



Golden Harvest, Inc

Golden Gates™

GH-9000 SERIES CONSTANT UPSTREAM LEVEL CONTROL GATE

- Self-adjusting design
- Requires no motors or outside power source
- Maintains accurate, constant upstream levels
- 21 standard sizes to fit most flow requirements
- For Flood Control, Water Management Systems, Irrigation, Flow Equalization, UV Level Control and Clarifier Odor Control in Water and Wastewater Treatment



The Golden Harvest, Inc. Model GH-9000 level control gate utilizes force-balance control to automatically maintain a constant upstream water level at any given discharge while minimizing head loss.

Sizes and materials of construction are available to meet a wide variety of flow control needs ranging from almost zero to 2000 cfs. The gate nearly closes at low discharge and progressively opens as the flow increases.

The level control gate operates completely free of outside power and after initial adjustment absolutely no manual intervention is required. While the initial purchase cost is competitive with other systems the GH-9000 offers substantial lifecycle cost benefits. The costs associated with PLC relays, modulating actuators, maintenance, replacement and energy are relieved.

Water distribution networks utilizing the GH-9000 become simplified and cost effective as ditch riders are no longer required to periodically adjust gates or manipulate flash boards at GH-9000 check structures. Thus, a more accurate and far more flexible distribution system is made available, reducing costly time and water waste. In addition, damage due to overtopping of banks is eliminated as the level control gates operate instantly year round to relieve or maintain a wide range of flows.



