. See Section 01 33 23 Shop Drawings, Product Data and Samples for submittal procedures.
- B. Product Data: Provide data acknowledging that products meet requirements of standards referenced.
- C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Project Record Documents:

1. Record location of valves and invert elevations.

PART 2 - PRODUCTS

2.1 GATE VALVES

A. Valves of the same size and service shall be provided by a single valve manufacturer. Packing shall be non-asbestos material. Actual length of valves shall be within 1/16 inch (plus or minus) of the manufacturer's specified length.

B. Gate Valves Less Than 2 Inches:

1. Valves shall be Class 125 minimum, non-rising stem, inside screw, single wedge or disc, compression ends, with control rod, and extension box.
2. Valve body shall be of Brass or Bronze material.
3. Gate valves less than 2 inches shall be Stockham Model B103/B104, Nibco Model T-113/S-113, or equal.

C. Gate Valves 2 inch through 12 inch:

1. Valves shall be resilient seated gate valve. Valves greater than 4 inches shall comply with AWWA C509.
2. Valves shall open by turning the stem counterclockwise. Buried valves shall be non-rising type with O-ring seal equipped with 2 inch square operating nut, and shall be bituminous coated. Buried valves shall have stem extensions to place operating nut within 6 inch of top of valve box. End connections shall be flanged ends or mechanical joint as required for the type of pipe used. Working pressure shall be 250 psi.
3. Flanges shall meet the requirement of ASME B16.5. Mechanical joints shall meet the requirements of AWWA C111.
4. Valve materials shall be as follows:
 - a. Body and Bonnet: Cast or ductile iron, ASTM A126, Class
 - b. Wedge: Cast iron, ASTM A126, Class B
 - c. Resilient seal: Buna N
 - d. Stem: Stainless Steel AISI 420
 - e. Stem Nut: Brass
 - f. Fasteners and hardware: Type 304 stainless steel
5. Gate valves 2 inches through 12 inches shall be American Flow Control Series 2500, Mueller 2360 Series, or equal.

D. Manufacturer's name and pressure rating shall be marked on valve body.

E. Gate valve interior and exterior body and bonnet shall be fusion bond epoxy coated per requirements of AWWA C550.

F. Factory hydrostatic testing of valves shall be required for valves greater than 20 inches. Results of factory testing shall be submitted conforming to Section 01 33 23 Shop Drawings, Product Data and Samples.

2.2 BUTTERFLY VALVES

- A. Valves of the same size and service shall be provided by a single valve manufacturer. Packing shall be non-asbestos material. Actual length of valves shall be within 1/16 inch (plus or minus) of the manufacturer's specified length.
- B. Butterfly Valves Greater than 12 inches: Valves shall be AWWA C504, flanged or mechanical joint type and have a rubber seat. Valve discs shall rotate 90 degrees from the full open position to the tight shut position. Valve seat shall provide a drip tight shutoff at a pressure differential of 150 psi upstream and 0 psi downstream in either direction.
- C. Butterfly valve materials shall be as follows:
 - 1. Body and cover: Cast iron, ASTM A126, Class B
 - 2. Disc: Cast iron, ASTM A126, Class B with Type 316 stainless steel seating edge
 - 3. Seat: Buna-N
 - 4. Shafts: Stainless steel, ASTM A276, Type 304
 - 5. Fasteners and hardware: Type 304 stainless steel
- D. The valve operator shall be the traveling nut type. Valve shall open with a counter-clockwise rotation of the 2 inch operating nut and have O-ring seals. Valve operator components shall withstand an input torque of 300 ft-lbs at the extreme operator positions without damage.
- E. Manufacturer's name and pressure rating marked on valve body.
- F. Butterfly valve wetted parts shall be coated with fusion bonded epoxy per requirements of AWWA C550.
- G. Factory hydrostatic testing of valves shall be required for valves greater than 20 inches. Results of factory testing shall be submitted conforming to Section 01 33 23 Shop Drawings, Product Data and Samples.
- H. Butterfly valves shall be Pratt Groundhog Buried Service, Mueller Lineseal III, or equal.

