

# { WATER CONTROL GATES }



GOLDEN HARVEST, INC.

# WATER CONTROL GATES

Golden Harvest, Inc., Golden Gates™, manufactures a complete line of aluminum and stainless steel gates for distribution worldwide. These products, based on extensive experience in all types of environments, are the result of intensive research, computer, lab, field-testing, analysis, and customer input.

The Company is located in Burlington, Washington 60 miles north of Seattle.

Our 30,000 square foot manufacturing facility includes advanced fabrication, welding, and machining areas.

Golden Harvest, Inc. has been manufacturing water control gates for the United States and International water and wastewater markets since 1983. Each Golden Gate is designed with specific features and characteristics, to meet the particular application. The basic design can be adapted to suit the exact requirements of the application in terms of size, shape, and strength.

New product ideas continue to evolve from Golden Harvest, Inc.'s experience and customer input. Innovative ideas have led to new perspectives and modern answers to emerging technical challenges. While service and prompt response times are important in the modern business world, we at Golden Harvest, Inc. take personal pride in meeting our customer's needs by maintaining a highly trained and motivated work force, including an engineering staff, combining many years of experience with a varied range of expertise. Our staff works closely with the Project Engineers during the entire process to deliver a properly designed quality product. We believe a successful project requires real teamwork and attention to the fulfillment of our customer's application. We are your partners and will work together to solve your needs.

Golden Harvest offers technical support in cost estimation and specification review as well as writing job specific specifications. We are an industry leader in quality, cost, customer service and lead time. If you should have any questions, please do not hesitate to contact us.



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# GH-29 SLUICE GATE TAPERED WEDGE DESIGN

# {29}

- **Superior Sealing Performance Under Moderate to High Unseating Head Conditions**
- **Fully Adjustable Wedging Design**
- **Heavy-duty Construction Available in Type 304 or 316 Grades Corrosive Resistant Stainless Steel**

The Golden Harvest, Inc. Model GH-29 Sluice Gate combines the time tested sealing methods of adjustable wedging action and resilient seals to provide a superior sealing performance surpassing the specified standards of AWWA. Flexible design is available in project specific

sizes and operating head conditions. Mounting options include wall, thimble, or 125# flange. Typically utilized in the non-self contained configuration self contained or bench stand frames are available.

**General Design:** The tapered wedge sluice gate is designed with the head guide angles attached to the slide in such a way to place the slide in an angle corresponding to the seating surface of the frame. At the final rotations of the operating stem acting down on the gate it wedges itself against the corresponding angle of the sealing perimeter creating a nearly leak tight orifice. Fully adjustable wedges are also located at the top of slide to provide additional reinforcement against unseating head pressures. Once the gate is unseated from the wedged position (approximately 2-inch upward travel) operation is nearly free of friction.

Similar design also available in Aluminum: Model GH-27

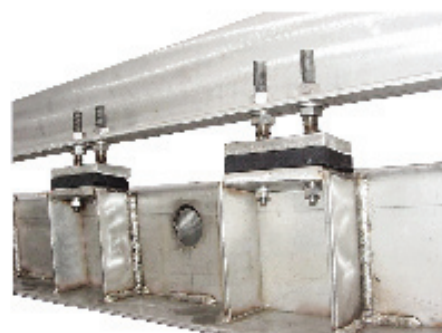
MODEL GH-29



TAPERED SEATING SURFACE



TOP WEDGE BAR



# {100}

## GH-100 FULLY WEDGED STAINLESS STEEL SLUICE GATE

- **Heavy-Duty Construction for Higher End Unseating Head Loads**
- **Leakage 1/2 of AWWA C-560 Standards for Cast Iron Gates**
- **Fully-Adjustable Wedges and Pressure Bars**
- **Available in Type 304 or 316 Grades Corrosive Resistant Stainless Steel**

The Golden Harvest, Inc. GH-100 Fully Wedged Stainless Steel Sluice Gate has been in the industry since 1988. The Model GH-100 offers some unique

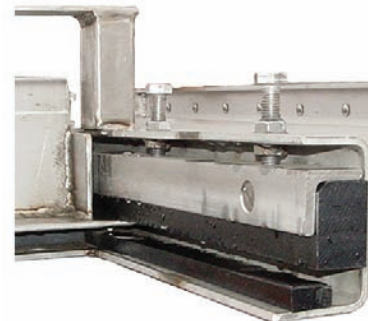
design features that have proven to be a reliable and cost effective alternative to the traditional cast iron sluice gate.

