

NEW JERSEY WATER SUPPLY AUTHORITY
DELAWARE AND RARITAN CANAL

GENERAL REQUIREMENTS
AND
TECHNICAL SPECIFICATIONS

REPLACEMENT OF ELEVEN SLUICE GATES
AND OPERATING ASSEMBLY COMPONENTS
ALONG THE DELAWARE AND RARITAN CANAL
SOMERSET COUNTY, NJ

BID# WSA-B23003

NOVEMBER 2022

TECHNICAL SPECIFICATIONS

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SECTION 100
GENERAL REQUIREMENTS

1. **PROJECT LOCATION/ACCESS**

The eleven sluice gates and operating assembly components proposed for replacement are located at multiple locks along the Delaware and Raritan Canal in Somerset County, New Jersey. Each Lock has limited vehicular access via the multi-use trail as well as access from the adjacent small parking lots. The Contractor is required to perform work in a manner that minimizes disruption to the public’s recreational use of the multi-use trail. The Contractor must store materials and equipment not in use off to the side of the multi-use trail in a manner that will not impede use of the trail. Coordination with the Authority is required before using the multi-use trail.

Lock	Location	# of sluice gates to be replaced
Griggstown Lock	1149 Canal Rd, Princeton, NJ 08540	3
10 Mile Lock	545 Weston Canal Rd, Somerset, NJ 08873	3
South Bound Brook Lock	169 Canal Rd, South Bound Brook, NJ 08880	2
5 Mile Lock	1950 Easton Ave Somerset, NJ, 08873	3

Table 1: Approximate location of each Lock.

2. **PROJECT DESCRIPTION**

The work required by the Contract Documents includes Canal water control, removal and disposal of eleven existing sluice gates and operating assembly components, and procurement and installation of eleven new sluice gates and operating assembly components. Work includes, but is not limited to the following:

- a. Protect existing historic features.
- b. Install & maintain water control system (stop logs, water proofing, dewatering pumps). Two (2) timber stop log systems will be provided by the Owner. Water proofing and dewatering pumps are the responsibility of the Contractor.
- c. Remove obstructions and sediment from work area as necessary.
- d. Remove sluice gate and assembly components including floor stand, operator, stem and guides.
- e. Remove existing anchor bolts flush with concrete headwall surface and patch as required.
- f. Grind or cut existing thimble flush with concrete headwall surface, as needed.
- g. Install sluice gate and operating assembly components sized for a 36” x 48” rectangular sluiceway.
- h. Perform concrete removal/repair where required for a proper installation of the gate acceptable to the Authority and in accordance with manufacturer recommendations.
- i. Remove water control systems (stop logs, water proofing, dewatering pumps).
- j. Restore site.
- k. The contractor shall provide all equipment, materials, supplies, labor and appurtenant items required for a complete and proper installation.

3. **PROGRESS OF ACTIVITIES**

The Contractor is required to submit a Gantt chart that provides a visual of project tasks scheduled over time. The Gantt chart shall include:

- a. Task start and finish date

- b. Percent complete for each activity
- c. How tasks group together and overlap with each other
- d. The critical path of the project
- e. The finish date of the project

4. HISTORIC SITE

The Delaware and Raritan Canal is on the National and State Register of Historic Places. The Canal's Historic District extends 100 yards on each side of the Canal centerline. All work shall be performed in such a manner as to minimize the adverse effects of construction activities in order to preserve the historic and natural environment at the site.

5. PARK PROPERTIES

The Delaware and Raritan Canal and the State-owned land adjoining the Canal are part of a State Park. Construction activities shall minimize disturbance to and shall not limit public access to these recreational and natural areas.

If the Multi-use trail must be closed to the public, for safety reasons, the Contractor shall post signage at the closest upstream and downstream access points stating the duration of the closure.

The Contractor shall provide the Authority with at least three business days notice prior to their anticipated need to close access to the towpath.

6. OPERATION AND STAGING AREAS

All operations of the Contractor (including storage of materials), upon lands owned by the State of New Jersey shall be confined to areas authorized or approved by the Authority.

