MPI
MCWANE
PLANT & INDUSTRIAL

HEAVY DUTY CAST SLUICE / SLIDE GATES

MODEL S-6000

Compliant with AWWA C560

Best-in-Class Construction for
Long Life in Critical Applications

mcwanepi.com



FULL DOMESTIC COMPLIANCE AVAILABLE

NOW MADE OF
CAST DUCTILE IRON

Waterman
A MCWANE PLANT & INDUSTRIAL SOLUTION

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CAST SLUICE/SLIDE GATES OVERVIEW



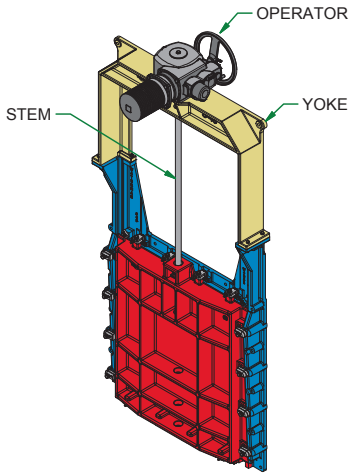
Waterman Cast Sluice Gates are used in applications where safety and reliable performance are essential (dams, tidal environments, water treatment plants) and where outstanding product longevity is desired. Waterman cast gates are preferred for high-head and high debris environments as well as for critical gateways in treatment plants.

Key Features:

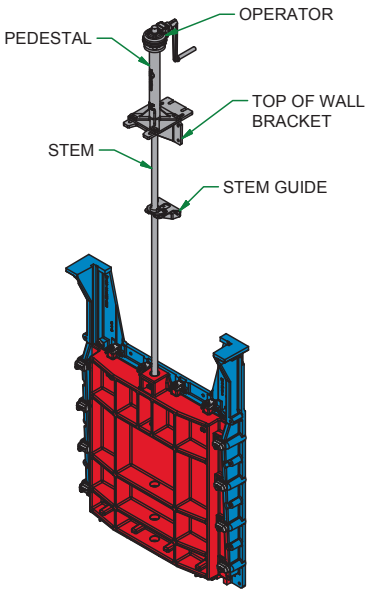
- Thick, highly rigid frame and cover to handle high heads and environments with floating debris. Cover and frame design fully tested to meet or exceed design specifications with finite element analysis. Stress and deflection are measured based on both seating and unseating heads and other external loading. Analysis allows gate to perform with maximum reliability and minimum leakage.
- Proven design as one of the industry's oldest manufacturers of cast iron sluice gates, Waterman has thousands in operation worldwide.
- Low leakage machined metallic seating surfaces create a reliable tight seal, minimizing leakage. Seating faces are corrosion-resistant and are mechanically locked into the gate frame and cover in full-width dovetail grooves. Seats are made of a malleable material that is formed into the grooves. The fullwidth dovetail design prevents the possibility of leakage between the seat material and the castings.
- High performance adjustable wedge system offers easier maintenance and proven performance. Assures proper reliable closure of top, bottom and sides. (Bottom wedges not required with Q-Seal Flushbottom Seal)
- Choice of ductile iron (other material options may be available upon request).
- Design flexibility with the industry's largest selection of sizes and mounting options: gate shapes available in square and rectangular, with square, rectangular or round openings to meet the needs of even the most unusual applications.
- Offered for a full range of mounting options: gates offered for submerged service, wall mounting, flange mount and more.

Gate Designs Available:

Most gate sizes are available as self-contained gates where the operating device is mounted on the top yoke of the gate. Operating loads are carried by the gate frame. The thrust required to open the gate is transmitted by the yoke and guides to the gate frame, unlike non-self-contained gates where these loads are carried by the structure above the gate where the floor stand is mounted. The self-contained design is used where the space above the gate is minimal and/or where structural supports limit the option of using a separate floor stand.



Non-self-contained gates separate the frame and guides from the operating floor stand. Often a crank-operated floor stand with a geared head is used to support the opening and closing thrust loads. These gates can also be fitted with motor and hydraulic actuators. Stem lengths can be varied to the application and are supported as needed by adjustable stem guides.