While this gate is a Standard fabricated and not cast iron, it should not be confused with a fabricated slide gate. The GH-100 sluice gate appurtenances meet the latest requirements of AWWA C-560. Depending on the water conditions the sluice gate frame and disc are fabricated from either type 304 or type 316 stainless steel. Although they do not meet the material requirements for AWWA C-560, which specifies cast iron, the structural design is in conformance with the American Water Works Association for cast iron sluice gates {ANSI/AWWA C-560, American Institute of Steel Construction Specifications ASD-Ninth Edition Uniform Building Code U.B.C. 97}. The model GH-100 is provided with adjustable wedge bars on the sides and top of the gate.

### TOP WEDGE BAR



### PRESSURE BAR





GH-40 ALUMINUM  
SLIDE GATE  
GH-46 STAINLESS STEEL  
SLIDE GATE

# {40-46}



- Submerged Service Or Open Top Gates For Seating And Unseating Applications.
- Flexible Design Customized To Fit Most Project Applications.
- Fully-Adjustable Sealing System
- Meets Awwa Leakage Standards

Golden Harvest Inc. Fabricated Slide Gates are the industry standard for price and performance. UHMW seating faces in guide grooves and neoprene face seals on some models provide for low leakage solutions at modest head levels. The resilient P-bulb design provides for a low leakage closure.



Standard mounting options include: flat-back for flush mounting to a wall face or wall thimble, embed mounting for new channel construction and in-channel mounting for existing channel retrofits. Golden Harvest, Inc. flat back designs are attached directly to the concrete wall without the need for any special block outs. A non-shrink grout pad is recommended so that the gate frame does not conform to possible imperfections in the concrete headwall during installation.



Channel gates can have a separate bolt-on head rail, enabling the embedded frame to be installed in the slots without the gate. The head rail and operating gear then can be fitted after construction work has been completed, reducing the possibility of damage to the full assembly.

Stainless steel and aluminum construction provides virtually limitless design flexibility.

#### **SLIDE GATE MODELS:**

- **GH-46 STAINLESS STEEL - SUBMERGED SERVICE**
- **GH-44 STAINLESS STEEL - OPEN CHANNEL**
- **GH-40 ALUMINUM - SUBMERGED SERVICE & OPEN CHANNEL**

# {60-66}

GH-60 ALUMINUM WEIR GATE  
GH-66 STAINLESS STEEL  
WEIR GATE

- Upstream Water Elevation Control
- Flow Measurement
- Flexible Design Customized to Fit Most Project Applications.
- Fully-Adjustable Sealing System
- Meets Awwa Leakage Standards

Golden Harvest Inc. Weir Gates are designed to control upstream water elevation and can provide a rough estimate of flow using notched gates via the downward-opening design. Weir gates function like slide gates, except that the disc opens downward allowing outflow to weir over the top of the gate.

Weir gates are typically required to be substantially wider than they are high. In order to insure proper alignment of the slide tandem lifts are often provided. As a general rule, when the width becomes equal to or greater than twice the height of a tandem lift should be utilized. On smaller weirs, 48" and below special UHMW rub strips or anti-racking devices can be used.

Weir gates with large widths should be mounted in the seating head condition whenever possible. When a wider span is subjected unseating heads the associated pressures tend to deflect the slide away from the seal. However, when necessary, weir gates are designed with an appropriate section to withstand unseating pressures.

Golden Harvest, Inc. weir gates are offered with Cipoletti, Rectangular or V-Notch weir shapes located at the top of the slide. Calibrated gauges may also be located / mounted to the slide for visual measurement.

Standard lifts are hand wheel or enclosed gear types. Electric motor operators coupled with level or flow sensors can provide for multiple daily adjustments.

#### **SLIDE GATE MODELS:**

- **GH-66 STAINLESS STEEL CONSTRUCTION**
- **GH-60 ALUMINUM CONSTRUCTION**

**NOTE:** Both models available with top seals when isolation is necessary.

#### **TANDEM OPERATED WEIR GATE**



#### **WEIR GATE**



## GH-9000 LEVEL CONTROL GATE

# {9000}



- 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 life cycle 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 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.



