

# HYDRO GATE®

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## FABRICATED SLIDE GATES



**MUELLER**

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# FABRICATED SLIDE GATES

## Description

### DESCRIPTION

Hydro Gate® fabricated slide gates are designed and manufactured with custom extrusions or structural and brake- formed angles, channels, and plates and are assembled by welds and bolts. Through years of fabricating experience, we have developed techniques for fabricating parts to a tight tolerance and straightness. Since there are no machined parts in the gate itself, the gate depends upon water pressure and seal design to seat the fabricated slide. Fabricated slide gates are usually furnished with rubber and UHMW seals to improve water-tightness. They are designed for either open channel use or aperture type applications. Open channel gates have no frame member or seal at the top of the slide. These gates will overflow. Aperture gates (over an opening) have top frame member and seals to shut off flow at depths greater than the slide height.

Head capacity is dependent on opening size and availability of structural members. The most common head rating is 20 ft seating and unseating. Higher heads require special designs, consult our Engineering Department for additional information.

### MATERIALS

#### Stainless Steel

This material is recommended when corrosive conditions make it necessary to add protection. These Hydro Gate fabricated slide gates are made from Type 304 or 316 stainless steel (exotics are available upon request). Gates manufactured from these materials are more corrosion resistant under most conditions than slide gates manufactured from other materials.



### APPLICATIONS

- Flood Control
- Irrigation Projects
- Low-Head Reservoirs
- Drainage Systems
- Soil Conservation Projects
- Water Treatment Plants
- Sewer Treatment Plant

