



Rodney Hunt
A ZURN Company
Slide Gates

Slide

Gates



Fabricated Slide Gates: Reliable, Low Maintenance Flow Control for a Variety of Applications

- Spillway Flow Control
- All Components Field Adjustable
- One Source: Design, Build, Actuate
- Open/Closed Channel Flow Control InChannel or EndofChannel Mounting
- Carbon Steel, Stainless Steel, Aluminum
- Embedded or WallMounted Frames
- 1 FlushBottom Closure, Resilient Seating
- Available for Downward-Opening (Weir Type) Applications
- Available in MultiLeaf Styles
- Seating or Unseating Heads to 20'
- Total Perimeter Sealing for Open and Closed Channel Applications
- Available in 304, 304L, 316, or 316L Stainless Steel for Corrosion Protection
- Manual, Electric, Hydraulic, and Side-Mounted Handwheel Actuators



Slide Gates: For Open and Closed Channel Flow Control

Rodney Hunt Company has been involved in the water power and control industry since 1840. We know your business; we know your challenges. For open and/or closed channel flow control, Rodney Hunt has a complete line of fabricated slide gates: carbon steel, stainless steel, aluminum from the most simple stop gate to the Series 600 (with wedging action).

Stop Gates

- Light duty open channel flow control
- Lightweight, easy to handle, extruded aluminum sections
- Embedded or surface mounted installation in-channel or end-of-channel
- Minimal leakage, not to exceed 0.1 GPM per foot of seating perimeter
- Stainless steel available

700 Series Slide Gates

- Self-contained or non-self-contained
- Embedded or surface mounted Installation---in-channel or end-of-channel
- 310 stainless steel for hostile environments
- Manual or power actuation

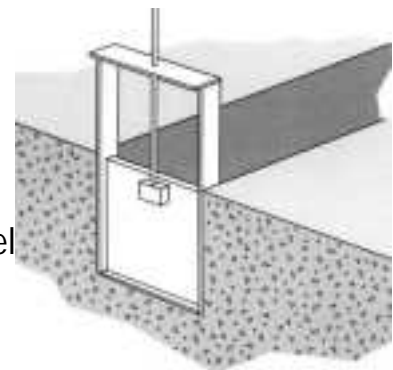
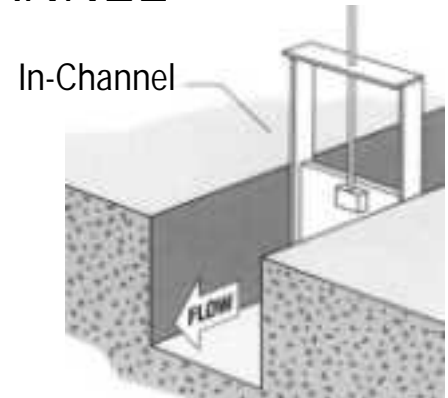
600 Series Slide Gates

- Stainless steel, for submerged openings
- HY-Q seal for flushbottom closure; resilient seal attached to disc
- Seals accessible without dewatering
- Heads to 20' seating or unseating
- Embedded or wall mounted designs
- 316 stainless steel for hostile environments, e.g. hydrogen sulfide exposure
- Adjustable pressure pads
- Minimal leakage, not to exceed 0.1 GPM per foot of seating perimeter; exceeds requirements of AWWA standards
- Manual or power actuation

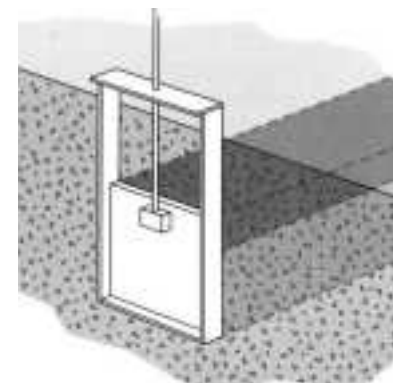
Slide Gate Variations

- Lower to open Weir Gates _ for decant or level control
- Self or Non-Self-Contained
- Available in aluminum or stainless steel
- Available with side or face-mounted actuation for accessibility
- Multiple leaf designs available for limited overhead clearance applications