# {8000}

## GH-8000 RADIAL GATES

- **Open Channel or Spillway Flow Control**
- **Increase Water Elevations and Upstream Storage Capacity**
- **Flow Diversion**
- **Efficient - Low Maintenance Design**

Golden Harvest, Inc. Radial or Tainter Gates are most commonly used for flow control structures on flood control projects, hydropower projects and other large conveyance systems. The radial gate is typically designed for overflow service. Shutoff service radial gates are available with top seals when required.

**General Design:** The radial gate disc is designed for mounting in wide unobstructed waterways or spillways. An accurately curved disc transfers the hydraulic load through the spanning strong ribs to the attached radial arms. The two radial arms, located at the sides of the opening, then transfer the load into the trunnion pins and abutments.

Resilient seals are mounted across the bottom and up both sides of the gate to provide a tight seal in the closed position. Horizontal top seals are offered with the breast wall design. Stainless steel sill and side plates are set flush in the concrete to provide a smooth sealing surface.

Operation of the radial gate is achieved by means of tandem cable drum hoist coupled with an electric or manual actuator. Manual or electric lifts are provided with gear boxes of the self-locking worm gear type. Actuators are available with position indication, limit and torque switches, and automated opening and closing controls.







- Upstream Water Level & Flow Control
- Water Distribution & Irrigation
- Flood Control
- Dam Overflow

The Model GH-1100 Overshot or Tilting Weir Gate is a convenient design for upstream level control customizable for installation in most open-channel structure applications. The overshot gate is an economical and dependable upstream level control or flow monitoring device on larger open channel water distribution or irrigation networks, dam overflow and flood control projects or when there is not room for a large downstream recess required for traditional downward opening weir gates.

The overshot gate consists of a gate leaf that spans the channel and is hinged across the invert. The gate is operated via tandem cables (articulating stem optional) attached at the upper corners of the gate leaf in conjunction with a manual or automated drum hoist mounted at the operating deck. A small recess in the channel floor enables the gate to be lowered into the full open position allowing the water way to be unobstructed. To prevent a hydraulic 'lock' or vacuum a vent tube or knap relief is incorporated into the channel wall or gate leaf design.

The overshot gate can be positioned infinitely between 0 degrees (full open) and 60 degrees (full closed). The height of the gate leaf is typically based on the maximum design upstream water level. Once installed, the upstream water level builds up behind the positioned gate leaf and the excess spills over the top. Resilient neoprene seals are attached and retained to the gate leaf to minimize any leakage around the sides and across the invert. Stainless steel rub plates should be embedded in channel walls for a smooth sealing surface.

On smaller sizes the GH-1100 Overshot Gate is available in a self-contained design. The yoke mounted operator, gate leaf, hinges and side rub-plates are designed/fabricated as a complete unit allowing for a quick and easy 'drop-in' style installation.



# { 39 }

## GH-39 STAINLESS STEEL & ALUMINUM FLAP GATES

- Back Flow Prevention in Water and Wastewater Treatment Applications
- Operates Automatically With Small Differential Head Pressure
- Provides for Flood and Salinity Control in Coastal Areas
- Flexible Design Customized to Fit Most Project Applications.

Golden Harvest, Inc. supplies Flap Gates in stainless steel, aluminum, and spun aluminum and supplied with neoprene seals. Flexible design available in square, rectangular and circular shapes.

Automatic, circular opening for gravity flow and pump discharge can be aluminum or stainless steel. Stainless steel construction is recommended for pump discharge applications where the flap gate is located such that pressures are violent at the discharge pipe.

Flap gates have a built-in taper. With a small differential pressure on the back of the gate, it opens automatically to allow discharge. When the head is greater on the face side of the gate, the flap closes automatically to prevent back flow.

Flap gates act as natural skimmers of debris such as branches, logs and trash. It is recommended that frequent inspection and cleaning be scheduled to keep the flap gate working effectively. Installation should incorporate a vertical elevation drop below the flap gate of 300 to 600mm, to allow debris to work its way free of the gate. Protection of a flap gate should be considered when the installation projects into a stream flow where heavy debris or ice may be present.

Special variations include side-hinged flap, top hinged flap with buoyancy chambers and secondary buoyant door designs.

### **MOUNTING OPTIONS:**

Surface / 125# Flange / Spigot or Collar / Thimble



# STAINLESS STEEL AND ALUMINUM DIVERSION GATES

# {30}

- Water Diversion Gates
- Stainless Steel and Aluminum Construction
- Flexible Design Customized to Fit Most Project Applications.