# Dimensional Data

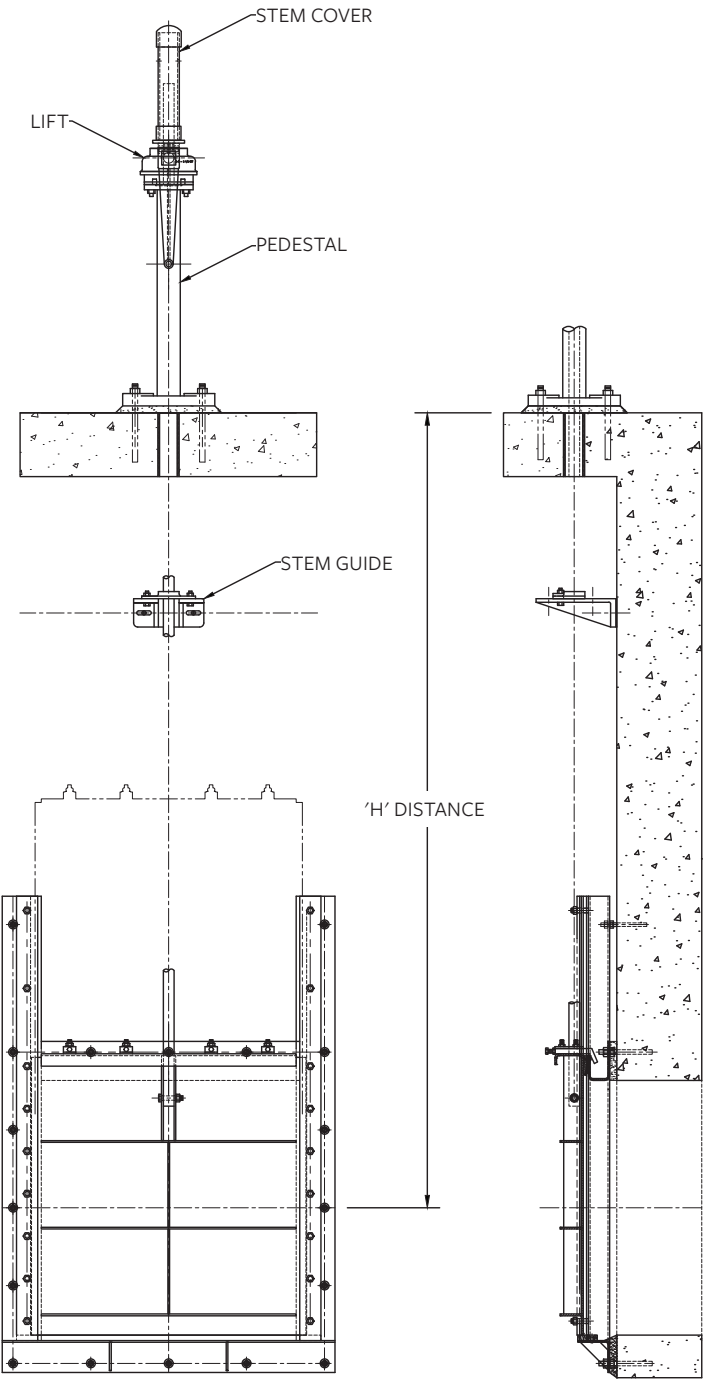


FIGURE 3-1  
FABRICATED SLIDE GATES - NOT SELF-CONTAINED

# Dimensional Data

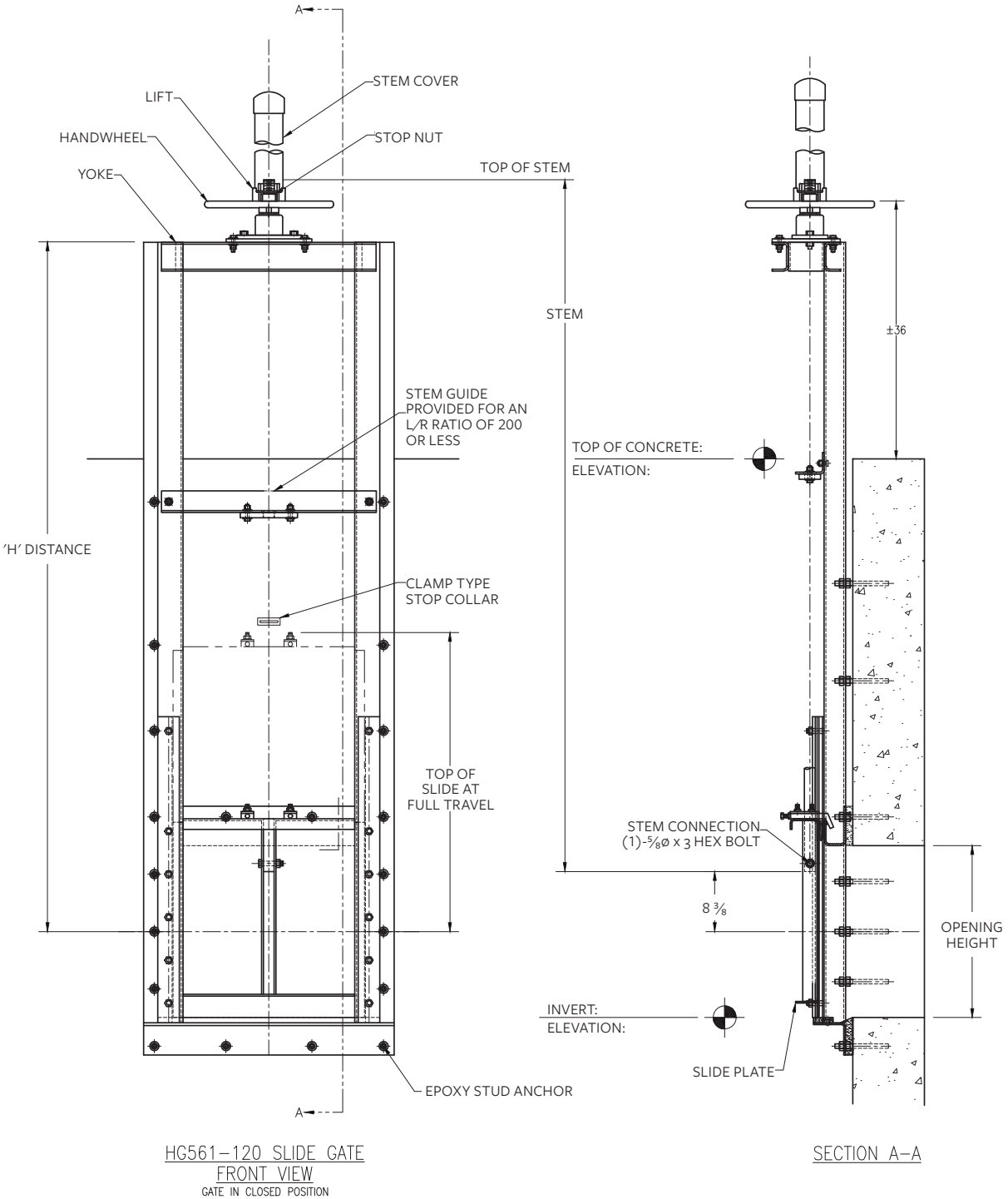


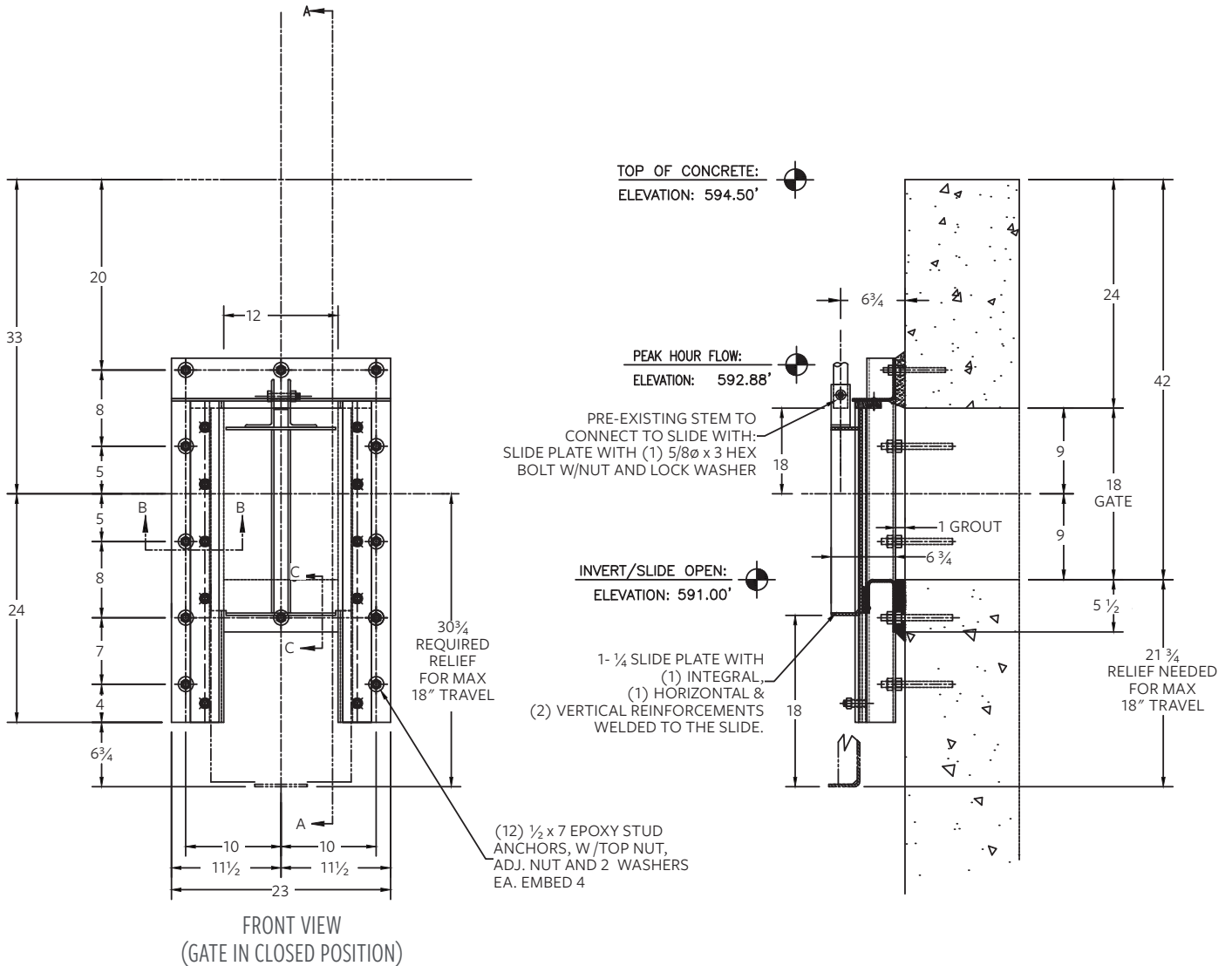
FIGURE 3-2  
FABRICATED SLIDE GATES – SELF-CONTAINED

# Weir Gates

Many treatment plants require downward-opening fabricated gates to permit a rough measurement of flow or to maintain a constant upstream water elevation. For these installations the gate slide is moved down to allow the flow of water over the top of the slide or weir plate. Sufficient room must be left on the gate side of the wall to permit the slide to travel downward for its maximum specified opening. Every effort should be made to mount the gate so it will be subjected to seating head.

If the gate must be mounted in an unseating position, seals are required along the sides and across the bottom of the gate. Weir gates mounted with unseating pressure, particularly wide gates, are subject to greater leakage because water pressure tends to deflect the slide away from the seals.

Most weir gates are required to be considerably wider than they are high. Gates up to 20 ft in width are not uncommon. Such a gate may be only 24 to 30" high. Tandem lifts and stems must be utilized to ensure alignment of the slide as it is raised or lowered. As a general rule, when the width is greater than twice the height and the width is greater than 48", a tandem stem arrangement should be used. Either manual or electrically actuated lifting devices may be utilized. Weir gates may be self-contained or not self-contained.