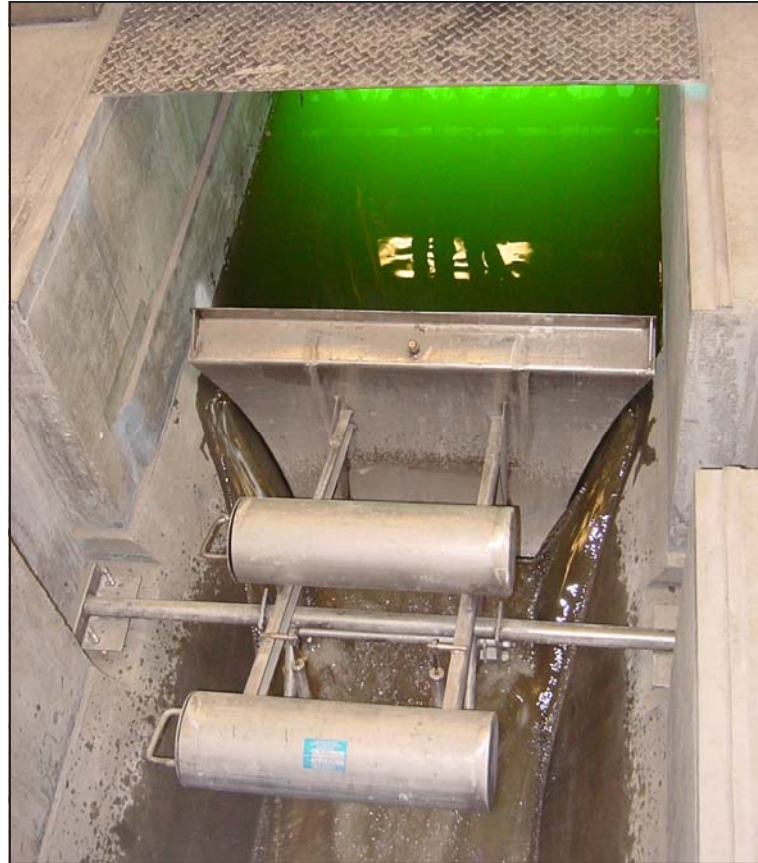
GH-9000 SERIES CONSTANT UPSTREAM LEVEL CONTROL GATE

OPERATING PRINCIPAL

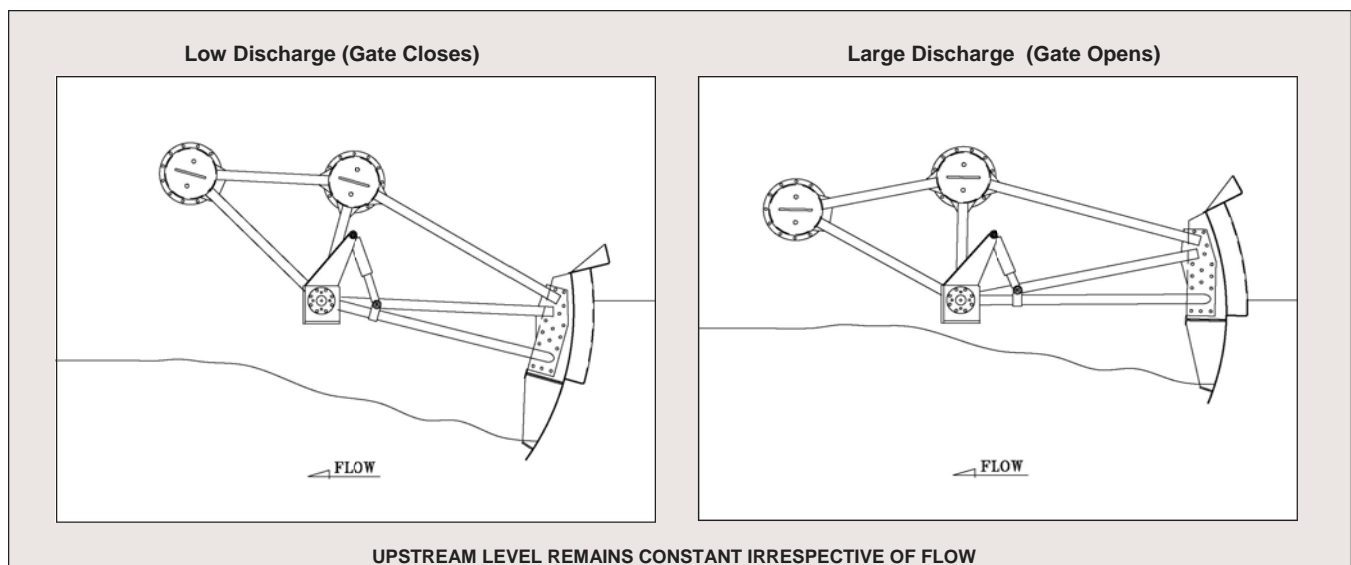
The gate consists of a cylindrical leaf with a cylindrical buoyant compartment provided on its upstream side and balancing ballast containers to the rear. The fabricated elements make up a rigid frame that rotates freely around a horizontal trunnion axis.

The gate is located over the center of axis so that hydraulic thrust on the gate leaf passes through the axis and does not effect the equilibrium. The torques generated by hydraulic force, buoyancy, and weight of the gate are equal and opposite for any angular position of the GHI Model 9000 level control gate.

As a rule the gate is set so that its trunnion axis coincides with the maximum upstream water level. As long as this condition is fulfilled, the gate will remain in complete equilibrium, when flows vary the gate automatically adjusts up or down passing the exact discharge required to keep the upstream water level constant.



Wenatchee Wastewater Treatment Plant U.V. Disinfection Channel.
Typical of three in parallel maintaining a constant upstream water level.





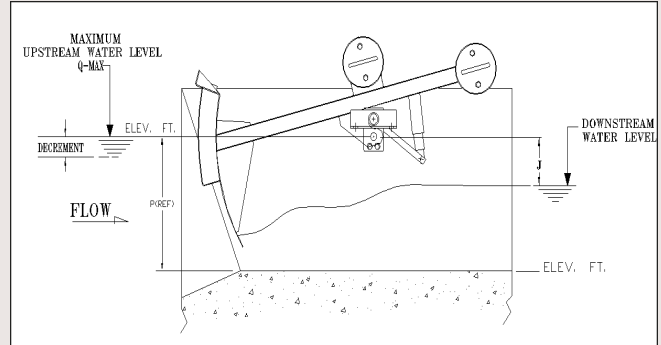
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LEVEL CONTROL GATE SELECTION

Golden Harvest, Inc offers 21 standard sizes to suit a variety of applications. The following data is required to select a suitable gate for a given structure:

- the maximum discharge (Q) to be handled
- the minimum head differential (J) at maximum discharge

