

ROLLER GATES

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Roller Gates are ideally suited for controlling water in any large openings such as may be found in power plants, water and sewage treatment facilities, flood control projects, irrigation systems, and on top of dams to increase reservoir capacity.

Waterman Roller Gates are available in either overflow or breast wall type. They are manufactured to be downward or upward opening. They may be engineered to take pressure from one or both sides of the gate.

FABRICATION FEATURES

Waterman Roller gates are made of stainless steel or coated mild steel. The gate leaf is a flat structural plate for which the structural members are welded into a box like construction for rigidity and lateral strength.

Rollers are mounted on each side of the gate. The numbers and sizes of rollers are determined by the size of the gate and the operating head. Rollers shall be single flanged type and shall be equipped with bushings.

The rollers operate against rails attached to the concrete or to the embedded members at the sides of the gate opening.

A J-seal is provided for sealing at the top and on each side of the gate. A flush compression type rubber seal is provided for the bottom of the gate. A stainless steel rub plate is provided wherever a sealing surface is in contact with the J-bulb seal.

Stems are stainless steel. They shall be in single or tandem configuration as determined by gate dimensions and design preference.

Actuators for the roller gate may be of manually operated crank, electrically driven, or hydraulically actuated.

Roller gates are nominated for heavy duty service where large loads and sizes are going to be encountered.

Double rail design is standard unless otherwise specified. Roller size and slot cross-sectional area increases proportionally to gate size and hydraulic loading.

Larger gates are built in two pieces and shipped separately for field assembly. Due to large size, slot and cross rails also must be bolted together in the field.

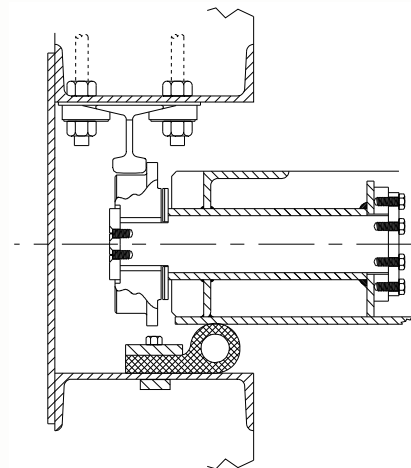
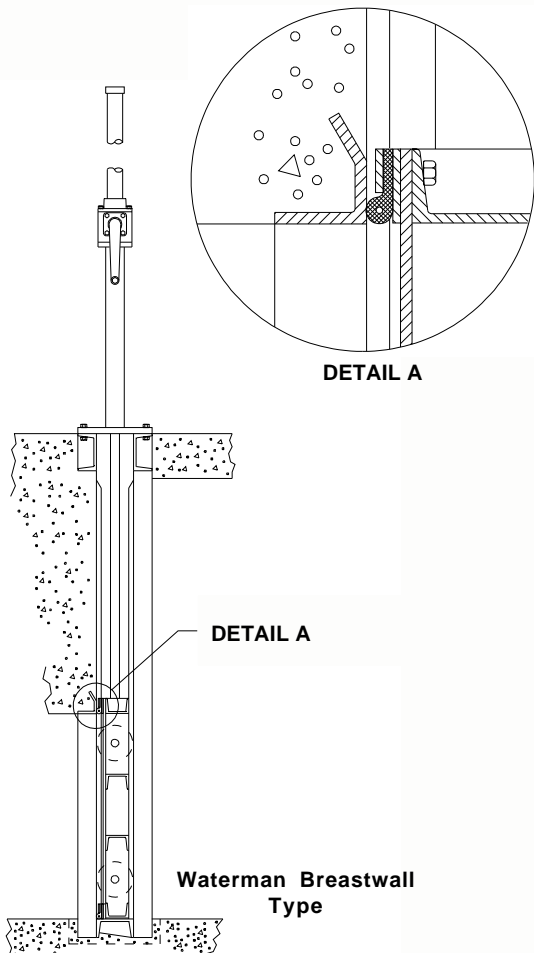
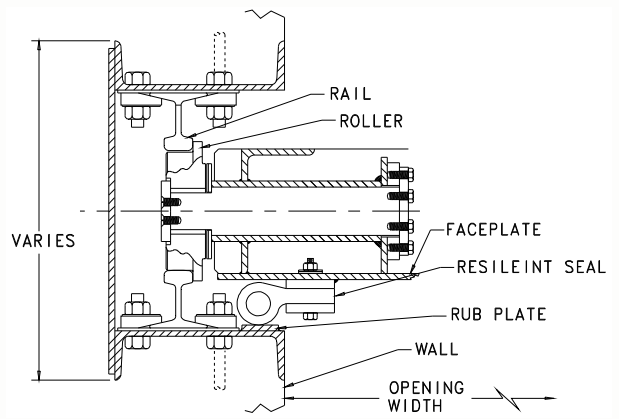
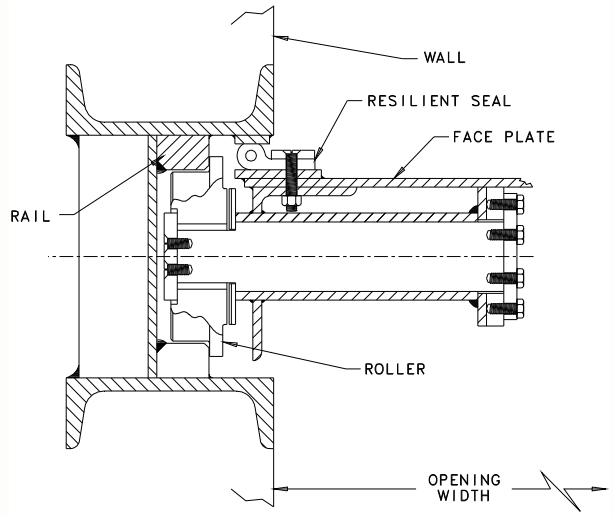
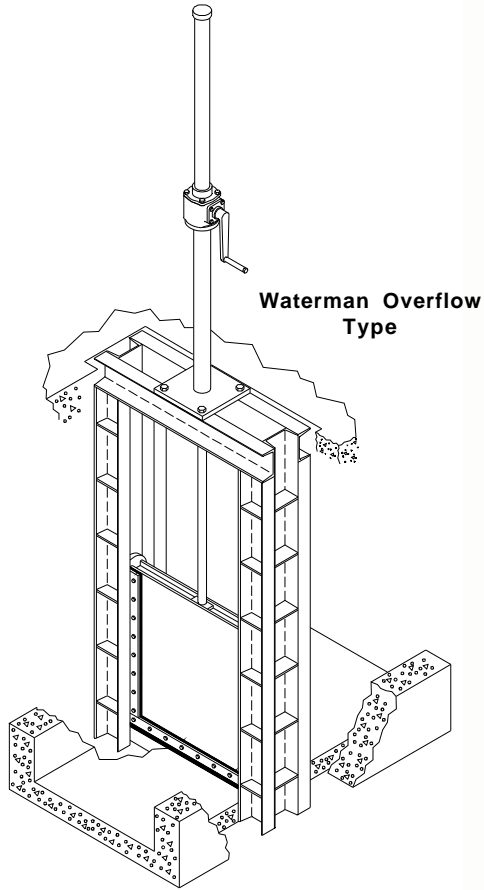
Single rail design can also be provided. Less expensive than double rail design with fabricated steel slot, it only requires additional labor to set anchor bolts and assure proper alignment.