# Tandem Gates

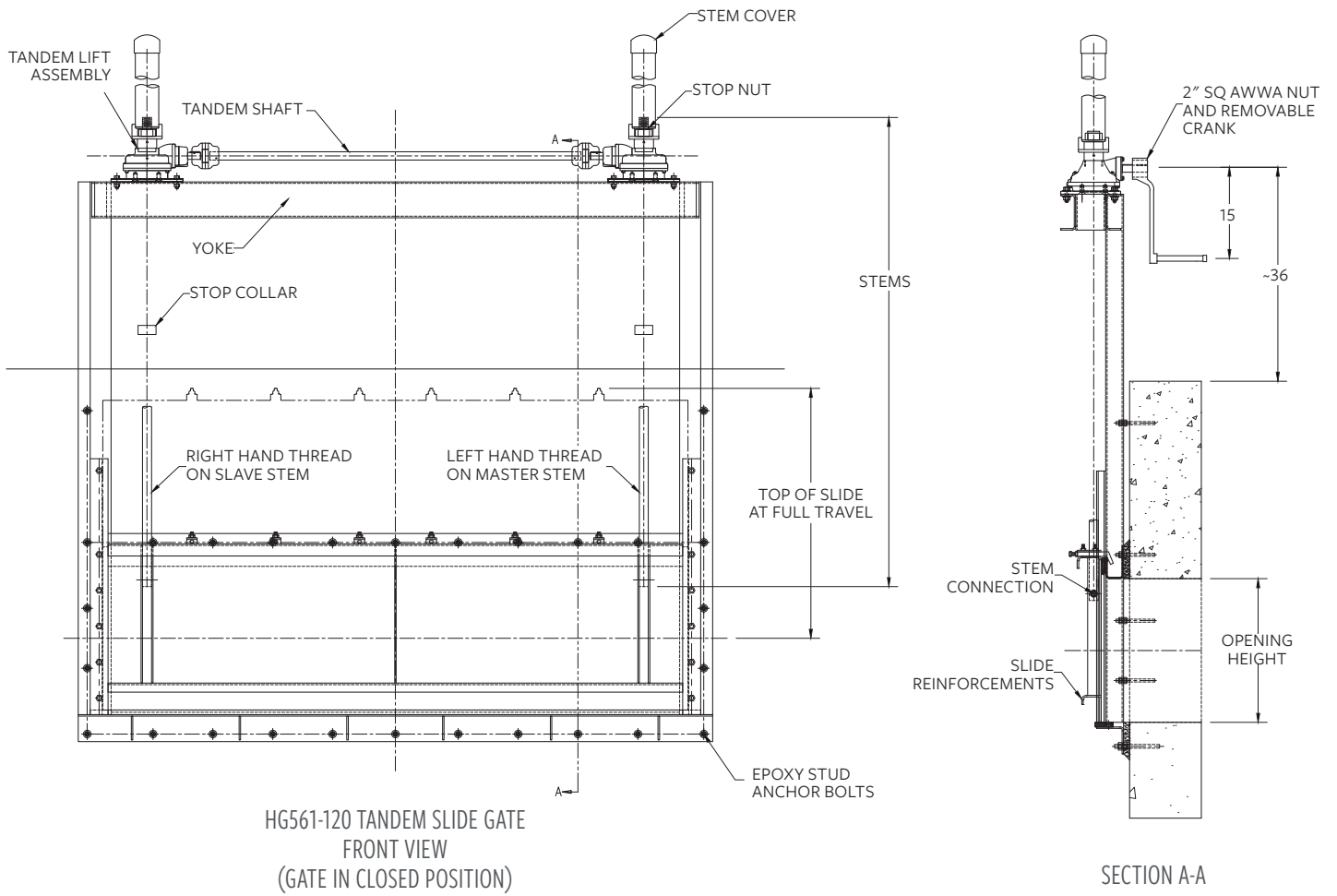


FIGURE 3-10  
SLIDE GATE – UPWARD OPENING (SELF-CONTAINED)

# Heavy Duty Fabricated Slide Gate Series HG561-240 & HG561-360

## DESCRIPTION

The HG561 Stainless Steel Slide Gate is an exceptional design for low leakage requirements in corrosive environments. The frame, slide, stem and fasteners are all stainless steel type 304 and 316 dependent on your application. The side guide seal assembly utilizes an ultra high molecular weight polymer molded and milled to positively retain the slide and form a watertight seal. The polymer provides a self-lubricating surface with a very low co-efficient of friction, ensuring smooth operation. The guide seal assembly is designed for positive retention allowing the compression force applied to the slide to be completely adjustable. All Hydro Gate® seals are factory adjusted and require no adjustment in the field. The 240 and 360 design utilize 3/8" and 1/2" material for skin plates and reinforcing members on the frame allowing for much higher head capacities.

The seal design of a HG561-240 model gate has similar features to the standard duty gate with larger components to allow for greater heads. The HG561-360 gate is the strongest fabricated gate option Hydro Gate offers. The wrap around frame with gussets offers the maximum resistance to un-seating head pressure. The frame has pre-compressed J-seals attached limiting leakage to standard AWWA rates even at significant depths.