7. SITE INVESTIGATIONS AND REPRESENTATIONS

The Contractor acknowledges that he has satisfied himself as to the nature and location of the work, the project's long-term funding due to sluice gate manufacturing processes, the constraints that may affect the water control devices installation and the manner how it may impact the sluice gates final installation method, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, floods or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during the execution of the work, and all other matters upon which information is reasonably obtainable and which can in any way affect the work or the cost thereof under this Contract.

The Contractor further acknowledges that he has or will conduct his own investigation into the existing condition of the gate, including, but not limited to, bolt pattern, size, material, etc. and Canal bed condition and that he will have all required material, equipment and labor forces in place and ready to install.

The Contractor also acknowledges that he has satisfied himself as to the character, quality and quantity of information regarding the above that is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Authority, as well as information contained in the DRAWINGS and SPECIFICATIONS forming a part of this Contract. Any failure by the Contractor to acquaint himself with all the available information shall not relieve him from responsibility for

estimating properly the difficulty or cost to successfully perform the work.

As-built drawings of the existing sluice gates do not exist and some dimensions shown on the Contract Drawings have been estimated. All distances and locations shown on the drawings shall be verified by the Contractor.

Photographs of the project sites are provided for the Contractor's information as Appendix A of these Specifications.

8. SUBMITTALS

The Contractor shall make all submissions to the Authority as required by the Contract Documents and review and resubmit as necessary to establish compliance with the specified requirements. All submittals must be approved by the Authority prior to commencement of the related works.

9. LIMITATION OF OPERATIONS

All heavy equipment and vehicles will be restricted to the crest of the embankment to minimize disturbance of the surrounding embankments and wetlands areas. Therefore, all equipment used to accomplish the work must remain on the designated staging areas or be of a size capable of being transported directly by the workers. All damage to the embankment or surrounding areas, caused by the Contractor's operations shall be repaired immediately, as directed by the Authority, and at the Contractor's expense.

The Contractor shall maintain access and safe passage along the Multi-use-trail for the public and for both Canal Park and Authority maintenance staff for the duration of the project. However, access may be blocked during periods between 9 am -3 pm when the existing gate is being removed and when the new gate is being set. Signage indicating that the trail is temporarily blocked must be placed at the closest north and south access points to the blocked zone.

For the duration of the construction project, the Contractor shall maintain and protect vehicular and pedestrian traffic as necessary for safety and conformance with all township and county traffic control regulations. Appropriate signs shall be posted at vehicle entrances and exits. In some instances, traffic may have to be manually controlled when construction vehicles are entering or exiting the construction site. Adequate safeguards controlling pedestrian access to the site shall be provided by the Contractor and approved by the Authority.

10. SPILLS AND MISPLACED MATERIAL

The Canal is a source of water supply and water purveyor intakes are located down canal from the proposed work. Every precaution must be taken to prevent trash, debris and spills of any kind from entering the Canal. If any spill of any quantity enters the Canal, the Authority must be immediately notified, and the Contractor must take immediate action to contain the spill as appropriate. The Contractor must maintain appropriate spill response materials on-site during work.

Should the Contractor, during the progress of the work, lose, dump, sink, or misplace any material, plant, machinery, or appliances, which in the opinion of the Authority may be dangerous or obstruct flow, recreation, or may be otherwise objectionable, the Contractor shall remove same from the water and/or land immediately, at his own expense.

If for any reason, the Contractor fails to promptly remove such objects, the Authority reserves the right

to have such objects removed with all incurred costs charged to the Contractor's account.

11. DISPOSAL OF MATERIALS

Unless otherwise directed by the Owner, all materials removed during construction shall not be reused and shall become the contractor's property unless otherwise directed by the Authority. All construction and demolition debris shall be removed from the site on a daily basis and legally disposed of in authorized facilities.

12. PROTECTION OF LAND RESOURCES

General: The land resources within the project boundaries and outside the limits of work performed under this Contract shall be preserved in their present condition or be restored to their pre-construction condition by the Contractor with regard to vegetative cover, soil type, and grade, contour and physical features prior to project completion.