Seal mounted on frame is shown in detail at right. This seal arrangement is required on downward opening or skimmer type gates. Shown here with single rail design, it can be supplied just as easily with double rail design.



Waterman Industries
of Egypt

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TYPICAL SPECIFICATIONS

GENERAL

Roller gates provided herein shall be fabricated, assembled and supplied in full conformity with the drawings, specifications, engineering data, instructions and recommendations of Waterman.

Roller gates and operators shall be supplied with all the necessary parts and accessories indicated on the submittal drawings.

All materials used in construction of the gate shall be new and selected according to the best engineering practice for this type of equipment.

SUBMITTALS

Shop Drawings. Submittals shall include a complete list of equipment and materials, including a descriptive and technical literature, catalog cuts and installation instructions. Drawings shall show proposed layout and anchorage of the system and appurtenances, design of structure to receive gates and equipment relationship to other parts of the work including clearances for maintenance and operation.

Certificate of Compliance. A certificate of compliance that the gates furnished are in conformance with the drawings and specifications shall be submitted to the project engineer.

Operating Instructions. Operating characteristics and instructions for system start-up and system operation shall be furnished. The instructions shall include service manual, parts list, and brief description of all equipment and their basic operating features.

Maintenance Instructions. O&M manuals detailing the maintenance instructions and listing routine maintenance procedures and troubleshooting guide shall be submitted.

SHIPMENT AND DELIVERY

Gates shall be shipped from factory in components or sub-assemblies to be bolted together in the field to the exclusion of any field welding. Match marks shall be provided on the heaviest components to facilitate field erection.

Care shall be taken to handle, store and ship the gate, actuator mechanism, stem and any other accessories. Particular care shall be taken as not to damage any coating.

GATE LEAF

The leaf shall be stainless steel or coated carbon steel plate reinforced with structural shapes welded to the plate. By proper sizing and placement of the structural shapes, the leaf shall not deflect more than 1/360th of the span of the gate under the maximum head.

The gate slide shall be fabricated in one or two sections and shall be furnished with a minimum of two rollers per side per section.

Rollers shall be spaced along the sides of the leaf such that the forces resulting from the water head are equally divided. Rollers shall be single flanged type and shall be equipped with bushings. Each roller shall be coupled with a shaft. Roller shafts shall be withheld by tube shaped housings welded to the leaf.

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The stem connection shall be a threaded and bolted (or keyed) thrust nut supported in a welded nut pocket.