FABRICATED SLIDE GATES



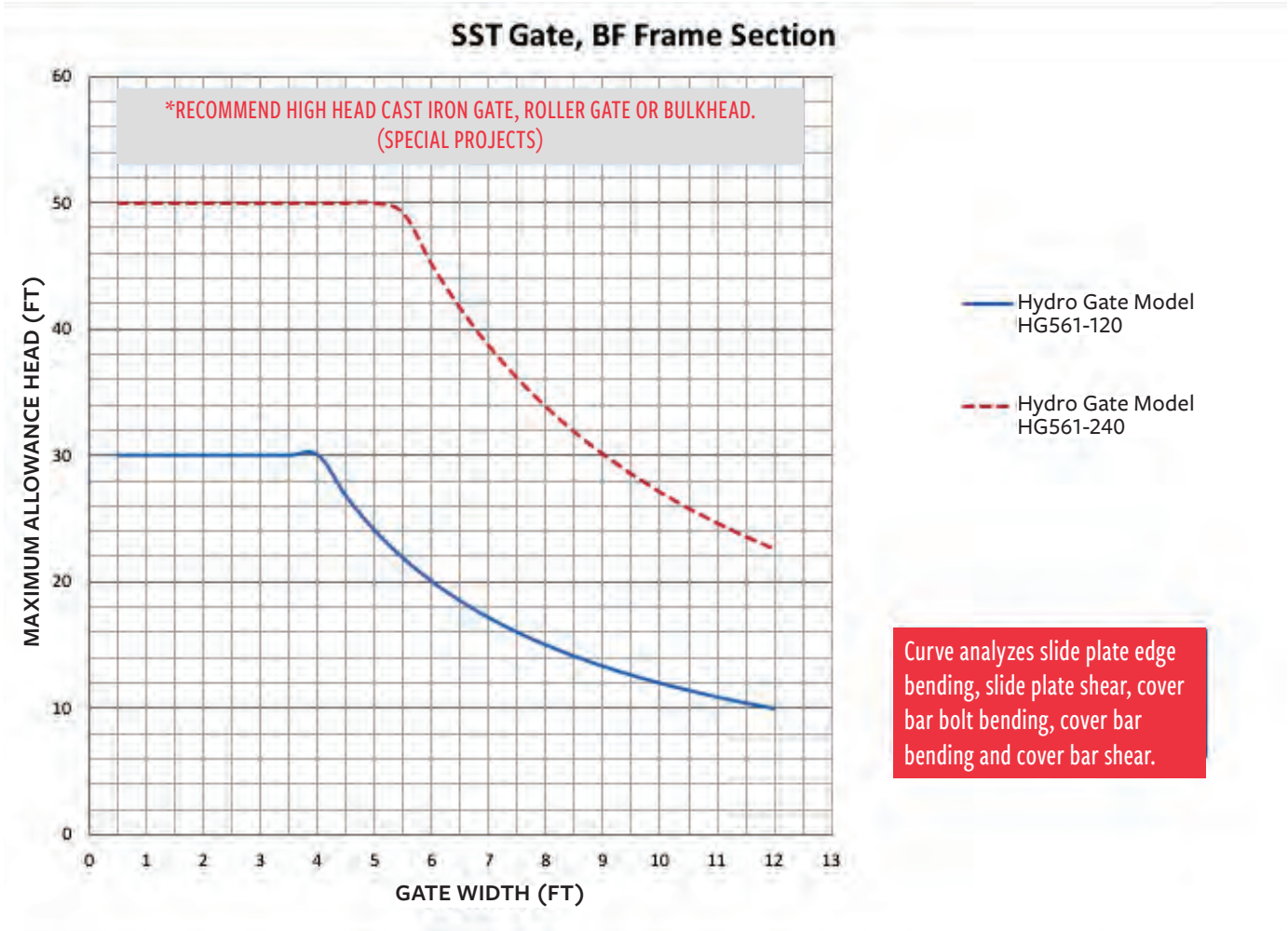
TOP WEDGE SYSTEM

## APPLICATIONS

- Water Treatment Plants
- Wastewater Treatment Plants
- Low-head Reservoirs
- Power Plants



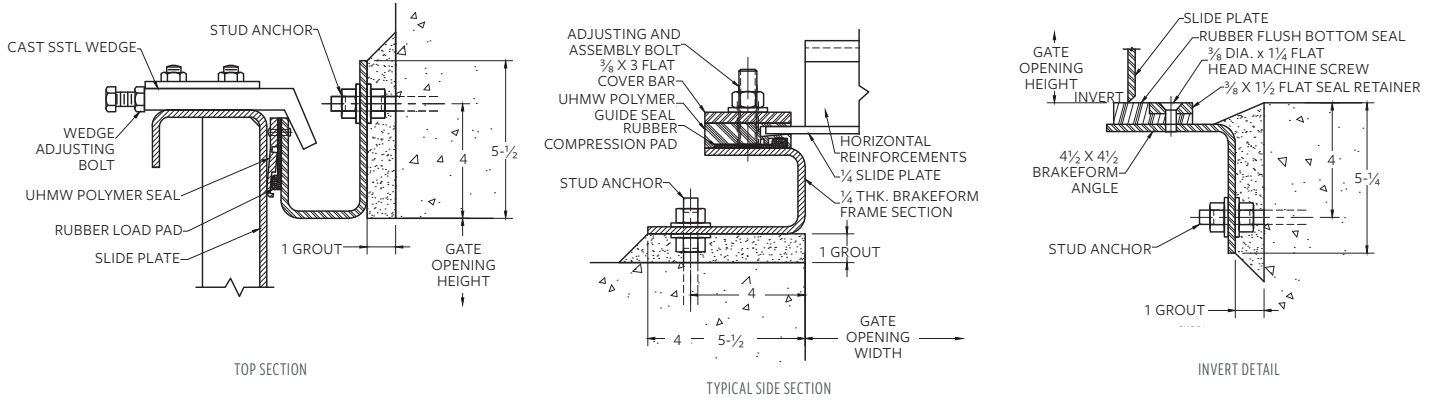
# HG 561 Allowable Head Limits (Unseating)



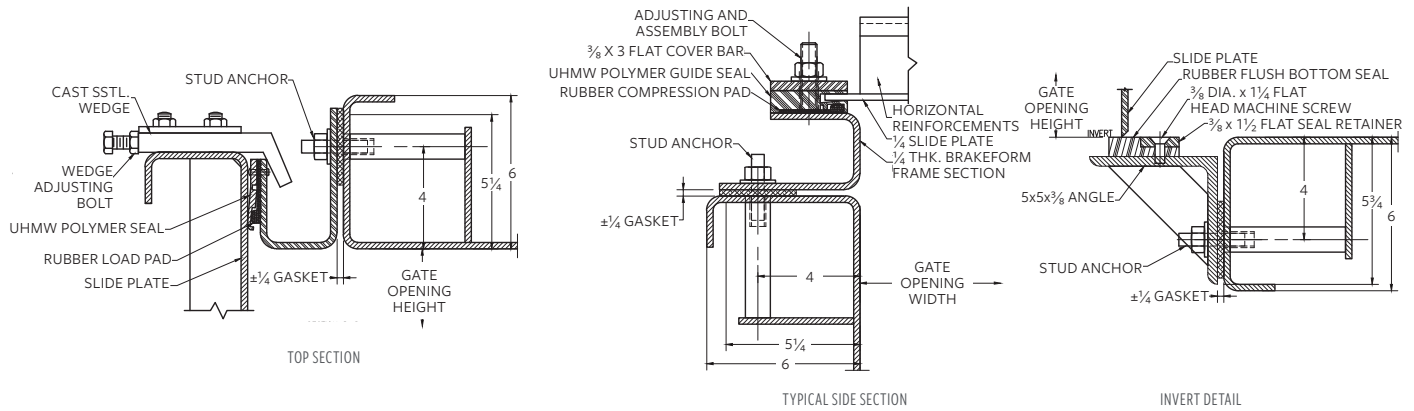
\*Higher head rating is available, please contact Hydro Gate

