

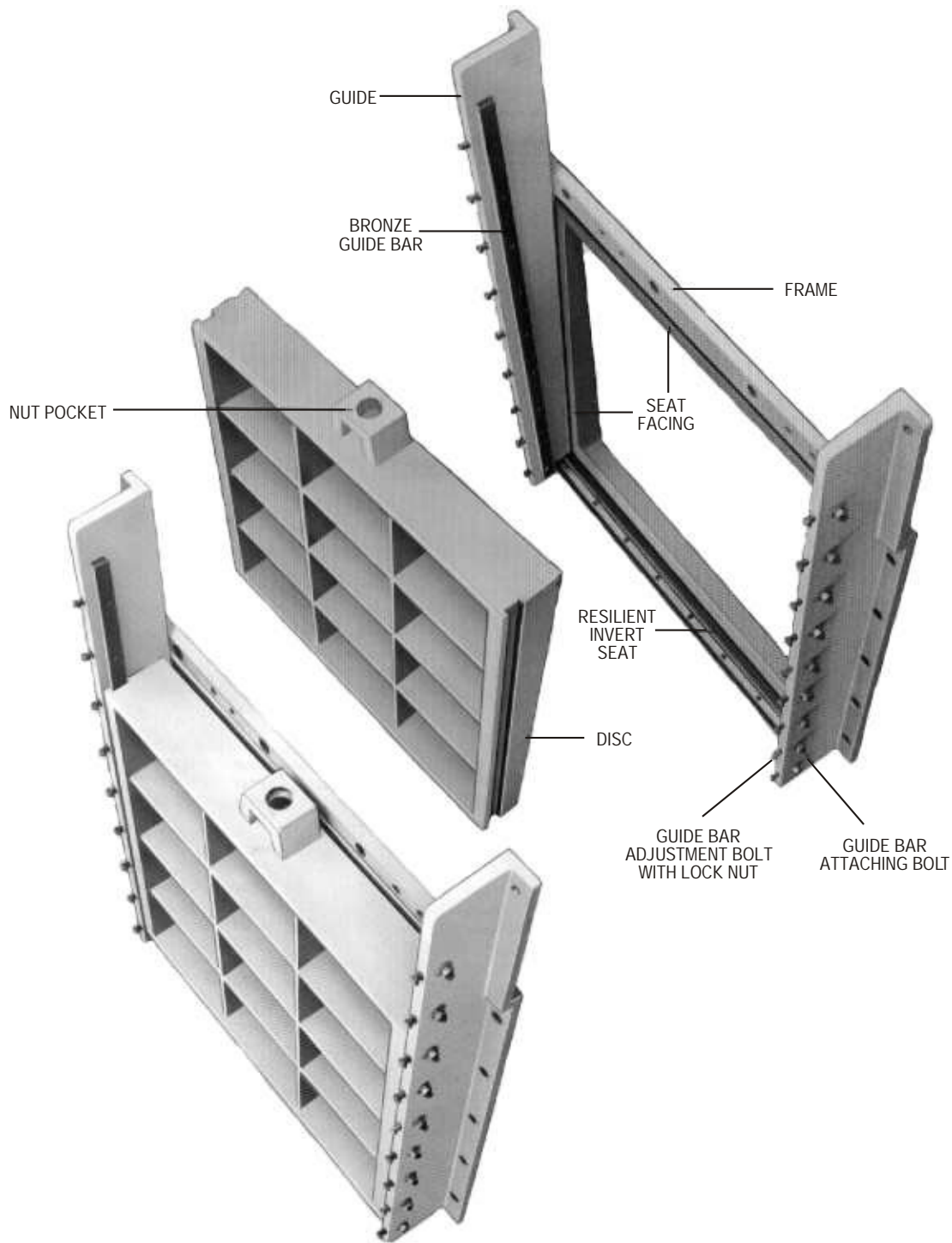


Rodney Hunt
A GA Industries Company
Glydaseal Gates

Glydaseal

Gates

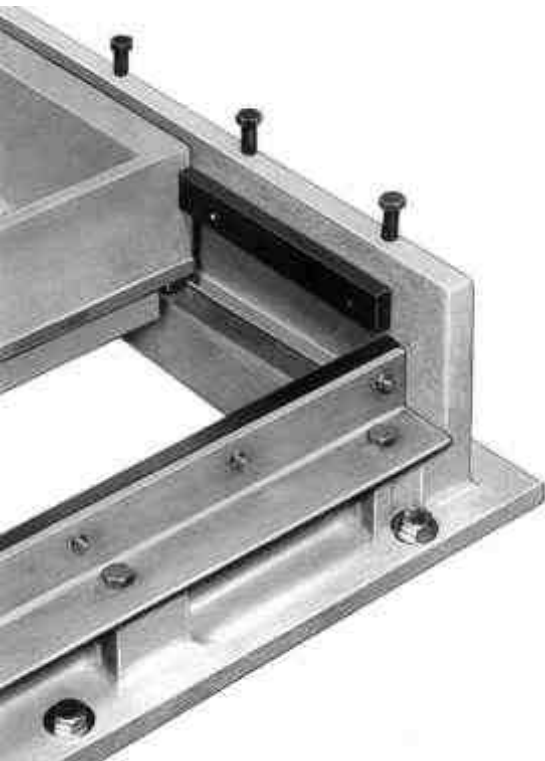




The Glydaseal Low Leakage Sluice Gate



Rodney Hunt manufactures a full line of integral and universal frame sluice gates. Each has design features that assure long life and low maintenance. The Glydaseal gate is an addition to that line and is designed to have the same long life and low maintenance. In addition, the gate has extremely low leakage characteristics. Extensive testing and over ten years of use have proven that the Glydaseal gate will meet a leakage specification of 0.001 gallons per minute per foot of perimeter for seating heads and 0.002 gallons per minute per foot of perimeter for unseating head. This is 1 % of that allowed by the American Water Works Association Standard for Cast Iron Sluice Gates, AWWA C501.



THE GLYDASEAL SLUICE GATE

The Glydaseal sluice gate, like a standard sluice gate, consists of a cast iron frame with integral guides and a movable cast iron disc. The frame attaches to a wall thimble and provides a seating surface. The disc is raised and lowered by means of a hoist and stem arrangement and has matching seats so that in the closed position the gate is virtually watertight. The difference between the Glydaseal sluice gate and the standard sluice gate is in the seating materials and the way the wedging action for tight sealing is obtained.

The very low leakage is obtained by using a resilient seal in the disc, which, in the closed position, seats against a PVC seating surface on the frame. This type of sealing takes place across the top and down both sides of the gate. The seal across the invert is obtained by a machined surface on the disc closing against a resilient seal attached to the frame. The standard material for the resilient seal on the disc and the flushbottom seal is neoprene which is resistant to corrosion and abrasion. The seating surface on the frame is PVC which is a proven material for use in water and sewage. The PVC has a low coefficient of friction so that the force necessary to open the gate is approximately the same as for a standard gate.

