

# AIS Waiver Request for Double Offset Butterfly Valves

## General Items

### Project Name

Tyzack Vault Capital Replacement Project

### Description of Work

The Ashley Valley Water Treatment Plant (AVWTP) receives a significant portion of its influent water from the Red Fleet Reservoir. The Red Fleet influent line supplies water to the plant as well as to the Uintah Water Conservancy District through a separate bypass line, flow meter, and flow control valve. The Red Fleet influent line is normally turned off and drained during the winter. The valve that isolates AVWTP from the Red Fleet line (the Tyzack Valve) is a butterfly valve that is at the end of its useful life. It leaks when fully closed and is left open during the winter due to difficulty opening and closing. Shear pins break regularly at the gearbox and the gearbox is often submerged with groundwater causing excessive corrosion. Access to the Tyzack gear box is through a deep, hazardous manhole and presents difficult confined-space safety issues each time the valve must be closed or repaired. There is no access to the valve for maintenance because it is buried. The Red Fleet Bypass Vault flow control valve and flow meter are also near failure and need to be replaced. This project will replace the existing Tyzack access manhole and valve with a new vault and isolation valve as well as replace the worn out isolation valve, flow control valve and flow meter on the Red Fleet bypass line. The existing roller valve will be replaced with a plunger valve and the existing propeller meter will be replaced with a mag meter. This new flow meter will be connected to the plant SCADA system. The new Tyzack vault and valve replacement will resolve a safety and maintenance issue and will provide the needed access for normal operations and maintenance activities.

The project will also replace the existing sleeve valve and flow meter in Meter Vault 2. This sleeve valve is near failure and needs replacement. Isolation gates will also be installed in the Influent Mixing Structure to provide better options for maintenance in the Red Fleet and Ashley Springs lines. Because of significant leakage into Meter Vault 2 from the drying beds, the project also includes installation of a new sump collection manhole and groundwater collection system. Fiber for controls for the new equipment will also be included.

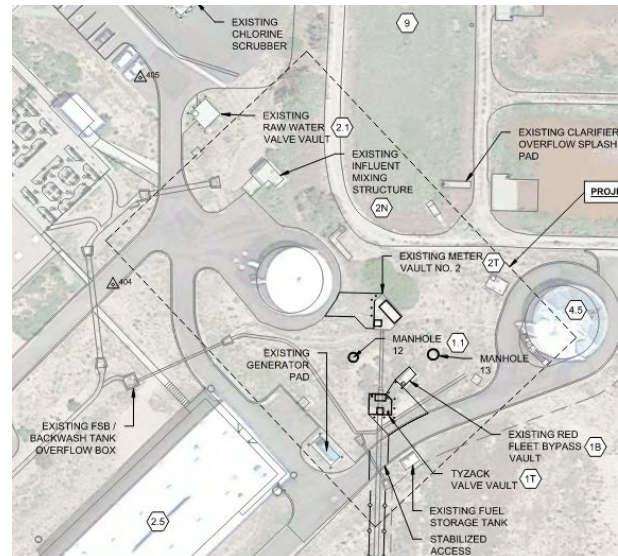


Figure 2. Site Plan

**Description of the Foreign and Domestic Construction Materials**

The plans and specifications require the replacement of 2 existing butterfly valves as well as the installation of 1 new butterfly valve ranging in size from 20-inch to 36-inch. The double offset butterfly valves are constructed of stainless steel, bronze, and ductile iron and must be designed to withstand high velocities. Double offset butterfly valves are produced internationally; there are no domestic manufacturers that can meet the required specifications within the United States.

**Unit of Measure**

The valves listed above are measured by ‘each’.

**Quantity**

A total of 2 20” double offset butterfly valves and 1 36” double offset butterfly valve listed in the table below.