# Model HG561 Details

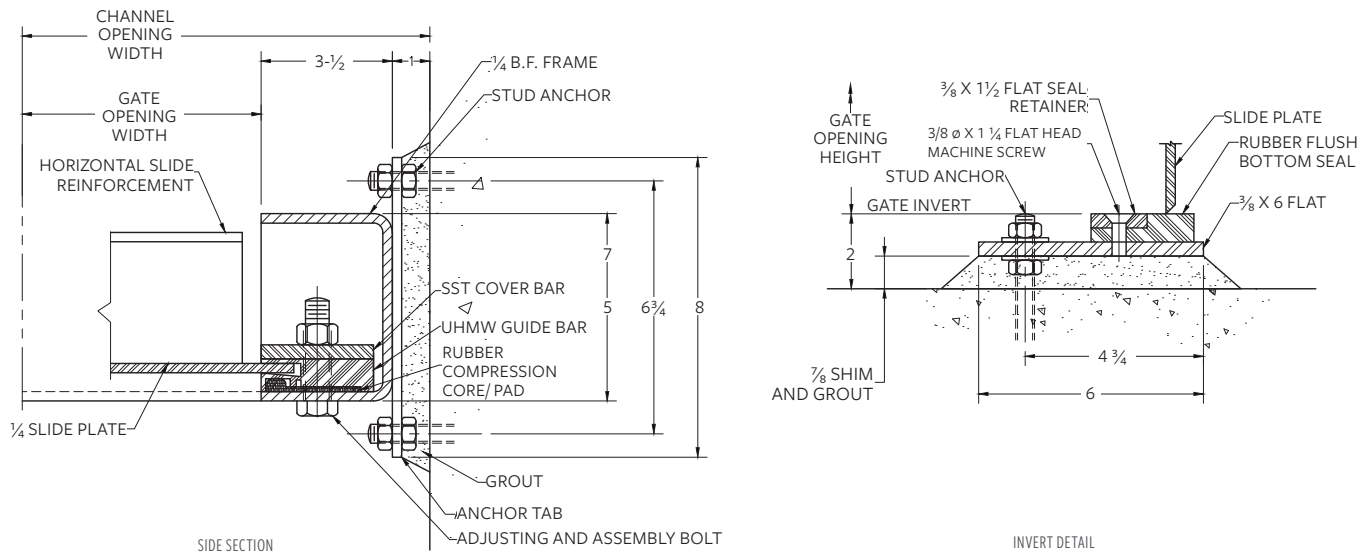
## MODEL HG561-120 WALL MOUNT



## MODEL HG561-120 THIMBLE MOUNT

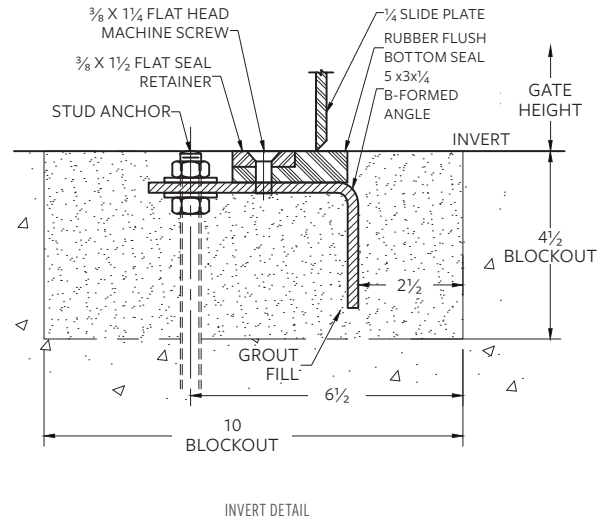
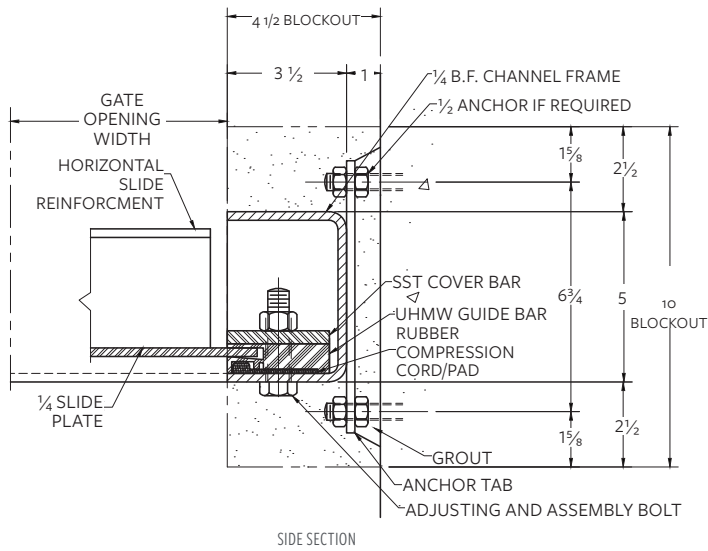


## MODEL HG561-120 CHANNEL MOUNT

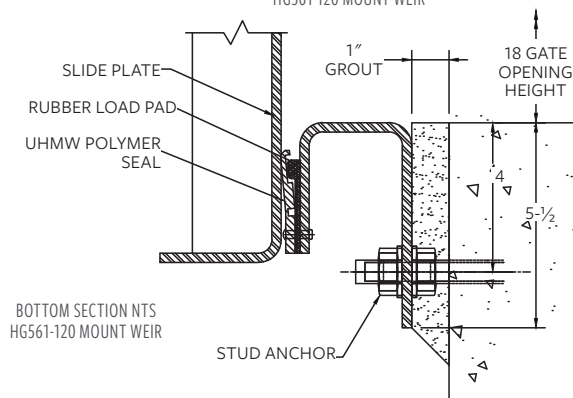
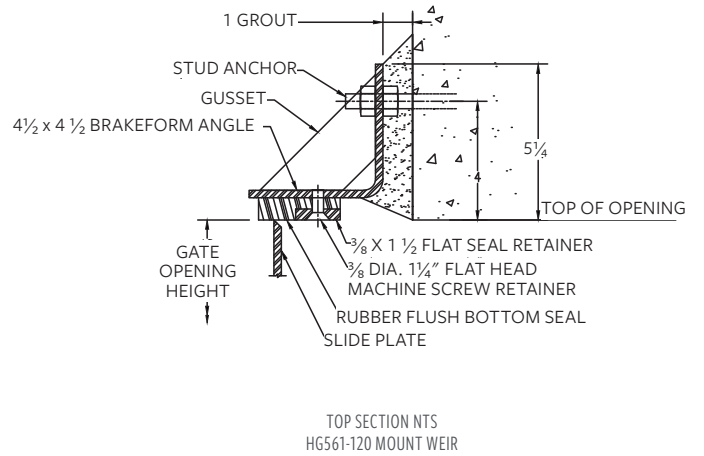
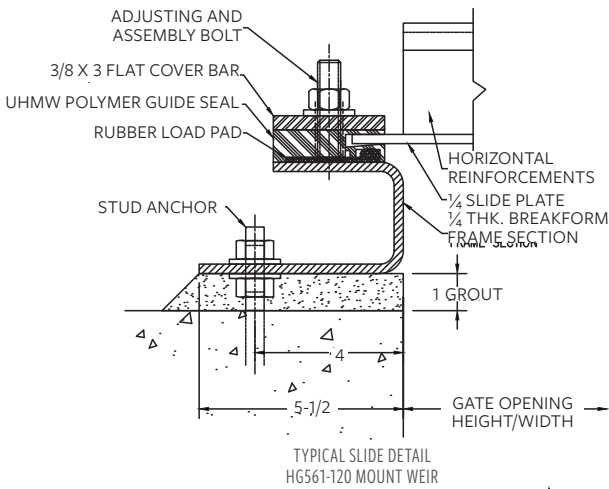


