



MEMORANDUM

ENGINEERING DIVISION
PUBLIC UTILITIES DEPARTMENT

TO: EPA Domestic Preference Team

FROM: Isaac Myers, PMP EIT

DATE: 03/20/2026

PROJECT: Salt Lake City Corporation for Waterline replacement project and related infrastructure Project No. 513800052

SUBJECT: AIS Waiver Request

NOTE: Information in this waiver may have been redacted or removed due to issues of proprietary business information or incompatibility with Federal accessibility requirements. To request the information redacted for purposes of accessibility requirements, please email CWSRFWaiver@epa.gov.

GENERAL

Description of the foreign and domestic construction materials

72-inch double offset butterfly valve whereby the elastomeric seal is not compressed while the valve is in the open position. Rated for a water working pressures up to 150 psi, exceed ANSI/AWWA C504 and ANSI/AWWA C519 as applicable to the use. The elastomeric seal will be suitable for 7.5 fps fluid velocity flow in fully opened position of the valve without damage. Valve actuators will be sized for drip tight sealing in the direction of flow at relevant head and flow velocity and inclusive of a 1.5 safety factor on the calculated valve torque. The valves hydrostatic test will be 50% greater than the maximum application head pressure. Lifting lugs will be provided for all valves 24 inches and larger.

Unit of measure

Each – EA

Quantity

One (1)

Price

Engineers' Opinion of Probable Cost - [REDACTED]

Time of delivery or availability

~26-42 weeks

Location of construction project

New BCC Isolation Valve ~ 40°38'52.6"N 111°48'16.2"W

Existing Tanner Turnout Vault ~ 40°38'32.8"N 111°48'00.9"W



Name and address of the proposed supplier(s)

[REDACTED]

[REDACTED]

Detailed justification of the use of foreign construction materials

The double eccentric butterfly valve was selected over gate valves, ball valves, and concentric butterfly valves because it's the most economic option while also provided a watertight seal when left in an open position. While gate valves and ball valves can provide watertight seals, a 72" valve would more than double the size of the project. The size of these valves makes regular maintenance and operations more difficult and costly.

Concentric butterfly valves are much smaller than a gate or ball valves but do not provide a watertight seal when left in the open position. When a concentric butterfly valve is left in the open position the disk sits on the rubber seat, which, in time, leaves it permanently disfigured. The concentric butterfly valves will then leak when closed, where the disk was touching the rubber seat.

The double eccentric butterfly valve gives SLCDPU the constructability of a butterfly valve while also giving the reliability of gate valves, especially for facilities that will not be pigged. Also, because of the criticality of this valve a reputable valve manufacturer is necessary to ensure that this valve functions as designed. This project has specified that the valve manufacturer must have more than 5 of their double eccentric butterfly valves installed in the last 10 years in diameters over 36-inches. This specification helps mitigate SLCDPU's risk from installing such a large valve on such a critical pipeline (Attachment B). Without this requirement the reward may not overcome the risk of this project.

During the design the project team reached out, formally, asked for quotes from valve manufacturers ([REDACTED]), [REDACTED] & [REDACTED] claimed that they could produce a double eccentric butterfly valve with modification to SLCDPU's specifications. The modifications that they requested are prohibitive and would not allow the isolation valve to function as designed. Below is a summary of their requested changes and an explanation of the chief difference from the project specification.

Dry Shaft:

- Specification 40 05 57 2.01.I states that "Shaft seals shall not need periodic manual adjustment. They shall be multi-O - ring seals protecting within a cartridge carrier. The cartridge shall be designed to protect the machined bearing hub surface from corrosion. The valve shaft shall remain non-wetted and unpressurized. The dry shaft shall allow the actuator to be removed without dewatering the pipeline. Neither manual pulldown packing glands nor braided packing are allowed. The outer shaft seals shall be a replaceable cartridge type, bolted to the valve body. Packing shall not be held in place with an adapter plate or by the valve actuator".
 - *Double Offset Valves offered by the domestic suppliers use adaptor plates to secure packing glands. Replacement requires dewatering the entire pipeline, which in this case would require a full treatment plant shutdown. This will not work for the purposes of this valve.*