Wedging action is obtained by machining the plane of the sealing surface on the frame and disc at an angle of $2'12''$ from the vertical motion of the disc. As the disc moves downward to the closed position, the seating surfaces come into initial contact for their full length, approximately 2" from the fully closed position. As the gate continues to close the resilient seal on the disc is compressed to form a very tight seal.

The amount of compression of the seal is precisely set in the factory. This pressure can be adjusted in the field if necessary by adjusting the bronze guide bar which is mounted on the guide and engages a slot in the sides of the disc.

Because of the design of the gate and the materials of construction, the gate can be used in most applications where a standard cast iron, bronze mounted gate can be used where the head is 25 ft. seating or unseating or less. The gate has all of the advantages of the cast iron, bronze mounted gate with the additional important feature of extremely low leakage.

Features and Variations of the Glydaseal Gate



PERFORMANCE TESTING

Prior to introduction of the Glydaseal gate into the U.S. market, it had been used in England and other areas of the world for over five years. It was inspected in use and was highly recommended by the plant operators. In order to obtain a better measure of its performance, however, Rodney Hunt subjected the gate to a series of demanding tests.

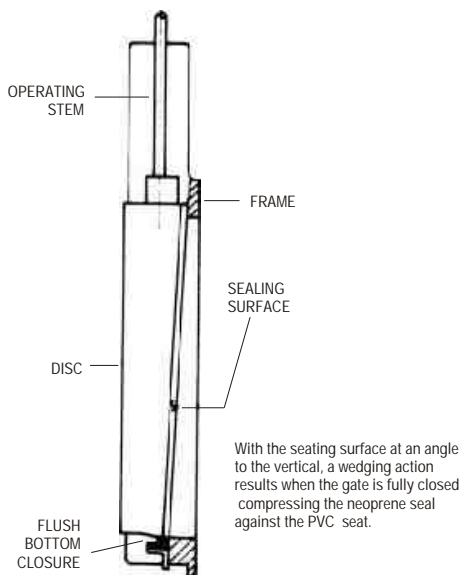
A 48" x 48" Glydaseal gate was arranged for operation by an electric actuator and was continuously cycled. The gate was subjected to 2500 operating cycles with no apparent change in the condition of the seal and no increase in the leakage rate.

The gate was mounted on a wall thimble with a blank flange so that it could be placed under unseating I conditions and the leakage measured. In all tests leakage was less than 1 % of the AWWA allowed I age at 25 ft. unseating head. The gate was then subjected to heads considerably greater than 25 ft. very little increase in leakage.

An ongoing testing program insures that the low I age characteristic of the Glydaseal gate is maintained Under this program, gates are placed under an unseating head of 25 ft. and the leakage measured. The gate is satisfactory if the leakage does not exceed 0.002 gallons per minute per foot of opening perimeter. Every gate that leaves Rodney Hunt meets this low leakage requirement.