OPEN CHANNEL



CLOSED CHANNEL



Submerged
or Aperture
Opening

Stop Gates



Aluminum

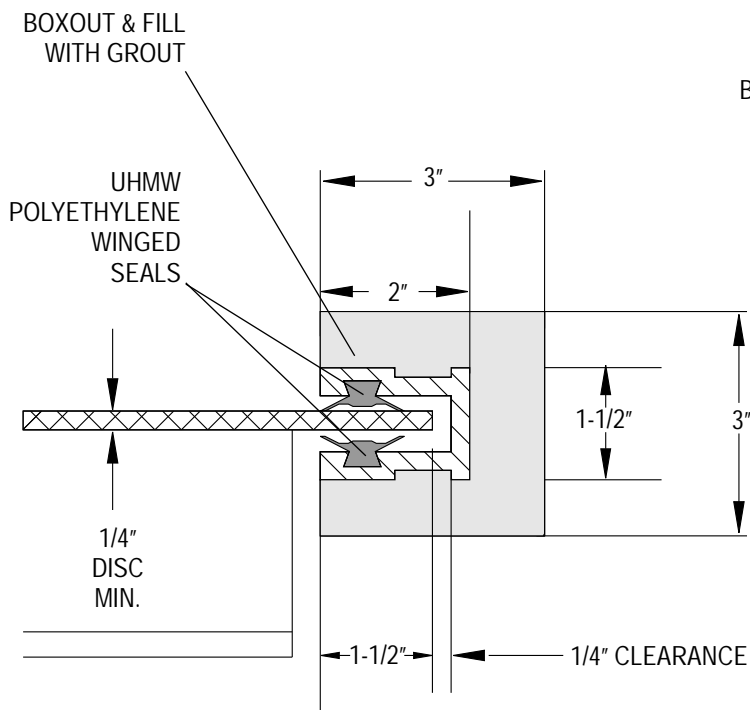
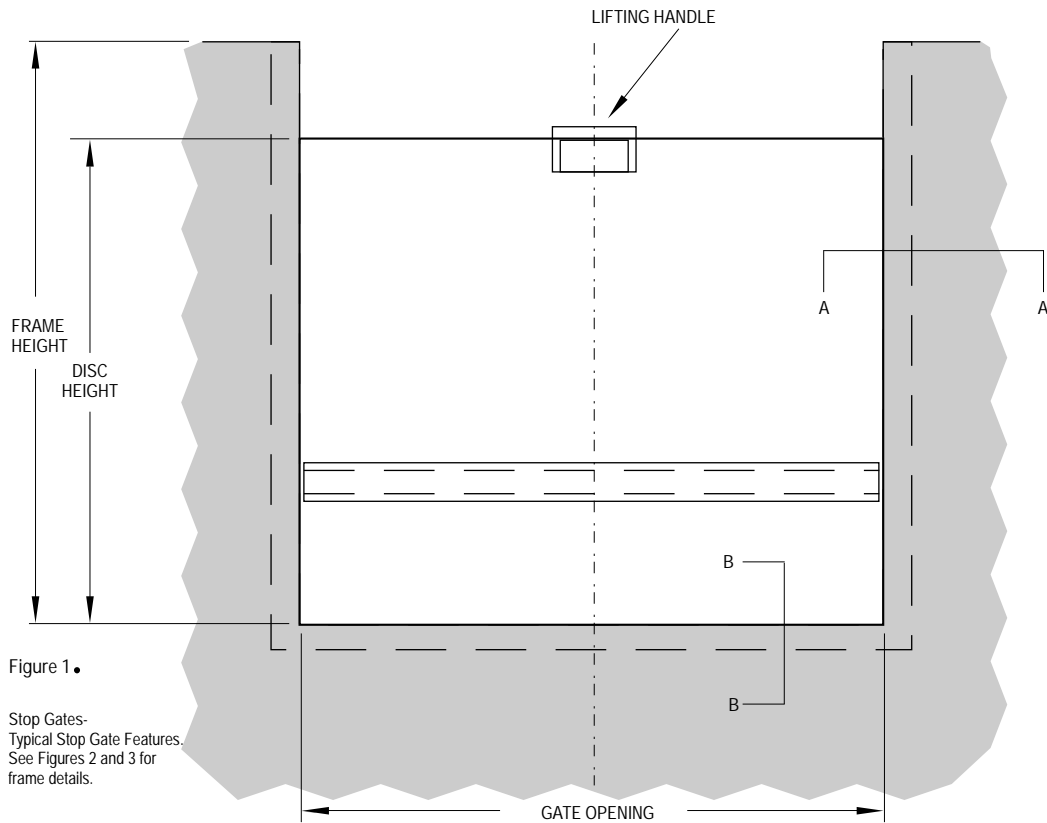


Figure 2. Section AA

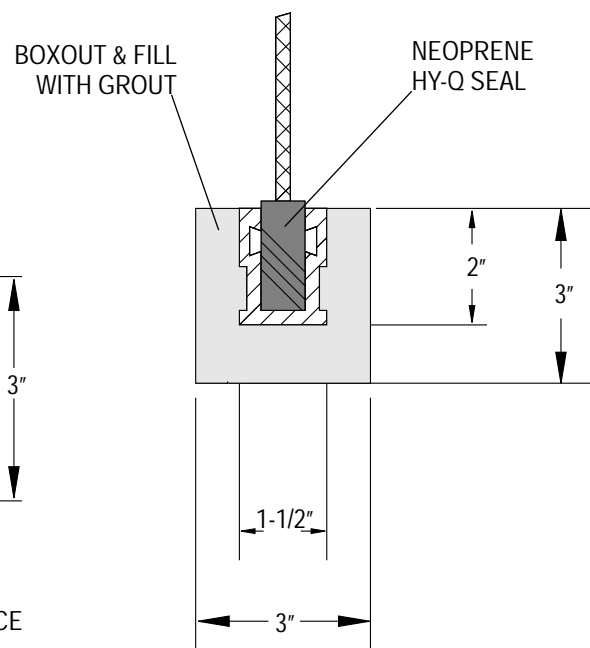


Figure 3. Section BB

700 Series Gates



Understanding 700 Series Notations
 Each digit of Rodney Hunt 700 Series gates designates the type of gate, frame and material used. Use these number designations to both understand the following drawings, and to specify the gate you need for your application.

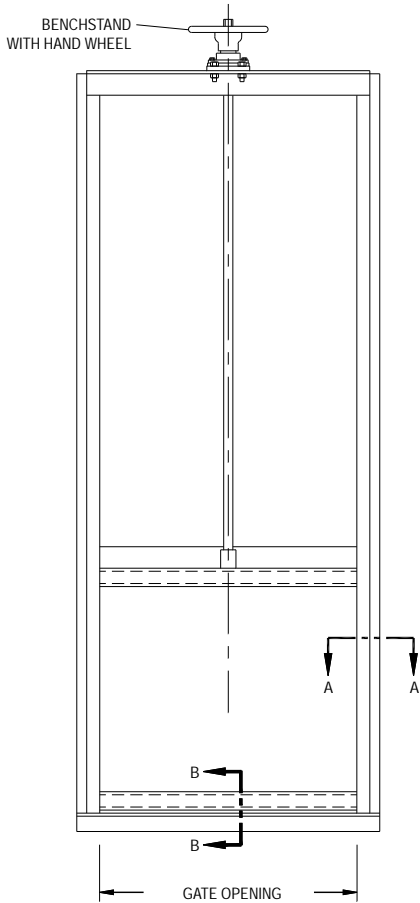
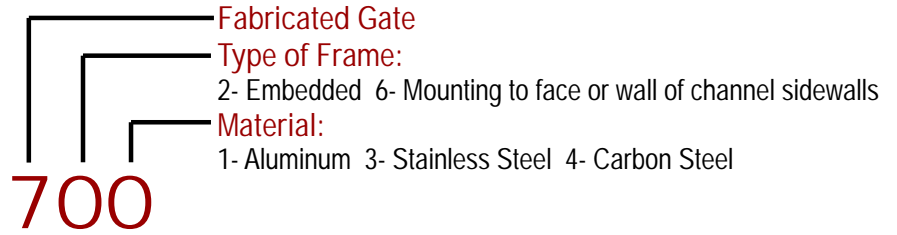


Figure 4. Series 700- Typical Gate Features. See Figures 5 through 22 for frame cross section details and seal variations.