Qualifications:

- Specification 40 05 57 1.05 states that "The valve manufacturer shall have manufactured waterworks butterfly valves for at least 25 years. As specified herein, submit a list of a minimum of five (5) of manufacturer's supplied valves of similar size and complexity and used in a similar application as the proposed valves and in service for at least 10 years. Provide three (3) owner references with contact information for similar valve and application".
 - *Neither domestic manufacturer listed ([REDACTED] & [REDACTED]) can provide a list of the specified number of valves of similar size (72-inch) which have been in service for 10 years or more.*

Seals:

- Specification 40 05 57 2.01.G states that "The elastomeric seal shall not be penetrated by fasteners. The valve shall be drip tight. The elastomeric seal shall be double shouldered and extend no greater than 0.25 inches past the disc edge to seat the valve".
 - *Double Offset Valves offered by the domestic suppliers are designed with fasteners penetrating the seal which become points of leaks.*

Submittal of Engineer-approved as-builts

January 2027

CONSTRUCTION ESTIMATED COST

Total Estimated Construction Cost	\$2,463,000
CDS Funds Requested From EPA	\$1,500,000
Estimated Cost Share Provided by SLCDPU	\$963,000

ATTACHMENTS-

Letters from Proposed Suppliers – Attachment A

Emails with Domestic Sources – Attachment B

Valve Specification- Attachment C

Project Plans- Attachment D

Project Specifications- Attachment E

SECTION 40 05 57
DOUBLE OFFSET BUTTERFLY VALVES (LARGE DIAMETER)

PART 1 - GENERAL

1.01 SUMMARY

- A. **Items within this Section are subject to the "American Iron and Steel" (AIS) requirement of the Consolidated Appropriations Act of 2014. Refer to Section 00 70 00 – Federal Requirements.**
- B. Section includes:
1. The Contractor (or Manufacturer) shall provide a 72" diameter double offset butterfly valve with manual actuator and all appurtenances, complete and operable, in accordance with the Contract Documents.
 2. For double-offset butterfly valves smaller than 72", see Section 50 05 58 Process Valves. Smaller valves shall use the same actuators specified in this section.
- C. Related sections include but are not necessarily limited to:
1. Section 00 70 00 – Federal Requirements.
 2. Section 01 33 00 – Submittal Procedure.
 3. Section 01 45 00 – Quality Control.
 4. Section 01 67 00 – Utility Materials.
 5. Section 09 96 00 – High Performance Coatings.
 6. Section 40 05 06 – Couplings, Adapters, and Specials for Process Piping.
 7. Section 33 11 13 – Steel Water Transmission Pipe.
 8. Section 40 05 97 – Identification for Process Equipment

1.02 QUALITY ASSURANCE

- A. Referenced Standards
1. ANSI/ASME B16.1: Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, 350, and 800
 2. ASME B 16.5: Pipe Flanges and Flanged Fittings - Sizes 1/2-inch Through 24-inch
 3. ASME B 16.47: Large Diameter Steel Flanges NPS 26 Through NPS 60 Metric Inch Standard
 4. ASME B 16.34: Valves-Flanged and Butt-welding End
 5. ASTM A 48: Gray Iron Fittings
 6. ASTM A 351: Standard Specification for Castings, Austenitic, Austenitic-Ferritic (Duplex), for Pressure-Containing Parts
 7. ASTM A 536: Ductile Iron Castings
 8. ASTM A 564/A564M: Hot-Rolled and Cold-Finished Age-Hardening Stainless and Heat-Resisting Steel Bars, Wire, and Shapes