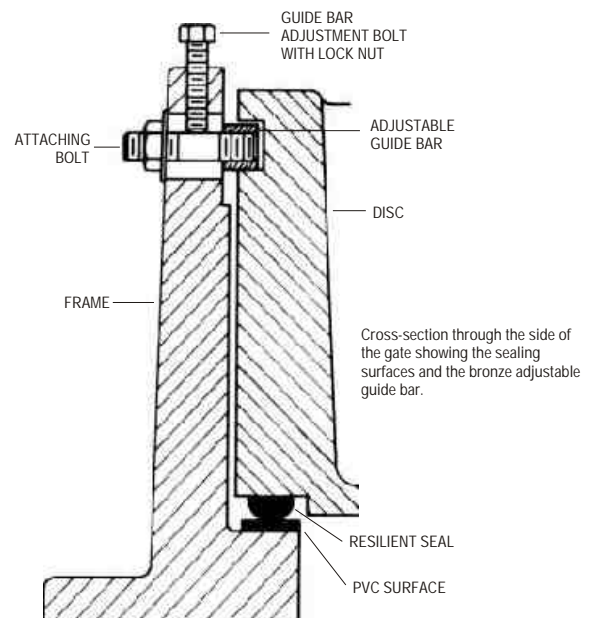
WEDGING ACTION

To obtain the very low leakage characteristics, the resilient seat on the disc must be compressed against the PVC seat on the frame when the gate is fully closed. This is accomplished by a wedging action that occurs along the full height of the gate when it is closed. The seats on the disc and the frame are in a plane $2\frac{1}{2}^\circ$ from vertical. A bronze guide bar which is set vertically and attached to the guides insures that the disc moves vertically and produces the wedging action. The two seats come in contact when the gate is approximately 2" from fully closed. Further travel of the gate in a closing direction causes the seal to compress.



ADJUSTABILITY

The proper compression between the resilient seal the PVC seat is set at the factory and further adjustments should not be necessary. Adjustability is possible, however, if required. The bronze guide bar is secured to the cast iron frame by means of bronze bolts passing through a slotted hole in the frame. Adjusting bolts are mounted at each clamping bolt so that bronze bar can be moved toward or away from seating surface to increase or decrease the amount of pressure exerted on the seats. This adjustment should be made very carefully in accordance with the instructions furnished with the gate.





DESIGN HEAD

All Glydaseal gates are designed for a head of 25 ft. seating or unseating. The gate has been successfully tested for heads greater than this, but this conservative approach insures that the leakage characteristics of the gate will be maintained throughout the life of the gate.

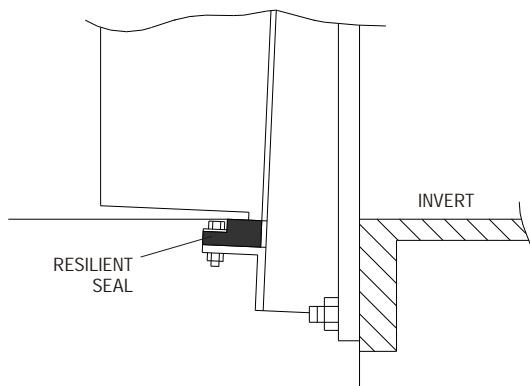
MATERIALS

The materials used with the Glydaseal sluice gate are proven for water and sewage use. It is a cast iron gate with bronze guide bars, stainless steel fasteners and special seats. The resilient seat on the disc is usually neoprene, the same seal material that has been used successfully in the Rodney Hunt HY-Q flushbottom closure sluice gate for over thirty years. The PVC seat on the frame is the same material proven in use in water and sewage treatment plants for many years.

FLUSHBOTTOM CLOSURE SEAL

All Glydaseal gates are provided with a flush type seal across the invert of the opening. This is particularly advantageous where it is desired to have the opening of the gate at the bottom of a wall. It results in complete drainage of the area, smoother flow through the opening and slightly less head loss through the gate.

On the Glydaseal gate, a machined surface across the bottom of the disc seats against a resilient seal mounted on a stainless steel bar attached to the frame at the invert of the opening.



NONRISING STEM

The Glydaseal gate can be furnished with a nonrising stem if necessary. In a nonrising stem arrangement, the disc climbs the stem as the stem is turned. Rodney Hunt does not recommend the use of nonrising stem gates because the threaded section of the stem is in the flow where debris can deposit on the threads. The gate becomes very difficult to operate and excessive stem thread wear can result.

SELF-CONTAINED GLYDASEAL

The Glydaseal gate can be furnished with the actuator mounted on the floor above the gate and connected the disc by the stem, or it can be furnished as a contained gate. With a self-contained gate, a yoke mounted on the top of the guides and the actuating mechanism is mounted on the yoke. All of the thrust operating the gate is taken by the yoke and, therefore, is not transmitted to the support structure around the gate.



RECTANGULAR AND CIRCULAR OPENINGS

All Glydaseal sluice gates are designed for rectangular openings. When the opening in the wall is circular cast iron wall thimble on which the gate is mount provided with a circular opening and a square flange. This allows the use of the standard square Glydaseal gate.



