



**City of Phoenix
Office of the City Engineer
Design and Construction Procurement**

**PROJECT NO. WS90400084
LIFT STATION 66 REFURBISHMENT**

ADDENDUM NO. 2



Brian Chong

Digitally Signed 08/17/2023

ISSUE DATE: Thursday, August 17th, 2023

Bidders are hereby notified that the Bidding and Contract Documents for the above referenced project for which Bids are to be received on **Tuesday, August 29, 2023**, are amended as follows:

Information to Bidders – The following is provided to Bidders for information only (Refer to Drawings, Specifications, and Addenda for construction instructions):

Q1.	Is there an electrical study that will be available after the LS 66 Feed project? It was advised that there would need to be coordination with the Feed project to be up to date as it applies to the new Refurbishment project.
A1.	The electrical coordination/arc flash study will be performed for the SES (Service Entrance Section), ATS (Automatic Transfer Switch), and MTS (Manual Transfer Switch) as a part of the Independent Service Project. This study will be performed by Arcadis which is the City's EI&C third party inspector. This study will be available for the LS66 rehabilitation project for another electrical coordination/arc flash study for the VFD replacement. This will also be performed by Arcadis. The Contractor will be required to coordinate with Arcadis for these services along with the project team during construction.
Q2.	Provide manhole bypass location.
A2.	There is a manhole located just east of the north gate as shown on Sheet C 16 of 60 – Site Plan-Existing. Per Section 02145, "CONTRACTOR to provide the design of the bypass arrangement and describe the means and methods of accomplishing the bypass and submit to the OWNER and ENGINEER to determine conformance to project objectives".
Q3.	Bid item #6 Furnish 2" Stainless Steel Drain Piping, I have searched the plans and Specs and I cannot find where 2" Stainless Steel piping is used. Please Identify what drain line is Stainless Steel.
A3.	Refer to Sheet 80, Detail 4 in the Construction Drawings.
Q4.	On the 36" SS Influent Line to the lift station, what size is the manhole?
A4.	Manhole size is 60".
Q5.	Regarding the 2ea. existing 24" force mains, where do they discharge and at what elevation? Need total LF of run and elevation at discharge, how deep are they buried? Is one line a primary and the other line is a back-up? How long can one line be down for? What's the discharge pressure on the force main?

A5.	The Force Mains discharge into the gravity system near the intersection of Cave Creek and Pinnacle Peak Road, approximately $\frac{3}{4}$ of a mile north. Per record drawings, the discharge elevation is 1602.20 Elev. Currently, one line is in use and the second line is redundant. However, by the time construction starts there is a possibility that both lines will be in service and there will be no redundancy. There are approximately 8.4 miles of force mains from the lift station to the gravity sewer discharge location. The maximum pressure while two pumps are running is 110 psi. Information shall be verified in the field after the Notice to Proceed is issued to the successful low bidder.
Q6.	Are the submersible pumps purchased? Please confirm and provide a submittal for these pumps if purchased already.
A6.	Submersible pumps have been purchased and are in the city's possession. Pump submittals can be found on the City's solicitation details web page, Attachment A, B, and C, Pre-Purchased Items.
Q7.	Bid Item # 47-All Other Work Not Previously Listed has an amount of \$340,000. Is this an allowance and what scope of work does this cover? Please provide more detail.
A7.	Please refer to revised Specification 01271 Measurement and Payment and Bid Schedule.
Q8.	Can the contractor work outside the walls of the lift station? Will the contractor be allowed to pump and make connections to the force main outside the wall of the lift station?
A8.	The work of the contractor under the contract documents and executed Notice to Proceed will lie within the lift station. Any work outside of the lift station shall be permitted and approved by the City of Phoenix and corresponding agencies.
Q9.	What diameter is the influent manhole right before the lift station?
A9.	The diameter of the influent manhole is 5' or 60". Information shall be verified in the field after the Notice to Proceed is issued to the successful low bidder.
Q10.	How deep is the 36" SS line at the manhole?
A10.	The manhole is approximately 23 feet deep. Information shall be verified in the field after the Notice to Proceed is issued to the successful low bidder.
Q11.	Please confirm all sections associated with Specification 01321 – Progress Schedule (CPM) are required for this Project, specifically "01321.1.8.A - Should CONTRACTOR fail to submit the Progress Schedule in the form indicated within the required time frames shall be cause for suspension of any Progress Payment."
A11.	All requirements of Specification 01321 – Progress Schedule (CPM) are required for this project.
Q12.	Specification 01332 – Shop Drawing Procedures, Section 1.2 Procedure, Section T discussed back-charges for resubmittals. Please confirm if this section is required in this Project?
A12.	All sections of Specification 01332 are required for this project.