13. PERMITS

The Authority will obtain permits, approvals or waivers from the following agencies:

- State Park Service, Special Use Permit
- Delaware and Raritan Canal Commission
- State Historic Preservation Office

The Contractor shall comply with the terms and conditions of these permits and approvals. Any other permits or approvals needed for work on this project are the responsibility of and must be obtained by the Contractor.

End of Section

SECTION 110
PROGRESS PAYMENT PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION

The work under this Section includes preparation and submittal of the Schedule of Values to accompany the payment application voucher.

1.2 GENERAL

- A. Submit the Schedule of Values to the Engineer for approval before the commencement of work.
- B. Upon request, the Engineer may request the Contractor to provide detailed information to support the values and the correctness.
- C. The schedule of values shall support the Contractor's payment application voucher.

1.3 ALLOCATION OF VALUES

- A. The schedule of values shall be broken down into at least these line items:
 - Mobilization and Start Up
 - 11- Individual Sluice Gate Removal and Replacements
 - Demobilization and Project Close Out

PART 2 MATERIALS

N/A

PART 3 CONSTRUCTION

N/A

End of Section

SECTION 120
HISTORIC FEATURES

PART 1 GENERAL

Work under this Section includes the preservation of the historic features of the Delaware and Raritan Canal, as well as the access routes and storage areas.

PART 2 MATERIALS

N/A

PART 3 CONSTRUCTION

The Delaware and Raritan Canal is a registered Historic Site. The Contractor, at all times, shall be careful to preserve and protect known historical features and shall be prepared to suspend or alter his work as described above when features of potential historic interest are found during construction.

The Contractor shall exercise special care during deconstruction of the sluice gate's protruding metal thimble to preserve original gate opening dimensions. Deconstruction shall be accomplished using hand tools and manual labor, if necessary, as directed by the Authority's project inspector.

The Contractor shall use equipment and a labor force that will minimize the area disturbed during its work and must return all disturbed areas to pre-construction condition.

End of Section

SECTION 125
DECONSTRUCTION

PART 1 GENERAL

Under this Section of the specifications, the Contractor is to provide all labor, materials and equipment required to complete removal of existing sluice gates and assembly components. The Contractor should exercise special care to remove any protruding portion of the metal thimble from the sluice gate's headwall concrete opening.

PART 2 MATERIALS (N/A)

PART 3 CONSTRUCTION

Sluice gate deconstruction work shall be done in a neat manner consistent with the best acceptable industry practices and with full protection of adjacent construction areas during the entire working period.

All materials removed during construction shall not be reused. All construction and demolition debris shall be removed from the site on a daily basis unless otherwise directed by the Owner.

The existing metal thimble set in the concrete shall not be removed. However, any part of the metal thimble that is protruding from the concrete headwall should be cut or ground flush if needed to provide a flat, smooth seating surface for installation of new sluice gate's frames and guides.

Any protruding anchors/bolts that were fastened into the thimble to hold the old frame should be cut flush and ground down.

End of Section

SECTION 140
WATER CONTROL DEVICES AND CARE OF WATER

PART 1 GENERAL

1.1 DESCRIPTION

Work under this section includes the removal of debris and sediments, where required, within the areas in front of the existing gate and within the confines of the flow control structure; installing the mechanical stop that has been designed and fabricated by others (stop logs) and restoration of normal flow upon project completion.

The Authority has fabricated two (2) timber stop log systems that the Contractor may install on the upstream and downstream sides of the existing gates. Note that the stop logs are not watertight. The Contractor may be required to improve on the water tightness of the stop log to safely perform the work. The Contractor is responsible for installing the stop logs, as well as any water proofing and dewatering as required. The Contractor shall inspect the stop logs on a daily basis to ensure they continue to work properly. At the end of the project, the Contractor will remove the stop logs and return them to the Authority.

1.2 DESIGN RESPONSIBILITY

The Contractor shall be responsible for the design and proper functioning of any additional dewatering devices and/or bypass facilities they may require, including but not limited to:

- Diversion & control of flow affecting the working site.
- Stability, including overtopping.
- Avoidance of pollution.
- Avoidance of damage to the D&R Canal and appurtenant structures.