Specifications



AWWA STANDARD

The AWWA Standard for Cast iron Sluice Gates, AWWA C501, provides detailed standards for cast iron, bronze mounted sluice gates. This standard also describes the wall thimbles, stems, hoists and other appurtenances required for the installation of the gates. The standard describes a high quality sluice gate that will last for many years with no maintenance on the gate and only periodic lubrication of the hoist and stem.

The Glydaseal sluice gate meets all aspects of the AWWA Standard for Cast Iron Sluice Gates except in the sealing method and the seal materials.

The gate is cast iron, with either bronze or stainless steel fasteners and a bronze guide bar. It mounts on a cast iron wall thimble and is operated by means of a hoist and stem identical to those used for standard cast iron sluice gates. Where electric driven actuators or

hydraulic cylinders are used, the same AWWA Standards apply.

There is a wedging action used to force the disc against the frame in the fully closed position just as there is standard gate. The sealing materials, instead of being bronze, are neoprene seating on a PVC strip, both of which are proven materials in water and sewage applications.

The allowable leakage for a sluice gate built to AWWA Standards under a head of 20 ft. seating would be 0.1 gallons per minute (GPM) per foot of seating perimeter. Under 20 ft. unseating head conditions, the allowable leakage for the same gate would be 0.2 GPM per foot of seating perimeter. For the Glydaseal gate under a head of 25 ft. seating the allowable leakage would be 0.001 GPM per foot of seating perimeter and under unseating head the allowable leakage would be 0.002 GPM per foot of seating perimeter.

ABBREVIATED SPECIFICATIONS

All sluice gates shown on the plans and listed in the specifications shall conform in all respects to the latest edition of the AWWA Standard for Sluice Gates, AWWA C501, with the following changes and additions:

Materials used in the construction of the sluice gates shall be as follows;

Wall Thimble,	
Frame, Guide and	
Disc of Sluice Gate	ASTM A126, Class B
Guide Bar	Bronze, ASTM B98, (CA655)
Frame Seat	Polyvinyl Chloride (PVC), ASTM D1921, Type 1, Grade 1
Disc Seal and	Neoprene,
Bottom Closure Seal	ASTM D-2000-2BC-615
Fasteners and	Stainless Steel ASTM
Adjusting Bolts A-276,	Type 304 or Bronze, ASTM B-98, (CA655)

The sluice gate shall be designed for a head of 25 ft. seating or unseating and will have a maximum allowable leakage of 0.001 gallons per minute per foot perimeter for seating head conditions and 0.002 gallons per minute per foot of perimeter for unseating conditions.

The seating surface on the frame shall be PVC strips permanently attached to the iron. The seating face on the disc will be a specially shaped resilient seal, bonded into a machined groove in the disc.

The sealing pressure between the resilient seal and PVC shall be increased or decreased by adjusting bronze guide bar attached to the cast iron frame. Adjustment shall be by means of adjusting screws.

The gate will be of the flush-bottom closure type incorporating a neoprene seal in the frame along the invert of the opening.

The sluice gate shall be the Glydaseal gate as manufactured by the Rodney Hunt Company or approved equal.



GLYDASEAL SLUICE GET SPECIFICATIONS

All sluice gates shown on the plans and listed in the specifications shall conform to the latest edition of the AWWA Standard for Sluice Gates, AWWA C501. In addition, the gates will conform to the following detailed specifications.

The sluice gate shall consist of a frame and guides as a single casting with a movable side or disc. Wedging action upon closure will be obtained by constructing the seating surface at an angle to the vertical mounting surface of the gate. Special seals between the movable disc and the frame will be used to maintain leakage at or below the rate required by these specifications.

The frame will be drilled for attaching to a matching wall thimble with studs and nuts. The mounting flange of the frame will be machined and all attaching holes will be drilled and faced. The seating face of the frame will be machined at an angle of 2112° to the plane of the mounting flange. The guides, which are cast integrally with the frame, will extend a sufficient distance above the opening to support one half the disc in the open position. Tie guides will be machined where the bronze guide bars are mounted. A bronze guide bar will be attached to the cast iron guides with studs and nuts spaced every 8". The attaching studs will maintain the position of the bronze bar against the full seating or unseating head on the gate. The bar may be adjusted by means of adjusting bolts which pass through the cast iron frame and bear on the guide bar attaching studs. A polyvinyl chloride seat having a minimum width of 1.25" will be attached to the frame by means of flat head screws of the same material and a two part epoxy adhesive. The seat facing will be clamped and fastened firmly in place during the bonding process and, after being attached, will be machined to a flat smooth surface. The seating surface will extend along both sides and across the top of the gate. The seat facing across the top of the gate will have a minimum width of 3.00".

A flush-bottom closure seal will be attached to the frame along the invert of the opening. The seal will be mounted to a stainless steel angle using a stainless steel retainer plate and attaching screws. In turn, the angle will be mounted to a machined surface on the frame with stainless steel attaching bolts. The top surface of the seal will be flush with the opening of the gate. The shape of the seal will allow full contact with the machined surface on the disc.