Q13.	We are requesting a specification for the 18" HDPE piping for the Foul Air. Section 15050 System 22 is FA. No specific specification for the HDPE Buried piping. We are referred to Section 13125 which is not in the Contract Documents. Section 15812 does not have a specification for the HDPE buried piping.
A13.	Foul Air shall be 24" FRP per the contract drawings and is above ground. The proposed 24" FRP will connect to the existing underground 18" HDPE Foul Air line. Refer to Specification 13126 Dated May 2023.

Project Specifications and Contract Documents:

Item 1: Section 00300 – Bid Form and Bid Form Attachments

The attached Bid Schedule pages 00300 - 3 through 00300 - 6, revised 8/17/23, supersede pages 00300 - 3 through 00300 - 6 contained in Project Specifications and Contract Documents and must be completed, affixed in place, and submitted with the bid.

Note: The following item on the Bid Schedule has been changed.

- Item 47 – All Other Work Not Previously Listed, Unit has been changed to Allowance

Technical Specifications

Item 2: Section 01271 – Measurement and Payment

Subsection 1.4 – Paragraph AU. Bid Item 47 – All Other Work Not Previously Listed

DELETE:

“1. Definition: Includes all other work, labor, material, coordination, equipment, and incidentals not specifically listed in the aforementioned bid items but required by the Drawings and Specifications.

2. Measurement and Payment: Payment shall be made as a lump sum for all work not previously listed as required by the description above based on percent complete and approved by the OWNER and ENGINEER. Measurement of the percent complete will be made by the CONTRACTOR and verified by the ENGINEER.”

REPLACE WITH:

“1. Definition: Includes all other work, labor, material, coordination, equipment, and incidentals not specifically listed in the bid items but required by the Drawings and Specifications to maintain a safe and operational facility. Work may include but is not limited to items such as eye wash stations, yard hydrants, backflow preventers, wall penetrations, signage, specialized hardware, etc. to ensure the facility is compliant with governing codes and regulations.”

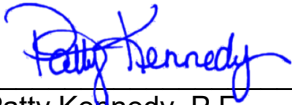
2. Measurement and Payment: Payments shall be made based on the terms agreed to in writing by the OWNER and CONTRACTOR. Measurement of the materials and labor will be made by the CONTRACTOR and verified by the ENGINEER.”

Item 3: Section 11200 – 480 Volt Motor-Operated Valve/Gate Actuators

ADD: Section 11200 – 480 Volt Motor-Operated Valve/Gate Actuators. The section is attached to this addendum.

Plan Sheets:

1. No revisions this Addendum.



Patty Kennedy, P.E.
Deputy Water Services Director
Wastewater Engineering

END OF ADDENDUM NO. 2

1.1 Bid Schedule

1.1.1 Bidder will complete the Work in accordance with the Bid Documents and accept in full payment for the Work items listed below, the following Unit Prices and/or Bid Prices, as applicable:

Bid Item No.	Bid Quantity	Unit	Description	Unit Price	Bid Price
1	1	LS	Mobilization, Demolition, and Temporary Facilities	\$	\$
2	25	LF	Furnish and Install 1" Non-Potable Water Piping (NPW)	\$	\$
3	135	LF	Furnish and Install 1" Drain Piping	\$	\$
4	75	LF	Furnish and Install 4" Drain Piping	\$	\$
5	125	LF	Furnish and Install 2" Drain Piping	\$	\$
6	25	LF	Furnish and Install 2" Stainless Steel Drain Piping	\$	\$
7	40	LF	Furnish and Install 2" PW	\$	\$
8	35	LF	Furnish and Install 2" NPW	\$	\$
9	100	CY	Furnish and Install New Reinforced Concrete	\$	\$
10	1600	SY	Furnish and Install New Asphalt Paving	\$	\$
11	110	CY	Furnish and Install New Concrete Paving	\$	\$
12	1	EA	Furnish and Install Electrical Building Trench Drain	\$	\$
13	1	EA	Remove and Replace Concrete Collars for Sewer Manhole	\$	\$
14	12	EA	Remove and Replace Concrete Collars for Electrical Manholes and Pull Boxes	\$	\$

Bid Item No.	Bid Quantity	Unit	Description	Unit Price	Bid Price
15	28	EA	Furnish and Install Removable Bollards	\$	\$
16	1	LS	Demolition of Existing Lift station Piping, Odor Control Facilities and Electrical Facilities	\$	\$
17	10	EA	Remove and Dispose of Existing Light Poles	\$	\$
18	1	LS	Provide Temporary Bypass Pumping	\$	\$
19	4	EA	Install Pre-Purchased Submersible Pumps and Accessories	\$	\$
20	10	EA	Install Pre-Purchased 24" Eccentric Plug Valves	\$	\$
21	4	EA	Install Pre-Purchased 16" Eccentric Plug Valves	\$	\$
22	4	EA	Install Pre-Purchased 16" Anti-Slam Check Valves	\$	\$
23	18	EA	Furnish and Install New Pipe Supports	\$	\$
24	6	EA	Install Pre-Purchased 8" Plug Valves	\$	\$
25	2	EA	Install Pre-Purchased 8" Surge Relief Valves	\$	\$
26	6	EA	Install Pre-Purchased 6" Plug Valves	\$	\$
27	3	EA	Install Pre-Purchased 6" Combination Air Release Valves	\$	\$
28	4	EA	Furnish and Install 3" Air Vacuum Valves	\$	\$
29	4	EA	Furnish and Install 3" Ball Valves	\$	\$
30	6	EA	Furnish and Install 2" Ball Valves	\$	\$
31	1	EA	Furnish and Install 1" Solenoid Valve	\$	\$

Bid Item No.	Bid Quantity	Unit	Description	Unit Price	Bid Price
32	1	EA	Furnish and install 1" Isolation Valve	\$	\$
33	2	EA	Furnish and Install New Magnetic Flow meter	\$	\$
34	1	LS	Furnish and Install Yard Piping and all Appurtenances not listed above	\$	\$
35	18	EA	Furnish and Install New Safety Tie Offs	\$	\$
36	3	EA	Furnish and Install New Removable Handrail for Splitter Box Hatches	\$	\$
37	2	EA	Furnish and Install New Removable Handrail for Wet Well Hatches	\$	\$
38	35	LF	Furnish and Install Biofilter Containment Area Handrail System	\$	\$
39	1	LS	Furnish and Install Miscellaneous Improvements for Electrical Building	\$	\$
40	6078	SF	Furnish and Install New Epoxy Coating for Wet Well and Splitter Structures	\$	\$
41	3	EA	Furnish and Install New Flow Control Gates	\$	\$
42	1	LS	Furnish and Install New Biofilter Odor Control Facilities	\$	\$
43	4	EA	Install Pre-Purchased Variable Frequency Drives (VFDs)	\$	\$
44	1	LS	Furnish and Install Electrical Facilities	\$	\$
45	1	LS	Furnish and Install Instrumentation, Controls and Accessories	\$	\$
46	1	LS	Furnish and Install Protective Finishes	\$	\$
47	1	Allowance	Allowance for All Other work Not Previously Listed	\$340,000.00	\$340,000.00

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BID FORM

Bid Item No.	Bid Quantity	Unit	Description	Unit Price	Bid Price
48	1	Allowance	Allowance for Unforeseen Conditions	\$500,000.00	\$500,000.00
49	1	Allowance	Allowances for Stormwater Pollution Protection Permit (SWPPP)	\$5,000.00	\$5,000.00

Base Bid (The sum of the computed totals for Bid Items 1 through 49 only):

_____ Dollars and _____ Cents
(Written words)

\$ _____
(Figures)

THE BIDDER ACKNOWLEDGES AND AGREES THAT DETERMINATION OF THE LOWEST BIDDER SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF PARAGRAPH 17.6 OF THE INSTRUCTIONS TO BIDDERS.

