



SPECIFICATION: ROLLER GATES

PART 1 GENERAL

This specification relates to the design, materials of construction, fabrication and furnishing of the roller gate with appurtenant seals, rails, sills, lifting stems, hoists and accessories required for complete and proper operation of the gate. The roller gate and hoist will be as manufactured by Rodney Hunt or approved equal. Manufacturers shall have a minimum of 10 years experience in the design and manufacture of equipment of this type and size. Manufacturer shall submit as a minimum a list of 10 projects with roller gate installations. The list shall include project name, contact, telephone number, years of service, size, and method of operation.

PART 2 MATERIALS

All component parts will be of the type of material shown and conform to the standards designated in this section.

Plate or Structural Steel: ASTM A36, A242, A516, A570, A992

Stainless Steel: ASTM A167 or A276, Type 302 or 304

Component Item	ASTM Standard
1. Gate Disc Skin Plate	Steel Plate
2. Gate Disc Frame Members	Structural Steel
3. Retainer Bars and Fasteners for Seals	Stainless Steel
4. Fasteners (Studs, Anchors and Assembly Bolts)	Stainless Steel
5. Contact Surfaces for Seals, Bottom Sill, J-Seals	Stainless Steel
6. Roller Assembly: a) Wheels b) Bearings c) Axle	Stainless steel type 17-4PH Composite, permanently lubricated Sleeve Type Stainless Steel Type 316
7. Roller Slots (Prefabricated) Rails	Structural Steel Hardened Stainless steel
8. Stems	Stainless Steel A276 type 316
9. Stem Couplings	Stainless steel A276, type 316
10. Stem Guides	Stainless steel A240, type 316, brackets B584 C86500 bronze guides



PART 3 DESIGN REQUIREMENTS

A. Gate Disc

The gate disc shall consist of a smooth skin plate with horizontal and vertical structural reinforcing members sized, spaced and connected to meet design criteria. All welding on carbon steel gate discs shall be continuously welded to form a box-like structure. The gate shall be designed to safely withstand the maximum unbalanced design head. The disc deflection shall not exceed 1/720 of the nominal gate width. A flat bar shall be welded to the outer periphery of the skin plate and machined to a true plane to provide a mounting surface for the gate seals. The axle mounting holes in the disc shall be machined after fabrication. Machining of the axle bores on each side of the disc will be done in a single setup so that the rollers will be parallel to the seal mounting surfaces. Eccentric axles to compensate for out of flat conditions will not be allowed.

B. Seals

Seals shall be of resilient EPDM or Neoprene rubber suitable for the installed environment. Seals shall be arranged such that hydrostatic pressure will energize the seal to force it into the seat facing on the frame. Seals shall be of the “J” bulb or center bulb type and shall be attached along the sides and top of the disc. Upper seal corners shall be one piece molded. Splices in seals are only allowed in a straight section of seal. The bottom seal shall seat against a stainless steel sill plate embedded in the concrete. The side seals and bottom seal shall be attached to the disc with stainless steel retainer bars and stainless steel fasteners.

C. Rollers/tracks

The rollers shall be spaced along the side of the gate disc to support approximately equal portions of the hydrostatic load. Roller running surface shall be machined to a 32 μ in finish and have a crowned profile to prevent edge loading of the wheels. Rollers and tracks shall be stainless steel of the same materials. Track hardness shall be 20 BHN to Maximum shear stress in the roller and track under the contact area shall not exceed 60% of the material ultimate tensile strength. The roller assemblies, complete with axles, shall be removable from the gate. The assembled rollers shall be aligned to within a 0.010” straightness tolerance along the rollers.

D. Side Rollers or Bumpers

Gates shall be equipped with side rollers or bumpers to ensure the gate rollers remain on tracks and seals are positioned on their frame facings

E. Roller Slots, Sill

Prefabricated structural steel roller slots shall be provided. These shall be to the proper dimensions including the location of the stainless steel rubbing surface and the mounting of the rail. The rail will be so located that proper compression of the seal will be obtained. These guides extend twice the height of the gate above the sill so that the gate disc will be fully contained when raised completely out of the flow. The stainless steel seal rubbing surface shall have a maximum roughness of 125 micro-inch rms. The bottom sill shall consist of structural steel member with stainless steel seating surface.

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F. Stems

Stems shall be Type 316 stainless steel. Stem threads shall be of the Acme type. Stems shall be designed to transmit in compression a minimum of 2 times the rated output of the hoist at 40 pounds effort on the crank or handwheel. The L/r ratio of the unsupported stem shall not exceed 200. Stem guides, where required to limit the unsupported stem length, shall be fabricated stainless steel brackets with split bronze bushings. The stem shall be connected to the disc by means of a stem connector threaded and keyed to the stem and captured in a nut pocket integral to the welded disc.

E. Stem Covers

Rising stem gates shall be provided with clear plastic stem covers to facilitate indication of gate position, permit inspection of the stem threads and to protect the stem from contamination. Vent holes shall be provided to prevent condensation.

G. Actuator

Benchstand hoists shall be sized to permit operation of the gate under the full operating load with a maximum effort of 40 pounds on the crank or handwheel. The hoist nut shall be manganese bronze conforming to ASTM B584 C86500. The hoist nut shall be supported on roller bearings. A lubrication fitting shall be provided for lubrication of the hoist bearings without disassembly of the hoist. Suitable seals shall be provided to prevent entry of foreign matter. The direction of handwheel or crank rotation to open the gate shall be clearly and permanently marked on the hoist.

H. Hardware

All necessary attaching bolts and anchor bolts will be stainless steel and will be furnished by the gate manufacturer.

PART 4 PAINTING

All exposed steel surfaces of the gate shall be blast cleaned to SSPC SP-10. Coating shall be applied by the gate manufacturer using a high solids, 2 part epoxy system. Only touch-up painting as required may be applied at field installation. The disc and frame shall be coated with a system suitable for immersion, and suitable for potable water use where required. Hoist equipment will be coated with the manufacturer's standard coating suitable for prolonged UV exposure and spray exposure.

PART 5 WELDING

All welding will be done in accordance with AWS D1.1/AWS D1.6.

PART 6 DOCUMENTATION

Drawings showing dimensions and essential details required to locate and install the gate, stem, lift and accessories shall be submitted for the engineer's approval. In addition, calculations shall be furnished in detail, including, but not limited to, structural sizing of disc, guide, yoke, wheel, axle and bushing members; maximum operating loads for hoist and stem sizing, verifying the manufacturer's design of the gate furnished.

Drawings and calculations shall be sealed by an engineer registered in the state where the gate will be manufactured.

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PART 7 INSTALLATION

The handling, storage and installation of all parts shall be done by the construction contractor in accordance with detailed technical installation procedures supplied by the manufacturer and approved by the engineer.