9. ASTM B 62: Composition Bronze Ounce Metal Castings
10. A240/A240M: Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels or cast equivalent to ASTM A351 CF8M.
11. ASTM A276: Standard Specification for Stainless Steel Bars and Shapes.
12. ASTM A283: Low and Intermediate Tensile Strength Carbon Steel Plates.
13. AWWA C 207: Steel Pipe Flanges for Waterworks Service - Sizes 4-inch Through 144-inch
14. AWWA C504: Rubber Seated Butterfly Valves
15. AWWA C 540: Power-Actuating Devices for Valves and Sluice Gates
16. AWWA C 550: Protective Interior Coatings for Valves and Hydrants

1.03 CONTRACTOR SUBMITTALS

- A. The Contractor shall furnish submittals in accordance with Section 01 33 00 and the following:
 1. Documentation of the manufacturer's qualifications, including name of facility, owner of facility, contact name, address, and telephone number.
 2. Provide Proof of Design Certificates. Provide written certification by the butterfly valve manufacturer that the valve manufacturer has properly sized and selected the correct valve actuators and that the actuators are sized for the specified working pressure with the appropriate AWWA M49 chapter 6 safety factors for both break and dynamic torques through the complete travel of the valve stroke. The manufacturer's written certification shall ensure that the valves are appropriate and correct for the project conditions. The manufacturer shall provide notice for any exceptions to the project design and specifications in the written certification for both the valves and actuators.
 3. Provide documentation and calculations for the total butterfly valve operating torque requirements and the required actuator torque output. The safety and application factor shall be mathematically demonstrated at both the maximum break and the greatest value of dynamic torque.
 4. Signed and dated compliance for factory hydro and leak tests shall be provided.
 5. Provide valve manufacturer's warranty for review.
 6. Provide a factory signed statement that elastomeric seal replacement: seal removal, and new seal installation allowing valve to be ready for service, shall take no more than 8 on-site hours to complete and that no specialized skillset or tools are required to accomplish this task.
 7. Submit Manufacturer's data and descriptive literature written in English and in US Imperial units. Include catalog data, calculations, detailed construction sheets showing all valve parts and descriptions of materials of construction as applicable to USA material specifications, such as AISI, ANSI, ASTM, AWWA. Identify each valve by tag or reference number to which the catalog data and detail sheets pertain.
 8. Provide information for material specifications including the design pressure rating for the valve, valve body lay length dimension in inches, flange classification/specification and bolt pattern, valve body minimum wall

thickness, valve shaft diameter, maximum calculated torsional shear stress as calculated by Equation 1 of AWWA C504, rated yield strength of the shaft material, and complete actuator sizing and design information.

9. Provide valve preparation and coating written QA and QC procedures as approved and endorsed by an independent third party such as NACE, GSK or SSPC. QA/QC test procedures shall include photographic documentation to communicate quality acceptance levels. Coatings shall be applied in strict accordance of the coating manufacturer's recommendations for valve prep, temperature, and humidity conditions. Poorly prepped or coated valves will be rejected.
10. The valve's name/brand/model and valve manufacturer shall be the same entity. Provide valve manufacturer's signed statement that its valve is not licensed to another entity for sale and that the manufacturer does not outsource the manufacture and/or assembly of their valve to another company.
11. Provide specific cv-values for related butterfly valves at 100% fully open position.
12. Provide a minimum list of five (5) valves that have been supplied by the manufacturer of similar size and complexity and used in a similar application as the proposed valves and in service for at least 10 years. Provide three (3) owner references with contact information for similar valves and applications.

1.04 GENERAL REQUIREMENTS.

- A. Manufacturers: Butterfly valves shall meet the totality of the butterfly valve specification. Butterfly Valves and actuators shall be provided from one source, which means from the same valve manufacturer.
- B. Operation Requirements: The 72-inch butterfly valves shall provide drip tight isolation and shall operate without vibration or pitting under the specified design conditions. Design parameters for the valve shall be as follows:

Design water pressure:	150 psi
Flow rate in normal operation:	60 cfs
Flow velocity in normal operation:	2.5 ft/s

The valve shall be suitable for frequent operation and for operation after long periods of being idle. The valve shall be capable of operating under all head and flow conditions specified herein.