**Price**

<b>Double Offset Butterfly Valves</b>			
Size (inch)	Quantity	Unit Price (each)	Total Costs
20 (with chainwheel)	1	[REDACTED]	[REDACTED]
20 (with handwheel)	1	[REDACTED]	[REDACTED]
36	1	[REDACTED]	[REDACTED]
<b>Total</b>	<b>3</b>		

**Time of delivery and availability**

Delivery time of the double offset valves is not applicable to this waiver. However, double offset valves that meet the required specifications are not fabricated domestically in the United States.

For similar projects, the EPA conducted market research on the supply and availability of double offset butterfly valves and concluded that there are no domestic manufacturers of these valves that meet the technical specifications of those projects (similar to the Tyzack Vault Capital Replacement Project specifications). There are domestic manufacturers capable of providing double offset butterfly valves in the sizes required for the project but these manufacturers cannot provide valves that meet the 100 percent leak proof requirement and/or a product that meets the AWWA C504 Standard for high velocity design as specified.

**Location of the construction project**

The project is located in Uintah County, Utah as described above.

[REDACTED]

[REDACTED]

### **A detailed justification for the use of foreign construction materials**

The double offset butterfly valves, discussed above, are not manufactured domestically in the United States. The purpose of the double offset butterfly valves is to provide isolation and shut-off service to control flow and allow for maintenance on the Red Fleet and Red Fleet Bypass lines. It is essential that the butterfly valves not leak. These valves are located below grade in confined spaces. The vaults must remain dry since they contain power cables and electronic devices, especially when CUWCD personnel are present and conducting maintenance activities. The double offset design ensures a 100 percent leak-free valve by preventing the elastomeric seal from being compressed by the disc when the valve is in the open position. The compression set or permanent indentation(s) of the elastomeric seal on single offset or zero offset valves could become a leak path. The project's technical specifications also require that the valves comply with the American Water Works Association C504 Standard, meaning that the valves must allow a maximum velocity of 16 feet per second. In addition, the project's technical specifications require the butterfly valves to have a high velocity elastomeric seal, which is rated to over 300 feet per second, because very high localized velocities could be produced when the valve is being closed. CUWCD and the prime contractor (WW Clyde) found no domestically manufactured double offset butterfly valves that meet this velocity criterion.

These valves are required and specified to isolate sections of the Red Fleet and Red Fleet Bypass lines. Isolation is necessary during maintenance times. The double offset butterfly valves provide improved performance over other types of valves and withstand leaking pressures. For these reasons, the Central Utah Water Conservancy District has specified double offset butterfly valves for use on the Tyzack Vault Capital Replacement Project.

# Availability Waiver Request

## Double Offset Butterfly Valves

### **Supplier information or pricing information from a reasonable number of domestic suppliers indicating availability/delivery date for construction materials**

The double offset butterfly valves are not manufactured domestically in the United States. There are no domestically manufactured replacement valves that would meet the specifications for the Tyzack Vault Capital Replacement Project.

For similar projects, the EPA conducted market research on the supply and availability of double offset butterfly valves and concluded that there are no domestic manufacturers of these valves that meet the technical specifications of those projects (similar to the Tyzack Vault Capital Replacement Project specifications). There are domestic manufacturers capable of providing double offset butterfly valves in the sizes required for the project but these manufactures cannot provide valves that meet the 100 percent leak proof requirement and/or a product that meets the AWWA C504 Standard for high velocity design as specified.

### **Documentation of the assistance recipient's efforts to find available domestic sources, such as description of the process for identifying suppliers and a list of contacted suppliers**

CUWCD requested that the prime contractor, WW Clyde, contact domestic suppliers of double offset butterfly valves. However, WW Clyde indicated that there are no domestic suppliers for the double offset butterfly valves that meet the project plans and specifications. WW Clyde's response attached.