Note: Where a gate is followed by a fall use 3.5 ft for (J)



EXAMPLE 1 (MGD):

A wastewater treatment plant has a treatment capacity of 8 mgd. A dual channel U.V. system safely disinfects a maximum discharge of 4 mgd per channel-unit. The U.V. bulbs require a constant water elevation 635.00 ft. maximum tailwater elevation is 632.00

The minimum head differential:

$$J = 635.00 - 632.00 = 3.0 \text{ ft.}$$

Point "a" on the chart corresponds to (Q) = 4 mgd and (J) = 3.0 ft. The appropriate size for the two parallel gates is a US-35.

EXAMPLE 2 (CFS):

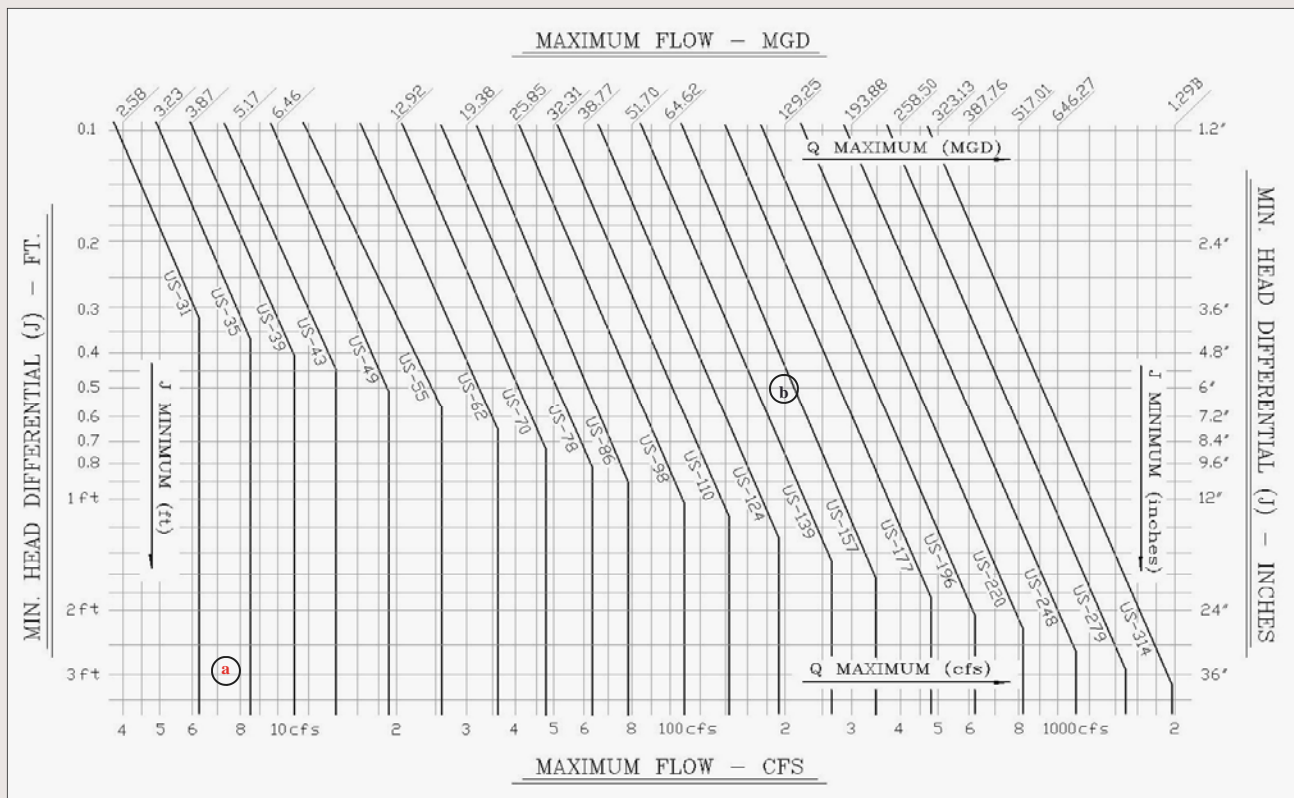
The water level in a canal must be kept constant at elevation 100 ft., where the maximum discharge is 200 cfs with a maximum downstream water elevation at 99.5 ft.

