ALUMINUM SLIDE & WEIR GATE

Product Specifications

GENERAL

SUMMARY

The Contractor shall provide all labor, materials, equipment, and incidentals required to furnish and install slide gates, operating stems, and operating floor stands, complete and operational with all necessary accessories as shown on the Contract Drawings, as specified herein, or as required for complete operation.

The Contractor shall obtain all equipment specified in this Section from one manufacturer to ensure proper coordination and functionality. The manufacturer shall have responsibility for performance and compatibility of the entire system. This does in no way relieve the Contractor for ultimate responsibility under this Contract for equipment, coordination, installation, operation and guarantee.

The Contract Drawings are for the purpose of guidance and to show functional features and required external connections. They do not necessarily show all components necessary to accomplish the desired results nor do they necessarily show all components required to interface with the equipment. The Contractor shall provide all parts, equipment, and devices necessary to meet the functional requirements of the system.

REFERENCES

Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified:

1. American Water Works Association (AWWA)
2. American National Standards Institute (ANSI)
3. American Society for Testing and Materials (ASTM)

SYSTEM DESCRIPTION

DESIGN REQUIREMENTS

1. The slide gates shall be manufactured in accordance with the latest version of AWWA, and shall be constructed of aluminum.
2. Liberal safety factors will be used in the design of all equipment. Working stresses will not exceed the lower value of one third of the yield strength or one fifth of the ultimate strength of the material, whichever is less. The slide gates and appurtenances shall be designed for installation in the structures as shown on the plans.

SUBMITTALS

A. For approval: Submit the following shop drawings for approval:

   1. Manufacturer's information, specifications, and data showing dimensions, materials of construction, and weight of all major items of equipment.
   2. Installation diagrams showing location, arrangement, and size of all fasteners required for the equipment.
   3. Setting drawings, templates, and instructions for installation of frames, thimbles, etc.

For more information about Hydro Gate or to view our full line of water products, please visit www.hydrogate.com or call Hydro Gate customer service at 1.800.423.1323.

F 13716 1/19

4. Certification that all components were designed based upon the maximum seating and unseating heads described herein.

B. Upon completion of installation, submit a digital copy of the Operation and Maintenance Manual for this equipment. A final copy of this manual shall be approved by the Engineer prior to distribution and as a minimum shall contain the following:

1. Operational and maintenance manuals shall include all approved shop drawings associated with this Section, complete instructions for installation, and parts list for all components.

2. Include a list and frequency of specific maintenance activities.

PRODUCTS

MANUFACTURERS

Provide slide gates as manufactured by the following:

1. Us (Hydro Gate products).

2. Approved equal.

EQUIPMENT MATERIALS

A. All slide gates shown on the plans and listed in the specifications shall conform in all respects to the latest version of AWWA, with the noted changes and additions: Materials used in construction of slide gates and appurtenances will be best suited for the application and will conform to the following specifications:

1. Frame, Slide, Reinforcing Members and Self-contained Yoke (as required): Aluminum, ASTM B209, Alloy 6061, or ASTM B308, Alloy 6061.

2. Stems and retainer bars: Stainless Steel, ASTM A276, Type 304 or 316.

3. Seal clips: Stainless Steel, ASTM A240, Type 304 or 316.

4. Fasteners: Stainless Steel, ASTM F593/F594, Alloy Group 1 or 2 (Type 304 or 316).

5. Seals: Neoprene or EPDM, ASTM D2000, 60 Durometer.

6. Guide liner: Ultra High Molecular Weight (UHMW) Polymer, ASTM D4020.

7. Pedestals, Wall Brackets and Stem Guide Brackets: Cast Iron, ASTM A126, Class B or Stainless Steel, ASTM A276, Type 304 or 316.

8. Stem Guide Bushings: Silicon Bronze, ASTM B584, Alloy 873 or Ultra High Molecular Weight (UHMW) Polymer, ASTM D4020.

B. Gate frame shall be flat back, embedded or channel mount as shown in the “Gate Schedule.” Spigot-back frames are not acceptable. The frame shall be an integral unit of extrusions and structural shapes, rigidly assembled to form the waterway openings. Holes shall be provided for mounting on anchor bolts. The primary slot of the frame extrusion shall contain polymer guide liner retained in grooves, to prevent metal-to-metal contact between slide and frame.

C. Gate slide shall conform to the safety factors stated under “General”, but shall, in no case, be less than ¼ inch thick. Deflection under full head shall be limited to 1/720 of the span, or 1/16 inch, whichever is less. The stem connector clips or stem block pocket shall be welded to the slide.

D. Flush Bottom: Slide gates shall incorporate a flush-bottom seal that is attached to the bottom frame invert member. The seal shall be of the materials shown in “Materials of Construction.”

E. Seals: J-seals shall be provided as specified in the “Gate Schedule.” Seals shall be securely fastened to the frame with formed stainless steel retainers and shall be replaceable and adjustable without removing the gate from the installed position. The corners of the J-seals shall be vulcanized. For downward opening (weir) gates, with a top seal, a four sided J-seal shall be used to create a full perimeter seal to control heads above the opening.