### **Project Schedule**

See attached

### **Relevant excerpts from project**

See attached



May 20, 2020

Caitlyn Erickson  
Central Utah Water Conservancy District  
1426 E 750 N Suite 400  
Orem, UT 84097

Re: Ashley Valley Water Treatment Plant Tyzack Vault Capital Replacement Project  
Subject: AIS Waiver Prime Contractor Statement

Dear Caitlyn,

The intention of the letter is to inform Central Utah Water Conservancy that the following permanent construction materials specified for the construction of the Ashley Valley Water Treatment Plant Tyzack Vault Capital Replacement Project are not available from domestic suppliers.

WW Clyde & Co. in an effort to meet the AIS requirements, has requested pricing for domestically produced double offset butterfly valves and plunger vales per specification 15206 and 15112 [REDACTED]. The suppliers have stated that the specified valves are not available from a domestic manufacturing source. [REDACTED]

Sincerely;

A handwritten signature in black ink, appearing to read "Jeff Whinham".

Jeff Whinham  
Project Manager

C.C Project Files



SECTION 15110  
COMMON WORK RESULTS FOR VALVES

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes: Basic requirements for valves.
- B. Related sections:
  - 1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
  - 2. It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.

**1.02 REFERENCES**

- A. American Water Works Association (AWWA):
  - 1. C111/A21.11 - Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe Fittings.
- B. ASTM International (ASTM):
  - 1. A 126 - Standard Specification for Gray Iron Casting for Valves, Flanges, and Pipe Fittings.
  - 2. A 167 - Standard Specification for Stainless and Heat-Resisting Chromium- Nickel Steel Plate, Sheet, and Strip.
  - 3. A 536 - Standard Specification for Ductile Iron Castings.
- C. NSF International (NSF):
  - 1. 61 - Drinking Water System Components - Health Effects.
- D. Society for Protective Coatings (SSPC):
  - 1. SP 7 - Brush-Off Blast Cleaning.
  - 2. SP 10 - Near-White Blast Cleaning.

**1.03 DESIGN REQUIREMENTS**

- A. Valves for similar service are to be by the same manufacturer.
- B. AGear boxes are to be mounted at floor level. Submerged valve gear boxes are not acceptable. Provide torque tube from valve to actuator and support extension as required by manufacturer.
- C. Pressure rating:
  - 1. Suitable for service under minimum working pressures of 150 pounds per square inch gauge.
  - 2. When a piping system is specified to be tested at a pressure greater than 150 pounds per square inch gauge, provide valves for that piping system with design

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working pressure which is sufficient to withstand the test pressure. Required piping system test pressure is listed in the Piping Schedule in the drawings.

- D. Valve to piping connections (unless indicated otherwise):
  - 1. Valves 3 inch nominal size and larger: Flanged ends.
  - 2. Valves less than 3 inch nominal size: Screwed ends.
  - 3. Plastic valves in plastic piping:
    - a. Up to 2.5 inches: Provide solvent or heat welded unions.
    - b. 3 inches and above: Provide solvent or heat welded flanges.

**1.04 SUBMITTALS**

- A. Submit as specified in Section 01300.
- B. Product data:
  - 1. Submit the following information for each valve:
    - a. Valve type, size, pressure rating, Cv factor.
    - b. Coatings.
    - c. Power valve actuators:
      - 1) Information on valve actuator including size, manufacturer, model number, limit switches, mounting; and motor enclosure, seating and unseating torque coefficient, dynamic torque, and bearing friction for calculation of maximum operating torque.
      - 2) Complete wiring diagrams and control system schematics.
    - d. Manual valve actuators:
      - 1) Information on valve actuator including size, manufacturer, model number.
    - e. Certified drawings with description of component parts, dimensions, weights, and materials of construction.
    - f. Certifications of reference standard compliance:
      - 1) Submit certification that the valves and coatings are suitable in potable water applications in accordance with NSF 61.
    - g. Clearly mark submittal information to show specific items, materials, and accessories or options being furnished.
    - h. Factory test data.
- C. Operation and maintenance data:
  - 1. Furnish bound sets of installation, operation, and maintenance instructions for each type of manual valve 4 inch in nominal size and larger, and all non-manual valves. Include information on valve operators in operation and maintenance instruction manual.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer qualifications:
  - 1. Valves manufactured by manufacturers whose valves have had successful operational experience in comparable service.