- C. All valves provided for this Contract that are 24-inches in diameter and larger, shall be Double Offset Butterfly Valves in accordance with these specifications, unless otherwise approved.

1.05 QUALIFICATION REQUIREMENTS

- A. The valve manufacturer shall have manufactured waterworks butterfly valves for at least 25 years. As specified herein, submit a list of a minimum of five (5) of manufacturer's supplied valves of similar size and complexity and used in a similar

application as the proposed valves and in service for at least 10 years. Provide three (3) owner references with contact information for similar valve and application.


The list shall include the following information:

1. Name of facility, owner of facility, contact name, addresses and telephone number.
 2. Pressure class.
 3. Model number and size.
 4. Date of installation
 5. Name, location, and contact information of local representative (if applicable).
- B. Published manufacturers literature indicating that the valve is full compliance with all aspects of the AWWA C504 for rubber seated butterfly valves including NSF 61 certification.
- C. The manufacturer shall demonstrate structured compliance to a repeatable build design and shall be ISO 9000 and ISO14001 certified.
- D. Valve manufacturer shall demonstrate a commitment to continuous improvement and quality control of their products. As such they shall have an “in use” and working in-house R&D lab. Valve testing shall be suitable for water hydraulic tests for sizes to a minimum of 12 inches. Photo documentation may be required.

PART 2 - PRODUCTS

2.01 DOUBLE OFFSET BUTTERFLY VALVES 24-INCH AND LARGER

General: The butterfly valves shall be designed for waterworks applications and shall be of the double-offset design whereby the elastomeric seal is not compressed while the valve is in the open position. Zero, single and API (American Petroleum Institute) based triple offset butterfly valve designs are not acceptable. Butterfly valves, 72 inches in diameter and smaller, rated for water working pressures up to 150 psi, shall appropriately exceed ANSI/AWWA C504 and or ANSI/AWWA C519 as applicable to the use and as noted herein. The elastomeric seal shall be suitable to **7.5 fps fluid velocity flows** in fully opened position of the valve without damage. Valves shall be of the size and class indicated in the valve schedule or in the plans. All valve actuators shall be sized for drip tight sealing in the direction of flow at relevant head and flow velocity and inclusive of a 1.5 safety factor on the calculated valve torque. The valves hydrostatic test shall be 50% greater than the maximum application head pressure. Lifting lugs shall be provided for all valves 24 inch and larger.

- A. Approved Manufacturers:
- a. 
 - b. Or approved equal.
- B. Flanges: The flanged valves shall mate to flanges of connecting pipe. Refer to Specification Section 33 11 13 – Steel Water Transmission Pipe. Flanges shall comply with applicable ANSI, ASME, and AWWA standards

- C. Body: Valve bodies shall be ductile iron, ASTM A536 65-45-12 or A536 60-40-18. The valve body shall include integrally cast support feet top and bottom. For all valves 48" and larger, the valve body needs to be equipped with base plate made of fabricated steel for the transmission of the forces and loads into the steel supports and concrete structure. Cast gray iron is not allowed due to near zero elongation and as it is vulnerable to shear stress.
- D. Provide a name plate in the form of a stainless-steel plate fastened on the body with a fastened stainless-steel stamped or engraved tag indicating manufacturer and reference build data. The valve build data shall be made available upon request by the customer and shall be retained by the manufacturer as well.
- E. Disc: Valve discs shall be ductile iron, ASTM A536 65-45-12 or A536 60-40-18. The disc design, valve disc material and thickness shall be suitable for the applications pressure and high velocity. For all valves 48 inch and larger, a streamlined disc design with optimized head loss is required whereby turbulence through the valve is minimized. Neither bronze nor cast iron is acceptable for disc material. Cast gray iron is not allowed due to near zero elongation and as it is vulnerable to shear stress. Both the disc and elastomeric seal retainer shall have recesses designed to retain a dual shouldered seal that works under extreme localized velocities, at full differential opening and/or line break closing. The disc shall be mechanically fastened to the valve shaft using tangential shaft pins of type AISI 431 stainless-steel, 17-4ph or higher alloy. Disc pins shall be mechanically retained. Disc shall be with double offset bearing with closed disk trunnions and dry bearing design.
- F. Shaft: Valve shafts shall be reinforced shafts made of stainless-steel AISI 316 with 3.1 material certification. The valve shaft material and thickness shall be suitable for the applications pressure and velocity inclusive of appropriate safety factors.
- G. Elastomeric Seal and Seal Ring: Valve disc seal shall be field replaceable, made of EPDM with minimum 70 Shore hardness, bolted to the valve disc by a AISI 316 stainless-steel retaining ring or segments and secured by AISI 316 stainless-steel fasteners with additional appropriate screw locking methods. The elastomeric seal shall not be penetrated by fasteners. The valve shall be drip tight. The elastomeric seal shall be double shouldered and extend no greater than 0.25 inches past the disc edge to seat the valve. The seal shall be designed to flex in either flow direction. There shall be a small gap on both sides of seal which will allow for pipeline pressurized media to further expand the seal against and into the metallic seat- the higher the differential pressure. The elastomeric seal shall be field replaceable and adjustable in line for diam. larger 30". It shall not require special skills or tools to replace the seat. With access to the seat

