ITEM 604.51 10 - FURNISH AND INSTALL TIDEGATE

DESCRIPTION

Under this item, the Contractor shall furnish and install new tidegates in locations shown on the plans, in accordance with these specifications and as directed by the Engineer.

MATERIALS

The self-regulating tide gates shall be manufactured by Golden Harvest, Inc., Burlington WA; Waterman Industries, Lubbock, TX; or approved equal.

Materials shall meet the following requirements:

American Society for Testing and Materials (ASTM)
ASTM A 276. (2008a) Standard Specification for Stainless Steel Bars and Shapes
ASTM B 209M. (2007) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B 221M. (2008) Standard Specification for Extruded Bars, Rod, Wires, Shapes and Tubes
ASTM B 308. (2002) Standard Specifications for 6061-T6 Standard Structural Shapes
ASTM F 593-02. (2008) Standard Specification for Stainless Steel Bolts, Hexcap Screws and Studs
ASTM F 594. (2008) Standard Specification for Stainless Steel Nuts

CONSTRUCTION DETAILS

To allow flow through the culverts during normal tide cycles, all self-regulating tide gates flaps shall float on the surface of the rising and falling tide water. The tide gate flaps shall automatically close at the pre-determined high water level. All tide gates shall be provided with properly sized vacuum relief vents and bypass doors. During storm surge the tide gate shall remain closed until the storm recedes and resume normal tidal cycle at which point the tide gate shall automatically reopen to allow free passage of water.

The self-regulating tide gates should be manufactured such that, the high water closing elevation, within the feasible range, can be adjusted utilizing normal hand tools. Therefore, it shall be designed such that position floats and float support arms can be adjusted in the field. The tide gate shall be fabricated such that the operation mode can be switched to that of a standard flap-type gate, using regular hand tools.

The body of the self-regulating tide gate shall be fabricated from tubular segments of aluminum conforming to ASTM B 209 alloy 6061-T6, of rectangular cross-section, with external reinforcement as required.

The body of the tide gate shall include a mounting flange, and a neoprene or urethane rubber gasket with factory drilled holes.

The bottom interior segment of the tubular body shall be reinforced with a wear plate formed to match the bottom of the tubular body. The wear plate shall be permanently attached to the

interior main body of the tide gate structure. A neoprene molded door gasket shall be provided in the tide gate.

The lateral bypass doors shall be hinged to open outward from the body of the tide gate.

The high-water closure floats shall consist of a polyurethane foam ball float enclosed in linear low-density polyethylene or polyvinyl chloride outer casing.

The vacuum relief vent shall be fabricated from high density polyethylene tubing of circular cross-section, or aluminum conforming to ASTM B-209 alloy 6061-T6.

The tide gates shall be provided with stainless steel mounting bolts conforming to AISI 316.

Miscellaneous hardware shall conform to ASTM F593 316 SS, F-594 316 SS, or other approved materials suitable for use in brackish water.

The self-regulating tide gates shall be securely mounted as indicated on the drawings, using the mounting flange, flange gasket and mounting hardware provided by the tide gate manufacturer. The self-regulating tide gates shall be installed such that the invert of the self-regulating tide gate body matches the invert shown on the plans. The self-regulating tide gates shall be installed in compliance with the manufacturer's specifications.

The Contractor shall take special care to ensure that dissimilar metals of the tide gate, the mounting hardware and the concrete reinforcing rods are isolated.

The Contractor shall provide an authorized representative of the manufacturer on-site for the adjustment and fine-tune operation of the self-regulating tide gates. The tide gate manufacturer's representative shall certify that installation of the final gate is correct and in accordance with the manufacturer's requirements.

Testing:

Contractor shall make the following operation tests:
1. Tidegates shall be tested for leakage on all four sides.
2. Tidegates shall be tested to meet the differential pressure head requirements specified.
3. The gate leakage rate shall not exceed 0.38 liters per minute per 304 mm of seating perimeter.

If any leakage exceeds these requirements or if the tidegate does not meet the differential pressure head requirements during the guarantee period of the contract, the Contractor shall readjust, repair or replace the necessary parts and repeat the tests, all to the satisfaction of the Engineer and at the Contractor's expense.

The Contractor shall arrange a final tidegate performance test in the presence of the Engineer. For all tests and inspections performed in the field, the Contractor shall provide all tools and equipment necessary for safe entry into the confined space.

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Working Drawings:

Detailed working drawings and descriptions of all tidegates and all necessary accessories shall be furnished in conformance with the General Provisions of the Standard Specifications. 5 sets of drawings shall be submitted to the Engineer for approval 3 weeks prior to the start of manufacturing. Manufacturing can not start without the Engineer's written approval.

METHOD OF MEASUREMENT

This work shall be measured by the number of tidegates provided and installed in accordance with the plans, specifications and the direction of the Engineer.

BASIS OF PAYMENT

The unit price bid to furnish and install the tidegates shall include the cost of all labor, materials and equipment necessary to complete the work in accordance with the plans and specifications and as directed by the Engineer.