



**Rodney Hunt**  
*A GA Industries Company*  
Roller Gates

Roller

Gates



# Roller Gates



■ Emergency (Gravity) Closure

■ Wheels Reduce Operating Thrust

■ One Source: Design, Build, Actuate

■ Manual or Power Operation

## Roller Gates: ideal for larger openings

Roller gates are used to control flow and reduce operating loads -- usually through large openings or in high head applications.

### Design Features

The gate consists of a flat structural steel plate, reinforced with structural members.

Ductile iron or steel-flanged wheels are mounted on each side of the gate. The size and number of wheels depends on the size of the gate and the operating head.

The wheels operate on rails which are mounted in the guide slots on each side of the opening. These rails can be

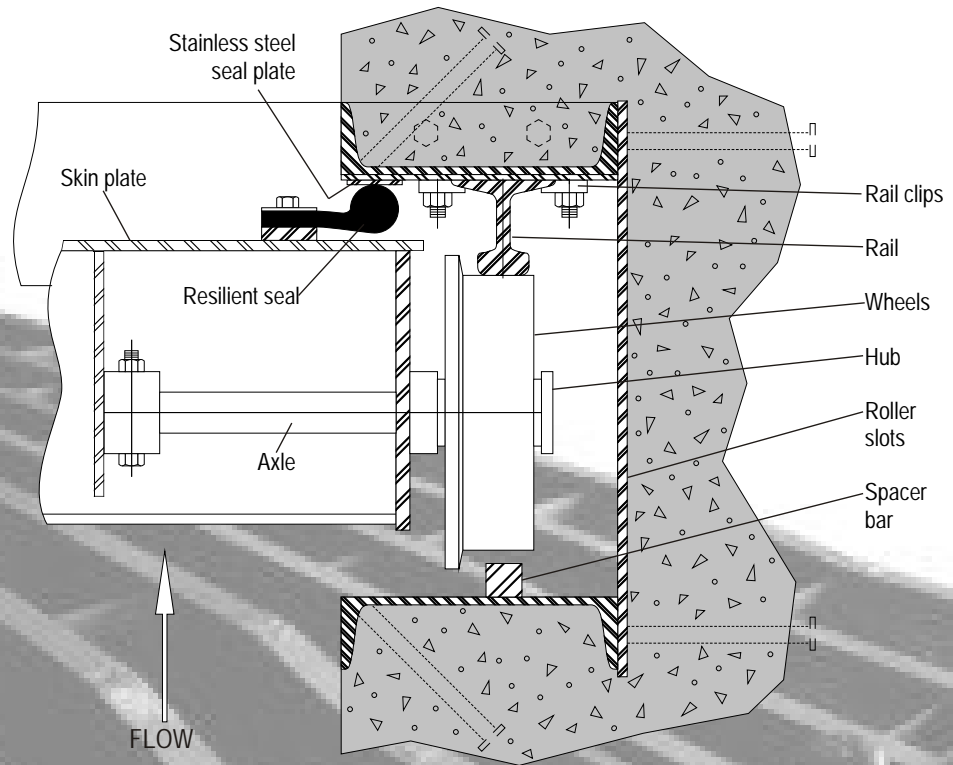
mounted in a concrete slot, or in a prefabricated guide provided by Rodney Hunt.

J-seals are attached across the top of the gate and on both vertical sides of the gate, with a conventional Rodney Hunt HY-Q seal along the invert for flush-bottom closure. The J-seals are attached with stainless steel strips and retaining bolts to provide a tight seal when the gate is in the closed position.

### Operation

The roller gate can be operated manually, with electric motor, cable drum hoist, or hydraulic cylinders. Operating stems are stainless steel, and depending on the width, dual interconnected actuators may be used.

*Cross-sections through roller and guide section of roller gate showing arrangement of the wheel and rails and the method of sealing.*



# Roller Gates Specifications



## 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 Company or approved equal. Manufacturers shall have a minimum of 10 years experience in the design and manufacture of equipment of this type. 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.