## STOP GATES

Golden Harvest Inc. Stop Gates are designed to block water flow in open channels. They are generally fabricated from aluminum to save weight, but can be provided in stainless steel. Design includes reinforcements to limit deflection of the gate under the designed head condition.

Guide frames are designed to fit into the channel structures and can include neoprene seals. Golden Harvest stop gates can be fitted with either fixed handles or a slot grip for hand placing. Lifters, (when provided), are designed to install and remove individual stop logs, and to travel in the frame guides.

## MODELS:

- **GH-31 - STAINLESS STEEL**
- **GH-30 - ALUMINUM (UHMW SEATS)**
- **GH-36 - ALUMINUM (UHMW SEATS & P-SEALS)**

## STOP LOGS

Golden Harvest Inc. Stop Logs are designed for incremental control of water flow in open channels, similar to weir gates, but made in separate sections. They are generally fabricated from aluminum to save weight, but can be provided in stainless steel. Design includes reinforcements to limit deflection of the gate under the designed head condition, and each log can have an extruded neoprene seal on its invert. Seals are held in place by a bolted retainer bar and are field replaceable. Heavier logs can be provided with lifters for mechanical 'hoisting' of the sections.

Guide frames are designed to fit into the channel structures and can include neoprene seals. Golden Harvest stop logs can be fitted with either fixed handles or a slot grip for hand placing. Lifters, (when provided), are designed to install and remove individual stop logs, and to travel in the frame guides.

Guide rails for embedded, flat back or channel mounting are available. These gates are designed for a maximum head of one foot over the slide, unless otherwise specified.

## MODELS:

- **GH-34 - STAINLESS STEEL**
- **GH-33 - ALUMINUM**





# WATER CONTROL PRODUCTS

## TIDE AND ESTUARY PRODUCTS

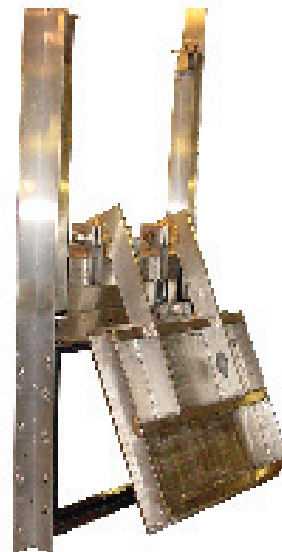
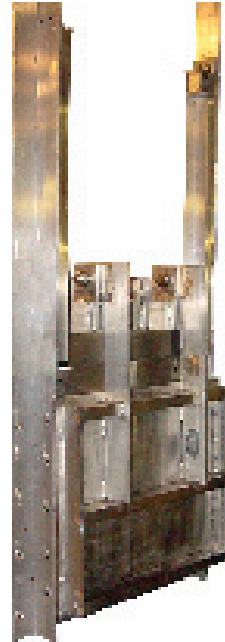
**GH-35 Self-Regulating Tide Gates**



**GH-37 Tide Regulated Flap Gates**



**GH-50 Combination  
Sluice-Flap Gates**



## GATE OPERATION

Portable Electric	Automated Operation Electric-Hydraulic-Pneumatic	Bevel Geared Lifts
		
Portable Electric	Portable Hydraulic	Portable Gas
		

**GH-1900 Bending Weir**



**GH-901 Fabricated Butterfly Valves**



**GH-1400 Shear Gates**



**Wall Thimbles  
F-Type, E-Type, MJ, Bell**



**GH-3000 Fabricated Roller Gates**





# { GENERAL NOMENCLATURE }

**FLUSH BOTTOM** – The bottom or invert section of the frame that is embedded in the floor slab to provide unrestricted flow.

**FRAME** – The part of the gate that is fixed to the structure and engages the gate head.

**GATE HEAD** (Slide, Cover, Disc) – The sliding or moving part of the gate.

**HEAD** – Differential water level or depth above invert of gate opening. (Used to design gate and lift)

Seating Head: Differential head pressure forcing gate against the wall it is mounted.

Unseating Head: Differential head pressure forcing gate away from the wall it is mounted.

**P-SEAL** (J-seal) – A neoprene rubber seal used to control leakage on slide, roller, and radial gates. Generally has a cross-sectional shape of the letter “P”.

