

SECTION 15100

GATES

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Flap Gate - Division IV (Open Drain Construction) Only.
- B. Flap Gate - Division VI (Detention Area E) Only.
- C. Aluminum Stop Logs.
- D. Fabricated Slide Gate.
- E. Sluice Gate.

1.2 RELATED SECTIONS

- A. Section 02715 – Lateral Tile Drains.
- B. Section 03300 – Cast-in-Place Concrete.
- C. Section 16000 – Basic Electrical Requirements.

1.3 REFERENCES

- A. AWWA American Water Works Association.
- B. ASTM American Society for Testing Materials.

1.4 UNIT PRICE – MEASUREMENT AND PAYMENT

- A. Flap Gate – Division IV Only:
 - 1. Basis of Measurement: At the unit price bid for each as stated in the proposal.
 - 2. Basis of Payment: Includes material, labor, and equipment to install and connect flap gates as shown on the plans and specified by the manufacturer. Includes connections, fitting, caulking, and accessories specified by manufacturer for watertight connection.
- B. Flap Gate – Division VI Only:
 - 1. Basis of Measurement: Included in the unit price bid for Inlet Control Structure or other work items of the Project where indicated on plans and specifications.
 - 2. Basis of Payment: Includes labor, equipment, and material to install the flap gate system complete as indicated on the plans and specifications and directed by the manufacturer.
- C. Aluminum Stoplogs:
 - 1. Basis of Measurement: Included in the unit price bid for Water Level Control Structure, Wetland Control Structure, Inlet Control Structure, Diversion Chamber or other work items of the Project where indicated on plans and specifications.

2. Basis of Payment: Includes labor, equipment, and material to install the stoplog system complete as indicated on the plans and specifications and directed by the manufacturer.
- D. Fabricated Slide Gate:
1. Basis of Measurement: Included in the unit price bid for Inlet Control Structure or Outlet Control Structure/Pump Station or other work items of the Project where indicated on plans and specifications.
 2. Basis of Payment: Includes labor, equipment, and material to install the fabricated slide gate system, including gate operator, complete as indicated on the plans and specifications and directed by the manufacturer.
- E. Sluice Gate:
1. Basis of Measurement: Included in the unit price bid for Inlet Control Structure or other work items of the Project where indicated on plans and specifications.
 2. Basis of Payment: Includes labor, equipment, and material to install the sluice gate system complete as indicated on the plans and specifications and directed by the manufacturer.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300 - Submittals.
- B. Submit shop drawings and product data for all items to be installed and/or constructed within this Section.
- C. Submit manufacturer's instructions for all product data.
- D. Submit manufacturer's certificate, which shall show actual test values obtained for the physical properties as tested for compliance with the specifications, for all product data.
- E. Shop Drawings: Indicate dimensions, weights, placement of openings and holes, and methods of attachments and restraint.
- F. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
- G. Manufacturer's Certificate: Certify that valves and gates meet or exceed specified requirements.

1.6 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 01700 – Contract Closeout.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Section 01700 – Contract Closeout.
- B. Operation Data: Indicate frequency of exercising and greasing.
- C. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to Site under provisions of Section 01600 – Material and Equipment.
- B. Accept specialties on Site in original factory packaging. Inspect for damage.

1.9 SEQUENCING AND SCHEDULING

- A. Coordinate placement of Flap Gates – Division IV Only with Section 02715 – Lateral Tile Drains.
- B. Coordinate placement of embedded items with Section 3300-Cast-in-Place Concrete.
- C. Coordinate installation of gates with Division IX – Electrical and Section 16000- Basic Electrical Requirements.

2. PART 2 PRODUCTS

2.1 MATERIALS

- A. General Note:
 - 1. Gates shall open to allow a complete unrestricted opening in all structures.
 - 2. All materials and equipment provided under this section shall be fabricated, supplies, assembled, erected, and placed in proper operating condition in full conformity with the plans, specifications, engineering data, instructions and recommendations of the equipment manufacturer and Engineer.
 - 3. All materials and equipment provided under this section shall be supplied with all the necessary parts and accessories indicated on the plans, specified or otherwise required for a complete, properly operating installation, and shall be the latest standard product of a manufacturer regularly engaged in the production of specified product.
 - 4. Attaching bolts and anchor bolts are to be furnished by the manufacturer.
 - 5. Furnish operators, pedestals, stem guides, and wall brackets as specified hereinafter and as shown in the plans.
 - 6. Studs, nuts, assembly bolts, anchor bolts and stems shall be ASTM A-582-303 stainless steel, unless otherwise specified hereinafter.
 - 7. Gates and Stoplogs shall be furnished complete, including gates and stop logs, thimble, rubber gasket, mounting hardware and appurtenances as specified hereinafter, or shown on the plans.
 - 8. Engineer must approve shop drawings prior to installation.

2.2 FLAP GATE – DIVISION IV ONLY

- A. Shall be manufactured by a company specializing in gate fabrication. Shop drawings shall be provided to Engineer prior to installation.
- B. Materials:
 - 1. Frame and Cover: Aluminum Alloy 6061-T6.
 - 2. Hinge Link: Aluminum Alloy 6061-T6.
 - 3. Assembly Hardware: Stainless Steel Type 18-8.