The disc will be a flat plate with horizontal and vertical reinforcing ribs. The disc will be designed so that deflection of any part of the disc with full head on the gate will be less than 0.060". A guide slot or groove will be

machined in the side of the disc to match the bronze guide bar on the frame. The groove will be fully machined to allow 1/8" of clearance between the bronze guide bar and the cast iron disc. The seating surface of the disc will be machined at an angle of 21/20 to the vertical guide grooves. A resilient seal will be bonded into a machined groove along both sides of the opening and across the top of the gate to match the seat facing on the frame. The shape of the seal will be such that the seal will be firmly bonded in place. A thrust nut pocket shall be part as part of the disc and shall be located on the vertical centerline of the gate. The thrust nut pocket shall be designed to withstand all thrusts placed upon it by the actuator.

Materials used in the construction of the sluice gates shall be as follows:

Wall Thimble, Frame, Guide and Disc of Sluice Gate	ASTM A126, Class B
Guide Bar	Bronze, ASTM B98, (CA655)
Frame Seat	Polyvinyl Chloride (PVC), ASTM D1921, Type 1, Grade 1
Disc Seal and Bottom Closure Seal	Neoprene, ASTM D-2000-2BC-615
Fasteners and Adjusting Bolts A-276,	Stainless Steel ASTM Type 304
	or Bronze, ASTM B-98, (CA655)

After the gate has been properly installed in accordance with the installation instructions from the manufacturer, it shall be tested for leakage. The leakage under the design seating or unseating head shall not exceed 1 % of the leakage allowed by the AWWA Standard for Sluice Gates, C501. At 25 ft. of seating head the leakage shall not exceed 0.001 gallons per minute per foot of perimeter, and at 25 ft. of unseating head the leakage shall not exceed 0.002 gallons per minute per foot of perimeter.

The sluice gate shall be the Glydaseal gate as manufactured by the Rodney Hunt Company or approved equal.

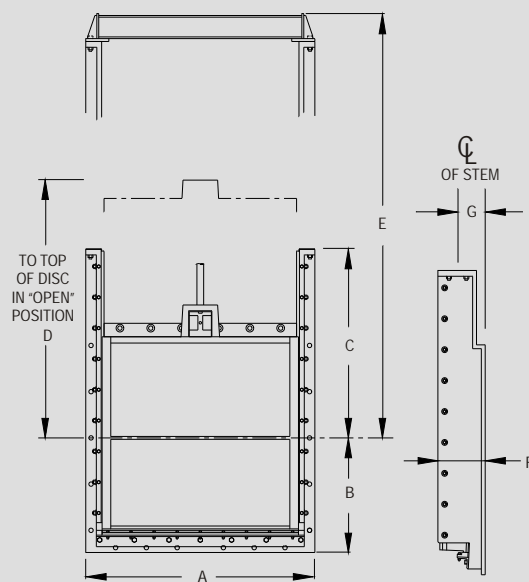
In all respects, except the method of sealing, the Glydaseal is the same as a conventional sluice gate. It mounts on a wall thimble in the same manner and is operated by a hoist and stem arrangement similar to the standard gate. Operation can be by a manual actuator, electric motor driven actuator or hydraulic cylinder. For specifications covering the remaining equipment required to complete the installation of the Glydaseal gate, please refer to the Specification Section of the Rodney Hunt Company catalog.



Glydaseal Gate Dimensions

The dimensions listed below are the actual dimensions to the nearest 1/4" for the sizes of the gates listed. These are the most important dimensions from the standpoint of installation clearance and stem location. Other dimensions are available upon request.

Where a gate is to be mounted on a pipe flange, an additional frame section and flange are added to the gate. This will change the "F" and "G" dimensions depending upon the size of gate. This information available from the factory.



SIZE	DIMENSIONS, INCHES						
WIDTH X HEIGHT INCHES	A	B	C	D	E	F	G
12 x 12	23.50	11.75	13.00	24.25	30.00	8.00	5.50
18 x 18	29.50	14.75	19.00	33.25	39.00	8.00	5.50
24 x 24	35.50	17.75	25.00	42.25	48.00	8.00	5.50
24 x 36	35.50	23.75	37.00	60.25	66.00	8.00	5.50
30 x 30	41.50	20.75	31.00	51.25	57.00	8.00	5.50
36 x 24	47.50	17.75	25.00	42.25	48.00	8.00	5.50
36 x 36	47.50	23.75	37.00	60.25	66.00	8.00	5.50
36 x 48	47.50	29.75	49.00	78.25	84.00	8.00	5.50
36 x 60	47.50	35.75	61.00	96.25	102.00	8.00	5.50
42 x 42	53.50	26.75	43.00	72.50	83.00	12.25	7.12
48 x 36	59.50	23.75	37.00	63.50	73.00	12.25	7.12
48 x 48	59.50	29.75	49.00	81.50	94.00	12.25	7.12
48 x 60	59.50	35.75	61.00	99.50	114.00	12.25	7.12
48 x 72	59.50	41.75	75.00	117.50	133.00	12.25	7.12
54 x 54	65.50	32.75	55.00	90.50	103.00	12.25	7.12
60 x 36	71.50	23.75	37.00	63.50	73.00	12.25	7.12
60 x 48	71.50	29.75	49.00	81.50	94.00	12.25	7.12
60 x 60	71.50	35.75	61.00	99.50	114.00	12.25	7.12
60 x 72	71.50	41.75	75.00	117.50	133.00	12.25	7.12
60 x 84	71.50	47.75	85.00	135.50	158.00	12.25	7.12
60 x 96	71.50	53.75	99.00	153.50	176.00	12.25	7.12
66 x 66	77.50	38.75	66.00	108.50	123.00	12.25	7.12