## 1.06 DELIVERY STORAGE AND HANDLING

- A. Protect valves and protective coatings from damage during handling and installation; repair coating where damaged.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Stainless steel: In accordance with ASTM A 167, Type 316, UNS Alloy S31600 or S30400.
- B. Valve and operator bolts and nuts:
  - 1. Fabricated of stainless steel for the following installation conditions:
    - a. Submerged in sewage or water.
    - b. In an enclosed space above sewage or water.
    - c. In structures containing sewage or water, below top of walls.
    - d. At openings in concrete or metal decks.
  - 2. Where dissimilar metals are being bolted, use stainless steel bolts with isolation bushings and washers.
  - 3. Underground bolts: Low-alloy steel in accordance with AWWA C111/A21.11.
- C. Bronze and brass alloys: Use bronze and brass alloys with not more than 6 percent zinc and not more than 2 percent aluminum in the manufacture of valve parts; UNS Alloy C83600 or C92200 unless specified otherwise.
- D. Valve bodies: Cast iron in accordance with ASTM A 126, Class 30 minimum or ductile iron in accordance with ASTM A 536, Grade 65-45-12 minimum unless specified otherwise.

### 2.02 INTERIOR PROTECTIVE LINING

- A. When specified in the particular valve specification, provide valves with type of protective lining specified in the particular valve Specification.
- B. Apply protective lining to interior, non-working surfaces, except stainless steel surfaces.
- C. Lining types:
  - 1. Fusion bonded epoxy:
    - a. Manufacturers: One of the following or equal:
      - 1) 3-M Company, ScotchKote 134; certified to NSF 61 for drinking water use. Clean surfaces in accordance with SSPC SP 7 or SP 10, as recommended by epoxy manufacturer.
    - b. Apply in accordance with manufacturer's published instructions.
    - c. Lining thickness: 0.010 to 0.012 inches except that:
    - d. Lining thickness in grooves for gaskets: 0.005 inches.
    - e. Do not coat seat grooves in valves with bonded seat.
    - f. Quality control:



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- 1) Lining thickness: Measured with a non-destructive magnetic type thickness gauge.
  - 2) Verify lining integrity with a wet sponge-testing unit operating at approximately 60 volts, or as recommended by the lining manufacturer.
  - 3) Consider tests successful when lining thickness meets specified requirements and when no pinholes are found.
  - 4) Correct defective lining disclosed by unsuccessful tests, and repeat test.
  - 5) Repair pinholes with liquid epoxy recommended by manufacturer of the epoxy used for lining.
2. High solids epoxy:
- a. Product equivalent to high solids epoxy specified in Section 09900.
    - 1) Certified in accordance with NSF 61 for drinking water use.
    - 2) Interior: Coat valve interior with manufacturer's equivalent high-performance high solids epoxy coating system with a certifiable performance history for the service conditions and as approved by the CONSTRUCTION MANAGER. Manufacturer shall provide for approval, coating information sufficient to allow CONSTRUCTION MANAGER to assess equivalence to the specified high solids epoxy coating specified in Section 09960.
  - b. Clean surfaces to meet SP-7 or SP-10, or as recommended by coating manufacturer.
  - c. Quality control: After coating is cured, check coated surface for porosity with a holiday detector set at 1,800 volts, or as recommended by coating manufacturer.
    - 1) Repair holidays and other irregularities and retest coating.
    - 2) Repeat procedure until holidays and other irregularities are corrected.

**2.03 UNDERGROUND VALVES**

- A. Provide underground valves with flanged, mechanical, or other type of joint required for the type of pipe to which the valve is to be connected.

