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SECTION _____
ALUMINUM FLAP GATES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to install and ready for operation aluminum flap gates as shown on the Contract Drawings and as specified herein.

1.02 SUBMITTALS

- A. Provide the following information to confirm compliance with the specification in addition to the submittal requirements specified in Section _____.
 - 1. Complete description of all materials including the material thickness of all structural components of the frame and flap.
 - 2. Installation drawings showing all details of construction, details required for installation, dimensions and anchor bolt locations.
 - 3. Maximum bending stress and deflection of the flap under the maximum design head (seating head).
 - 4. The location of the company headquarters and the location of the principle manufacturing facility. Provide the name of the company that manufactures the equipment if the supplier utilizes an outside source.

1.03 QUALITY ASSURANCE

- A. Qualifications
 - 1. All of the equipment specified under this Section shall be furnished by a single manufacturer with a minimum of 20 years experience designing and manufacturing water control gates.
 - 2. The specification is based on the Series 451 Aluminum Flap Gate as manufactured by Whipps, Inc. of Athol, Massachusetts.

PART 2 EQUIPMENT

2.01 GENERAL

- A. Gates shall be as specified herein and have the characteristics and dimensions shown on the Contract Drawings.
- B. Leakage shall not exceed 0.1 gpm/ft of wetted seal perimeter in seating head condition.
- C. The flap gate shall utilize a resilient seal around the perimeter of the opening.
- D. All structural components of the frame and flap shall be fabricated of aluminum having a minimum thickness of 1/4-inch and shall have adequate strength to prevent distortion during normal handling, during installation and while in service.

- E. All welds shall be performed by welders with AWS certification.
- F. Finish: Mill finish on aluminum. Welds shall be cleaned to remove weld burn and scale.
- G. Materials:

<u>Components</u>	<u>Materials</u>
Frame	6061-T6 Aluminum
Flap, Stiffeners and Hinge Arms	6061-T6 Aluminum
Hinge Pins	Stainless Steel, Type 304, ASTM A-240
Hinge Pin Bushings	UHMW or bronze
Anchor Studs, Fasteners and Nuts	Stainless Steel, Type 316, ASTM A276
Seal	Neoprene ASTM D-2000 or EPDM

2.02 FRAME

- A. The frame shall be constructed of extruded aluminum shapes or reinforced plate with a minimum thickness of 1/4-inch.
 - 1. Frame design shall be of the flanged back type suitable for mounting directly to a wall with stainless steel anchor bolts and grout or mounting to a pipe flange with stainless steel mounting studs and a mastic gasket material. Mounting style shall be as shown on the Contract Drawings.
 - 2. The angle of the flap when seated against the frame shall be between 2 degrees and 5 degrees from the vertical.
 - 3. Lifting lugs shall be provided on the top of the frame to facilitate installation.

2.03 HINGE ARMS

- A. Hinge arms shall be constructed of aluminum plate with a minimum thickness of 1/4-inch and shall connect the frame to the flap.
 - 1. Dual hinge arms shall be provided on all flap gates in excess of 18 inches wide.
 - 2. Flap gates in excess of 30 inches wide shall have two pivot joints per arm. An adjustable lower pivot with limited rotation and a fixed or adjustable upper hinge lug arrangement to permit adjustment of the opening sensitivity to unseating head.
 - 3. The hinge pins shall have a minimum diameter of 1-3/8 inch and shall be constructed of solid stainless steel rod.
 - 4. The hinge pin bushings shall be UHMW or bronze.

2.04 FLAP

- A. The flap and reinforcing stiffeners shall be constructed of aluminum plate with a minimum thickness of 1/4-inch.
 - 1. The flap shall not deflect more than 1/360 of the span under the maximum design head.
 - 2. Reinforcing stiffeners shall be welded to the flap.

2.05 SEALS

- A. All flap gates shall be provided with a seal system to restrict leakage in accordance with the requirements listed in this specification.
 - 1. A continuous resilient seal shall be mounted to the seating surface of the frame to restrict leakage.
 - 2. The seal system shall be durable and shall be designed to accommodate frequent operation without loosening or suffering damage.

3. All seals must be bolted or otherwise mechanically fastened to the frame. Arrangement with seals that are force fit and/or held in place with adhesives are unacceptable.
4. The seals shall be mounted so as not to obstruct the water way opening.

2.06 ANCHOR BOLTS

- A. Anchor bolts shall be provided by the flap gate manufacturer for mounting the gates when shown on the Contract Drawings.
 1. Quantity and location shall be determined by the gate manufacturer.
 2. If epoxy type anchor bolts are provided, the gate manufacturer shall provide the studs and nuts.
 3. Anchor bolts shall have a minimum diameter of 1/2-inch.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Installation of the gates and appurtenances shall be done in a workmanlike manner. It shall be the responsibility of the CONTRACTOR to handle, store and install the equipment specified in this Section in strict accordance with the manufacturer's recommendations.
- B. The CONTRACTOR shall review the installation drawings and installation instruction prior to installing the gates.
- C. The gate assemblies shall be installed in a true vertical plane, square and plumb.
- D. The CONTRACTOR shall fill the void in between the gate frame and the wall with non-shrink grout as shown on the installation drawing and in accordance with the manufacturer's recommendations.

3.02 FIELD TESTING

- A. After installation, all gates shall be field tested in the presence of the ENGINEER and OWNER to ensure that all items of equipment are in full compliance with this Section. Each gate shall be visually inspected to confirm that the flap seats against the frame properly.

END OF SECTION