Whipps, inc.

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SECTION _____
BUTTERFLY GATES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to install, ready for operation and field test stainless steel butterfly gates and appurtenances 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.
   2. Installation drawings showing all details of construction, details required for installation, dimensions and anchor bolt locations.
   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 Model 340 Stainless Steel Butterfly 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 0.05 gpm/ft of wetted seal perimeter in seating head and unseating head conditions.
C. The gate shall utilize resilient seals mounted on the frame or the door.
D. All structural components of the frame and door shall be fabricated of stainless steel 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 D1.6 certification.
F. Finish: Mill finish on stainless steel. Welds shall be sandblasted to remove weld burn and scale. All iron and steel components shall be properly prepared and shop coated with a primer.
G. Materials:

Components	Materials
Frame	Stainless Steel, Type 304L, ASTM A240
Door	Stainless Steel, Type 304L, ASTM A240
Shafts	Stainless Steel, Type 304, ASTM A276
Anchor Studs, Fasteners and Nuts	Stainless Steel, Type 316, ASTM A276
Seals	Neoprene ASTM D-2000 or EPDM
Pedestals and Wall Brackets	Stainless Steel, Type 304L, ASTM A240
Operator Housing	Cast iron or ductile iron

2.02 FRAME

A. The frame assembly including the side frames, invert member and yoke members, shall be constructed of formed stainless steel plate with a minimum thickness of 1/4-inch.
1. Frame design shall allow for embedded mounting, mounting directly to a wall with stainless steel anchor bolts and grout or mounting to a wall thimble with stainless steel mounting studs and a mastic gasket material. Mounting style shall be as shown on the Contract Drawings.
2. The yoke shall consist of two angles or channels and shall serve as a mounting surface for the base of the pedestal unless otherwise shown on the Contract Drawings.
3. A rigid stainless steel invert member shall be provided across the bottom of the opening. A rubber seal shall be mounted along the invert member.
4. The lower pivot bearing housing shall be an integral part of the invert member.
5. The adjustable bearing housing for the upper drive shaft shall be mounted to the yoke assembly and connect to the drive shaft.
6. The upper and lower bearings shall be self-lubricating, oil-impregnated sintered bronze.

2.03 DOOR

A. The door and door reinforcement shall be constructed of formed stainless steel plate. All structural components shall have a minimum thickness of 1/4-inch.
1. The door shall have no external reinforcement transverse to the flow.
2. The door shall be outfitted with an upper drive shaft and a lower pivot shaft. The shafts shall be welded to the door.
3. The shaft shall be constructed of solid stainless steel round bar for the entire length, the metal having a tensile strength of not less than 75,000 psi. The use of hollow pipe is not acceptable.
4. The shafts shall have a minimum diameter of 1-1/2 inches.
5. Shafts shall be designed to transmit the maximum operating torque with a safety factor a 2 based on the minimum yield strength of the shaft material.
6. Shafts of more than one section shall be joined by stainless steel or bronze couplings. The coupling shall be keyed and bolted to the shafts and shall be of greater strength than the shaft itself.

2.04 SEALS

A. All gates shall be provided with resilient seals along the wetted perimeter of the opening. The seal system shall restrict leakage in accordance with the requirements listed in this specification.

1. The seals shall be adjustable to ensure proper mating with the seating face.
2. The side seals shall be J-bulb or P-seals and shall be teflon-clad rubber.
3. The invert seal and top seal (when applicable) shall be rubber.
4. The seal system shall be durable and shall be designed to accommodate high velocities and frequent cycling without loosening or suffering damage.
5. All seals must be retained with stainless steel retainers and mechanically fastened.

2.07 WALL THIMBLES

A. Wall thimbles shall be provided when shown on the Contract Drawings.
   1. The wall thimble depth shall be equal to the thickness of the concrete wall in which the thimble is to be mounted.
   2. Wall thimbles shall be fabricated stainless steel construction of adequate section to withstand all operational and reasonable installation stresses.
   3. Wall thimbles shall be constructed of 1/4-inch minimum thickness stainless steel and the front face shall have a minimum thickness of 1/4–inch.
   4. The fabrication process shall ensure that the wall thimble is square and plumb and the front face is sufficiently flat to provide a proper mounting surface for the gate frame.
   5. A water stop shall be welded around the periphery of the thimble. Wall thimbles shall be designed to allow thorough and uniform concrete placement during installation. The water stop may be stitch welded.
   6. Studs and nuts shall be stainless steel.
   7. A suitable gasket or mastic shall be provided to seal between the gate frame and the wall thimble.

2.08 MANUAL OPERATORS

A. Unless otherwise shown on the Contract Drawings, the gate shall be operated by a pedestal mounted, quarter-turn worm gear operator.
   1. The gate manufacturer shall select the proper gear ratio to ensure that the butterfly gate can be operated with no more than a 40 lb effort when the gate is in the closed position and experiencing the maximum operating head.
   2. An arrow with the word "OPEN" shall be permanently attached or cast onto the operator to indicate the direction to open the gate.
   3. Crank-operated worm gears shall be fully enclosed and shall have a cast iron or ductile iron housing.
      a. Gearboxes shall be provided with a steel or bronze output sleeve to engage the drive shaft. The connection shall be a keyed connection.
      b. The worm shaft shall be supported by ball bearings.
      c. Worm shaft, gears and input shaft shall be steel.
      d. Positive mechanical seals shall be provided to exclude moisture and dirt and prevent leakage of lubricant out of the hoist.
      e. The removable crank shall be cast aluminum or cast iron with a revolving nylon or brass grip.
   4. Unless otherwise shown on the drawings, the operator pedestal should mount to the yoke of the frame.
      a. Pedestals shall be constructed of stainless steel. Aluminum pedestals are not acceptable.
      b. The pedestal height shall be such that the input shaft is located approximately 36-in above the operating floor.

2.09 ELECTRIC MOTOR ACTUATORS

A. See Section _____.

2.10 ANCHOR BOLTS

A. Anchor bolts shall be provided by the gate manufacturer for mounting the gates and appurtenances.
   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.
E. The CONTRACTOR shall add a mastic gasket between the gate frame and wall thimble (when applicable) 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 cycled to confirm that they operate without binding, scraping, or distorting. The effort to open and close manual operators shall be measured, and shall not exceed the maximum operating effort specified above. Electric motor actuators shall function smoothly and without interruption. Each gate shall be water tested by the CONTRACTOR, at the direction of the ENGINEER and OWNER, to confirm that leakage does not exceed the specified allowable leakage.

END OF SECTION