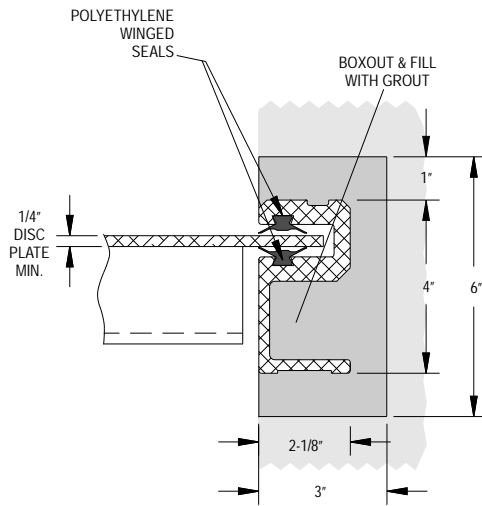


Figure 5. 721- Aluminum Embedded Frame for In-Channel Flow; Section AA

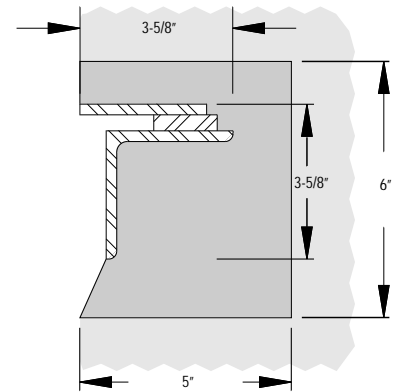


Figure 6. 723- Stainless Steel Embedded Frame for In-Channel Flow; Section AA
 *9" with J-Seal (See Figure 10)

Aperture or End-of-Channel Mounted

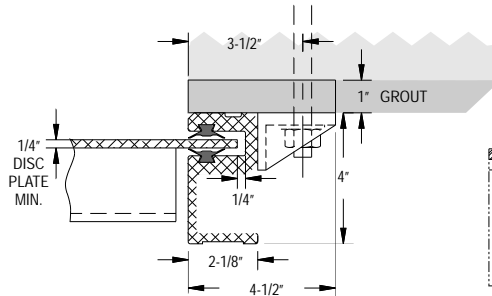


Figure 7. 761- Aluminum Flat Frame Mounting; Section AA

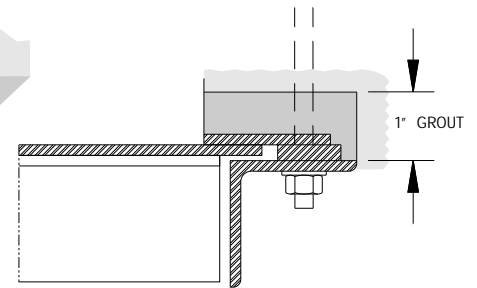


Figure 8. 763- Stainless Steel Flat Frame mounting; Section AA

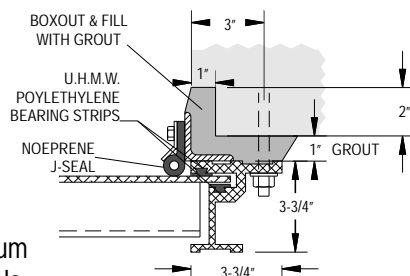


Figure 9. 761- Aluminum End-of-Channel Mounting with J-Seals; Section AA

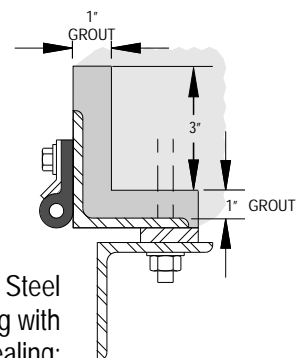


Figure 10. 763- Stainless Steel End-of-Channel Mounting with J-Seals, for Tight Sealing; Section AA