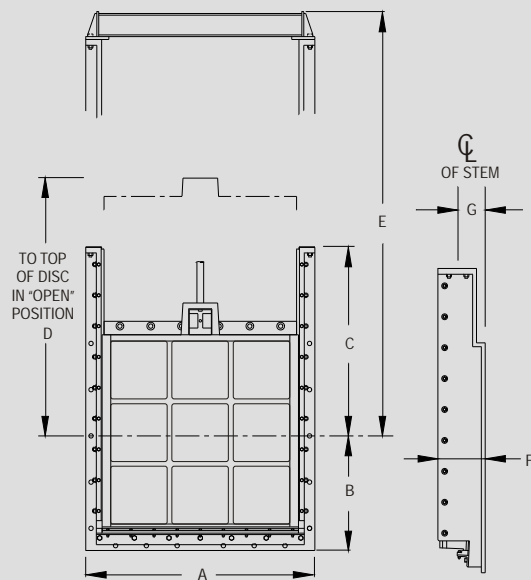
Flush-bottom Closure

All Glydaseal gates have a resilient seal along the invert for flush-bottom closure. Where the invert of the opening is flush with the floor, a boxout required beneath the gate. The size of this boxout depends on the size of the gate, specifically, dimension "F" in the table. The drawing shown here illustrates the size of concrete boxout required based on this dimension. The boxout should be made at least 6" wider than the width of the gate dimension "A".

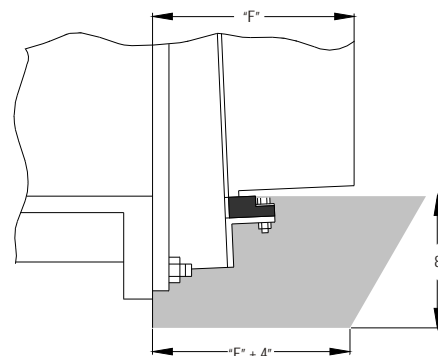


All sluice gates listed in the table can be installed where the installation clearance along each side and along the bottom of the gate is 1". The flange of the gate is drilled so that the attaching studs extend to the front of the gate where they are easily accessible.

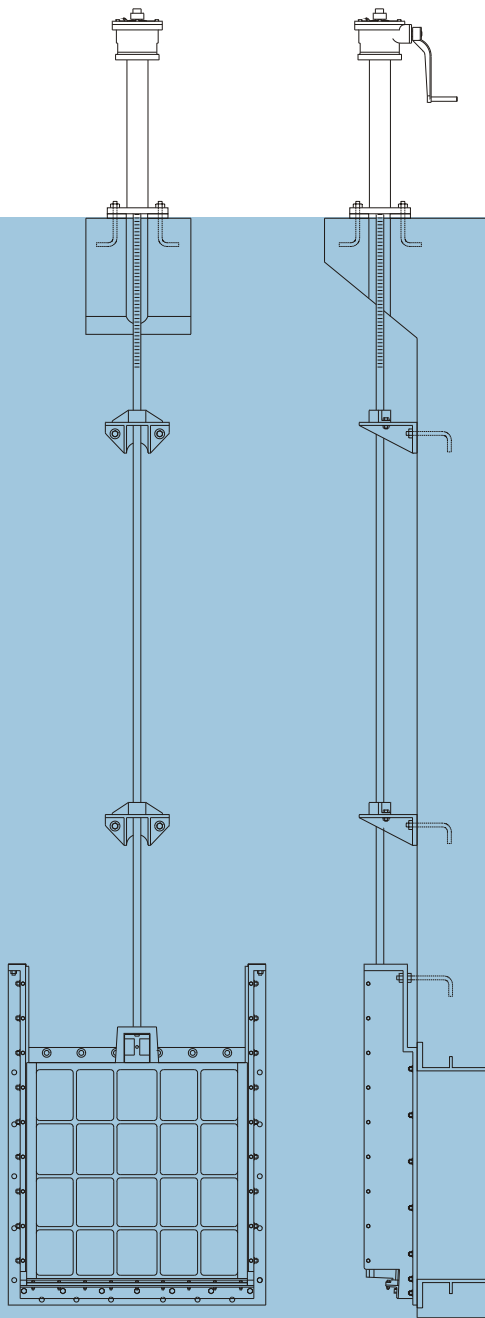
Glydaseal gates can be furnished in many sizes not listed in the table. Please contact Rodney Hunt Company for dimensions of gates not shown in the table.