The Contractor's attention is directed to the fact that the work of this contract is within the Delaware and Raritan Canal, which provides raw water to the Authority's water treatment customers. Water must continually pass through the lock to meet the Authority's contractual obligations. At least one gate at each lock must remain fully functional and not blocked in any way. Please also note that the volume of flow and elevation of water in the Canal is subject to variation due to rainfall or operational changes by the Authority.

1.3 OVERTOPPING

The Contractor is notified that certain high precipitation storm events may cause flooding, with the possibility of water levels 2 feet above normal during hurricane events. The Contractor shall be solely responsible for any and all damage to the work caused by floods and/or floating debris and shall plan and implement measures to minimize damage during such events. Examples of Canal water levels can be observed at USGS gaging stations located on the Canal:

USGS Gage at Kingston:

https://waterdata.usgs.gov/nj/nwis/uv/?site_no=01460500&PARAMeter_cd=00065,63160,00060,62614,62615

USGS Gage at Landing Lane:

https://waterdata.usgs.gov/nj/nwis/uv/?site_no=01460595&PARAMeter_cd=00065,63160,00060,62614,62615

Please note that this gaging station data is informational only and does not represent the actual water surface elevation at the various project sites.

PART 2 MATERIALS

Materials shall be obtained from sources proposed by the Contractor and approved by the Authority.

PART 3 CONSTRUCTION

3.1 MAINTENANCE OF WATER CONTROL DEVICES

Throughout the period when the stop logs are in place, dewatering devices shall be inspected regularly by the Contractor and properly maintained. Sufficient materials and equipment shall be available on site to perform any repair work that may be required. The Contractor shall clean debris from the work area as needed.

3.2 REMOVAL AND DISPOSAL OF WATER CONTROL DEVICES

When no longer required, the water control devices shall be carefully removed to facilitate the restoration of flow.

End of Section

SECTION 250
SLUICE GATES

PART 1 **GENERAL**

1.1 DESCRIPTION

This project involves replacing eleven sluice gates along the Delaware and Raritan Canal. Work under this section includes, but is not limited to furnishing and installing eleven new cast iron sluice gates and operating assembly components, including a wall mounted frame and rising stem and operator, designed for a minimum seating rating of 55 ft and 20 ft unseating head. The sluice gate package shall include a pedestal with enclosed geared lifts, all mounting hardware, stem, galvanized steel stem cover and stem guides. **The sluice gate shall be designed and fabricated to fit a 36” x 48” opening. It is the Contractor’s responsibility to obtain accurate field measurements as required by the sluice gate manufacturer to develop and manufacture the sluice gates.**

The Contractor may be required to saw cut and/or demo some portion of the existing concrete slab upstream of the sluiceway opening to create a recess for the bottom of the sluice gate frame. The Contractor shall patch any areas of removed concrete to the original grade and slope.

1.2 SOURCE QUALITY CONTROL REQUIREMENTS

- A. The Contractor must choose a sluice gate manufacturer, which shall have demonstrable experience in water control gate design and providing and servicing the proposed equipment. The Contractor shall procure the sluice gates from Hydro Gate, Rodney-Hunt or Authority approved equal.
- B. The Contractor must provide the sluice gate package built, tested and shipped by one manufacturer to ensure single source of supply and responsibility.
- C. The Contractor’s sluice gate manufacturer shall provide, at the request of the Authority, at least five (5) references including name, location and contact information of similar project applications in the area that have been in service for a minimum of one (1) year. If, in the opinion of the Authority, the proposed manufacturer does not meet the required experience the Contractor shall submit information from another manufacturer until an acceptable manufacturer is submitted.
- D. The Contractor must provide a 1-year manufacturer-backed warranty for the sluice gate package to guarantee against defective material and workmanship in accordance with the manufacturer’s published warranty.
- E. The Contractor shall provide a 1-year, minimum, warranty on the installation of the sluice gate to guarantee against defective material or workmanship with respect to the installation of the gate itself.