In-Channel Mounted

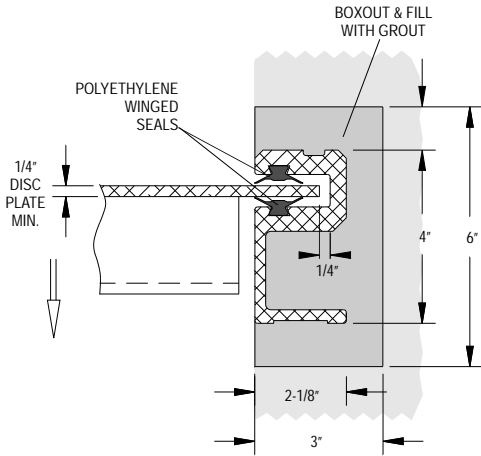


Figure 11. 721- Aluminum Embedded Frame; Section AA

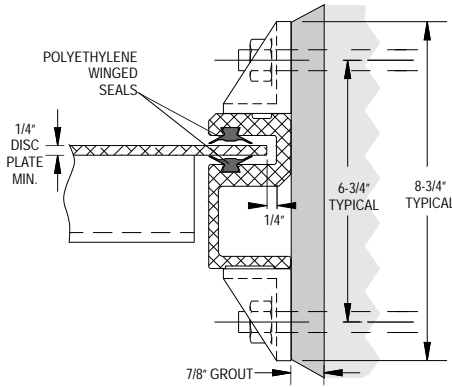


Figure 12. 761- Aluminum Flat Frame Mounting; Section AA

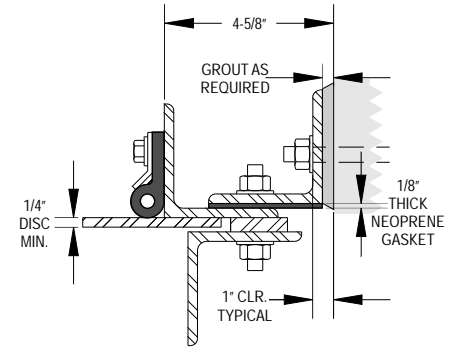


Figure 13. Series 763- Stainless Steel Surface Mounting; Section AA

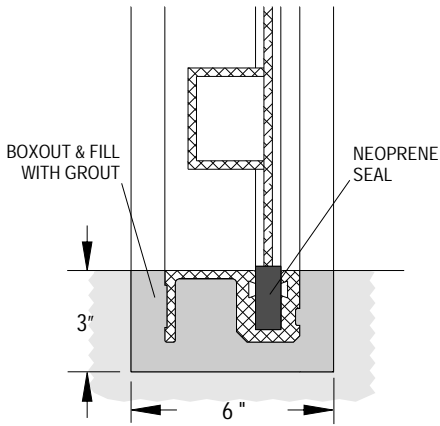


Figure 14. 721- Aluminum Embedded Frame; Section BB

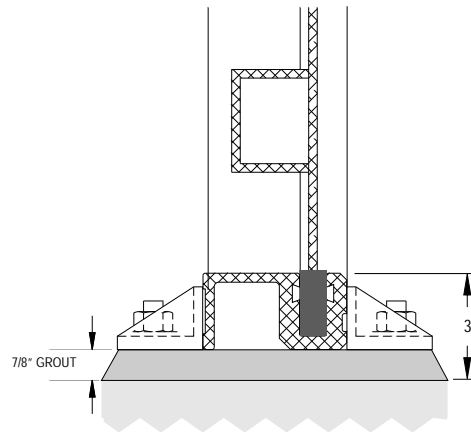


Figure 15. 761- Aluminum Flat Frame Mounting; Section BB

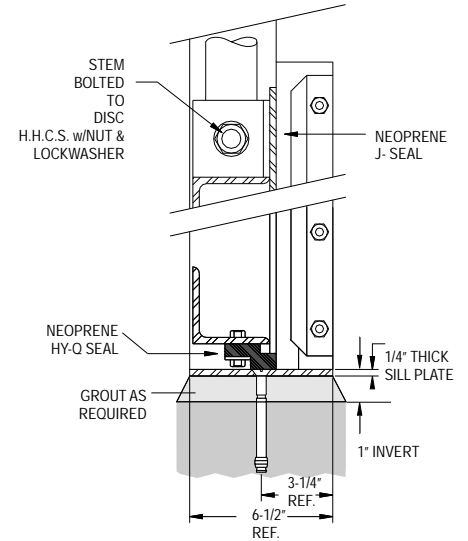


Figure 16. 763- Stainless Steel Surface Mounting; Section BB

Bottom Sealing

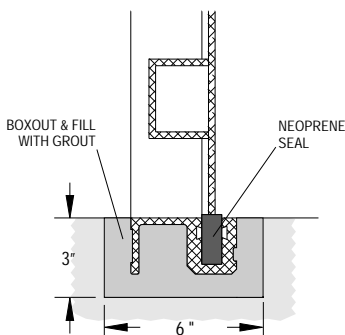


Figure 17. 721- Aluminum Embedded Frame In-Channel Mounting; Section BB

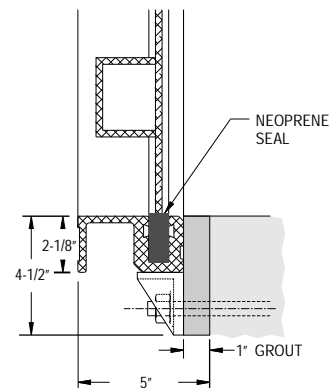


Figure 18. 761- Aluminum Flat Frame End-of-Channel Mounting; Section BB

HY-Q SEAL Flush bottom Closure

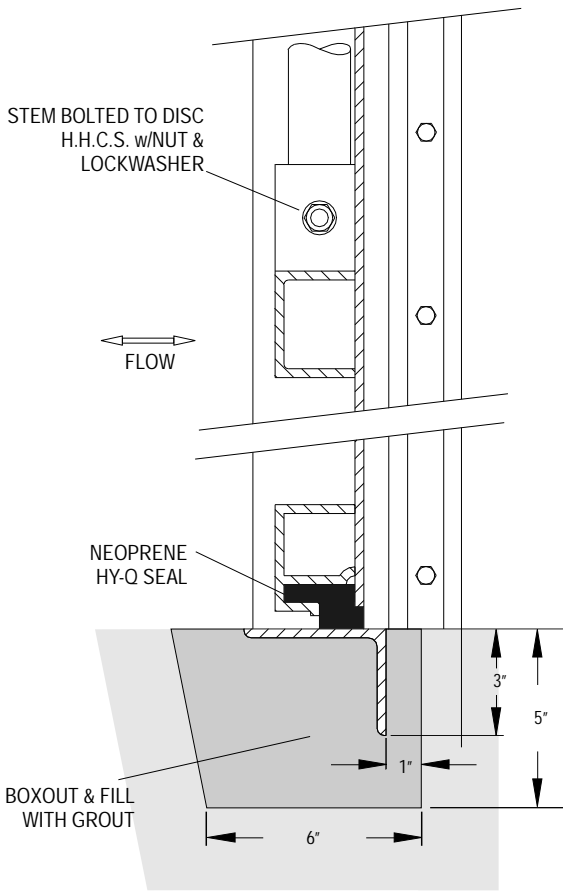


Figure 19. 721- Aluminum Embedded Frame In-Channel Mounting with HY-Q Seal; Section BB