retaining bolts, the seat removal, replacement, and readiness for service must be able to be accomplished in a maximum of 8 hours for all size valves (time without valve dismantling). Seat methods which do not comply or use either irreplaceable vulcanized seals or which use hardened epoxy or grout in a dovetailed groove are not acceptable.

- H. Metallic Seat: The metallic valve seat shall be in the valve body. Metallic seats shall be welded and constructed of high alloy with NI > 67%, Cr 18-22%, Mn.2.5-3.5% Mechanically retained seat ring into the valve body by fasteners are not accepted.
- I. Shaft Seals: Shaft seals shall not need periodic manual adjustment. They shall be multi-O - ring seals protecting within a cartridge carrier. The cartridge shall be designed to protect the machined bearing hub surface from corrosion. The valve shaft shall remain non-wetted and unpressurized. The dry shaft shall allow the actuator to be removed without dewatering the pipeline. Neither manual pulldown packing glands nor braided packing are allowed. The outer shaft seals shall be a replaceable cartridge type, bolted to the valve body. Packing shall not be held in place with an adapter plate or by the valve actuator.
- J. Shaft Bearings: Valve shaft bearings shall be corrosion resistant, self-lubricating sleeve type made of bronze, stainless steel or stainless steel backed PTFE. Bearing choice and consequent bearing friction shall be correctly added to valve input torque requirements.
- K. Strength: The proportion and dimensions of all parts of the valve and actuator shall be designed to withstand, without failure, the stresses occurring under the testing and operating conditions. The maximum allowable stress in any material shall not exceed 1/3 of the ultimate tensile strength or 2/3 of the minimum yield strength. Valve body and anchor design should be according to Manufacturer strength calculations. For any non-standard flanges a strength calculation needs to be provided by valve manufacturer.
- L. Hardware: All fasteners and hardware shall be minimum type AISI 316 stainless-steel.
- M. Paint and coatings: The manufacturer is required to have and follow a system of valve preparation and coating which assures a quality holiday free application, and which maximizes the available multi-decade protection the coating offers. Manufacturers that do not properly prepare or coat their valves properly will not be accepted.

The manufacturer must provide their written system of valve preparation and coating. This document shall include the methodologies used (quality compliance) as well as post application review (quality assurance). It will be based on a professional system of coating and grading such as NACE, SSPC,

GSK, ISO or DIN and will include both text and color photo-documentation. The manufacturers coating system must be documented as well as implemented with a quality assurance program to prevent unacceptable deviation. This coating system shall be submitted for approval. It shall be titled, signed and dated by the manufacturers staff.