THE BASE BID DOLLAR VALUE WILL BE ANNOUNCED AT THE BID OPENING.

2. Time of Completion

- 2.1 Bidder agrees that the Work will be substantially complete within 670 calendar days after the date when the Construction Times commence to run as provided in Article 2 of the General Conditions and completed and ready for final payment in accordance with Article 14 of the General Conditions within thirty (30) calendar days after the actual date when pursuant to paragraph 14.04 of Section 00700, General Conditions, Substantial Completion of the Work has been achieved.
- 2.2 Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified in the Agreement.
- 2.3 In addition, Bidder agrees to meet the specified interim Milestones as defined in the General Requirements.

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SECTION 11200

480 VOLT MOTOR-OPERATED VALVE/GATE ACTUATORS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Provide all labor, materials, equipment, and incidentals required to furnish and install all 480-volt motor-operated valves/gate actuators and appurtenances complete and operational as stated in the Contract Documents.
2. Each 480-volt motor-operated valve/gate actuator shall be supplied along with its associated valve/gate as a coordinated unit assembled by the individual valve/gate manufacturers.
3. The Work includes, but is not necessarily limited to, all actuators required for buried, exposed, submerged and other types of piping, and all gates, anchorage systems with all appurtenances, except where otherwise specifically included in other Sections as stated in the Contract Documents.

B. Coordination:

1. Review installation procedures under other Sections and coordinate with the Work which is related to this Section including buried piping installation, exposed piping installation and site utilities.

1.2 QUALITY ASSURANCE

A. MANUFACTURER'S Qualifications:

1. MANUFACTURER shall have a minimum of five years experience of producing substantially similar equipment and shall be able to show evidence of at least five installations in satisfactory operation for at least five years.
2. Person(s) adjusting, repairing, or receiving training on electrically energized equipment shall follow guidelines outlined in NFPA 70E, OSHA 910, Subpart "S" and OSHA 1926 Subpart "K" regarding arc flash safety, and protection.

B. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

1. ABMA Standards.
2. AGMA Standards
3. ANSI B16.4, Cast Iron Threaded Fittings.
4. ASTM A 48/A 48M, Specification for Gray Iron Castings.
5. ASTM A 307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
6. ASTM A 354, Specification for Quenched and Tempered Alloy Steel Bolts, Studs and Other Externally Threaded Fasteners.
7. ASTM A 436, Specification for Austenitic Gray Iron Castings.

8. ASTM B 62, Specification for Composition Bronze, or Ounce Metal Castings.
9. AWWA C541, Hydraulic and Pneumatic Cylinder and Vane-Type Actuators for Valves and Slide Gates
10. AWWA C542, electric Motor Actuators for Valves and Slide gates
11. National Electrical Code (NEC) current adoption.
12. City of Phoenix – Amendments to the National Electrical Code.
13. NEMA, National Electrical Manufacturer’s Association.
14. NSF 61, Drinking Water System Components-Health Effects.