# Model HG561 Details

## MODEL HG561-120 EMBEDDED MOUNT

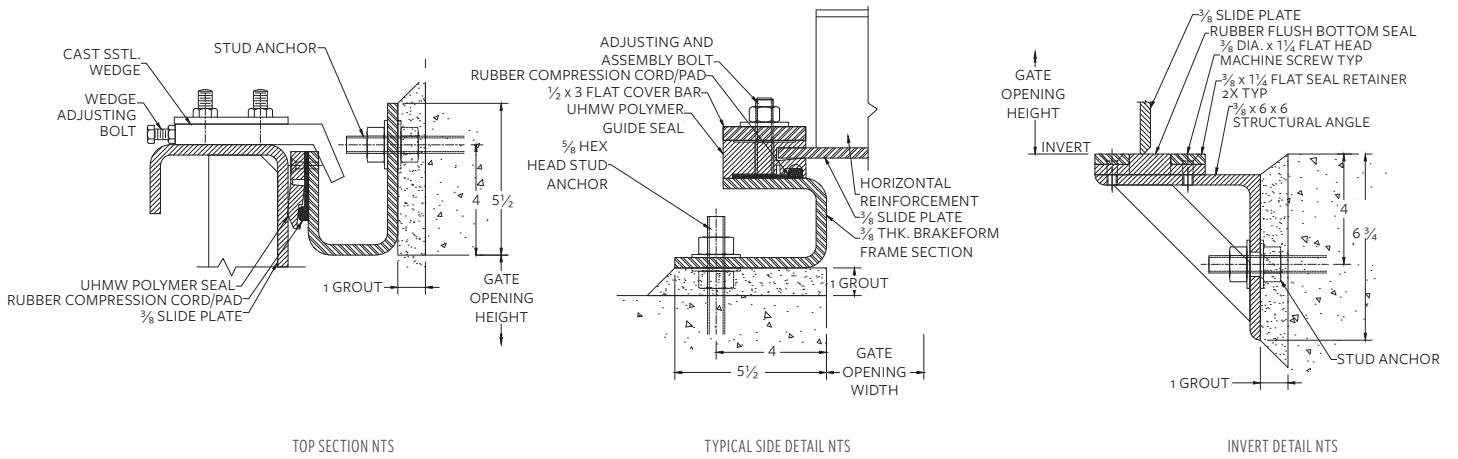


## MODEL HG561-120 WEIR WALL MOUNT

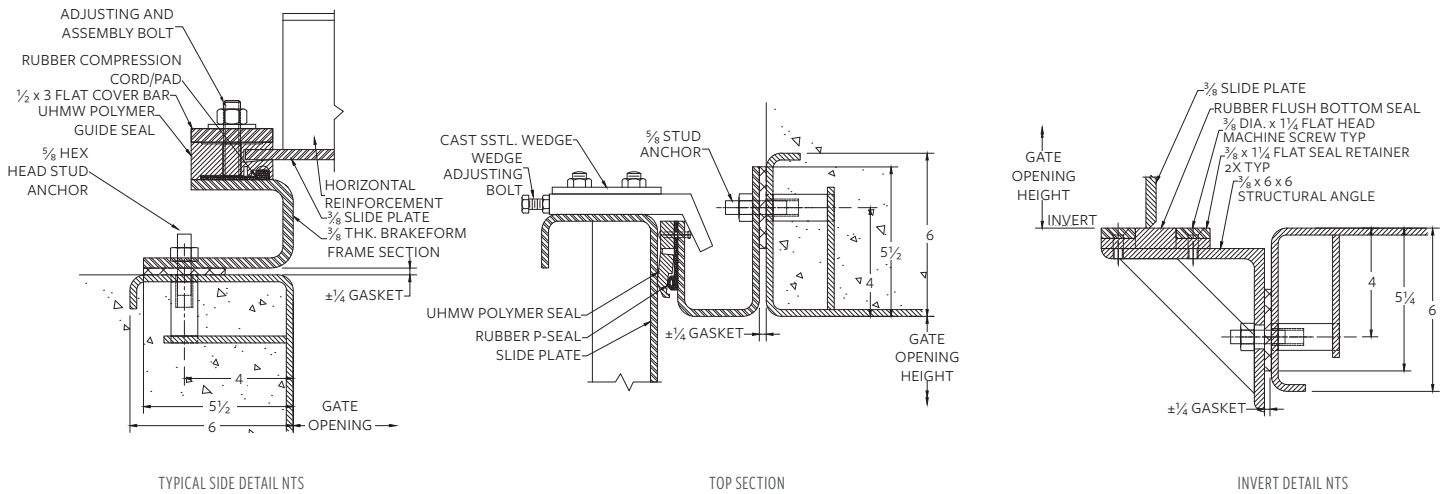


# Model HG561 Details

## MODEL HG561-240 WALL MOUNT



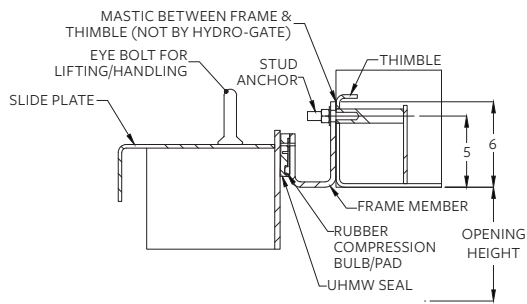
## HG561-240 THIMBLE MOUNT



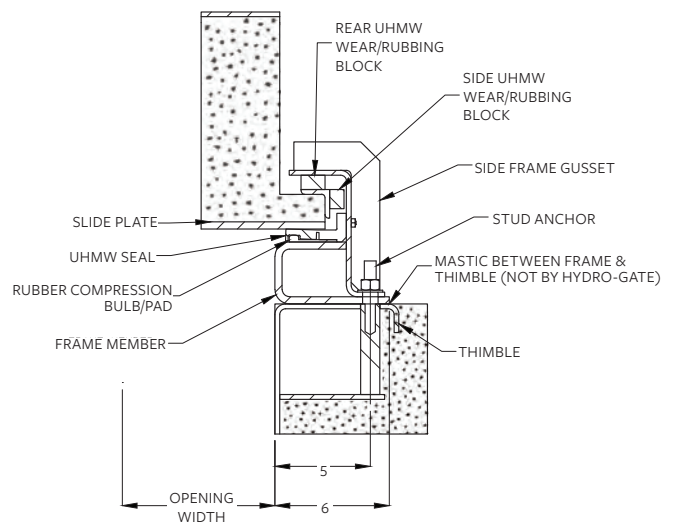
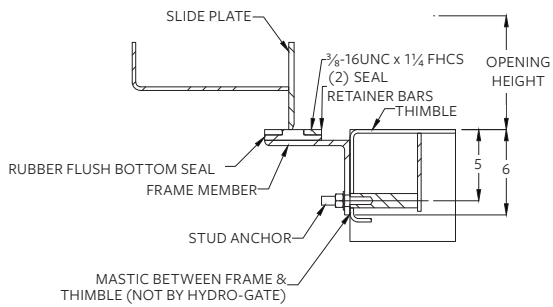
# Model HG561 Details

## MODEL HG561-360 THIMBLE MOUNT

\*DESIGN SUBJECT TO MODIFICATION TO MEET INDIVIDUAL PROJECT REQUIREMENTS



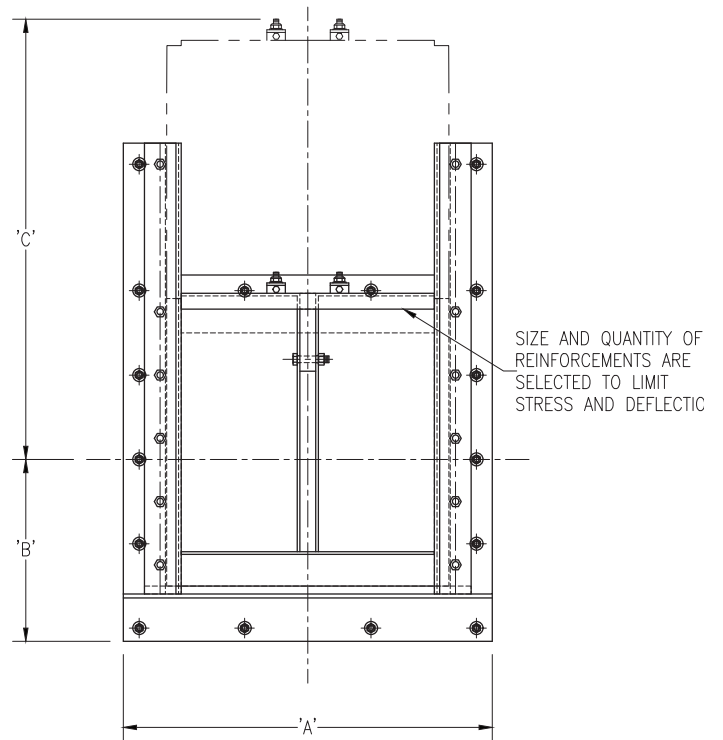
SCALE 1:6



INVERT DETAIL NTS

# Typical Non Self-Contained HG561-120 Gate Dimensions

GATE SIZE - W X H	A	B	C
6	17	8.25	12.75
12	23	11.25	21.75
18	29	14.25	30.75
24	35	17.25	41.75
30	41	20.25	50.75
36	47	23.25	59.75
42	53	26.25	68.75
48	59	29.25	77.75
54	65	32.25	86.75
60	71	35.25	95.75
72	83	41.25	113.75
84	95	47.25	131.75
96	107	53.25	149.75

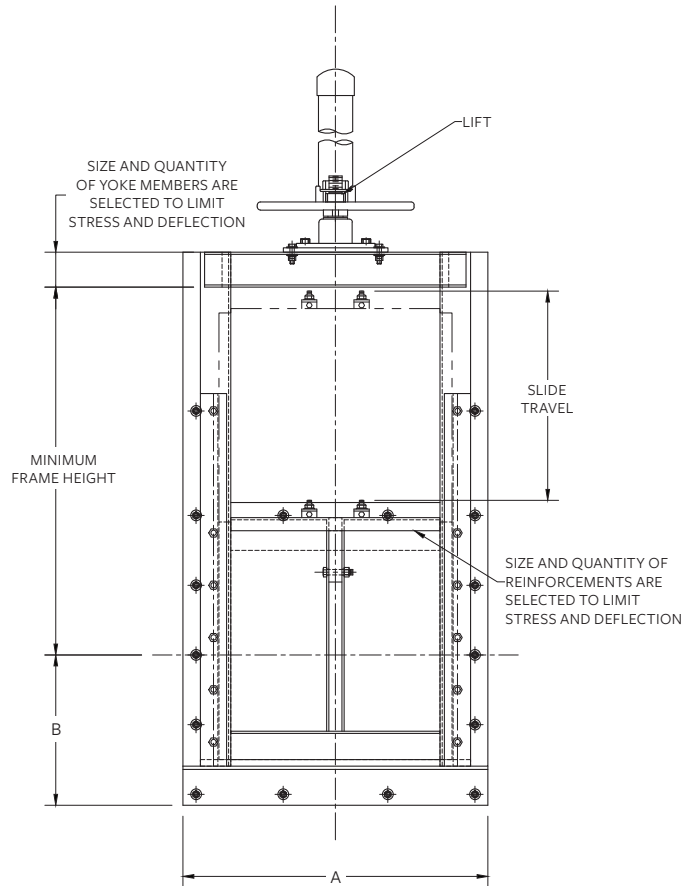


NON-SELF-CONTAINED FRAME  
FABRICATED HG561-120 SST SLIDE GATE

All measurements are in inches.

# Typical Self-Contained HG561-120 Gate Dimensions

GATE SIZE - W X H	A	B	MIN FRAME HEIGHT
6	17	8.25	12.75
12	23	11.25	21.75
18	29	14.25	30.75
24	35	17.25	41.75
30	41	20.25	50.75
36	47	23.25	59.75
42	53	26.25	68.75
48	59	29.25	77.75
54	65	32.25	86.75
60	71	35.25	95.75
72	83	41.25	113.75
84	95	47.25	131.75
96	107	53.25	149.75



All measurements are in inches.

# Specifications for Heavy Duty Fabricated Stainless Steel Gate

## GENERAL

### MANUFACTURER BRAND

Hydro Gate® products or approved equal.

### GENERAL

Fabricated stainless steel heavy duty service gates shall be fabricated from formed stainless steel plate and structural shapes. The size, quantity, gate configuration and operating conditions shall be as listed on the gate schedule. Gate, frame and yoke design shall conform to AWWA C561 as required.