1. **All external surfaces shall be coated with a minimum of 10 mils of fusion bonded epoxy or a liquid epoxy.** All sharp edges to be coated shall have the necessary beveling or long radius to assure consistent coating thickness. The coating inspection report will include inspection of the entire circumference where the edges are most sharp, around the complete circumference of both the body seal and the disc edge to assure proper coating and compliance. Compliance of proper casting or beveling of all sharp edges with proper coating will be strictly enforced as a condition of providing a proper continuous water service valve.
2. Valve coating color shall be RAL 5005 blue.
3. **The valve interior surface shall be epoxy coated per Specification Section 09 96 00 High Performance Coatings. Shop drawing submittals shall include all required information for complete evaluation of the proposed coating by the Engineer.**

N. Inspection, Testing and Rejection: Notify Engineer for the option to be present for testing on all valves 72 inch and larger.

1. **FACTORY TESTS**
 - a. General: Inspection shall be made, and tests performed at the manufacturer's facilities on the valves listed in this Subsection.
 - i. Submit test reports to the ENGINEER. Test reports shall include all factory required tests showing each valve is in conformance. Test shall include hydrostatic leak tests, proper function and actuation of the valve and holiday free coating tests.
 - ii. Notice of each type of valve test shall be given to the ENGINEER no later than 30 days prior to the scheduled tests.
 - b. The Manufacturer shall perform factory tests in the following sequence with valve and actuator completely assembled as a unit.
 - i. Valve Body Hydrostatic Test: The test shall be performed with both flanged ends bulkheaded and the disc in a slightly open position. Apply internal hydrostatic pressure equal to 1.5 times the system maximum static head pressure to the inside of the sealed valve. With the disc in the slightly open position and both flanges bulkheaded, water shall be allowed to enter and completely fill the cavity between both flanged ends; then high-pressure water shall be applied through one of the bulkheads into the cavity supplying up to and maintaining the test pressure for 10-minute test duration. During the hydrostatic test, there shall be no leakage through any portion of the valve, the metal, end flange joints or the valve shaft seal, and there shall be no permanent deformation of any valve component.

- ii. Valve Shutoff Leak Test: All valves will be leak tested in the proposed as-installed orientation. The valve shall be positioned with one flanged end bulkheaded and the disc in the fully closed position. The test for valves shall be performed at a differential pressure equal to 1.1 times the maximum system static head pressure. With the disc in the closed position, water shall be allowed to enter and completely fill the cavity between the disc and bulkheaded flange, and then high-pressure water applied through the bulkheaded flange into the cavity, supplying up to and maintaining the test pressure for a 5-minute test duration. The entire surface of the valve disc shall be visible. There shall be no indication of any water or air leaks during the test period.
- iii. Valve Actuator and Operations Test: The operator shall be used to unseat the valve at a test pressure of 150 psi. With the bulk heads removed the valve shall be opened and closed three (3) times. Over the full travel of the actuator, during all cycles, there shall be no sign of binding, scraping, misalignment of parts, permanent deformation, or other defects. Actuator stops shall be adjusted so that the valve disc will travel 90 degrees.
- c. Protective Coating Testing: The coating thickness must respond at least to the thickness of 0,10 inch from the spec. Measuring of layer thickness will be performed in random tests on at least 6 points outside and inside the valve body and at least 6 points on the disk. The measuring method is left up to the manufacturer. Test shall be taken at all locations with critical focus around seat and seal. Coating thickness measurements at raised cast lettering may be visual. Results and validation shall be signed and dated by a supervisor level or greater.


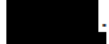

2. FIELD TESTS

- a. Field Tests: An authorized service representative of the manufacturer shall visit the site for a minimum of one service day per each valve. They shall sign and certify in writing that the equipment and controls have been properly installed, tested, and readied for operation.
- b. Performance tests shall be made on all completely installed valves as follows:
 - a. Each valve shall be operated three (3) times from fully closed to fully opened position, and the reverse, under a no-flow condition. Depending on the version of the actuator (for electric actuators the voltage and power is relevant), the actuator may switch off due to overheating. In such a case the tests need to be continued after cooling down.
 - b. Valves shall be hydrostatically, and leak tested while the adjacent pipeline is tested. Joints shall show no visible leakage. Repair any joints that show signs of leakage prior to final acceptance. If there are any special parts of control systems or operators that might be damaged by the pipeline

test, they shall be properly protected. Repair any damage caused by the testing.