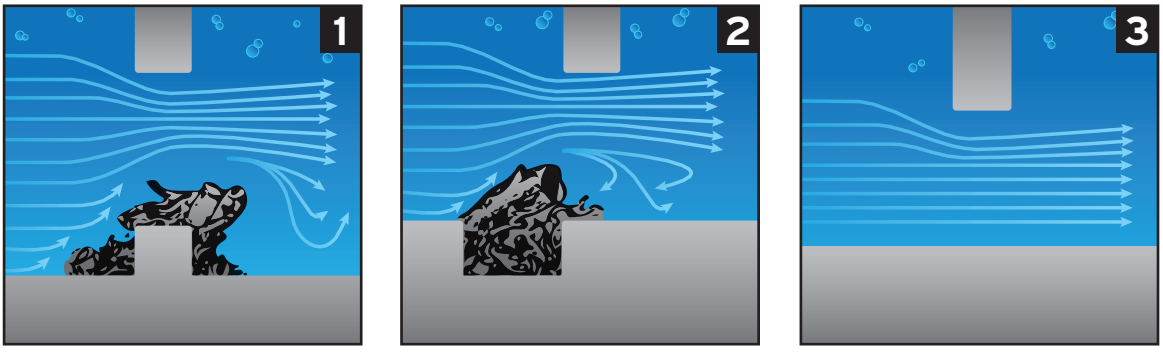


SPECIAL OPTIONS

Q-Seal™ Flushbottom Seal is available for applications where a full, continuous opening area without obstructions to impede solids is desirable. Typical applications include wastewater settling tanks, aeration tanks, sedimentation and flocculation basis.

The flushbottom closure features a continuous neoprene seal contained in the invert of the frame, providing a flat plane across the bottom of the gate without projections into the opening. The seal is firmly supported on three sides, exposing only the flat top side, minimizing the chance for damage. When a flushbottom seal is used, a smooth rounded projection is used on the bottom of the slide. When this compresses against the flushbottom Q-Seal, it makes a watertight closure.

Why Choose Q-Seal™ Option:



1. On competitor units, raised seat wall traps debris
2. Or, recessed pocket seat traps debris
3. Q-Seal creates flow-through opening, no debris

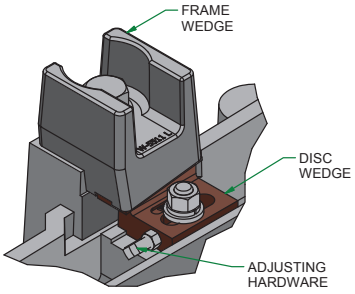
THE WATERMAN ADJUSTABLE WEDGE SYSTEM

High-performance wedges are used to insure tight contact between the bronze seating surfaces of the cover and the frame. As the gate moves, the wedges pull the top and bottom seats into contact. Wedges are cast bronze and are precision machined and are designed for maximum adjustability and serviceability.

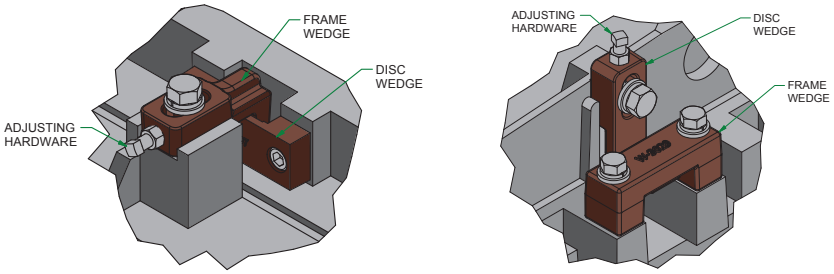
The side wedge system is the most critical portion of the design. It is designed to resist the vertical loads from gate operation and is designed to carry much of the unseating head load. The loads in the side wedge system can be high, so the right design is critical.