Manufacturer shall be experienced and in regular production of gates and water control equipment. Welders and procedures shall be certified according to AWS D1.6 or ASME Section IX.

The gate shall be fully shop assembled, adjusted, inspected and tested for proper operation and leakage before shipment.

## MATERIALS

Materials used in construction of gates shall be of type best suited for the application and shall conform to the following ASTM specifications:

### Frame and Slide

Stainless Steel, ASTM A276, Type 304 or 316 – specify on gate schedule.

### Fasteners and Anchor Bolts

Stainless Steel, ASTM F593/F594 alloy group 1 (304)

Stainless Steel, ASTM F594/F594 alloy group 2 (316) – specify on gate schedule

### Guides, Liner and Seals

Ultra High Molecular Weight (UHMW) Polymer, ASTM D4020

### Flush Bottom Seal / Loading Pads

Natural or Synthetic Rubber, ASTM D2000

## GATE CONSTRUCTION

### SLIDE

The slide shall be a weldment of plate with integrally formed reinforcements at top and bottom with welded-on interior reinforcements. A stem block connection shall be used for non-rising stem applications or when precise adjustment of a hydraulic cylinder is required. All edges and corners shall be rounded and polished for smooth operation within the guide seal assembly.

Provision shall be provided for attaching stems to the gate with a clevis-type connection. Alternatively: stem block connection shall be used when precise adjustment of hydraulic cylinders is required

## FRAME

Gate frame shall be flange back, embedded, or channel mount as shown in the “Gate Schedule.” Spigot-back frames are not acceptable. The frame shall be an integral unit of brake form and structural shapes, rigidly assembled to form the waterway openings. Holes shall be provided for mounting on anchor bolts. The head channels shall be welded or bolted to the gate frame. The channels are to be sufficiently spaced to allow removal of the gate slide. The primary frame shall contain polymer guide, to prevent metal-to-metal contact between slide and frame.

## GUIDE / SEAL ASSEMBLY

UHMW seals shall be provided as specified in the “Gate Schedule.” Seals shall be securely fastened to the frame with stainless steel retainers and shall be replaceable and adjustable without removing the gate from the installed position. A mechanically fastened compression cord with tail shall be set behind the UHMW seal to allow for a self-adjusting seal system. The UHMW guide shall have a recess for the compression cord to create a cantilever of the UHMW seal onto the slide and to allow for secondary adjustment of the seal clamp force. Contact surfaces of UHMW seals shall be extruded to ensure smooth surface finish.

## TOP SEAL

Top member shall be sufficiently flexible to self-adjust, using a mechanically fastened compression cord with a tail, accounting for deflection in the slide plate under unseating loads. For gate widths 24” and greater, top wedges may be used to ensure engagement of the top seal and prevent overclosure of the slide.

## FLUSH BOTTOM CLOSURE

Rectangular solid bulb section neoprene seal shall be mechanically attached to frame horizontal member. Sealing action shall be against lower edge of slide plate. Seals attached to the slide or “press fit seals” are not acceptable.

*\*CSI format specs are available on the website*



# Specifications for Heavy Duty Fabricated Stainless Steel Gate

## WEDGES

Gates 24" wide and wider shall have adjustable wedges across top of opening. Wedges may be fabricated or cast and shall be held onto slide reinforcing member with two in-line welded studs with backing plate.

## YOKE

The yoke or head frame may be welded or bolted to frame extensions. The slide shall be removable through the yoke opening or by disassembly / removal of the yoke. Yoke shall be sufficiently strong to prevent deflection greater than 1/4" under load.

## STEMS

Gate stem diameter shall be adequate to withstand twice the force created by a 40 lb. pull on the hand-wheel or crank. Stems shall have rolled threads with a maximum roughness of 16 micro inches. Cut threads are not acceptable. The stem shall be supported by integral stem guide angles or wall mounted brackets with bronze split type stem collars, spaced to provide an l/r ration of 200 or less. Stems shall withstand 1.25 times the stalled motor thrust of the actuator.

## WALL THIMBLES

When thimbles are used, they shall be fabricated stainless steel with minimum thickness of 1/4". The flange shall be flat and plane within 3/16" without machining. Welded studs or threaded holes for screwed in studs shall be provided to match the gate layout. The top of the thimble flange shall be permanently marked top. The thimble shall be set plumb and flat. The gate shall be mounted with hard setting mastic and a 1/4" thick rubber gasket. Refer to the gate schedule for type and application of wall thimbles.

## MANUAL LIFTS

Gate lifts shall be hand-wheel or geared crank type as shown in the gate schedule. Lifts shall operate the gate with a maximum pull of 40 lb. on the hand-wheel or crank. Hand-wheel or crank shall be located approximately 36" above grating or walkway. All lifts shall have thrust bearings, bronze lift nuts and a bronze stop nut to limit the downward travel of the stem and slide. All geared lifts shall have cast iron or steel housing and pedestals. Aluminum housing and pedestals shall not be acceptable. All lifts shall be rising stem type. Stem covers made of clear butyrate shall be furnished for all lifts. Lifts shall be grease lubricated and regreaseable through grease zerks. Oil bath lifts are not acceptable.

## MOTOR OPERATED LIFTS

Motor operator shall be a 460-V, 3 phase, 60-Hertz motor with precision reduction gearing enclosed in weather-proof housing. The operator shall be designed to raise the gate at a rate of approximately 12 in/min. Integral controls shall include a control power transformer, reversing controller, torque and limit switches, open-stop-close push buttons.

## INSTALLATION

The gate and accessories shall be installed according to manufacturer's recommendation. The gate shall be clean and free of construction debris and stem threads shall be lubricated prior to operation of the gate. If electric motor operator is used, limit switches shall be adjusted according to manufacturer's instructions. If hydraulic cylinder is used, the rod or stem connection shall be adjusted for correct opening and closing action. The gate shall be cycled minimum of 1 cycle (open-close or vise versa) to ensure smooth operation. The gates may be field leak tested by the contractor. Leakage shall not exceed 0.1 gpm per foot of perimeter at the rated head, seating or unseating. Consult installation drawing for pressure rating of the specific gate.

**HEAVY DUTY FABRICATED STAINLESS STEEL GATE SCHEDULE**

Size W x H	Quantity	Operating Head Seating / Unseating	Gate Configuration Mounting & Operation	Lift Type	Remarks

# NOTES

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# NOTES

**OUR MISSION IS TO BE THE LEADING WATER CONTROL GATE MANUFACTURER IN THE WORLD, THROUGH CONTINUOUS DEVELOPMENT OF AN ORGANIZATION WHICH PROMOTES EXTRAORDINARY CUSTOMER SERVICE, SUPERIOR ENGINEERING, QUALITY PRODUCTS AND ON-TIME DELIVERY.**

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