**2.04 VALVE BOXES**

- A. Provide cast-iron valve boxes at each buried valve to access valve and valve operators.
- B. Do not support boxes on valve, valve operator, or pipe.
- C. Boxes:
1. 2-piece, fabricated of cast iron; provide cover, with asphalt varnish or enamel protective coating.
  2. Adjustable to grade, install centered around the upper portions of the valve and valve operator.



## 2.05 VALVE OPERATORS

- A. Valve operator "Open" direction: Open counterclockwise.
- B. Provide valves located below operating level or deck with extensions for key operation or floor stands and handwheels.
- C. Provide manually operated valves located not more than 6 feet above the operating level with tee handles, wrenches, or handwheels.
  - 1. Make the valve operator more conveniently accessible by rolling valves, located more than 5 feet but less than 6 feet above the operating level, toward the operating side.
  - 2. Secure tee handles and wrenches to the valve head or stem, except where a handle or wrench so secured constitutes a hazard to personnel; in which case, stow handle or wrench immediately adjacent to the valve on or in a suitable hanger, bracket, or receptacle.
- D. Fit valves located more than 6 feet above operating level with chain operated handles or valve wheels.
  - 1. Chains: Sufficient length to reach approximately 4 feet above the operating level.
  - 2. Where chains constitute a nuisance or hazard to operating personnel, provide holdbacks or other means for keeping the chains out of the way.
- E. Provide an operator shaft extension from valve or valve operator to finished grade or deck level when buried valves, and other valves located below the operating deck or level, are specified or indicated on the Drawings to be key operated; provide 2 inch square AWWA operating nut, and box and cover as specified, or a cover where a box is not required.

## 2.06 VALVE POSITION INDICATORS

- A. Mounting bracket shall have slotted hole to provide flexibility to offset or makeup misalignment.
- B. No bending of bracket allowed to make up for misalignment.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Preparation prior to installation:
  - 1. Install valves after the required submittal on installation has been accepted.
  - 2. Determine after flanged valves and flanged check valves are selected, the face-to-face dimensions of flanged valves and flanged check valves.
- B. Fabricate piping to lengths taking into account the dimensions of flanged valves and flanged check valves.

### 3.02 INSTALLATION

- A. Provide incidental work and materials necessary for installation of valves including flange gaskets, flange bolts and nuts, valve boxes and covers, concrete bases, blocking, and protective coating.
- B. Where needed, furnish and install additional valves for proper operation and maintenance of equipment and plant facilities under the following circumstances:
  - 1. Where such additional valves are required for operation and maintenance of the particular equipment furnished by CONTRACTOR.
  - 2. Where such additional valves are required as a result of a substitution or change initiated by CONTRACTOR.
- C. Install valves with their stems in vertical position above the pipe, except as follows:
  - 1. Butterfly valves, gate valves aboveground, globe valves, ball valves, and angle valves may be installed with their stems in the horizontal position.
  - 2. Install buried plug valves with geared operators with their stems in a horizontal position.
- D. Install valves so that handles clear obstructions when the valves are operated from fully open to fully closed.
- E. Place top of valve boxes flush with finished grade or as otherwise indicated on the Drawings.
- F. Valves with threaded connections:
  - 1. Install valves by applying wrench on end of valve nearest the joint to prevent distortion of the valve body.
  - 2. Apply pipe joint compound or Teflon tape on external (male) threads to prevent forcing compound into valve seat area.
- G. Valves with flanged connections:
  - 1. Align flanges and gasket carefully before tightening flange bolts.
  - 2. When flanges are aligned, install bolts and hand tighten.
  - 3. Tighten nuts opposite each other with equal tension before moving to next pair of nuts.
- H. Valves with soldered connections:
  - 1. Do not overheat connection to prevent damage to resilient seats and metal seat rings.
  - 2. Position valves in full open position before starting soldering procedure.
  - 3. Apply heat to piping rather than to valve body.