**LIFT** – The device that produces torque and/or thrust to operate the gate.

**PEDESTAL** – A support for the lift.

**RISING STEM** – A lift/stem arrangement where the stem rises above the lift as the gate opened or closed.

**NON-RISING STEM** – A lift/stem arrangement where the stem does not rise above the lift when the gate is opened or closed

**SELF-CONTAINED GATE** – A gate with an extended frame and yoke with a lift mounted to the yoke. (Not recommended after frame length from invert to yoke exceeds approx. 10 feet)

**NON SELF-CONTAINED GATE** – A gate with a minimum frame length without a yoke. (Used when distance from invert to lift exceeds approx. 10 feet, or when a floor slab is over the gate.)

**STEM** – A threaded rod that allows operation of the gate through a lift as a power screw.

**STEM GUIDE** – The devices used to provide lateral support of the stem to prevent buckling.

**STEM BLOCK** (Clevis) – A block that transmits the thrust of the stem to the gate head and prevents rotation of the stem to provide linear movement of the gate head.

**UHMW** – Ultra High Molecular Weight polyethylene used as a guide and wear surface material.

**WALL BRACKET** – A structural bracket that mounts to a wall and supports the lift pedestal.

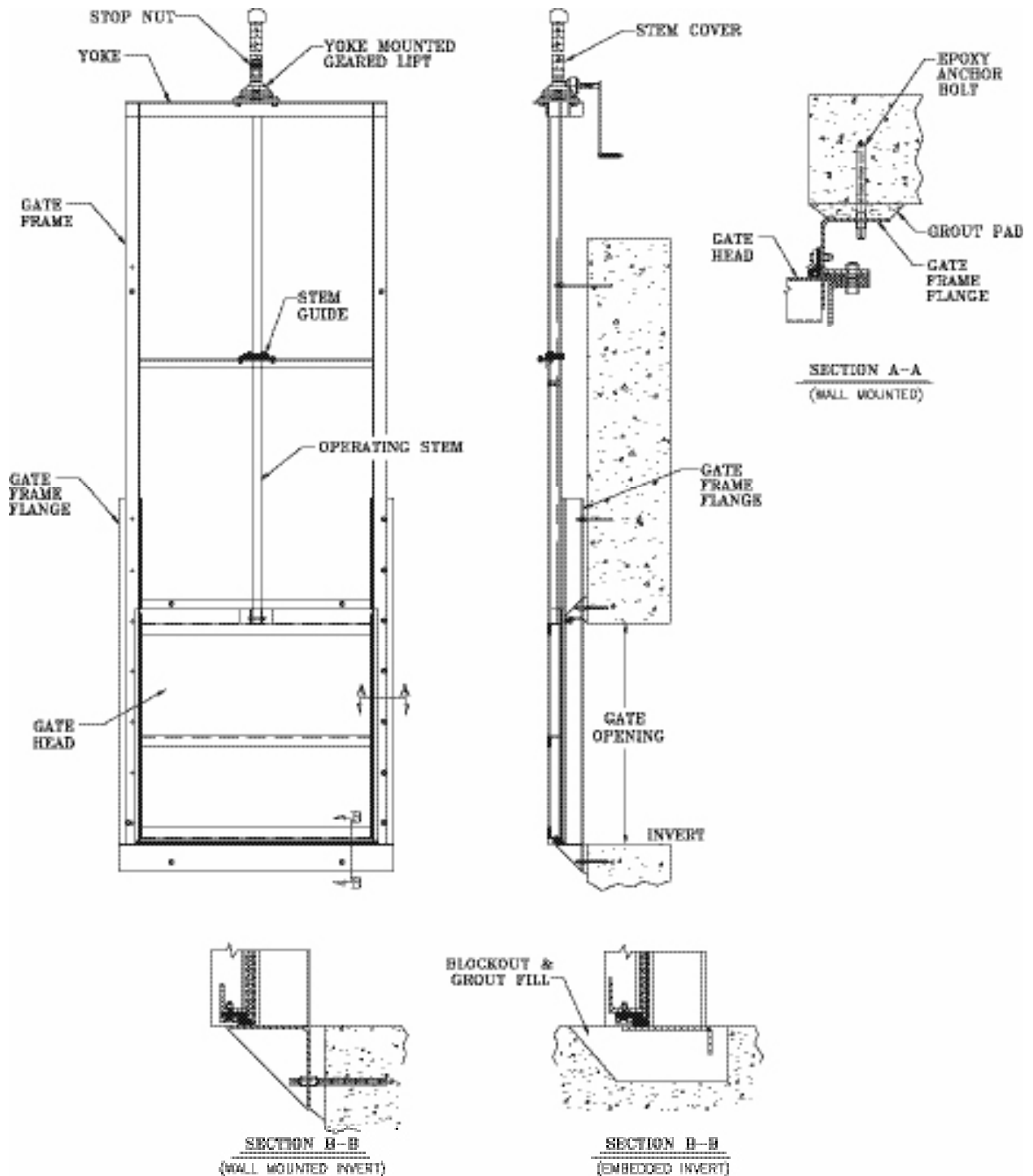
**WALL THIMBLE** – A wall piece embedded in concrete to provide a mounting surface for the gate, and to a wall pipe when applicable.

