

Breastwall Type

The breastwall type is designed for the maximum heads that will be encountered on the horizontal centerline of the gate. These heads range up to 40 ft or more.

The breastwall-type gate functions in connection with a wall over the top of the opening and usually is used for flood control on a storm sewer or any other conduit that flows under a levee. This gate is similar in construction to the overflow type, but the higher head of water requires the gate to be strengthened with additional or heavier cross-support members and with larger rollers. Also, a top seal makes contact with an angle embedded in the concrete across the top of the opening. This angle must project from the face of the concrete, thus permitting the top seal to move upward without the bulb of the seal being dragged against the concrete and above the opening.

Size Range

Since roller gates are fabricated of steel and with rubber seals contacting angles embedded in concrete, they are the most versatile as far as size range is concerned. This is due to the ability to fabricate the gate to virtually any size and configuration. The maximum width of a roller gate depends to a certain extent on the height of that particular gate, the maximum operating head, and the availability of very long structural steel.

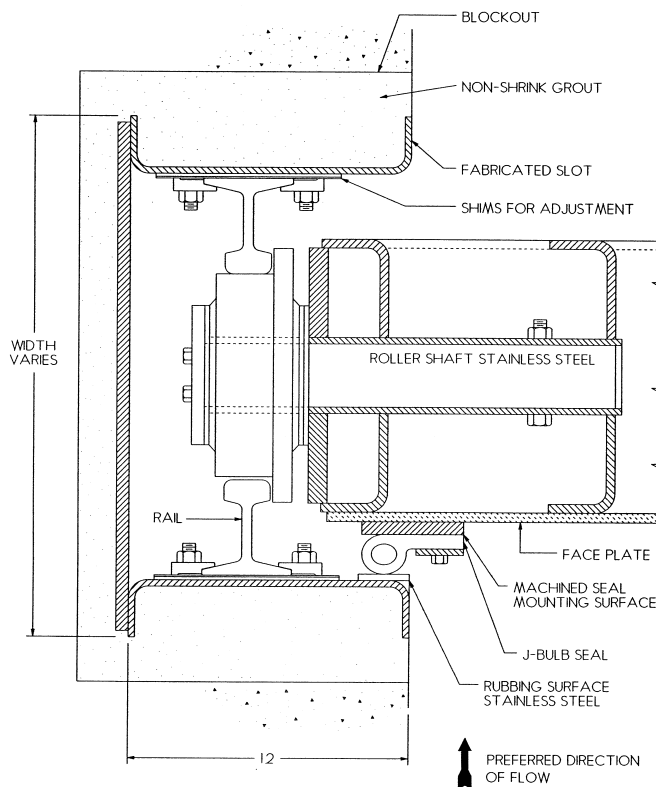


Figure 8-1
Fabricated Roller Slot with Double Rails

Gates that are higher than 10 ft are made in two or more sections to facilitate fabrication, shipping and installation. Each section is provided with a minimum of two rollers per side. Sections are match drilled for ease of field assembly. A flat rubber gasket is supplied to seal the joint between sections. Very small gates are economically impractical.

Gates for Face and/or Back Pressure

Roller gates are quite versatile and can be designed to handle either face or back pressure. They should be arranged so that the higher pressure is on the face (smooth) side. Where both high face and back pressures exist, the leaf can be “double skinned” to increase strength; however, doing so may lead to corrosion/infiltration problems in the interior of the leaf. Filling the dead air space with an inert material such as concrete adds significantly to the lift load requirement and shipping costs.

Seals are designed and mounted to be most effective for the given head pressure conditions. The most effective and reliable seal for head in either direction is the hollow J-bulb seal in direct bulb compression between the gate leaf and seal contact surface. Cantilevered bulb seals (pressure energized) are not completely effective at low heads since the stem of the seal is very stiff.

Roller Slots

The roller slot assembly interfaces the gate leaf with the structure. It forms the “frame” of the gate. The slot consists of two structural channels and a plate welded together to form a “U”. Inside the U, two T-head rails are attached to carry and transmit the wheel (roller) loads into the structure. The U also contains the corrosion-resistant seal rubbing surface. The slot assemblies extend to the top of the structure. They may be one piece per side or multiple sections, depending on the length (see Figure 8-1).

The slots may be embedded in the original pour concrete or they may be mounted and grouted in a blocked-out recess. The owner/engineer or contractor should decide which method is best for the project. Alignment of the slots – plumb, parallel and correct spacing – is extremely critical for successful gate performance. Slots can also be surface mounted with special design. A slot design without the steel U-shaped slot is possible. This requires the rails and seal contact surface to be mounted and grouted in a slot cast in concrete. This is very work intensive and does not result in the quality roller gate system that the complete fabricated slot system provides.