1.3 SUBMITTALS

A. Shop Drawings: Submit for approval the following:

1. Comply with the requirements of Section 01332, Shop Drawing Procedures.
2. Manufacturer and Engineering literature including motor NEMA rating, controls compartment NEMA rating, remote mounted control stations NEMA rating, type of actuator gearing lubrication, dimensions, materials, size and weight, illustrations, paint certifications, detailed mechanical and electrical schematic drawings, data and descriptive literature, and valve/gates appurtenances for each actuator provided.
3. Provide a certification of “Unit Responsibility” as specified in Specification 01600, General Equipment Provisions from the valve/gate equipment MANUFACTURERS stating that the 480 Volt Motor-Operated Actuator furnished installed with the valve/gate will successfully operate under the operating load condition requirements as stated in the Contract Documents.
4. Installation diagrams and instructions.
5. Power and control wiring diagrams, including termination numbers.
6. Complete manufacturer’s nameplate data of electric actuators.
7. Provide documentation for each actuator’s shop test as to be performed in accordance with the requirements of AWWA C540. Submit valve/gate manufacturer’s shop test certificates that will be utilized for the shop test listed in Section 1.3.C.
8. Calculations:
 - a. Sizing of electric actuators: Include maximum torque output, design operating torque, and safety factor to design torque.
9. Deviations from Contract Documents.

B. Operation and Maintenance Manuals:

1. Furnish Operation and Maintenance Manuals in conformance with the requirements of Section 01781, Operation and Maintenance Data.

C. Shop Test:

1. All actuators must be factory mounted and tested as one unit prior to shipment by the individual valve/gate manufacturers. Valve/gate manufacturers to test motor operated valves/gates to ensure that the mechanisms close and open in the specified time limit, torque limits, and for proper seating. Test motor operated valves/gates for conformance with the requirements of AWWA C540.
2. Valve/Gate Manufacturers Shop Test Certificates to accompany the valve/gate

upon delivery.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Store materials in compliance with requirements under Section 01661.
- B. Deliver materials to the site to ensure uninterrupted progress of the Work. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete, in ample time to not delay the Work.
- C. All boxes, crates and packages shall be inspected by CONTRACTOR upon delivery to the Site. A document shall be provided by CONTRACTOR, notifying the ENGINEER if any loss or damage exists to equipment or components. Replace loss and repair damage to new condition, in accordance with manufacturer's instructions.
- C. Store materials to permit easy access for inspection and identification. Keep all materials in covered storage, off the ground utilizing pallets, platforms or other supports. Protect steel members and packaged materials from corrosion and deterioration.
- D. Store all mechanical equipment to prevent condensation and in accordance with the manufacturer's instructions for long term storage. Provide power to the space heater while actuators are in storage to avoid condensation on the control devices.
- E. Include Valve/Gate Manufacturers Shop Test Certificates for each valve/gate upon delivery.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Application Criteria:
 - 1. Actuator Component Temperature Rating: -22° to +158° F (-30° to 70°C).
 - 2. Ambient Humidity: 100 percent.
 - 3. Power Supply: 480 volts, three phase, 60 Hz.
 - 4. Control Voltage: 120 volts, single phase, 60 Hz.
 - 5. Torques: In accordance with the valve/gate manufacturer, but not less than two times the required operator torque for opening and closing the valve/gate.
 - 6. Continuous Duty Cycle: Minimum of 600 starts per hour.
- B. General
 - 1. Painting shall conform to the Specifications for surface preparation and shop priming requirements under Section 09900, Painting. For sun-exposed installations, lighter colors to be used are beige, white, or light gray.
 - 2. Valve/gate manufacturer to coordinate the sizing of each electric actuator.
 - 3. Provide electric actuators suitable for the valve/gate orientation as stated in the

Contract Documents.

C. Electric Motors:

1. General:
 - a. Provide motors suitable for continuous duty modulating service, regardless of actual valve/gate application. Motors shall have high torque characteristics and minimum 70°C temperature rating.
2. Motor Construction:
 - a. Enclosure: NEMA 4 is minimum, NEMA 6 for submersible and NEMA 7 for explosion-proof.
 - b. Insulation: Class H
 - c. Service Factor: 1.0
 - d. Power Supply: 480 volts, three phase, 60 Hz.
 - e. Over-current Protection: Winding thermostat(s) and thermal overloads for each phase.
 - f. Efficiency: High-efficiency conforming to NEMA MG-1, with exception to the motor housing mount which may be an integral part of the actuator design.
 - g. Bearings: Anti-friction with a minimum B-10 life of 100,000 hours, lifetime pre-lubricated and sealed.