F. Yoke: Self-contained gates shall be provided with a yoke designed to withstand the thrust of the operator. Yoke deflection shall not exceed 1/360 of the gate width or a maximum of ¼ inch, whichever is less at maximum operating load. The yoke head channels shall be welded to the gate frame. The channels shall be sufficiently spaced to allow removal of the gate slide.

G. The operating stem shall be of a size to safely withstand, without buckling or permanent distortion, the stresses induced by normal operating forces. In addition, the stem shall be designed to transmit in compression at least 2 times the rated output

of the floor stand or bench stand with a 40-pound effort on the crank or handwheel. The threaded portion of the stem will have cold rolled threads of the double lead Acme type. Stainless Steel couplings, threaded and keyed to the stems, will join stems of more than one section. All threaded and keyed couplings of the same size will be interchangeable. Manually operated, rising stem type gates will be provided with an adjustable stop collar on the stem to prevent over-opening of the gate.

H. Gates 48 inch and wider and having widths greater than twice their height shall be provided with two operators connected by a tandem shaft for simultaneous operation.

I. Stem guides will be split collar bronze type, mounted on cast iron brackets to allow for installation after the stem is placed. They will be adjustable in two directions and will be spaced at sufficient intervals to adequately support the stem. The inside diameter of the guide shall be 1/8 inch to ¼ inch larger than the outside diameter of the stem. Stem guide spacing will not exceed an L/r ratio of 200.

J. Manually operated lifts shall be handwheel or geared crank type as shown in the "Gate Schedule." Lifts shall operate the gate with a maximum pull of 40 lb on the handwheel or crank. Handwheel or crank shall be located approximately 36 in. above grating or walkway. All lifts shall have thrust bearings, bronze lift nuts, and a bronze stop nut to limit the downward travel of the stem and slide. All geared lifts shall have cast or ductile iron housings and cast or fabricated pedestals. All lifts shall be rising stem type if possible. Lifts shall be grease lubricated and regreasable through grease zerks. Oil bath lifts are not acceptable.

K. Motor operated lifts shall be a 460-V, 3-phase, 60-Hz motor with precision reduction gearing enclosed in weatherproof housing. The operator shall be designed to raise the gate at a rate of approximately 10 to 14 inches/min. Integral controls shall include a control power transformer, reversing controller, torque switches, limit switches, internal atmospheric controls to prevent condensation, open- stop-closed push-buttons, and gate position indicator. Where applicable, the controls shall also include a local-off remote selector switch. Motor reduction helical gear and pinion shall be of heat- treated alloy steel. Final reduction worm shall be of alloy steel and worm gear of machined, high- tensile strength bronze. All gearing shall be proportioned for 100% overload condition. Operator shall have a de-clutch lever and handwheel for manual operation.

L. A clear, polycarbonate plastic stem cover and indicator shall be provided on each slide gate operator. Stem indication shall be provided to denote gate level. A cast aluminum adaptor shall be used to mount the cover to the lift or operator. The covers shall be capped, vented, and of sufficient length to allow full travel of the gate.

FINISHES

A. The gate manufacturer shall be responsible for shop prime and finish painting of all gates and appurtenances supplied under this contract. All coatings shall conform to VOC Emission Regulations in effect at the manufacturing location and at the project site to allow touch up or recoating to be performed with the same products.

B. Submerged surfaces shall be cleaned to SSPC SP10, dry, and grease-free prior to painting in conformance with the paint manufacturer's instructions. Non-submerged surfaces shall be cleaned to SSPC SP6.

C. All aluminum surfaces in contact with concrete shall receive a protective coating.

D. All cast iron and steel accessories shall receive a primer and finished coat with a high-solids epoxy coat or approved equal for potable water use. Primer and finished coats shall be applied in the manufacturer's shop.

E. Where required by application, the coating shall be approved for contact with drinking water by the NSF, EPA, or other appropriate governing agencies. Number of coats, mil thickness, and surface preparation shall be in accordance with the paint manufacturer's recommendations for that application.

F. Coating for aluminum shall be Tnemec, Series 1, 1216 greenish gray color.

G. Coating for accessories shall be Ameron Amerlock 400, medium gray color.

SHOP TESTING

The completely assembled gate will be shop inspected for proper seating. Seals shall be adjusted to exclude a 0.004 inch thickness gauge between the seating surfaces. The slide gate shall be shop-operated from the fully open to the fully closed position to verify the assembly is workable.

EXECUTION

INSTALLATION

The slide gate equipment and appurtenances shall be installed in accordance with the Installation Manual furnished by the gate manufacturer. Extreme care should be used in handling, storage, and installation of this equipment to prevent damage or distortion of the equipment and to insure proper performance.

FIELD QUALITY CONTROL

Field testing shall be performed after installation of the equipment. The field testing shall demonstrate the following:

1. The equipment has been properly installed in accordance with manufacturer's instructions and recommendations.
2. The equipment has been installed in the specified location and orientation or as shown on the Contract Drawings.
3. The equipment has been aligned.
4. There are no mechanical defects in any of the parts.
5. The slide gates shall undergo a leakage test following installation. The leakage test shall be in accordance with the latest version of AWWA.

MUELLER