**WEDGE & WEDGE BLOCK** – A device when engaged it squeezes the seating faces together to limit leakage.

**YOKE** – The horizontal member that supports the lift of a self-contained gate.

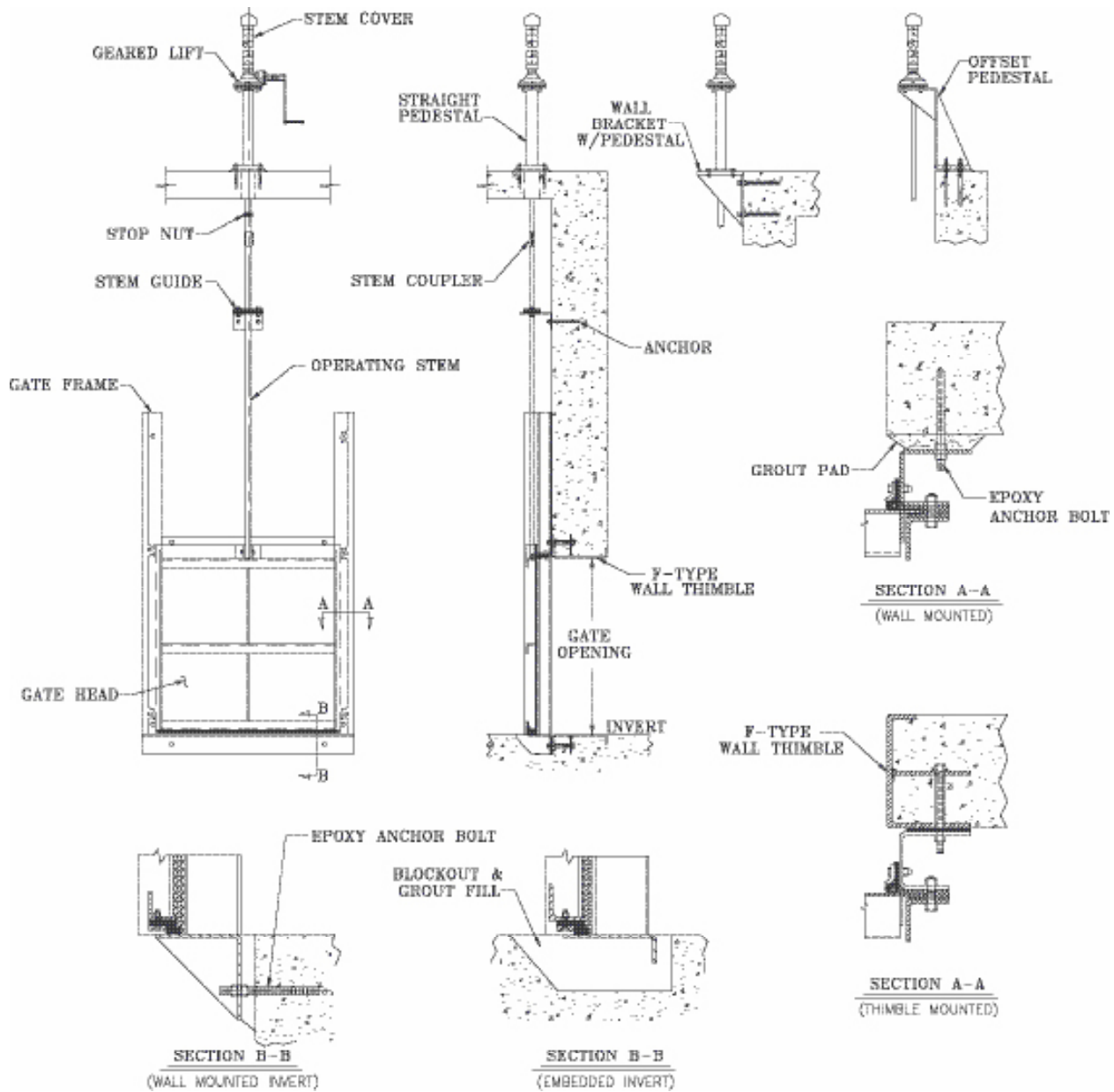
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## SELF - CONTAINED GATE