2.3 CHECK VALVES

- A. Valves of the same size and service shall be provided by a single valve manufacturer. Packing shall be non-asbestos material. Actual length of valves shall be within 1/16 inch (plus or minus) of the manufacturer's specified length.
- B. Check valves 2 inches and smaller:
 - 1. Valves shall be AWWA C508, Class 150 bronze swing check valves with Y-pattern body and threaded ends. Rotating disk design and regrindable seat.
- C. Check valves greater than 2 inches:
 - 1. Valves shall be AWWA C508, adjustable spring tension. The design of the spring attachment shall permit adjustment of closing force by tensioning the spring or replacement with different active length springs.
 - 2. Disc and lever arms shall be keyed to the shaft and retained by bushings or pins.
 - 3. Unless otherwise specified, valves 2 inches through 12 inches shall have a minimum working pressure of 175 psi. Valves greater than 12 inches shall have a minimum working pressure of 150 psi.
- D. Check valves wetted parts shall be coated with fusion bonded epoxy per requirements of AWWA C550.

E. Check valve materials shall be as follows:

1. Body and cover: Cast iron, ASTM A126, Class B or Bronze ASTM B62
2. Disc: Ductile iron, ASTM A536 or Bronze ASTM B61
3. Seat rings: Aluminum bronze, ASTM B148 or Stainless steel, ASTM A276, Type 316
4. Hinge shafts and hinge pins: Stainless steel, ASTM A276, Type 301 or 304
5. Shaft bushings: Bronze, AWWA C508
6. Fasteners and hardware: Type 304 stainless steel

2.4 CORPORATION STOPS

- A. Valves of the same size and service shall be provided by a single valve manufacturer. Packing shall be non-asbestos material. Actual length of valves shall be within 1/16 inch (plus or minus) of the manufacturer's specified length.
- B. Corporation stops for smaller service lines shall be ball type, conforming to AWWA C800, maximum working pressure of 300 psig.
- C. Stem rotation shall be a full 360 degrees.
- D. Corporation stop materials shall be as follows:

1. Body: Brass, 85-5-5-5 ASTM B62
2. Seat Seal: Stainless steel
3. Fasteners and hardware: Type 304 stainless steel

E. Corporation stops shall be Mueller or equal.

2.5 VALVE BOXES

- A. Valve boxes shall be precast concrete with cast iron traffic covers. Traffic box shall be circular with the word WATER embossed on the top surface of the lid.
- B. Valve boxes shall be Christy G-5, Brooks, or equal.

Note to specifier: coordinate painting with Section 09 90 00. If Section 09 90 00 is not provided, sufficient information shall be provided under this paragraph to fully instruct the contractor on the requirements for painting ferrous materials, including preparatory work and proper conditions for conducting the work.

- C. Valve box cover shall be painted light blue (ICI Devoe DC4100 semi gloss or equal) for domestic water valves and white (ICI Devoe DevFlex-659 White Semi Gloss 4206 or equal) for utility water valves. Coatings shall conform to Section 09 90 00 Painting and Coating. An identification number shall be welded onto the valve box rim with 1-inch high text. Identification numbers shall be assigned by the University's Representative.

PART 3 - EXECUTION

3.1 INSTALLATION

The following paragraph related to University's Standard Details coordinate usage with Drawings.

- A. Valve installation shall be in accordance with details. Set valves on solid bearing.
- B. Center and plumb valve box over valve. Set box cover flush with finished grade.
- C. For valves without valve boxes, stainless steel tags bearing the specified valve identification number stamped in 1/2-inch high letters shall be installed on valve flanges in a position visible from floor level. Flangeless valves 8 inches in diameter and larger shall have tags attached to the valve body by self-tapping corrosion resistant metal screws. Flangeless valves 6 inches in diameter and

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smaller shall have tags attached to the valve stem by stainless steel wire or nylon tie. Wire shall be 0.063 inch minimum. Identification numbers shall be assigned by a University's Representative.

D. Valves shall be installed in the closed position.

3.2 TESTING

A. Water distribution valves shall be tested according to manufacturer's instructions and according to system testing requirements of **Section 33 11 00 Water Utility Distribution Piping**.

B. Perform field inspection and testing in accordance with Section 01 43 00 Quality Assurance.

END OF SECTION 33 12 16