D. Actuator Gearing:

1. Housing: Cast iron or die-cast aluminum.
2. Close coupled to electric motor.
3. Input shaft gearing: Spur or bevel gear assembly.
4. Output shaft gearing: Self-locking worm gears with minimum gear backlash to prevent valve/gate chatter or vibration.
5. All gearing shall be of hardened alloy steel or a combination of hardened alloy steel and alloy bronze, accurately cut by a CNC machine.
6. Lubrication: High temperature grease or food grade oil suitable for operating temperatures of 22°F to 170°F. For potable water applications, the food grade oil or grease must meet NSF requirements.
7. Bearings: Ball or roller with a minimum B-10 life of 100,000 hours, lifetime pre-lubricated and sealed.
8. Input Shaft: Hardened alloy steel.
9. Electrical or Mechanical Stops: Adjustable to \pm five degrees at each end of travel.

E. Limit Switches:

1. Provide each actuator with “end of travel” open and close limit switches.
2. Provide a minimum of four auxiliary contacts with each limit switch, two of which shall open and two of which shall close at the end of travel associated with that limit switch. A minimum of 4 (four) limit switches shall be supplied .
3. Limit switches shall be geared to the drive mechanism and in step at all times, whether the unit is operated electrically or manually and whether or not the actuator is powered by the three phase power supply. Friction devices or set-

screw arrangements cannot be used to maintain the setting.

4. Limit switch gearing shall be appropriately lubricated, with totally enclosed driven mechanism to prevent entrance of foreign matter or loss of lubricant.
 5. Limit switch contacts shall be form C type, with a minimum rating of 5 amperes, 120 VAC or changeover type with a minimum rating of 5 amperes, 250 VAC, 5 amperes, 30 VDC.
- F. Torque Switches:
1. Provide adjustable torque switches with each actuator. The torque switches shall operate throughout the complete valve/gate cycle without the use of auxiliary relays, linkages, latches, or other devices.
 2. Wire torque switches to de-energize the actuator motor in the event excessive torque is developed during either direction of travel.
 3. Torque switches operate in either direction of valve/gate travel.
- G. Actuator Controls:
1. Provide the following controls in a separate compartment integral with the actuator:
 - a. Compartment enclosure type: NEMA 4 is minimum, NEMA 6 for submersible and NEMA 7 for explosion-proof.
 - b. Starter: Heavy duty combination reversing magnetic starter suitable for 600 starts per hour.
 - c. Control Power Transformer: Provide a transformer to transform the rated three phase, 60 Hz power to 120 VAC, single phase for all control logic. The 120 VAC controls shall not be microprocessor based or have solid state electronic circuitry. The transformer secondary shall be grounded, and the transformer shall have primary fusing at a minimum.
 - d. "LOCAL/OFF/REMOTE" selector switch: "LOCAL" position provides operation from "OPEN/STOP/CLOSE" pushbuttons or switch mounted on the actuator. "REMOTE" position enables "OPEN/CLOSE" control from a remote source via an external 120 VAC, 5 ampere rated contact closure, when the contact opens the actuator stops. Provide a set of form C dry contacts to remotely indicate that the actuator is in the "REMOTE" position.
 - e. "OPEN/STOP/CLOSE" pushbuttons or switch: The Open and Close to be provided with seal-in circuits and "STOP" pushbutton or switch position release the seal.
 - f. Provide "OPEN/CLOSE" indicating lights and a 0 to 100 percent position indicator. Red indicating light shall represent "OPEN" and green indicating light to represent "CLOSE".
 - g. Provide a thermal overload and single phasing protection of the motor.
 - h. Provide a Position Transmitter
 - j. All internal terminal and circuit boards shall be conformal coated and rated for high temperature service, minimum 70°C.
 - k. Solid State Electronic Devices: No solid state devices may exist in the valve operator internal control circuitry.
 - j. Provide a 120 VAC space heater to maintain internal housing temperature

at 20°C.

