

TILTING WEIR GATES (OVERSHOT GATES)

For Precise Manual or Automated Level Control

APPLICATIONS

The standard tilting weir is an overflow-type gate used to control levels in canals, basins and other agricultural, municipal and industrial applications. They are an effective replacement to manually installed check boards or stop logs. The basic gate design uses a rectangular panel mild steel panel that is mounted to a piano hinge at the forward bottom edge of the gate leaf. This leaf is raised and lowered using a cable drum hoist to control the upstream water level.

Gates are custom-designed to the application and can be ordered for both new construction and replacement installations.



KEY CHARACTERISTICS

The gate seals against stainless steel side sills using layered, cloth-inserted neoprene rubber side seals backed up by UHMWPE side wipers. This reduces wear, leaks and potential repairs.

The piano hinge is also sealed by a layer of cloth-inserted neoprene mechanically attached to the gate leaf and the structure side of the piano hinge.

The piano hinge is mounted to a cast-in place mount that is supplied with the gate. This cast-in-place mount is located on either a raised concrete weir in the structure, on a fabricated stainless steel mount that is anchored to the structure or on the forward edge of a tray in the structure. All of these mounting styles are intended to allow the gate to open fully to a flat position for flushing of the controlled water system.

The gate can be operated manually, electrically by way of a motor-operator or by way of a portable operator. Manual gate operation will require no more than 40 pounds of effort at right angles to the gearbox input shaft.

When fitted with an electric motor operator and controls, these gates can be networked to measure and optimize the whole network's flow. They can be operated remotely when connected to a SCADA network.

The hoist system for these gates uses at least a pair of multi-strand IWRC wire ropes wound around a rotating hoist drum. The wire rope is sized so that the load on the rope is less than 1/5 the nominal breaking strength of the wire rope itself. The hoist drum diameter is sized to be at least a factor of 15 above the diameter of the wire rope.

The hoist system commonly consists of an operator mount and a bearing mount on opposite sides of the controlled channel. The hoist system can be configured as a operator skid and fitted as a complete assembly.

The gearboxes used on hoist systems for these gates shall be of the self-locking worm/wormwheel type. Additional gear reduction shall be supplied as needed to maintain manual operation below the 40-pound effort level.

The gearbox and hoist system shall be mounted as close to the structure deck as possible to reduce operational over-turning moment. If manually operated, an extension shaft can be fitted to place the manual hand wheel at a convenient height.

TYPICAL SPECIFICATIONS: TILTING WEIR (OVERSHOT) GATE

DESIGN REQUIREMENTS:

The radial overshot gate shall be between a 60 and 70 degree angle upward from the horizontal channel bottom when in the fully closed position.

When fully opened, the gate shall lay parallel with the concrete channel bottom to allow for full flow.

MATERIALS AND CONSTRUCTION:

The gate leaf is fabricated of either ASTM A 36 mild steel plate and shapes or a combination of ASTM A 240/A 276 Type 304/304L or 316/316L stainless steel plate and shapes.

The piano hinge set will be fabricated of ASTM A 240/A 276 Type 304/304L or 316/316L plate and shapes. The piano hinge bearing material will be either Perma-Lube bronze sleeves or will utilize a bronze rod running in the stainless steel piano hinge bores in accordance with ASTM B139.

The fabricated hinge mount, optional, shall be fabricated of ASTM A 240 Type 304/304L or 316/316L plate and ASTM A 276 or ASTM F 593 studs or bolts.

The side sills shall be fabricated of ASTM A 240/A 276 Type 304/304L or 316/316L stainless steel.

The operator mount, bearing mount and hoist drum shall be fabricated of ASTM A 36 plate or ASTM A 53 pipe. The drum pivot shafts shall be ASTM A 276 Type 304 or Type 316.

The anchor bolts required to mount the individual components shall be ASTM A 276 Type 304.

Seals shall be cloth-inserted flat rubber and shall be fastened to the leaf with formed stainless steel retainers and shall be field-replaceable and adjustable.

Gate leaf shall be fabricated in one piece unless shipping limitations require multiple sections.

MANUFACTURER:

Tilting Weir Gate manufacturer shall have a minimum of 30 years' experience in the design and manufacture of this type of equipment.

Tilting Weir gate, piano hinge, side sills and hoist mounts shall be products of Waterman Valve LLC, a McWane Company, of Exeter, CA. The companion hoist gearbox, hoist bearings, hoist wire ropes and electric operator also are furnished through Waterman Valve LLC, a McWane company, of Exeter, CA.



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