Waterman's B and B-1 wedge systems place the adjustable portion of the side wedge on the slide and keys it in place, preventing twisting or rotation. The corrosion resistant fasteners allow for long life and also for field-replacement of damaged wedges. The performance of the wedge system is modeled with finite element analysis to assure an even load distribution.

Top and bottom wedges (where applicable) are fully-adjustable units that are easily set and locked into place with corrosion-resistant fasteners. They use a bronze hook-and-loop design and are also keyed in place to prevent movement under force.



SIDE WEDGE SYSTEM



TOP AND BOTTOM WEDGE SYSTEM

WHAT TYPE OF GATE WORKS BEST FOR THE APPLICATION?

Ductile iron gates are known for providing long life in critical applications, particularly in installations where large dimensions are required or where higher heads are required.

This chart illustrates the wide range of applications for our cast gates, and notes applications where a specialty gate might be required. Please contact our applications support team for guidance in gate selection for your specific requirements.

GATE SELECTION GUIDE BY HEAD AND SIZE

Head	12" x 12"	48" x 48"	72" x 72"	96" x 96"	120" x 120"
80'	Cast / Fabricated	Cast / Fabricated	Specialty	Specialty	Specialty
70'	Cast / Fabricated	Cast / Fabricated	Cast	Specialty	Specialty
60'	Cast / Fabricated	Cast / Fabricated	Cast	Cast	Cast
50'	Cast / Fabricated	Cast / Fabricated	Cast / Fabricated	Cast	Cast
40'	Cast / Fabricated	Cast / Fabricated	Cast / Fabricated	Cast / Fabricated	Cast / Fabricated
30'	Cast / Fabricated	Cast / Fabricated	Cast / Fabricated	Cast / Fabricated	Cast / Fabricated
20'	Cast / Fabricated	Cast / Fabricated	Cast / Fabricated	Cast / Fabricated	Cast / Fabricated
10'	Cast / Fabricated	Cast / Fabricated	Cast / Fabricated	Cast / Fabricated	Cast / Fabricated

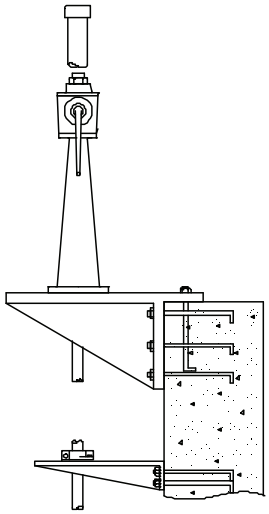
Fabricated **Cast or Ductile Iron** **Specialty or Roller**

WHY WALL THIMBLES ARE THE PREFERRED METHOD TO MOUNT A GATE

KEY BENEFITS:

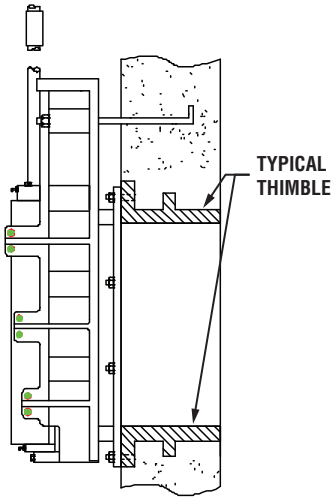
- Pre-positions and aligns proper mounting location for gate. Provides a flat mounting surface.
- Eliminates time spent placing and drilling anchors – exact alignment occurs automatically with pre-drilled thimble holes. No errors or accidental deflection from improper anchor spacing.
- Provides an "engineered", optimum anchor pattern with correct size and placement of anchors, critical in high head applications.

- Eliminates need for grouting behind gate – and potential for grout to foul gate seats.
- Creates proper opening during pour.
- Forms transition, where needed, from pipe on one side of wall with gate on other.
- Allows gate to be removed and reinstalled easily.



DESCRIPTION:

In most installations, mounting a gate to a cast-in-place wall thimble will lead to superior results. Wall thimbles are widely used with cast-ductile sluice gates. They can also be used with fabricated slide gates, particularly in high-head applications.