**END OF SECTION**

SECTION 15112  
BUTTERFLY VALVES

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section includes: Butterfly valves.
- B. Related sections:
  - 1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
  - 2. It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.

**1.02 REFERENCES**

- A. American Society of Mechanical Engineers (ASME):
  - 1. B16.1 - Cast Iron Pipe Flanges and Flanged Fittings, Classes 25, 125 and 250.
  - 2. B16.5 - Pipe Flanges and Flanged Fittings, NPS 1/2 through NPS 24.
- B. American Water Works Association (AWWA):
  - 1. C110 - Standard for Ductile-Iron and Gray-Iron Fittings.
  - 2. C504 - Rubber-Seated Butterfly Valves.
  - 3. C540 - Standard for Power-Actuating Devices for Valves and Sluice Gates.
  - 4. C550 - Protective Interior Coatings for Valves & Hydrants.
  - 5. C606 - Standard for Grooved and Shouldered Joints.
- C. ASTM International (ASTM):
  - 1. A 126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
  - 2. A 216 - Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for Higher-Temperature Service.
  - 3. A 276 - Standard Specification for Stainless Steel Bars and Shapes. A 351 - Standard Specification for Castings, Austenitic, for Pressure-Containing Parts.
  - 4. A 395 - Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.
  - 5. A 479 - Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels.
  - 6. A 515 - Standard Specification for Pressure Vessel Plates, Carbon Steel, for Intermediate - and Higher-Temperature Service.
  - 7. A 516 - Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate - and Lower-Temperature Service.
  - 8. A 536 - Standard Specification for Ductile Iron Castings.
  - 9. A 564 - Standard Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes.

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10. A 582 - Standard Specification for Free-Machining Stainless Steel Bars
  11. A 743 - Standard Specification for Castings, Iron-Chromium, Iron-Chromium- Nickel, Corrosion Resistant, for General Application.
  12. A 890 - Standard Specification for Castings, Iron-Chromium-Nickel- Molybdenum Corrosion-Resistant, Duplex (Austenitic/Ferritic) for General Application
  13. B 584 - Standard Specification for Copper Alloy Sand Castings for General Applications.
  14. B 691 – Standard Specification for Iron-Nickel-Chromium-Molybdenum Alloys (UNS N08366 and UNS N08367) Rod, Bar, and Wire.
  15. D 429 - Standard Test Methods for Rubber Property-Adhesion to Rigid Substrate.
- D. NSF International (NSF):
1. Standard 61 - Drinking Water System Components - Health Effects.
- E. United States Code of Federal Regulations (CFR):
1. 21 - Food and Drugs.

### 1.03 SYSTEM DESCRIPTION

- A. Design requirements:
1. General purpose AWWA butterfly valves:
    - a. Design standard: Provide valves designed and manufactured in accordance with AWWA C504.
    - b. Butterfly valves shall be of a double offset design whereby the centerline of the disc is horizontally and vertically offset from the body seat and where the elastomeric seat releases compression only after a few degrees of opening.
    - c. Class:
      - 1) Provide butterfly valves in accordance with AWWA Class 150B, unless otherwise specified.
      - 2) Provide butterfly valves in accordance with AWWA Class 250B in piping systems with test pressure greater than 150 pounds per square inch and less than 250 pounds per square inch. Required piping system test pressure is listed in the Piping Schedule in the drawings.
- B. Usage:
1. Provide and install butterfly valve types as outlined in the Valve Schedule as shown on the drawings.
- C. Design requirements for all butterfly valves with power actuating devices:
1. Design valves and actuators for maximum operating torque, in accordance with and using safety factors required in AWWA C540, using the following values:
    - a. Maximum water velocity: 16 feet per second with valve fully open.
    - b. Maximum pressure differential across the closed valve equal to the pressure class designation.
    - c. Coefficient for seating and unseating torque, dynamic torque, and bearing friction in accordance with valve manufacturer's published recommendations.
  2. Valve disc: Seat in an angular position of 90 degrees to the pipe axis and rotate an angle of 90 degrees between fully open and fully closed positions:

- a. Do not supply valves with stops or lugs cast with or mechanically secured to the body of the valve for limiting the disc travel.
  - 3. Unacceptable thrust bearings: Do not provide valves with thrust bearings exposed to the fluid in the line and consisting of a metal bearing surface in rubbing contact with an opposing metal bearing surface.
- D. Performance requirements:
- 1. Tight shutoff at the pressure rating of the valve with pressure applied in either direction.
  - 2. Suitable for the following service conditions:
    - a. Throttling.
    - b. Frequent operation.
    - c. Operation after long periods of inactivity.
    - d. Installation in any position and flow in either direction.

#### 1.04 SUBMITTALS

- A. Shop drawings: Submit the following information as specified in Sections 01300 and 15110:
- 1. Product data:
    - a. For general purpose AWWA butterfly valves, include description of the method of attachment of the disc edge to the valve disc.
  - 2. Certificates:
    - a. General purpose AWWA butterfly valves:
      - 1) Proof-of-design tests: Certified statement that proof-of-design tests were performed, and all requirements were successfully met.
      - 2) Affidavit of compliance attesting valves provided comply with all provisions in accordance with AWWA C504.
    - b. Interior epoxy coatings: Affidavit of compliance attesting that epoxy coatings applied to interior surfaces of butterfly valves comply with all provisions in accordance with AWWA C550.
    - c. Certification, for all valves and coatings in contact with potable water, that the products used are suitable for contact with drinking water in accordance with NSF Standard 61.
  - 3. Operation and Maintenance Data.

### PART 2 PRODUCTS

#### 2.01 GENERAL PURPOSE AWWA BUTTERFLY VALVES

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

- B. Valve body:
- 1. Material: Cast iron, ASTM A 126, Grade B, or ductile iron, ASTM A 536, Grade 65-45-12.
  - 2. Body design:

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- a. Flanged body valves:
  - 1) Usage: Comply with limitations specified in the Valve Schedule as indicated in the drawings.
  - 2) Flanges: In accordance with ASME B16.1 Class 125 flanges for Class 150B valves, in accordance with ASME B16.1 Class 250 flanges for Class 250B valves.
- 3. Disc:
  - a. Material: Cast iron or ductile iron with Type 316 stainless steel edge or Type 316 stainless steel retaining ring that matches seat in valve body.
  - b. Secure valve disc to shaft by means of smooth-sided, taper or dowel pins, Type 316 stainless steel, or Monel.
  - c. Extend pins through shaft and mechanically secure in place.
- C. Shaft and bearings:
  - 1. Shaft design:
    - a. Valves 20-inch and less: 1 piece, through disc design.
    - b. Valves greater than 20-inch size: 2-piece, stub shaft design.
    - c. Shaft seal: O-ring design.
  - 2. Shaft material for Class 150B valves: Type 316 stainless steel, ASTM A276.
  - 3. Shaft material for Class 250B valves: Type 17-4 pH stainless steel, ASTM A 564.
  - 4. Shaft bearings: Self-lubricating sleeve type:
    - a. Self-lubricating bronze.
- D. Seats:
  - 1. Seat materials:
    - a. All applications: EPDM.
  - 2. For valves 20 inches in nominal size and smaller, bond or vulcanize seat into the valve body.
  - 3. For valves 24 inches in nominal size and larger, retain seats mechanically or by adhesive:
    - a. Mechanical retainage: Retain seat by a clamping ring with segmented clamping ring locks with adjusting locking screws.
      - 1) Clamping ring, ring locks, and adjusting locking screws: Type 316 stainless steel.
      - 2) Provide means to prevent ring locks and screws used to retain seats from loosening due to vibration or cavitation.
    - b. Adhesive retainage: Inset the seat within a groove in the valve body and retain in place with epoxy injected behind the seat so that the seat expands into the body.
    - c. Do not provide valves with seats retained by snap rings or spring-loaded retainer rings.
  - 4. Resilient seat: Withstand 75 pound per inch pull when tested in accordance with ASTM D 429, Method B.
- E. Valve packing:
  - 1. Valves 4-inch to 48-inch nominal size: Self-adjusting V-type packing or chevron-type packing. EPDM to match seat material.