The minimum head differential:

$$J = 100.00 - 99.50 = 0.50 \text{ ft.}$$

Point "b" on the chart corresponds to (Q) = 200 cfs and (J) = 0.5 ft. The appropriate gate size is the US-157.

Note: The US-157 has a discharge capacity of approx. 350 cfs.



GATE SIZE SELECTION CHART



GH-9000 SERIES

CONSTANT UPSTREAM LEVEL CONTROL GATE

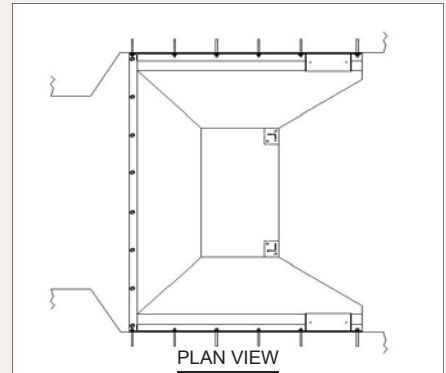
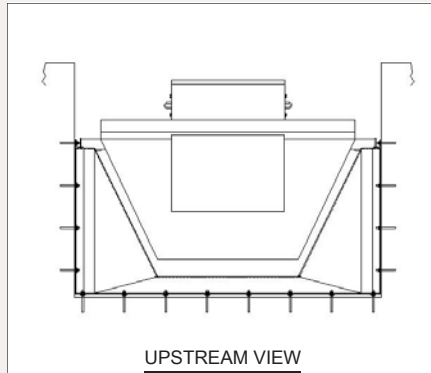
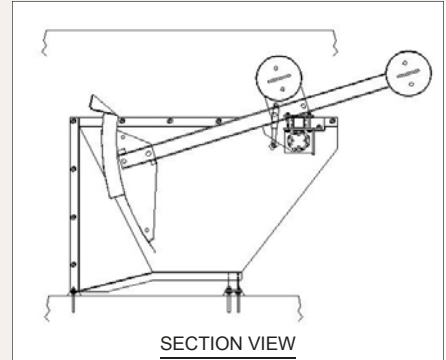
CONTROL STRUCTURE

Prefabricated Control Structures are designed and built specific to a wide variety of applications. Fabricated sluiceways are particularly attractive for smaller applications (Size US-31 up to size US-86 - larger sizes are available).

Utilizing the prefabricated sluiceway takes the place of designing and building a concrete structure. The gate and sluiceway come packaged for easy and quick installation.

The prefab sluiceway can be adjusted or relocated at minimal cost if a revised water level or new turnout location is desired.

On concrete rectangular channels, a smaller prefabricated control structure can be installed without dewatering.



GH-9000 SERIES GATE APPLICATIONS

Drainage Canals	Retainage of high water surface in the drainage system providing for ground water recharge and wetlands management during dry seasons.
Recreation Lakes and Reservoirs	Water level is maintained in all seasons without sacrificing spillway capacity or reliability and reduces threat of residential flooding.
Flood Control	Automatic protection of flood zones by using the GH-9000 Series gate as an inlet to storm water retention system.
Irrigation Canals	Automatic canal check gates for reliable turn-out control at all flows.
Wastewater Treatment	<p>With the GH-9000 Series gate placed at the outlet of a clarifier it will maintain a constant higher water level in the effluent troughs, thereby reducing the release of odorous gases.</p> <p>Automatic level control for U.V. disinfection channels maintain constant and desired upstream water levels to decrease chances of UV bulb burnout when water levels are too low and to prevent inefficient U.V treatment when water levels are too high.</p> <p>Automatic regulation of sedimentation / flow equalization basin levels during fluctuating flow rates.</p>
Hydro-Electric	<p>Optimization of forebay levels while providing instant bypass during scheduled or unscheduled plant shut-downs.</p> <p>Increase hydro profitability by drawing stream diurnal flow increases into the forebay while maintaining minimum required fish and recreation flows in the stream.</p>