## 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, A441 or A588

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. Metal Contact Surfaces	
for Seals, Bottom Sill,	
J-Seals	Stainless Steel
6. Roller Assembly:	
a) Wheels	AISI 1045
Carbon Steel	
Forging	
b) Bearing	Bronze ASTM
B22/B271,	
C86300	
Self-lubricating,	
Sleeve Type	
c) Axle	Stainless Steel
A564, Type 630	
d) Hub	Stainless Steel
7. Roller Slots	
(Prefabricated)	Structural Steel
8. Rails	Standard
Crane Rail	
9. Stems	Stainless Steel
10. Stem Couplings	Bronze
B584-865	
11. Stem Guides	Cast Iron A126,
CL B Bronze	
Bushed	
12. Gear Boxes	Cast Iron
Housing	

## 3. DESIGN REQUIREMENTS

### A. Gate Disc

The gate disc shall consist of a smooth skin plate with horizontal and vertical structural reinforcing members and shall be continuously welded throughout to form a boxlike structure. The gate shall be designed to safely withstand the maximum unbalanced head as designated in the gate schedule without exceeding 15,000 psi tensile and 10,000 psi shear for all steel materials. For all other materials, the maximum allowable stress

will be 40% of the yield strength or 25% of the ultimate strength, whichever is smaller. The disc deflection shall not exceed 1/360 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. This seal support surface must be within a .03" overall flatness tolerance. The axle mounting holes in the disc shall be linebored after fabrication to be parallel to the seal support surface within a .045" parallelism tolerance. Eccentric axles will not be allowed. All steel gate components shall have a minimum thickness of 5/16".

### B. Seals

Side seals shall be of the "J" bulb type and shall be attached along the sides of the disc. The bottom seal shall be a resilient seal that will seat against a 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.

### G. Roller Assemblies

The rollers shall be spaced along the side of the gate disc to support equal portions of the hydrostatic load. The rollers shall have turned treads and be bored for proper bearing size. The roller axle bearings shall be permanently lubricated and designed for continuous submerged service. The roller loadings shall not exceed 900 times the roller diameter times the effective head width of the rail. The roller assemblies, complete with axles, shall be removable from the gate. In all cases, the rollers shall be aligned to within a .010" straightness tolerance along the rollers.

### D. 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. Standard lightweight steel rails will be used to guide the rollers on the gate disc as it moves. These rails shall be shop attached inside the roller slots on the upstream and downstream side of the gate using stainless steel fasteners. 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 can be raised completely out of the flow. The stainless steel seal rubbing surface shall have a maximum roughness of 125 microinch rms. The bottom sill shall consist of a wide flange with stainless steel seating surface.

### E. Stems

Stems shall be Type 304 stainless steel. Stem threads shall be of the machine cut 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 hand-wheel. The L/r ratio of the unsupported stem shall not exceed 200. Stem guides, where required to limit the unsupported stem length, shall be cast iron with bronze bushings. The stem shall be connected to the disc by means of a stem connector bolted to the stem and captured in a nut pocket welded to the disc. Gates having a width more than twice the height shall be operated by an interconnected stem and actuator. Where the actuator will be interconnected, it shall be by means of flexible coupling and stainless steel tubing.

### E. Stem Covers

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

### G. Actuator

The 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 hand-wheel. 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 hand-wheel 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.

## 4. PAINTING

The gate disc and all exposed steel surfaces shall be blasted to SSPC SP10.

### Hoisting Equipment

Prime: One (1) coat of Amerlock 400 at 5.0 mils thick

Finish: One (1) coat of Amercoat 450HS, color gray

### Immersed Equipment

Prime: One (1) coat of Amerlock 400 at 5.0 mils thick

Finish: One (1) coat of Amerlock 400 at 5.0 mils thick

## 5. WELDING

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

## 6. DRAWINGS

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; and corrosion and metallurgical data, verifying the manufacturer's design of the gate furnished.

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

## 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.