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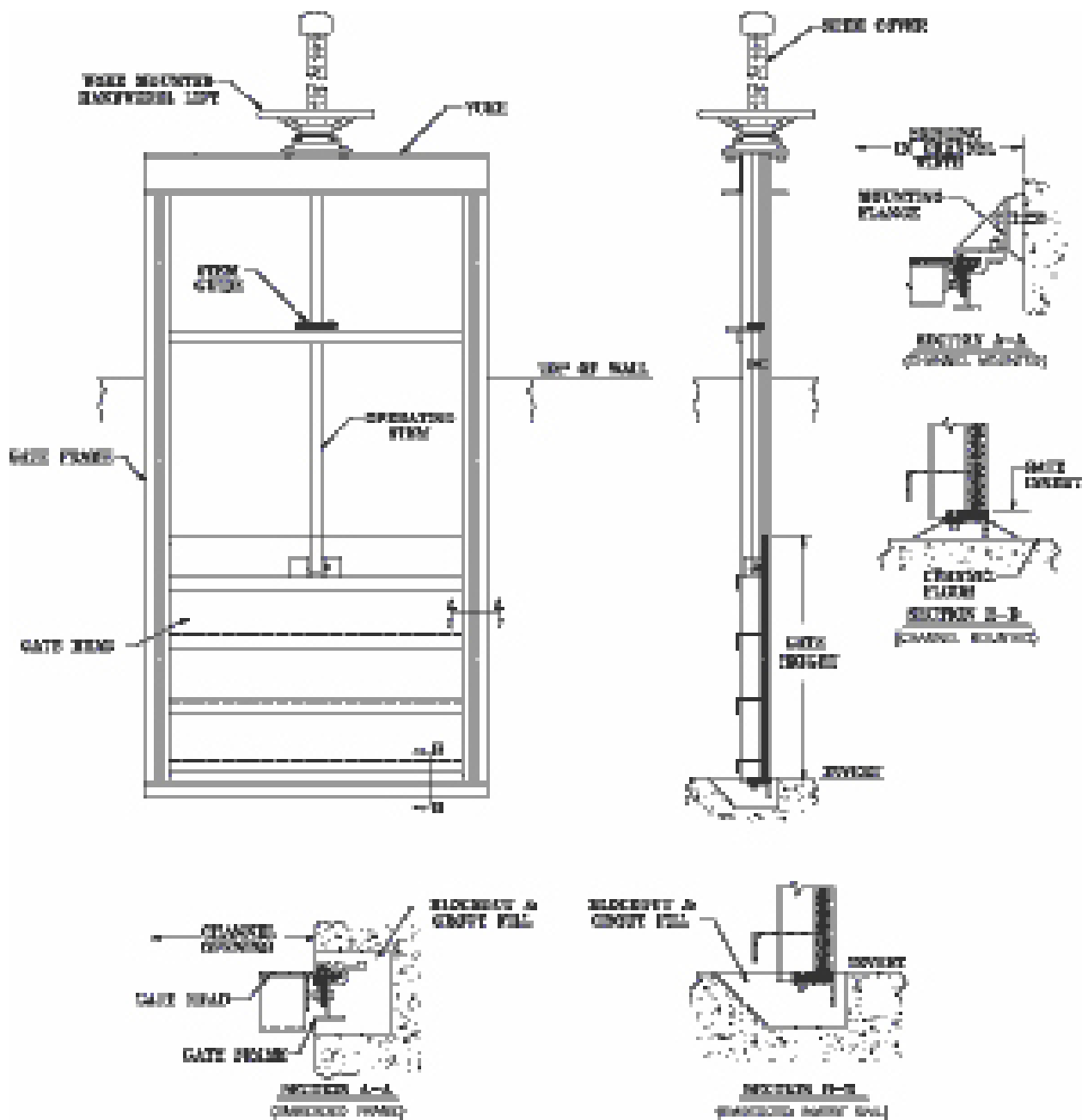
## NON SELF - CONTAINED GATE





