SECTION 11500 ROLLER GATES

Product Specifications

GENERAL

SUMMARY

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

B. Roller gates shall be provided at the following locations: (Insert Structure Number or Building Number)

C. 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.

D. The Contract Drawings are for 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 National Standards Institute (ANSI)
2. American Society for Testing and Materials (ASTM)
3. American Welding Society (AWS):
    i. D1.1 Structural Welding Code Steel
    ii. D1.6 Stainless steel

SYSTEM DESCRIPTION

DESIGN REQUIREMENTS

1. Liberal safety factors will be used in the design of all equipment. Working stresses will not exceed the lower value of, one half of the yield strength, or one fifth of the ultimate strength of the material per ASD design approach. The Roller gates and appurtenances shall be designed for installation in the structures as shown on the plans.
2. Roller gates without a stem or hydraulic lifting system to be installed under zero or balanced head conditions, unless otherwise specified.

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3. Roller gates shall be provided in accordance with the Schedule to be provided as outlined below:

Location	Tag	Operating Head (If Unbalanced)	Maximum Design Head	Mounting Configuration	Lift Type (Manual/Electric/Hydraulic) or Lifting Lugs	Other

SUBMITTALS

A. Submit the following 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 guides, etc.
4. Calculations justifying that all components were designed based upon the maximum heads described herein.

B. Upon completion of installation, submit three (3) digital copies 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

A. Provide roller gates as manufactured by the following:

1. Us (Hydro Gate products).
2. Prior-approved equal.

B. Roller Gate manufacturer shall have a minimum of 10 years' experience in the design and manufacture of this type of equipment.

EQUIPMENT MATERIALS

A. All roller gates shown on the plans and listed in the gate schedule shall conform in all respects to the project specifications and manufacturer's design standards. Materials used in construction of roller gates and appurtenances will be best suited for the application and will conform to the following specifications:

1. Hot-Rolled Steel (Flats, Structural Shapes, Plates): ASTM A36, A283, Grade C or D; or ASTM A306, Grade 60.
2. Stainless Steel (Structural, Plates, Flats): ASTM A167, ASTM A240 or ASTM A276, all Type 304L or 316L.
3. Fasteners: Stainless Steel, ASTM F593/F594, Alloy Group 1 or 2 (304 or 316).
4. Bushings: Bronze, self-lubricating (Lubron).
5. Ductile Iron Castings (Rollers): ASTM A536, Grade 80-55-06
6. Rail: A.S.C.E. standard crane rail, ASTM A36.
7. Side Seals: EPDM or Neoprene ASTM D2000, 60 Durometer.
8. Flush Bottom seal: EPDM or Neoprene, ASTM D2000, 60 Durometer, Type 304 or 316 retainer bar.

B. Leaf: The leaf shall be of horizontal and vertical structural reinforcing members and a smooth faceplate, and shall be assembled and securely welded to provide a flat, box-shaped gate leaf. The structural members shall be of the proper size, dimension, and placement to safely withstand the maximum unbalanced head designated in the "Gate Schedule". The faceplate shall be of sufficient thickness to safely withstand the maximum unbalanced head and shall be attached to structural members by welding. The leaf shall be designed to limit defection to L/360 for overflow-type gates and to a maximum 1/8 in. for breastwall-type gates at upper reinforcing members. The gate slide shall be fabricated in one piece unless shipping limitations require multiple sections. When multiple sections required, joints shall include a rubber gasket to minimize leakage.

   Cast rollers shall be spaced along the sides of the gate slide to carry equal portions of the hydraulic forces. Each roller shall be provided with a heavy, one-piece, self-lubricating bushing. (OPTIONAL): Rollers shall be furnished with eccentric shafts to provide for field adjustment.

C. Frame: Shop-fabricated slots shall be provided for attaching to the front of concrete or for embedding as shown on the contract drawings. The slot shall consist of structural or extruded shapes of the proper assembled dimension to provide a rubbing surface for the seals, design compression of the seals, and the housing area for the roller assemblies. The seal rubbing surface shall be a stainless steel flat attached to the inside of the roller slot. It shall be finished and polished after all other welding has been completed. The roller slot shall be of sufficient vertical height to provide for full opening of the gate plus 1 foot when the slide is full opened, or as otherwise indicated. The assembled slot shall be provided with a means for anchorage in the concrete or for attachment to the concrete forms. Frames shall be provided with lifting eye for installation.

D. Sill Plate: The bottom sill plate shall provide a smooth, level, and corrosion-resistant contact surface for the bottom seat for the full width of the invert of the gate. The sill plate shall be adjustable on anchor to permit leveling and alignment with the gate bottom. After the gate has been installed and the sill plate adjusted, it shall be grouted in place.

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. The corners of the J-seals shall be vulcanized. The bottom seal shall be a flat faced rubber hollow or solid shape. Seals and retainer flats shall be provided with holes to match those on the slide. Corners shall be vulcanized.

F. Gate 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 an aluminum stop nut to limit the downward travel of the stem and slide. All geared lifts shall have cast or ductile iron housings and pedestals. All lifts shall be rising stem type. Stem covers made of clear butyrate shall be furnished for all lifts. Lifts shall be grease lubricated and regreasable through grease zerks. Oil bath lifts are not acceptable.

FINISHES

A. All 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.

B. Carbon or structural steel: 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. All surfaces 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. 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. Coating shall be Ameron Amerlock 400, medium gray color.

C. Stainless Steel: Stainless steel components shall not be coated.

SHOP TESTING

The complete gate assembly will be shop inspected for proper tolerances as shown on the manufacturer's drawings.

EXECUTION

SHIPPING & INSTALLATION

A. Manufacturer shall provide guides with temporary bracing to maintain tolerances during shipping and installation.

B. The roller gate equipment and appurtenances shall be installed by the contractor in a workmanlike manner 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. Testing shall demonstrate the following:

A. The equipment has been properly installed in accordance with manufacturer's instructions and recommendations.

B. The equipment has been installed in the specified location and orientation or as shown on the Contract Drawings.

C. The equipment has been aligned.

D. There are no mechanical defects in any of the parts.

E. The roller gates shall undergo a leakage test following installation. The leakage test shall be performed at full head. Leakage shall not exceed 0.1 gallons per minute per foot of sealing perimeter for each individual leaf section.