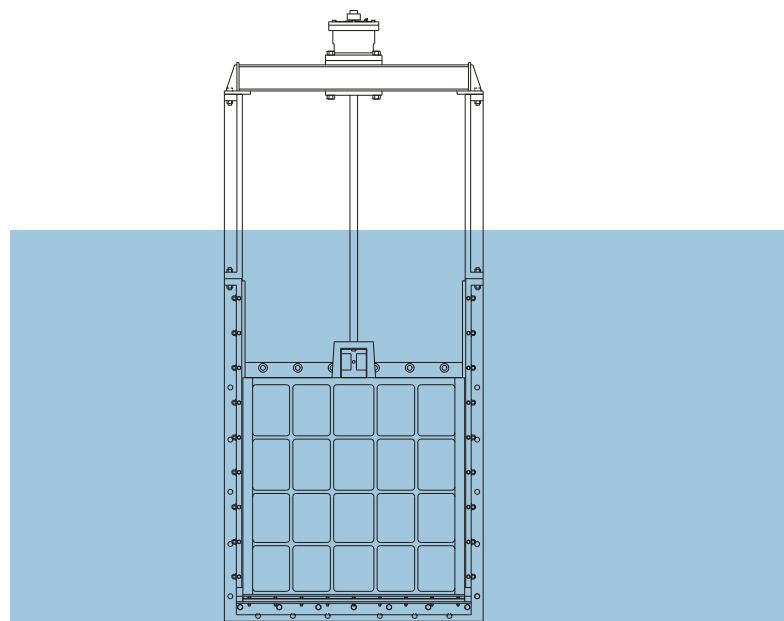
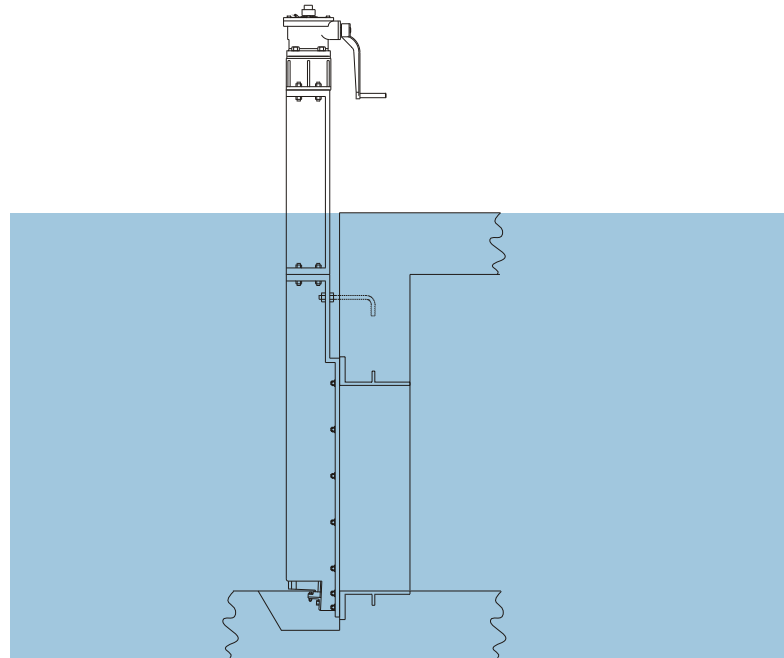
SIZE WIDTH X HEIGHT INCHES	DIMENSIONS, INCHES						
	A	B	C	D	E	F	G
72 x 48	83.50	29.75	49.00	81.50	94.00	12.25	7.12
72 x 60	83.50	35.75	61.00	99.50	114.00	12.25	7.12
72 x 72	83.50	41.75	75.00	117.50	133.00	13.00	7.12
72 x 84	83.50	47.75	85.00	135.50	158.00	13.00	7.12
72 x 96	83.50	53.75	99.00	153.50	176.00	13.00	7.12
84 x 60	95.50	35.75	61.00	99.50	114.00	12.25	7.12
84 x 72	95.50	41.75	75.00	117.50	133.00	13.00	7.12
84 x 84	95.50	47.75	85.00	135.50	158.00	13.00	7.12
84 x 96	95.50	53.75	99.00	153.50	176.00	13.00	7.12
84 x 108	95.50	59.75	109.00	171.50	194.00	13.00	7.12
96 x 72	107.50	41.75	75.00	117.50	133.00	13.00	7.12
96 x 84	107.50	47.75	85.00	135.50	158.00	13.00	7.12
96 x 96	107.50	53.75	99.00	153.50	176.00	13.00	7.12
96 x 120	107.50	65.75	121.00	189.50	212.00	13.50	7.12
108 x 84	119.50	47.75	85.00	135.50	158.00	13.00	7.12
108 x 96	119.50	53.75	99.00	153.50	176.00	13.00	7.12
108 x 108	119.50	59.75	109.00	171.50	194.00	13.00	7.12
108 x 120	119.50	65.75	121.00	189.50	212.00	13.50	7.12
120 x 96	131.50	53.75	99.00	153.50	176.00	13.50	7.12
120 x 108	131.50	59.75	109.00	171.50	194.00	13.50	7.12
120 x 120	131.50	65.75	121.00	189.50	212.00	13.50	7.12
120 x 132	131.50	71.75	133.00	207.50	230.00	13.50	7.12
120 x 144	131.50	77.75	145.00	225.50	248.00	13.50	7.12