- C. Construction:
1. Connection to C.M.P. shall be watertight.
 2. Flap Gate shall be designed to allow free outflow and prevent backflow.
 3. Frame shall be aluminum and allow for direct connection to corrugated metal pipe.
 4. Aluminum cover shall be attached to the frame to allow proper seating and full opening of the gate.
 5. Flap gates shall be designed so that when water is not flowing, they fall into a closed position.
 6. Built in stops shall be provided to prevent cover from rotating too far and becoming wedged open.
 7. A neoprene seal shall be provided to act as a seat for the flap gate.
 8. Linkage system shall be double pivoted.

2.3 FLAP GATE – DIVISION VI ONLY

- A. Manufacturer: Shall be Hydro Gate with a 12 inch diameter. Gate: Shall be Hydro Gate Model 50C.
- B. Materials: Cast iron flat back seat, cast iron or ductile iron cover, stainless steel seating faces, cast iron links, bronze bushings, and stainless steel fasteners.
- C. Mounting: Stainless steel anchor bolts.

2.4 ALUMINUM STOP LOGS

- A. Manufacturer: Shall be Series 97 Aluminum Stop Logs as manufactured by H. Fontaine Ltd.
- B. Performance: Stops logs shall be substantially watertight under the design head conditions. Leakage shall not exceed 0.1 US gallons per minute per foot of periphery for the rated seating head.
- C. General Design: Stop logs shall be constructed of aluminum and shall operate in a stainless steel frame. All hardware shall be stainless steel (ASTM F593 and F594 GR1 for type 304 and GR2 for type 316).
- D. Frame: The frame shall be made of stainless steel (ASTM A-240, Type 304L or 316L) channels. The frame shall be suitable for mounting on a concrete wall or embedding in a channel as shown on the Project plans.
- E. Logs: The logs shall consist of flat aluminum (B-209 Alloy 5083-H32) plate reinforced with formed plates or structural members to limit their deflection to 1/360 of the gate's span under the design head. Each end of the log shall have a UHMWPE (ASTM D-4020, ultra high molecular weight polyethylene) guide block to ensure proper alignment of the log, to reduce friction and to prevent metal-to-metal contact.
- F. Seals: Seals shall be made of EPDM (ASTM D-2000). The end seals shall be attached to the logs by means of a UHMWPE guide block. The bottom seal is attached to the log with a stainless steel retainer.

- G. Lifting Device: A stainless steel lifting device shall be supplied for each log width. The width of the lifting device shall be the same as the log channel. The lifting device shall be equipped with a device to allow releasing of the stop log from the operating floor. This device shall grab the log automatically when lowered into the guides.

2.5 FABRICATED SLIDE GATE:

- A. Manufacturer: Shall be Hydro Gate
- B. Materials: Aluminum frame and slide, stainless steel fasteners, polymer bearing bars in guide grooves, and rubber j-seals.
- C. Mounting: Stainless steel anchor bolts.
- D. Lift: Pedestal mounted electric actuator for 240 volt, 1 phase, 60 hertz power, local electrical station, and appurtenances per specifications, with 304 stainless steel non-rising stem.

2.6 SLUICE GATE:

- A. Manufacturer: Shall be Hydro Gate.
- B. Materials: Cast iron frame and slide, bronze seating faces and wedges, and stainless steel fasteners.
- C. Mounting: Stainless steel anchor bolts.
- D. Lift: Pedestal mounted electric actuator for 240 volt, 1 phase, 60 hertz power, local electrical station, and appurtenances per specifications, with 304 stainless steel non-rising stem.

2.7 GATE ACTUATOR:

- A. General Note:
 - 1. Designed with a safety factor of 5 for all torsion and shear stresses.
 - 2. Operate mechanism located and designed so that all parts subject to maintenance shall be easily accessible.
 - 3. Size manual operators so that a maximum of 80 pounds of rim force/pull is required for operation.
 - 4. The Engineer shall approve positions of operators.
 - 5. Gate shall be made to open when turned to the left or counterclockwise.
 - 6. Indicate on the operator, the direction of operation needed to open.
 - 7. Contractor to verify lift/thrust requirements based on each station and use correct IQS family member.
- B. Manufacturer: Shall be Rotork Controls, Inc IQS family.
- C. Actuator shall operate on 240VAC single phase, 60 Hz.
- D. Operator shall be equipped with a 4-20 mA feedback signal for position location and a 4-20 mA input for remote opening and closing control. Also alarm contacts for mechanical failure. Additional contacts shall be configured for: local control selected, thermostat tripped, actuator being operated by a side handwheel.

3. PART 3 EXECUTION

3.1 PREPARATION

- A. Coordinate installation of proposed work item with Engineer prior to delivering material to Site.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with the plans and Engineer approved shop drawings.
- C. Operate items of this section to verify alignment and operation of moving parts.

END OF SECTION