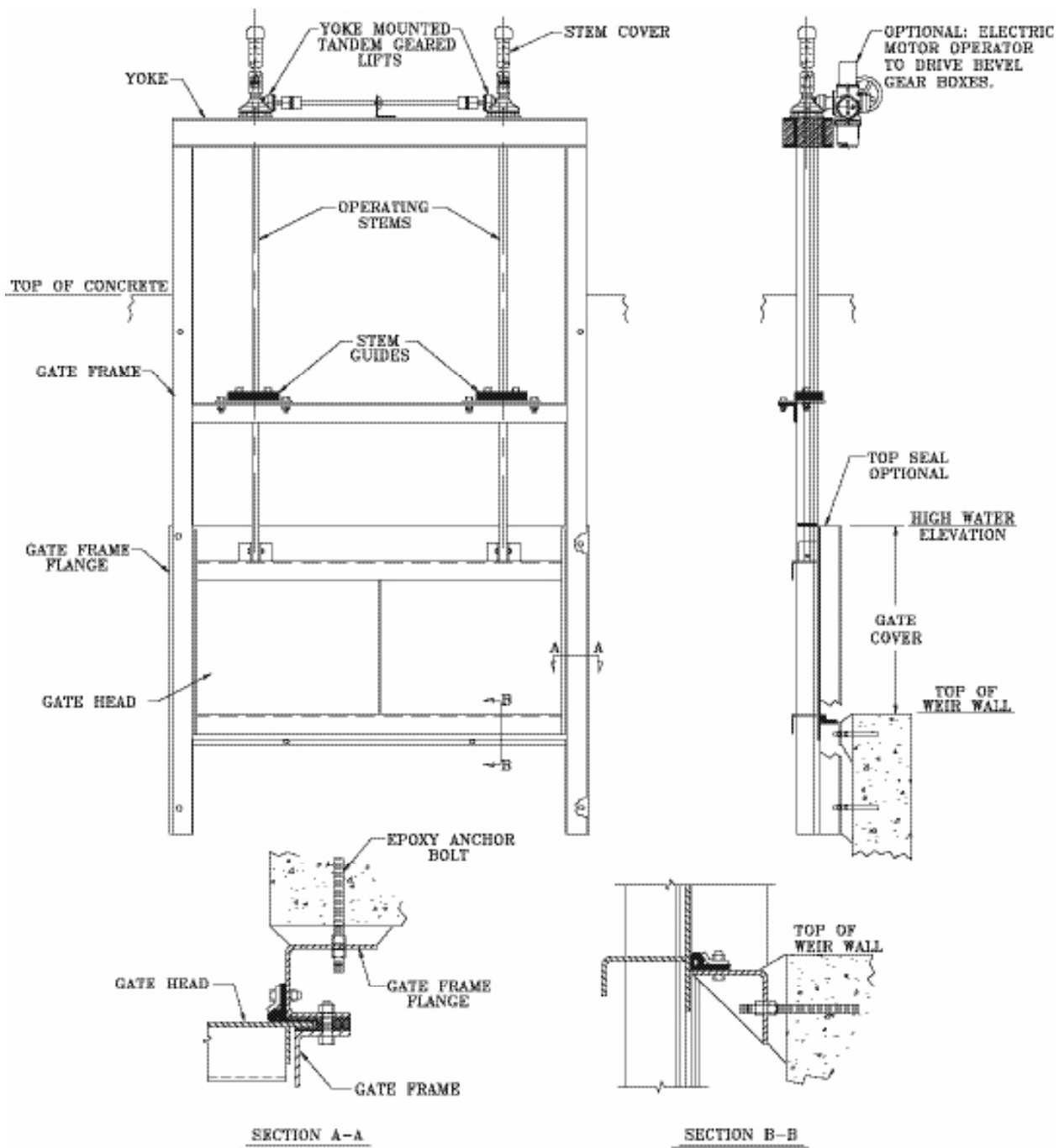
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## EMBEDDED / CHANNEL MOUNTED SELF - CONTAINED GATE



# {DETAILS}

## SELF - CONTAINED WEIR GATE



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