H. Electrical Remote Mounted Control Stations:

1. Provide remote control station with integral module for application with remote located motor starter,

I. Chainwheel/Handwheel Operation:

1. Provide valves/gates with chainwheel operators for manual control when actuator is installed approximately five feet above the operating floor and as stated in the Contract Documents.
2. Provide actuator operator operable with handwheel or chainwheel even after the electric motor has been disengaged and removed.
3. The unit shall be designed such that should power be returned to the motor while the handwheel is in use, motor torque will not be transmitted to the handwheel.
4. The handwheel shall require an effort of no more than 80 pounds on the rim for seating or unseating load.
5. The handwheel shall have an arrow and the word "OPEN" or "CLOSE" indicating required rotation cast on the trim of the handwheel. The handwheel shall operate in the clockwise direction to close, unless otherwise stated in the Contract Documents.
6. The handwheel shall be constructed of steel, cast iron or cast aluminum.
7. The handwheel shall conform to the applicable AWWA Standards.

2.2 TOOLS, SPARE PARTS AND MAINTENANCE MATERIALS

- A. For every four (4) installed actuators as shown on the drawings (if less than four (4) installed actuators provide a minimum of one each), furnish one each of the following spare parts.
 1. Control Power Transformer
 2. Heavy Duty Combination Reversing Magnetic Starter with Coil
 3. Sealed Mylar Film or Conductive Plastic Precision Slide Wire (Potentiometer) Position Transducer
- B. Spare parts shall be packed in sturdy containers with clear indelible identification markings and shall be stored in a dry, warm location until transferred to the OWNER at the completion of the project. Comply with the requirements of Section 01783, Spare Parts and Maintenance Materials.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install all electrically operated valve/gate actuators and appurtenances in accordance with the manufacturer's instructions and requirements outlined in Division 16, Electrical.

- B. Conform to appendices of AWWA Standards, where applicable.
- C. Install all actuators so that operating handwheels or levers can be conveniently turned from operating floor without interfering with access to other valves/gates and equipment, and as approved by the ENGINEER. Orient chain operators out of the way of the walking areas. Mount valves/gates actuators so that indicator arrows are visible from floor level.
- D. For motor-operated valves/gates located lower than five feet above the operating floor, orient the motor actuator to permit easy access to the pushbuttons and the handwheel.

3.2 FIELD TESTS AND ADJUSTMENTS

- A. Adjust all parts and components as required to provide correct operation of the valve/gate actuators.
- B. Conduct a functional field test on each valve/gate actuator in the presence of the ENGINEER to demonstrate that the motor and controls operate correctly.
- C. Test and adjust the 4 to 20 mADC output position signal, remote indication switch, position limit switches, torque switch, and other required operational controls from the actuator to all remote locations as stated in the Contract Documents. Complete the Valve/Gate Actuator Test form as Specified in Section 01331.
- D. Demonstrate satisfactory opening and closing of valves/gates at the specified criteria requiring not more than 80 pounds effort on the manual actuators.

3.3 ACTUATOR MANUFACTURER'S SERVICE

- A. Provide the services of qualified factory-trained service representative to check and approve the installation of all electrically operated valve/gate actuators.
- B. The factory trained service representative shall be provided for installation supervision, initial setting setup for torque, position signals and limit switches, start-up, testing services. The representative shall make a minimum of two (2) visits to the site to approve the completed installation and to perform start-up testing of the equipment. The representative shall coordinate each visit with the ENGINEER prior to arrival on the site. The representative shall test operate the system in the presence of the ENGINEER and verify that the equipment conforms to requirements. The representative shall revisit the job site as often as necessary until the installation and testing is entirely satisfactory.
- C. The factory trained service representative shall be provided for operation and maintenance personnel training services. The representative shall make a minimum of two (2) visits to the site to perform the services as described under Section 01821,

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Instruction of Operations and Maintenance Personnel. The representative shall coordinate each visit with the ENGINEER prior to arrival on the site.

- D. For the factory trained service representative, all costs, including travel, lodging, meals and incidentals, shall be considered as included in the bid price.
- E. Warranty: A. Manufacturer's standard 5-year warranty.

+ + END OF SECTION + +