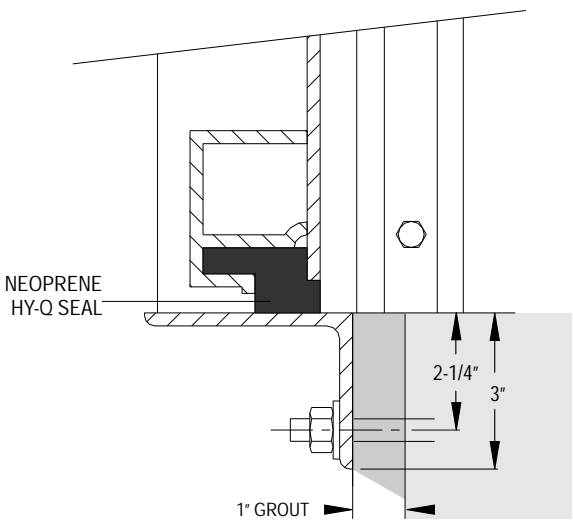


Figure 21. 761- Aluminum End-of-Channel Mounting with HY-Q Seal; Section BB

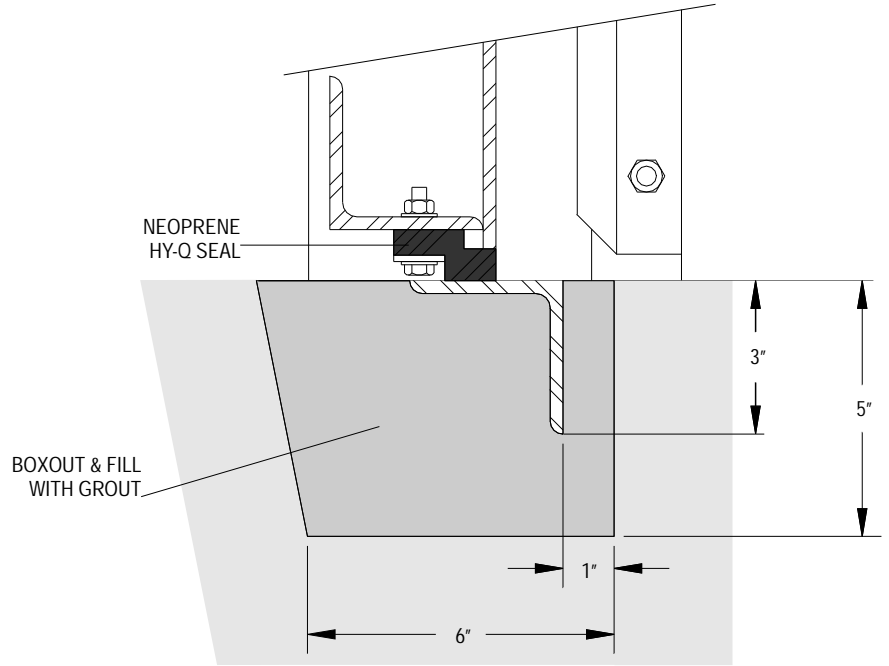


Figure 20. 723- Stainless Steel Embedded Frame In-Channel Mounting with HY-Q Seal; Section BB

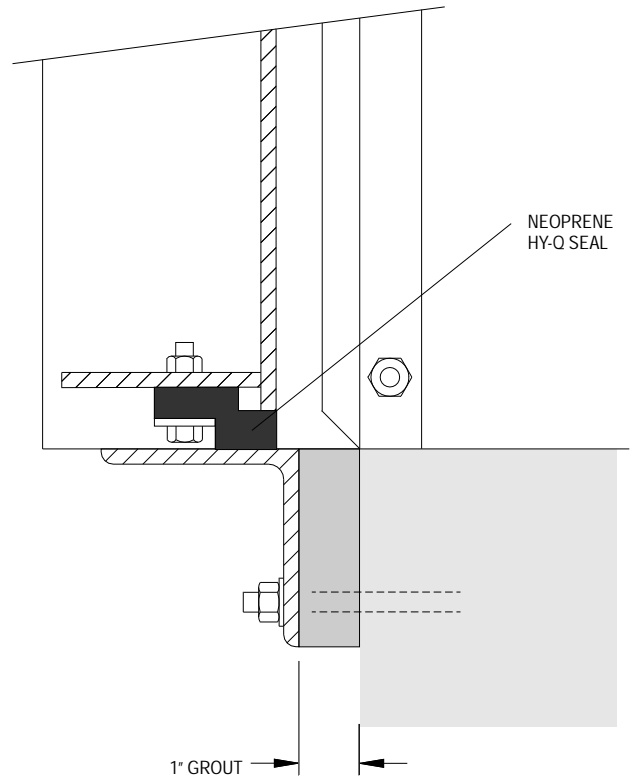


Figure 22. 763- Stainless Steel End-of-Channel Mounting with HY-Q Seal; Section BB

Figure 23. Series 600- Typical Gate Features.
See Figures 23 through 26 for frame cross section details and seal variations.

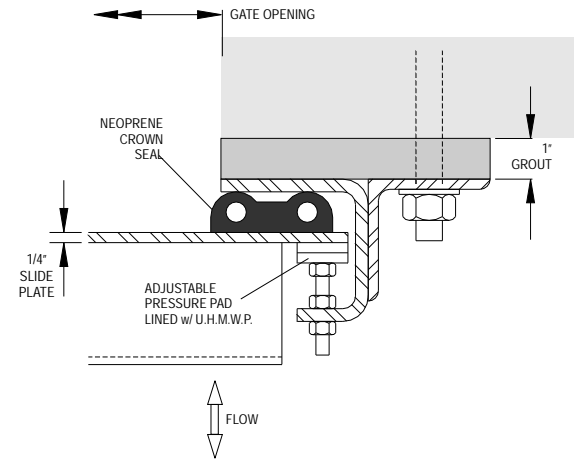
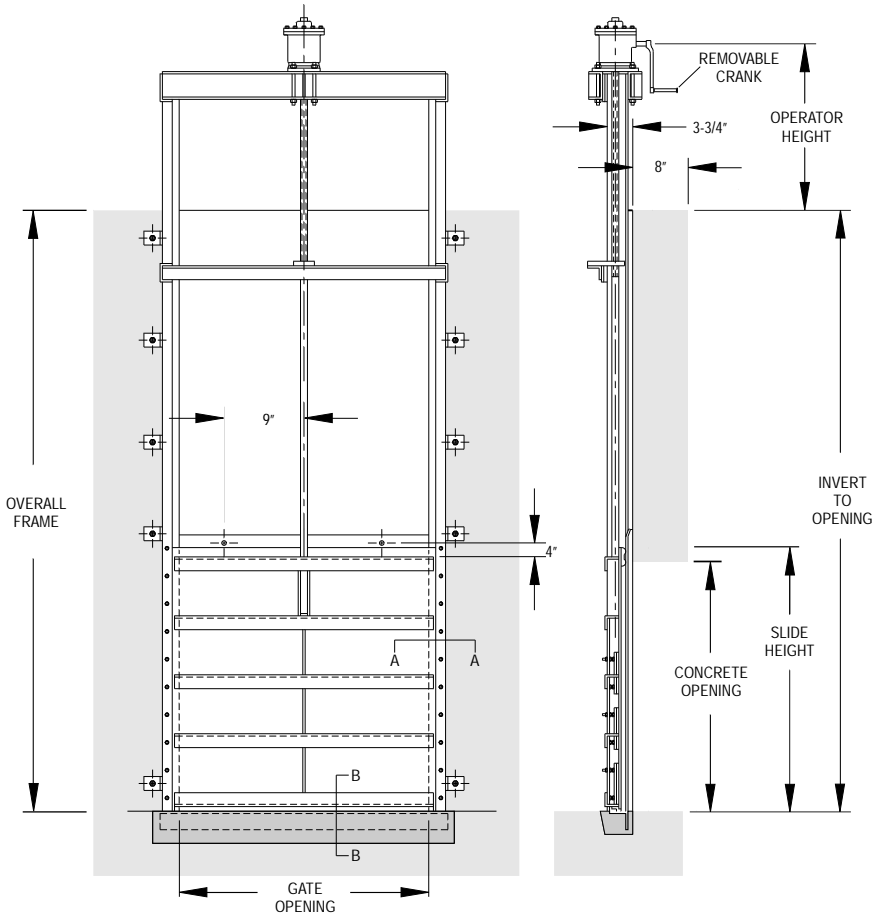