Typical Installations



This diagram illustrates the most common installation of a Glydaseal sluice gate. It is mounted on a cast iron wall thimble and operated by a crank-operated actuator mounted on a concrete haunch above the gate.



The Glydaseal gate can be furnished as a self-contained gate as illustrated here. The crank-operated benchstand is mounted directly on the yoke of the gate and the guides are extended to place the crank at the proper operating elevation. The invert of the opening is level with the floor so that the flush-bottom closure gate is clearly advantageous.

Questions and Answers



Why is the Glydaseal limited to 25 ft. of head, seating and unseating?

In most sluice gate applications, the gates, are under less than 25 ft. seating or unseating head and Glydaseal meets the requirements of these heads with a very conservative design. Actually, the gate has been extensively tested at heads nearly double the 25 ft.

Is there any problem with discoloration or deterioration of the PVC?

In the years that this gate has been in use, the PVC seal has shown no deterioration. It is very seldom exposed to sunlight and it withstands the corrosive aspects of water and sewage extremely well.

Is the operating thrust necessary to open the gate more or less than for a standard sluice gate?

It is approximately the same. The initial thrust necessary to move the gate from fully closed may be slightly more than a standard gate, but once the gate has been initially moved the operating thrust may be lower for the Glydaseal, particularly under unseating head conditions.

Is there any difference in the design of the hoist and stem for the Glydaseal gate's

None whatsoever. The manual hoist must be designed to open the gate with a 40 lb. effort on the crank, and the stem must be designed to withstand at least twice the output of the floorstand with a 40 lb. effort on the crank or handwheel. The design criteria for electrically driven and hydraulic cylinder actuators are exactly the same as those used for standard cast iron gates.

Are the seats on the Glydaseal gate replaceable in the field?

For all practical purposes, no. In this situation, the gate should be sent back to the factory the same as a cast iron, bronze mounted sluice gate would have to be. Because of the design of the gate and the materials used, it is expected that the seats will last the life of the gate. The materials are very corrosion and abrasive resistant, and they are in contact with each other only when the gate is fully closed.

When the Glydaseal gate is used for modulating service, are there any changes that must be made in the gate?

No changes are required unless the modulation is severe or nearly continuous. In that case, it would be desirable to line the groove in the disc with bronze so that there is bronze-on-bronze sliding contact during operation.

Can a Glydaseal gate be mounted on a circular flange of a pipe?

Yes. The gate frame can be made with a special circular flange which can be drilled for either 25 lb. or 125 lb. standard mounting, whichever is required. This is the only change that is made in the gate for this application.

Can a Glydaseal gate be mounted without the wall thimble?

Yes. It can be mounted to the wall with anchor bolts and with 1" of grout between the back flange of the gate and the concrete wall. However, this type of installation is not recommended. Wall thimbles are required by the AWWA Standard and a far better installation is achieved when wall thimbles are used.

How does the cost of the Glydaseal gate compare to that of the standard sluice gate?

The cost of a complete Glydaseal installation is very little more than the cost of a similar installation using a standard sluice gate. The difference in leakage performance, however, is substantial.

Why use a Glydaseal gate instead of a butterfly valve?

There are a number of reasons. The Glydaseal gate provides a clear opening with no obstruction in the flow. It has a flush invert for complete drainage and in the larger sizes it is likely to be less expensive.

Operation and Maintenance of the Glydaseal Gate



The materials used in the construction of the Glydaseal gate assure its long life under very difficult conditions. Once the gate has been properly installed, there should be a minimum amount of maintenance required for the life of the gate. No periodic maintenance of the gate is required. If for any reason, the leakage appears excessive, the seating pressure between the resilient seal and the PVC seat can be adjusted. This adjustment should not be necessary at the time the gate is installed, and it is not expected that it will be required for the life of the gate.

Proper care in the handling and installation of the gate is extremely important to assure that no damage occurs to any part of the gate, particularly to the seating surfaces. The Rodney Hunt Instruction Manual, WCE 87-4, is provided with the approval drawings and with the equipment whenever the Glydaseal gate is furnished. The installation, adjustment and maintenance instructions for the Glydaseal gate are included in that manual. If questions arise which are not covered by the Instruction Manual, please contact Rodney Hunt Company.