- c. If possible, a leak test will be conducted to verify that bubble tight shut-off has been achieved post installation and with operating pressure on one side of the disc and atmospheric pressure on the other. The owner reserves the right to field verify that valve leakage is zero.
- d. Failure by the OWNER to inspect or witness tests at the manufacturer's plant shall not be construed as waiving inspection upon delivery.

O. Manual Actuators:

1. General. Actuators of the types listed in the valve specifications, Drawings, or schedules shall be provided by the valve manufacturer. Actuators shall produce the required torque with a maximum pull of 80 lbs on the lever, handwheel, or chain and shall withstand, without damage, a pull of 200 lbs on the handwheel or chainwheel or an input of 300 foot-lbs on the operating nut.
2. Types:
 - a. Wrench Nut Actuator: Operator nuts shall be 2 inches in size.
 - b. Handwheel Actuator: Not used.
 - c. Chainwheel Actuator: Not used.
 - d. Levers Actuator: Not used.
 - e. Electric Actuators: Not used.
3. Provide manual gear/nut actuator on all valves unless indicated otherwise on the Drawings. The direction of rotation of the wheel, wrench nut, or lever to open the valve shall be to the left (counterclockwise). Each valve body shall have cast thereon the word "OPEN" and an arrow indicating the direction to open.
4. The housing of traveling-nut type actuators shall be fitted with a removable cover which shall permit inspection and maintenance of the operating mechanism without removing the actuator from the valve. Travel limiting devices shall be provided inside the actuator for the open and closed positions. Travel limiting stop nuts or collars installed on the reach rod of traveling-nut type operating mechanisms shall be field adjustable and shall be locked in position by means of a removable roll pin, cotter pin, or other positive locking device. The use of stop nuts or adjustable shaft collars which rely on clamping force or setscrews to prevent rotation of the nut or collar on the reach rod will not be acceptable.
5. Each actuator shall be designed so that shaft seal leakage cannot enter the actuator housing.
6. Valves for throttling service shall be equipped with an infinitely variable locking device or a totally enclosed gear actuator.
7. Provide riser stem and floor mounted base as indicated on the Drawings.
8. Provide position indicator.
9. Approved Manufactures:
 - a. 
 - b. 
 - c. 

- d. 
- e. 
- f. 
- g. Approved Equivalent.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All exposed butterfly valves shall be installed in a manner whereby the complete valve can be removed without dismantling the valve or operator.
- B. Contractor shall use the provided lifting lugs to move all project valve(s). The use of chains, lifting straps, rope or any type other strapping through the valve body is strictly prohibited. Correct lifting procedures shall be the Contractor's responsibility. As necessary, consultation with the valve manufacturer is recommended. The contractor shall be responsible for all damage and project delays resulting from improper lifting and moving procedures, these shall include but shall not be limited to pulling the valve body out of round, gouges, scratches, displacing the gear box etc.
- C. Butterfly valves must be inspected and certified by the manufacturer that the final installation meets all the manufacturers' requirements, and that the actuator and disk have not changed positions from that as successfully tested at the factory.
- D. Strict care shall be taken to assure valves are not installed under stress. In no instance shall adjacent mating flanges be forced into position. A progressive and proper star cross pattern shall be used to tighten valve flange mating bolts. Where tapped flanged holes are required due to shaft bore placement, these bolts shall be partially installed first to assure proper alignment of all flange bolts.

3.02 WARRANTY

- A. The butterfly valve manufacturer shall warrant all valves and their operator against material and workmanship defects for a period not less than one (1) year. The warranty period shall start at completion of the installation and testing of the valves to the acceptance of the Engineer as indicated and dated by the certificate of Substantial Completion.

- END OF SECTION -