Figure 24. Series 663- Stainless Steel End-of-Channel Mounting with crown Seal; SectionAA

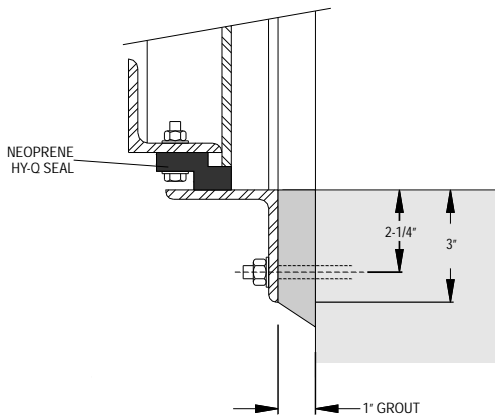


Figure 25. Series 623- Invert Seal, Stainless Steel Embedded Frame In-of-Channel Mounting with HY-Q Seal; SectionBB

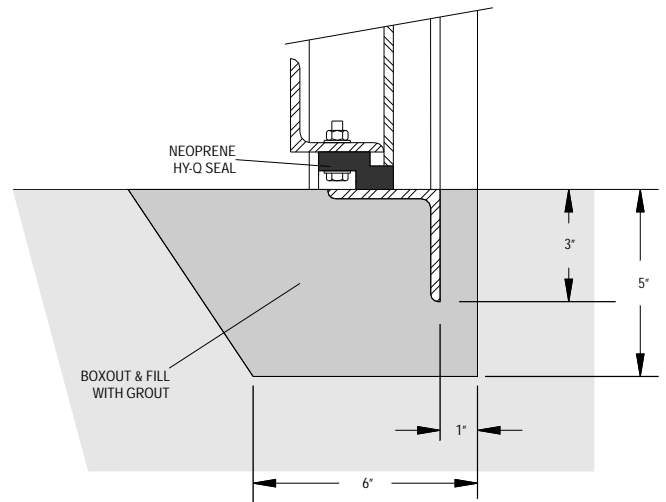
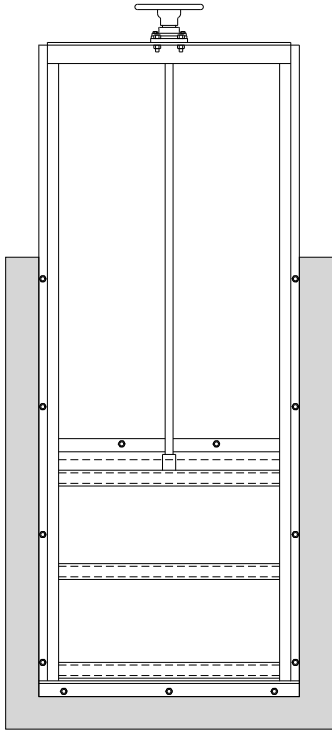
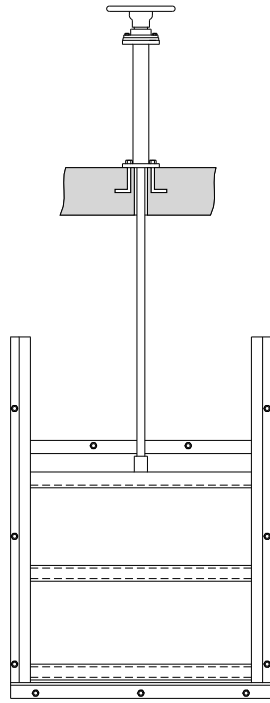


Figure 26. Series 663- Invert Seal, Stainless Steel End-of-Channel Mounting with HY-Q Seal; SectionBB

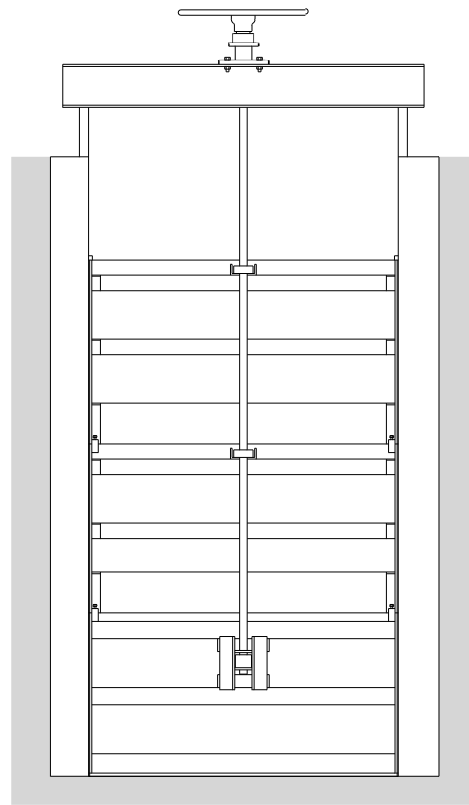
Slide Gate Variations



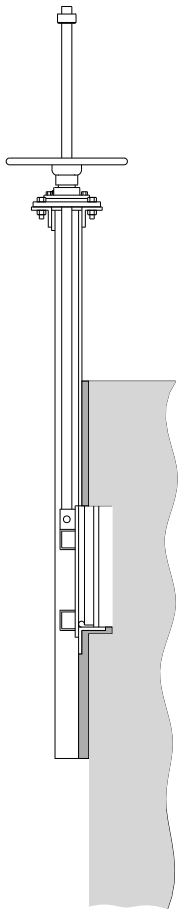
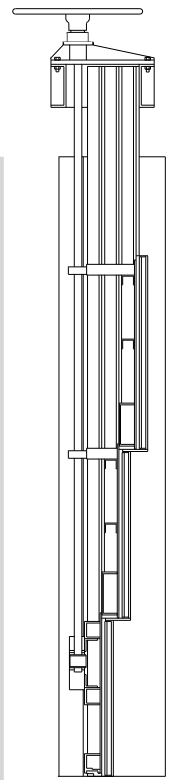
Self-Contained Gate