1.3 SUBMITTALS

- A. Product Data: Submit for approval by the Authority:
 - List of materials to be used, including Anchors, Sealants and Grout.
 - Catalog cuts of all materials and equipment.
 - Shop Drawings: submit for approval by the Authority, Shop drawings showing the

- principal dimensions and general construction of all sluice gates and lift mechanisms.
 - **Factory Tests:** Upon approval of all shop drawings the manufacturer shall fabricate and factory test the unit. A factory test report certifying the unit's pressure rating and AWWA leakage requirements compliance shall be forwarded to the Authority for review, comments and approval.
 - Upon receipt of the above referenced factory test approval, the manufacturer shall release the units for shipment; and forward the Operational and Maintenance Manuals to the Authority for review and comments.
 - **Operation and Maintenance Manual Contents:** shall include spare parts lists, lubricating oils, special tools, and maintenance requirements and schedule if any.
- B. **Adherence to Contract Documents:** This Contractor is cautioned that all shop drawing submittals must be complete and comply with the contract drawings and specifications, and the design intent of the Authority. Failure to comply, even though the submittal is based on the manufacturer and equipment specified, will result in an immediate rejection of the submittal.

1.4 MATERIAL DELIVERY AND STORAGE

Deliver the sluice gates and operating assembly equipment to the selected staging areas in a clean condition with all parts closed and locked in position before shipment. Clearly identify pick-points or lift-points on delivered crating and/or packaging. The sluice gate shall be securely bolted or otherwise fastened to skids in such a manner that they may be safely handled. The Contractor must notify the Authority about the delivery schedule.

1.5 DESIGN CRITERIA

- A. **FRAME AND GUIDES.** The gate frame and guides shall be cast iron and shall be a one-piece integral casting. Guide grooves shall be machined on all contact faces. Overall clearances with slide tongue shall be not more than 1/16-in. Faces for mounting of wedge blocks shall be fully machined. Guide grooves shall be of such length as to support at least one-half of the slide when it is in the full open position. The frame shall be designed for the minimum seating rating of 55 ft and 20 ft unseating head. The frame shall be standard flange back type and capable of mounting directly to the concrete wall surface.
- B. **SLIDE.** The gate slide shall be cast iron and shall be one-piece construction. The slide shall be rectangular in shape with integrally cast vertical and horizontal reinforcing ribs. A heavy reinforcing rib along each side shall be provided to ensure rigidity between side wedges. The slide shall be designed to operate under maximum specified unbalanced head with the minimum safety factor of five. Guide tongues along each side of the slide shall be machined all over. A thrust nut pocket shall be cast on the vertical centerline of the gate and shall be provided with a threaded block for attachment of the stem to the slide. Surfaces for mounting of side wedges shall be integrally cast on the slide and machined to receive the adjustable wedges.
- C. **SEATING FACES.** Seating faces shall be made of strips of rolled or extruded bronze or stainless steel and shall be mounted around the perimeter of the slide and frame. They shall be impacted into dovetail slots and held in position without use of screws or other fasteners. After mounting, they shall be machined to a plane with a 63 micro-inch finish or better. When the slide is in fully closed position and wedged in position against the frame, maximum clearance between seating faces shall not exceed 0.004 inch.
- D. **WEDGES.** Each gate shall be provided with a sufficient number of wedges to grant a practical

degree of water-tightness. Side wedging devices shall be designed to make full metal-to-metal contact with the overhung portion of the frame-mounted wedge block. Wedges shall be fully adjustable and keyed into the side to prevent any lateral rotation. Wedges shall be machined with angled faces and secured with a stud bolt to prevent any slippage during operation of the gate. All contact faces of wedges and wedge blocks shall be precision-finished with 63 micro-inch finish or better.