SEALS

J-type seal is provided for sealing at the top and on each side of the gate. A flush compression type rubber seal is provided for the bottom of the gate. A stainless steel rub plate is provided wherever a sealing surface is in contact with the J-bulb seal.

STEMS

Stems shall be made of stainless steel. Diameter of the stem shall be sufficient to withstand a minimum of twice the rated output of the lift when subjected to 18 Kg (40 lbs) pull on the handwheel or crank. Where an electric actuator is used, stems shall withstand 1.25 times the stalled motor thrust. Stem threads shall be of the Acme type.

STEM COVER

For rising stem type gates, a clear plastic stem cover shall be provided to give means of indication of gate position whenever required, allow inspection of the threads and to protect the stem from contamination. To avoid condensation of vapor on the threads, sufficient number of vent holes shall be present. A Mylar tape position indicator shall be provided.

MANUAL LIFT

Gate lifts shall be the geared crank type. Under full operating head, the lift shall be able to operate the gate with a maximum pull of 18 kg (40 lbs) on the crank.

The crank shall be located at approximately 900mm above ground level unless otherwise specified. The lift shall have cast iron housing and steel pedestals. Lifts shall be grease lubricated. Two stem limit nuts shall be provided to limit the gate stroke in the opening or closing directions. Lubrication fittings shall be provided for lubrication of the bearings without disassembly of the lift housing. Suitable seals shall be provided to prevent entry of foreign matter.

ELECTRIC ACTUATOR

The electric actuator shall include the motor, operator unit gearing, limit switch gearing, limit switches, torque switches, controls as specified, declutch lever or knob, space heater, mechanical dial position indicator (optional), gear housings, and auxiliary handwheel as a self-contained unit.

The motor shall be specifically designed for slide gate service and shall be for high torque, totally enclosed, non-ventilated construction, with motor leads brought into the limit switch compartment. Motor insulation shall be Nema Class B with a maximum continuous temperature rating of 120° C (rise + ambient).

The motor shall be of sufficient size to open or close the gate against the maximum expected differential pressure when voltage to the motor terminals is 10% above or below minimal 380V-3Ph-50Hz voltage (other voltages are available on request). The motor duty rating shall be sufficient for one complete open to close to open (or reverse) cycle without exceeding its temperature rating. The motor shall be pre-lubricated and all bearings shall be of the anti-friction type.

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Limit switches and associated gearing shall be an integral part of the actuator. Limit switch gearing shall be of the intermittent type, totally enclosed in its own gear case to prevent dirt and foreign matter from entering the gear train, grease-lubricated, and shall be made of bronze or stainless steel. Limit switches shall be of the adjustable type capable of being set to trip at any point of gate travel between fully open and fully closed, and not be subject to breakage or slippage due to over-travel. Each actuator shall have a minimum of two (four) rotor-switch assemblies and a minimum of eight (sixteen) heavy duty contacts.

Each actuator shall be equipped with a double torque switch which is responsive to loads encountered in either the opening or closing direction. Each side of the switch shall have a numbered dial and shall be adjustable. A calibration tag shall be mounted near each switch correlating dial setting with unit output torque.

The torque switch shall operate during the complete gate cycle without the use of auxiliary relays, linkages, latches, or other devices. The torque switch shall be wired to shut off the actuator motor in the event of excessive torque being generated in either direction of travel.

Emergency handwheel shall be provided for manual operation. The handwheel shall not rotate during motor operation nor shall a fused motor prevent manual operation. When in manual operating position, the unit will remain in this position until motor is energized at which time the gate operator will automatically return to electric operation and shall remain in motor position until handwheel operation is desired. This movement from motor operation to handwheel operation shall be accomplished by a positive declutching knob or lever which will disengage the motor and motor gearing mechanically but not electrically. Hand operation must be reasonably fast. It shall not be possible for the unit to be simultaneously in manual and motor operation. The direction of rotation to open gate shall be marked on the handwheel.

The control circuit shall have a red and green pilot light for visual indication of gate position. The red light will indicate that gate is in the closed position, while the green light will indicate that gate is in open position. Both lights on will indicate that gate is in an intermediate position. Three push-buttons, open-stop-close, will be furnished for gate operation. Starter, push-buttons, and lights are to be furnished (integral with) (remote from) the operator.

For remote or automatic operation a three position selector switch, H-O-A (Hand-Off-Auto) shall be provided.

Continuous remote gate position indication shall be provided by use of 1000 OHM potentiometer connected to MDPI gearing (optional).

MATERIALS

Frames, Rails, Leaf

Stainless Steel - ASTM A-240/A-276, Type 304L or 316L, as specified

Carbon Steel - DIN 17100 ST. 37-2

Fasteners and Anchor Bolts

Stainless Steel - ASTM F-593 and F-594, Type 304 or 316, as specified

Stems

Stainless Steel - ASTM A-276, Type 304 or 316, as specified

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TYPICAL SPECIFICATIONS

J-type Seals and Flushbottom Seal
Rubber - ASTM D-2000

Finish

Mill finish on all stainless steel surfaces
Epoxy paint on all cast iron or steel surfaces