SECTION 11280

KNIFE GATE VALVE AND HYDRAULIC ACTUATOR

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for a knife gate valve and actuator.

1.02 REFERENCES

A. Manufacturers Standardization Society (MSS):
    1. MSS SP-81, Stainless-Steel or Stainless-Steel-Lined, Knife Gate Valves with Flanged Ends

B. American Water Works Association (AWWA):
    1. ANSI/AWWA C520-14, Knife gate valves, sizes 2 in through 96 in.
    2. ANSI/AWWA C541, Hydraulic and Pneumatic Cylinder and Vane-Type Actuators for Valves and Slide Gates

C. American Society for Testing and Materials (ASTM):
    1. ASTM A179/179M-19, Seamless Cold-Drawn Low-Carbon Steel Heat-Exchanger and Condenser Tubes

1.03 SUBMITTALS

A. Shop Drawings and Product Data: Submit Shop Drawings, Catalog Cuts or other data for products furnished. Fabrication shall not begin until shop drawings and product data are approved by the Engineer.

PART 2 PRODUCTS

2.01 KNIFE GATE VALVE AND HYDRAULIC ACTUATOR

A. Knife gate valve and actuators shall be supplied by a single supplier, responsible for coordination and compatibility of the valve and actuator system. The scope of supply includes a 36-inch knife gate valve and actuator supplied as a complete assembly.

B. Knife Gate Valve and Hydraulic Actuator: Provide valve conforming to MSS SP-81 standard and AWWA C520. The valve shall be Pratt Figure 193 or Hilton H-261-B bonneted Knife Gate Valve supplied with RDC Controle hydraulic cylinder Model HP3000 or approved equal.

C. Design Requirements:
    1. Valve shall be of the bonneted knife gate valve type, rated for 150 PSI CWP. Flanges shall be drilled through to ASME B16.47/1996 Class 150, Series A for 36-inch valve. Flange raised face shall be machined using serrated- spiral or

serrated-concentric grooves with a 125-250 RMS finish. Valve bodies shall be cast or fabricated 316 stainless steel.

2. The valve shall have extended 316 SS cans and carbon steel flanges. The face-to-face dimensions shall be 30 inches for the 36-inch valve.
3. All exterior ferrous surfaces shall be sandblasted to SSPC-SP6 and painted with 4-6 mils DFT of Tnemec Model V69 Hi-Build Epoxoline II, two component- high solids polyamidoamine epoxy and high solids polyamidoamine epoxy or approved equivalent.
4. The valve bonnet shall be fabricated with 316 stainless steel liner, packing box and bonnet flange raised face. Bonnet flange and stiffeners shall be carbon steel. A gate wiper shall be used between the bonnet and the body flanges. The wiper material shall be UHMWPE.
5. Valve shall have 316 SS gate and integral stainless steel seat with an EPDM o-ring resilient seat for uni- directional drip tight shut-off. Gate shall be of design and thickness to withstand full 150 PSI rated pressure without permanent deflection to the gate. Gate shall have a rounded, beveled bottom. Seat and gate shall have a fully machined finish for tight one-way shutoff. Minimum of two gate wedges shall be provided to assist seating of the gate against the seat in the lower half of the valve body. At least two gate guides shall be provided in the upper half of the valve body.
6. The valve shall be supplied with the hydraulic cylinder. Nominal pressure rating is 3,000 PSI. The cylinder shall be suitable for permanent submersible service and use with the existing hydraulic pressure unit (1,500 psi). The piston rod shall be 17-4 SS. The tie rods shall be 17-4 SS. The cylinder shall incorporate a rod gland seal configuration against water intrusion. The cylinder shall include a full marine grade SSPC-PC6 preparation, base coat epoxy, with a secondary coating of urethane. The manufacturer's standard warranty shall be applicable for submersed applications.
7. Valve:
    a. Pratt/Mueller Co.
    b. DeZurik/Hilton
    c. Or Approved Equal
8. Actuator
    a. RDC Controle
    b. Or Approved Equal.
9. Fasteners/Hardware
    a. All nuts, bolts, rods, clips, embedments, etc. shall be 316 stainless steel.

2.02 SOURCE QUALITY CONTROL

A. Tests, Inspection:

1. The actuator/s shall be connected to the knife gate valve, where the actuator will be used to move the knife gate for required valve testing.
2. Before delivery to the site, the valve shall be hydrostatically pressure tested according to the requirements of AWWA C520-14. Per AWWA C520-14, every valve:
    a. Operate through a full cycle to ensure the proper functioning of parts

b. Hydrostatically shell test at 1.5 times rated pressure
c. Hydrostatically seat test on one side at full rated pressure to confirm there is no leakage across the seat.

3. Actuator proof of design shall be provided and in compliance with latest revision of ANSI/AWWA C541.
4. The supplier shall also send a technician to the installation site to oversee and commission the installation of the actuator. Start-up of these actuator shall not commence until the technician is on-site. Pricing for this actuator technician to be on-site for one full day max for each gate on this project shall be included in the proposal.
5. The chosen gate manufacturer shall disclose all thrust requirements to the actuator manufacturer for proper design and sizing of the actuator. The actuator shall be designed in accordance to these given values, applying safety factors, where applicable.

PART 3 EXECUTION

3.01 INSTALLATION

A. Installation sequence shall be approved by the Engineer prior to beginning work. Installation of the valve and actuator system will be completed without draining the pond. All hydraulic connections shall be made before submerging the valve system.

B. Valve assembly shall be attached to the existing concrete support with stainless steel fasteners.

3.02 FIELD QUALITY CONTROL

A. Perform field testing as required by the manufacturers.

END OF SECTION