- E. STEM. The operating stem for stem rising sluice gates shall be one sole piece (no splices) from stainless steel, type 304, sized to safely withstand, without buckling or permanent distortion, the stresses induced by normal operating forces. The minimum size stem shall be 2.5 inches in diameter. In addition, the stem will be designed to transmit in compression at least 2 times the rated output of the lift or operator with a 40-pound effort on the crank or handwheel. The threaded portion of the stem will have machine cut threads of the Acme type. The manufacturer shall determine the stems total length and the number of threads per inch such as to work most effectively with the proposed lift mechanism and the existing elevations.
- F. The geared floor stand shall have a weather-proof, cast iron housing painted black, with a bronze operating nut, and shall be mounted on the existing concrete stand with a steel bracket if required. The operating nut shall be internally threaded with Acme threads corresponding to stem threading. Tapered roller bearings shall be located above and below the bronze operating nut to support the output thrust of the floor stand. The gearing shall be accurately cut and of proper design to support the load conditions without undue stress. The stainless steel pinion shaft will be mounted on tapered roller bearings to provide low friction operation and to resist axial and radial thrusts. Mechanical seals shall be provided around the operating nut and the pinion shaft to prevent lubrication from leaving the unit and moisture from entering the sealed housing. The reduction gear case shall be precision machined and equipped with tapered roller or needle bearings and sealed about the reduction shafts. Lubrication fittings shall be provided for all bearings. A maximum effort of 40 lbs shall be required to operate the gate after it is unseated from the wedging devices. All rising stem gates shall be supplied with visual position indication via slotted metal covers. The covers shall be capped, vented, and long enough to allow full travel of the gate.
- G. FASTENERS. All anchor bolts, studs, assembly bolts, cap screws, nuts, and adjusting screws shall be of ample section size to withstand the force created by operation of the gate under the minimum seating rating of 55 ft and 20 ft unseating head and shall be stainless steel.
- H. A galvanized steel stem cover, painted back and indicator shall be provided on each slide gate operator. Stem indication shall be provided to denote gate level. A cast aluminum adapter shall be used to mount the cover to the lift operator. The cover shall be capped, vented, and of sufficient length to allow full travel of the gate.

PART 2 MATERIALS

2.1 GENERAL

All materials designated hereinafter, when used in sluice gates produced under this standard, shall conform to the requirements designated below for each material listed. When reference is made to American Society for Testing and Materials (ASTM), American National Standard Institute (ANSI), Copper Development Association Alloy (CDA), American Water Works Association (AWWA), or other standards as may be stipulated, the latest revision thereof shall apply.

The requirements of ASTM, ANSI, or other standards, to which reference is made elsewhere in this text, shall govern the physical and chemical characteristics of the sluice gate components.

Whenever sluice gate components are to be made in conformance with ASTM, ANSI, AWWA, or other standards that include test requirements or testing procedures, the sluice gate manufacturer shall meet such requirements or procedures. The records of such tests shall be made available to the Authority if requested.

2.2 MATERIALS REFERENCES

- A. ASTM A 120; Specification for Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary Uses.
- B. ASTM A 126 Class B; Specification for Cast Iron Frame, Slide, Pedestal, Gear Housing, and Stem Guide Brackets.
- C. ASTM B 584; Specification for Bronze Wedges, Wedge Blocks, Lift Nut and Stem Block (CA 872, CA 865 or CA 867).
- D. ASTM B 148; Specification for Bronze Gears (CA 952, CA 954, or CA 958).
- E. ASTM B 98; Specification for Silicon Bronze Seating Faces (CA 651 or CA 655).
- F. ASTM A 276; Specification for Stainless Steel Type 304 Stems.
- G. ASTM A 593/F 594; Specification for Stainless Steel Fasteners.

3.0 WORKMANSHIP

All parts in the sluice gate and accessories shall be accurately machined on mating and bearing surfaces. All like parts, except the bronze seating surfaces shall be interchangeable so that replacement parts can be furnished at any time and attached in the field with a minimum of fitting, chipping or re-machining. All parts shall conform to the design dimensions and shall be free of defects of material and workmanship. All anchoring boltholes shall be drilled with a new bolt pattern. All castings shall be clean and sound without defects capable of impairing their functions.

4.0 CLEANING AND COATING

The surfaces shall be cleaned by commercial sandblasting to base material, dry and free of grease before painting in conformance with the paint manufacturer's instructions. After cleaning, the surfaces shall be primed by application of either one shop coat of zinc chromate or a coal tar coating suitable for use in potable water and applied in conformance with paint manufacturer's instructions. After painted surfaces are dry, the machined or bearing surfaces and the holes, both plain and threaded, shall be coated with protective grease.