2. Valves 54-inch nominal size and larger: Adjustable V-type packing with bronze packing gland or self-adjusting V-type packing. EPDM to match seat material.

F. O-Rings:

1. Provide 6 EPDM O-ring seals on the shaft.

## 2.02 BUTTERFLY VALVE ACTUATORS

A. Manual actuators for aboveground valves and valves in vaults in nominal sizes and in-service applications, except for valves 30 inches and larger.

1. For valves operating at pressures up to and including 250 pounds per square inch, provide either a totally enclosed worm gear actuator or a totally enclosed traveling nut actuator mounted on the valve.
2. For valves operating at pressures above 250 pounds per square inch, provide totally enclosed worm gear actuator mounted on the valve.

B. Manual actuators for aboveground valves and valves in vaults 30 inches in nominal size and larger, all pressures.

1. Provide totally enclosed worm gear actuator mounted on the valve.

C. Position indication:

1. For all aboveground or vault enclosed worm gear or traveling nut manual actuators, provide position indication on the actuator enclosure.

D. Limit switches: Provide limit switches on manually actuated valves where indicated on the Drawings:

1. Limit switches: Heavy-duty, industrial grade, oil tight, with not less than 2 auxiliary contacts.
2. Rating: Rated for 10 amps, 120 volts alternating current.
3. Enclosure: NEMA Type 4X enclosure and with stainless steel levers and arms. Provide switch with NEMA Type 7 enclosure when switch is located within areas with NEC Class 1, Division 1 or Class 1, Division 2 designations as indicated on the Drawings.

## 2.03 COATING

A. Shop coat interior and exterior metal surfaces of valves, except as follows:

1. Interior machined surfaces.
2. Surfaces of gaskets and elastomeric seats and stem seals.
3. Bearing surfaces.
4. Stainless steel surfaces and components.

B. Coating material for potable water applications:

1. Formulate coating material from materials in accordance with CFR 21.

C. Field applied coatings:

1. Additional coating of the valve exterior will be required to match the moisture cured urethane paint system as specified in Section 09900 - Painting.



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- a. When shop applied finish coating matches field applied coating on adjacent piping, touch up shop coating in damaged areas in accordance with instructions recommended by the paint manufacturer.
  - b. When shop applied coating does not match field coating on adjacent piping, or when damage has occurred to the shop applied coating that requires more than touchup, blast clean valve surfaces or utilize other surface preparation recommended by the manufacturer of the coating material and apply the coating system used for coating adjacent piping.
- D. Surface coatings:
1. Interior surfaces: High solids epoxy.
  2. Exterior surfaces of valves, actuators, and accessories:
    - a. Other valves: High solids epoxy with polyurethane topcoat.
  3. Polished and machined surfaces: Apply rust-preventive compound.
- E. Coating materials:
1. High solids epoxy:
    - a. Products: As specified in Section 09900 - Painting:
      - 1) Coating product in contact with potable water must be in accordance with AWWA C550 and NSF 61.
  2. Rust-preventive compound: One of the following or equal:
    - a. Houghton, Rust Veto 344.
    - b. Rust-Oleum, R-9.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

- A. Install valves with valve shafts horizontal, unless a vertical shaft is required to suit a particular installation, and unless a vertical shaft is indicated on the Drawings.
- B. Install pipe spools or valve spacers in locations where butterfly valve disc travel may be impaired by adjacent pipe lining, pipefittings, valves, or other equipment.

**END OF SECTION**