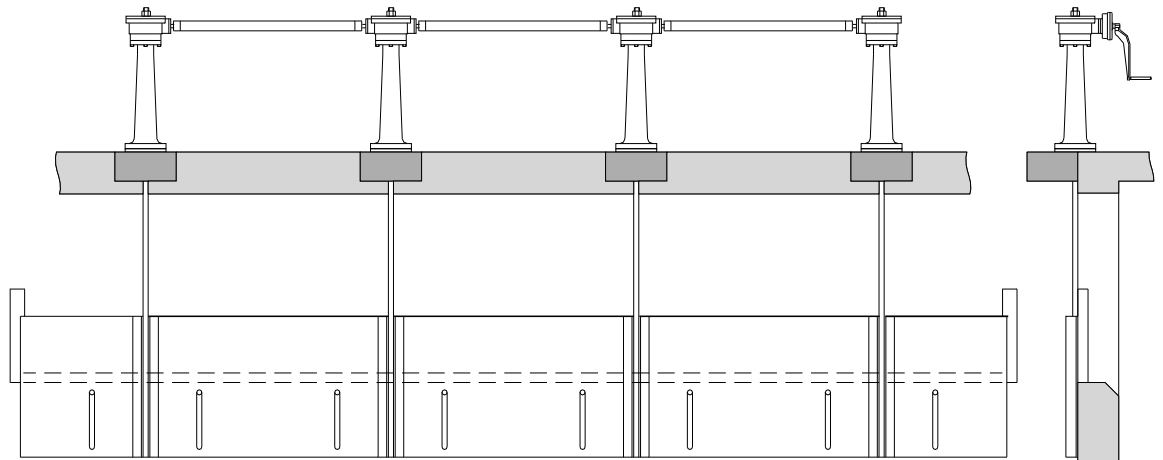
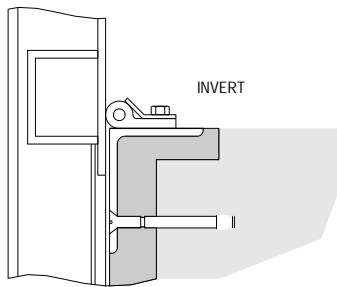
Non-Self-Contained Gate



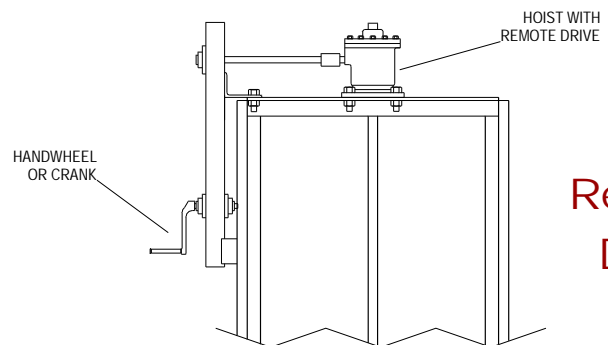
Multiple Leaf Gate



Weir Gate



Long Movable Weir



Remote Drive

Fabricated Slide Gates Sample Specifications

1. GENERAL

This specification defines the design, materials of construction, fabrication, testing and supply of Fabricated Slide Gates as shown on the plans and specifications. The gates shall be either self-contained or the non self-contained type with the guides designed to mount on the face of the concrete wall or embedded in the channel wall. The fabricated slide gates shall be as manufactured by Rodney Hunt Company, or approved equal. The gates shall be designed and sealed by a professional engineer registered in the state where the gates will be designed and manufactured. Manufacturers shall have a minimum of five years experience in the design and manufacture of equipment of this type.

2. ALUMINUM STOP GATES

A. Discs

The disc shall be of aluminum plate ASTM B209 6061-T6 reinforced with structural aluminum shapes or extrusions welded to the plate. The disc shall not deflect more than 1/360th of the span of the gate under the design head. The disc shall be equipped with handles for use in raising and lowering. Handles will be aluminum castings which shall be welded to the disc. No hand holes through the plate will be allowed. For gates wider than 36" two handles will be provided.

B. Guides

The guides and inverts shall be of extruded aluminum ASTM B221 6061-T6. The guides shall be designed for maximum rigidity and shall have a weight of not less than 1.5 lbs. per linear foot. The guides shall be designed to embed in or mount to the face of the concrete and shall be provided with keyways to lock them into the concrete. The invert of the frame shall be welded to the lower ends of the guides. The guides will incorporate an ultrahigh molecular weight double winged polymer strip on both the upstream and downstream side of the disc. The polymer strips will be held in dovetailed grooves.

C. Seals

Specially extruded resilient seals shall be mounted on the frame to provide flush-bottom closure. With head to the top of the disc, leakage shall not exceed 0.1 gallons per minute per foot of seating perimeter.

D. Fasteners

All necessary attaching bolts and anchor bolts shall be stainless steel ASTM A276 Type 304 and shall be furnished by the stop gate manufacturer.

3. ALUMINUM SLIDE GATES

A. Discs

The disc or sliding member shall be of aluminum plate ASTM B221 6061-T6 and will be reinforced with U-shaped aluminum extrusions welded to the plate. The disc will be designed to limit deflection of the gate to 1/360th of its span under the design head. The working design stresses shall not exceed the lesser of 40% of the yield strength or 25% of the ultimate strength of the material. All disc components shall have a minimum material thickness of 1/4".

B. Guides

The guides and inverts shall be of extruded aluminum ASTM B221 6061-T6. The guides shall be designed for maximum rigidity and shall have a weight of not less than 3.0 lbs. per linear foot. The guides shall be designed to embed in or mount to the face of the concrete and shall be provided with keyways to lock them into the concrete. The invert of

the frame shall be welded to the lower ends of the guides. The guides will incorporate an ultrahigh molecular weight double-winged polymer strip on both the upstream and downstream side of the disc. The polymer strips will be held in dovetailed grooves. The guides shall be designed for maximum rigidity and will be provided with keyways to lock it into the concrete. The invert of the frame will be an aluminum extrusion welded to the lower ends of the guides to form a seating surface for the resilient seal. Where the guides extend above the operating floor, they shall be sufficiently strong so that no further reinforcing will be required. On the self-contained gates, the yoke to support the operating benchstand will be formed by two angles or channels welded at the top of the guides to form a one-piece rigid frame. The design of the yoke will be such to limit its deflection to 1/360th of its span under full operating load.

C. Seals

A specially extruded resilient neoprene seal will be mounted on the bottom of the disc or installed into the invert member to provide flush-bottom closure. The shape of the seal will produce a seating surface having a minimum width of 3/4" and the seal will extend into the secondary slot of the vertical guide. The vertical face of the seal will be in contact with the seating surface of the guide to provide a proper seal at the corners.

i. Under a design seating head of less than 20 ft. (measured from gate invert) the leakage shall not exceed 0.1 gallons per minute per foot of seating perimeter.

ii. Under a design unseating head of less than 10 ft. (measured from gate invert) the leakage shall not exceed 0.2 gallons per minute per foot of seating perimeter.