The finished color for the sluice gate floor stand, stem covers, and steel mounting brackets shall be black.

PART 3 CONSTRUCTION

3.1 INSTALLATION OF SLUICE GATES ASSEMBLY COMPONENTS

- A. The Contractor shall remove the existing gate, frames, protruding portions of metal thimble, operator, stem, and associated equipment to install new sluice gate system.
- B. After removal of existing sluice gate system, the Contractor shall prepare and repair the concrete and metal surfaces. Bolt holes repair is expected prior to the installation of new sluice gate system by filling in with epoxy grout suitable for underwater application.
- C. The Contractor shall furnish all labor, tools, equipment and materials to install in an accurate and plumb manner, frame, guides, slides, floor-stand, new mounting plates (if required), new 2-1/2 inch diameter stainless steel stem, and other fasteners, anchoring accessories and hardware materials required for the satisfactory operation of the sluice gate.
- D. Assembly and start-up operation of the sluice gate includes but is not limited to the following: All gate wedges shall be torque tightened and adjusted as per manufacturer specifications. The gate slide, guides, and invert shall be cleaned of all silt, debris, and concrete dropping. The stem shall be securely threaded into the thrust nut, perfectly and vertically aligned to the stem guide and the operating mechanism, and the threads lubricated with heavy-duty grease. The manual crank shall turn easily with no binding during operation.
- E. The Contractor shall test the installed sluice gate in the presence of Authority designated inspectors to demonstrate bind free operation using the hand wheel and water-tight performance when exposed to normal upstream head pressure. Allowable leakage of the sluice gates shall be in accordance with AWWA Standard C560.

PART 4 EXECUTION

- 4.1 All underwater work shall be performed in accordance with all applicable safety standards, including, but not necessarily limited to OSHA subpart T and The Association of Diving Contractors International (ADCI), where applicable.
- 4.2 All divers shall have CPR, First Aid and current Breathing Air Test Certificate.
- 4.3 Submit Safe Practice Manual in accordance with OSHA subpart T.
- 4.4 All underwater work shall provide sufficient labor, equipment and materials to perform the required work.
- 4.5 The Contractor shall provide all necessary divers, safety provisions and equipment to perform the required tasks in a workmanlike manner that meets the requirements of OSHA and ADCI standards.

End of Section

SECTION 260
STEEL MOUNTING BRACKET

PART 1 GENERAL

1.2 DESCRIPTION

Work under this section includes, but is not limited to, furnishing and installing eleven custom steel mounting brackets. The steel mounting bracket shall utilize the existing concrete corbel and accommodate the change in offset from the headwall. New gates are likely to be offset a slight distance further outward from the headwall, therefore the existing concrete corbel will need a new steel mounting bracket that allows the operator stand to be positioned further from the headwall.

1.2 SOURCE QUALITY CONTROL REQUIREMENTS

- A. The Contractor may use a prefabricated mounting bracket supplied by a reputable sluice gate manufacturer. However, due to the uniqueness of the retrofit, a custom fabricated mounting bracket may be necessary.

1.3 SUBMITTALS

- A. Product Data: Submit for approval by the Authority:

- Shop Drawings: submit for approval by the Authority, Shop drawings showing the principal dimensions and general construction.

- B. Adherence to Contract Documents: This Contractor is cautioned that all shop drawing submittals must be complete and comply with the contract drawings and specifications, and the design intent of the Authority. Failure to comply, even though the submittal is based on the manufacturer and equipment specified, will result in an immediate rejection of the submittal.

PART 2 MATERIALS

2.1 GENERAL

The steel mounting bracket shall at a minimum be constructed of a 1" thick top plate and ¾" thick vertical support pieces. The bracket shall be painted black.

PART 3 CONSTRUCTION

- 3.1 The steel mounting bracket shall be designed in a manner that allows for field adjustments.

End of Section

APPENDIX A

SITE PHOTOGRAPHS

APPENDIX B

DRAWINGS