E. Stems

Stems shall be ASTM A276 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 two times the rated output of the hoist at 40 lbs. 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 have polymer or bronze bushings. The stems shall be connected to the disc by means of a cast aluminum stem connector bolted to the stem and welded to the disc.

F. Stem Covers

Rising stem gates shall be provided with clear polycarbonate stem covers (ASTM D3935/D707) to provide visual 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

The hoist shall be sized to permit operation of the gate under the full operating load with a maximum effort of 40 lbs. on the crank or hand wheel. The hoist nut shall be manganese bronze, conforming to ASTM 8584 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 pre-

vent entry of foreign matter. The direction of handwheel or crank rotation to open the gate shall be clearly and permanently marked on the hoist. Where the actuators are to be interconnected it shall be by means of a flexible coupling and stainless steel tubing.

H. Fasteners

All necessary attaching bolts, studs, and anchors will be ASTM A276 Type 304 stainless steel and will be furnished by the slide gate manufacturer.

4. STAINLESS STEEL SLIDE GATES

A. Disc

The gate disc shall consist of a flat plate reinforced with structural or formed members welded to the plate. The disc plate and structural or formed members shall be ASTM A276 Type 304 stainless steel. The disc is to be designed to limit deflection of the gate to 1/360th of its span. The working design stresses shall not exceed the lesser of 40% of the yield strength or 25% of the ultimate strength of the material. All disc components shall have a minimum material thickness of 1/4".

B. Frame

The gate frame shall consist of guides, invert member and, if self-contained, an operator yoke welded or bolted together to form a rigid one piece frame. The guides shall be of a sandwiched type construction built of plates, angles and formed shapes. The guide slot shall engage the disc plate a minimum of 1". The invert members shall be of an angle, channel or formed shaped welded to the bottom of the guide to form a flush surface and to meet with the disc seal. For self-contained gates the yoke member shall be designed for the maximum output of the gate hoist. Yoke members to be designed to limit the deflection to 1/360th of its span. The working stresses shall not exceed the lesser of 40% of the yield strength or 25% of the ultimate strength of the material and shall be arranged to permit removing the disc from the frame.

C. Seals

A specially molded resilient seal (neoprene) will be mounted on the bottom of the disc to provide flushbottom closure. The shape of the seal produces a seating surface having a minimum width of 3/4". The vertical face of the seal will be in contact with the seating of the guide to provide a proper seal at the corners. J-type seals (rubber ASTM D2000, Grade 2BC615) shall be attached to the frame to restrict leakage to the following limits.

i. Under a design seating head of less than 20 ft., measured from the gate invert, leakage shall not exceed 0.1 gallons per minute per foot of seating perimeter.

ii. Under a design unseating head of less than 10 ft., measured from the gate invert, leakage shall not exceed 0.2 gallons per minute per foot of seating perimeter.

D. Stems

Stems shall be ASTM A276 Type 304 stainless steel. Stem threads shall be of the cut Acme type. Stems shall be designed to transmit in compression a minimum of two times the rated output of the hoist at 40 lbs. 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 polymer or bronze bushed.

E. Stem Covers

Rising stem gates shall be provided with clear polycarbonate stem covers (ASTM D3935 D707) to provide visual 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.

F. Actuator

The benchstand or floorstand hoist shall be sized to permit operation of the gate under the full operating head with a maximum effort of 40 lbs. 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. The lubrication fittings shall be provided for lubrication of 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. Where the actuators are to be interconnected it shall be by means of a flexible coupling and stainless steel tubing.

5. SERIES 600 SLIDE GATES

A. Design

All components of the gate shall be designed to withstand the maximum head indicated on the plans and in the gate schedule in the seating and unseating directions and the maximum output of the hoist. The design stresses shall not exceed the lesser of 40% of the yield strength or 25% of the ultimate strength of the materials for maximum load conditions. The minimum thickness of the disc plate, its reinforcing members and all structural components of the guide and frame shall be 1/4".

B. Disc

The disc shall consist of a flat plate reinforced with structural or formed members (all ASTM A276 or A240 Type 304 stainless steel) to limit its deflection to the lesser of 1/1000th of the gate width or 1/16". A resilient neoprene ASTM D2000 Grade AA625 seal shall be attached to the bottom of the disc to provide a flushbottom closure. The side and top double bulb seals will be neoprene, and will be of a design to seal in both the seating and unseating directions. Plastic or polyethylene is not acceptable as a seal material. The side and top seals shall be a double hollow bulb design. Each bulb shall have a minimum 1" outside diameter and a concentric hollow with a maximum 5/8" inside diameter. The double hollow bulb seal shall be attached to the gate disc with ultrahigh molecular weight polyethylene grommets secured by stainless steel fasteners to provide a low friction bearing surface between the disc and guides and to allow easy replacement of the seals. All seals, the double hollow bulb, and flushbottom, shall be replaceable without de-watering the gate. Frame mounted seals are not acceptable.

C. Frame

The gate will be constructed of structural members formed with stainless steel plate and welded to form a rigid one-piece frame. The gate frame shall be of a flat back design to allow wall mounting without a box-out into the concrete opening. The gate shall be attached to the concrete wall with stainless steel anchor bolts. A minimum of two independent and adjustable ultrahigh molecular weight polyethylene pressure pads with a maximum spacing of 12" shall be provided in each guide to control the seal compression, and shall provide point-to-point adjustment of the double hollow bulb seal. The pressure pads shall be attached with stainless steel fasteners. All sealing surfaces shall have a finish smoother than 125 micro-inch rms.

The invert shall be a stainless steel angle welded to the bottom of the guides to form the seating surface for the flushbottom seals attached to the disc.

Where self-contained gates are required, the yoke shall consist of two structural or formed members welded to the top of the guides in a manner to allow removal of the disc without removal of the yoke. The yoke shall be designed so that its deflection under full operating load will not exceed 1/360th of the gate width.

D. Leakage

The gate leakage, when subjected to the specified heads, shall not exceed:

i. Under seating head conditions, the leakage shall not exceed 0.1 gallons per minute per foot of perimeter.

ii. For unseating head conditions up to a maximum of 20 feet, the leakage shall not exceed 0.2 gallons per minute per foot of seating perimeter.

E. Stems

Stems shall be ASTM A276 Type 304 stainless steel. Stem threads shall be of the cut Acme type. Stems shall be designed to transmit in compression a minimum of two 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 bronze bushed.