Thimbles are typically a solid cast iron piece positioned into the wall structure before the concrete wall is poured. It provides the fixed dimensional opening through the wall, in addition to an accurate machined mounting surface for the gate. Holes are factory-drilled and tapped in the thimble flange to match exactly to the gate frame mounting dimensions.

Because a thimble is an entirely separate part, it can be shipped prior to the gate so that it added before the concrete is poured. The thimble makes mounting a gate easier. The gate is quickly plumb and parallel, with the possibility of distortion minimized.

The use of thimbles offers considerable advantage to the engineer, contractor, or owner. Since most anchor bolts are omitted, time is saved, accuracy is enhanced, and form work is reduced. Often the cost of a thimble is easily justified with lower labor cost and additional peace-of-mind. Additionally, thimbles can be shipped early for inclusion in the construction forms, accelerating the job progress and eliminating the need for extra jobsite forming of the opening through the wall.

Overall construction costs may be reduced, installation time is lessened, a rigid machined surface is provided, and dependency upon the expertise of the installer is not as crucial. When a thimble is used, gates can be removed and installed again without disturbing the concrete. Future gate locations can also be planned with pre-installed thimbles matched to blind plates

STYLES/TYPES OF THIMBLES OFFERED:

Thimble types are named for the casting cross section shape. Each type has its own application, and remains the same even though the size and depth of thimble may vary. The illustrations indicate the most popular types and their particular application.

"F" THIMBLE (STANDARD)

The "F" type wall thimble is the most widely used for mounting sluice or flap gates which are subject to any seating pressure and moderate unseating pressure. As is shown, the "F" thimble has a flange for mounting the gate on one side only. The small inner staff of the "F" thimble provides both a cleat for holding the thimble more securely in the wall and a water stop to prevent "end run" seepage. The end opposite the flange merely forms the opening to the other side of the wall or bulkhead.

"E" THIMBLE (HIGH HEAD)

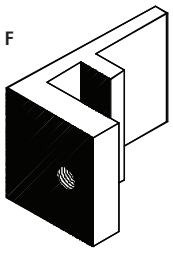
The "E" type wall thimble is similar to the "F" thimble except that it has a flange on both ends. It is required for sluice gates subjected to high unseating heads, severe conditions, and when extension, another type flange, trash racks, or flap gates may be added to the back of the thimble. As with the "F" type thimble, the small inner staff of the "E" provides both a holding cleat and a water stop. The back side of a Type E thimble can also be drilled to accommodate connection to flanged pipe.

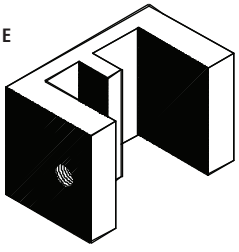
"MJ" THIMBLE

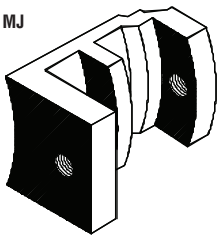
The Mechanical Joint type wall thimble has a standard flange on one end and a mechanical joint type flange on the other. It is the most widely used for direct connection to pipeline or penstock without requiring a flange on the pipe end. The "mechanical joint" employs a following ring around the pipe which is cinched to a minor bolt flange on the thimble end.
In cinching the ring a rubber gasket is squeezed between the tapered end of the thimble and the pipe, thus holding the pipe into the thimble end through friction, as well as providing a seal.

THIMBLE SPECIFICATIONS AND INSTALLATION:

Wall thimbles shall be heavy, one piece castings. The front flange shall be machined to a plane and shall be drilled and holes tapped to mate the drilling pattern of the gate frame. Holes shall be plugged as to prevent concrete from intruding into threaded area. The vertical centerline shall be clearly shown by permanent marks at the top and bottom of the machined face. The word "top" shall be marked permanently near the top center-line of the thimble opening. The surfaces to be cast into the concrete shall be free of paint, oil, and grease. Corrosion-resistant studs and nuts shall be provided for attaching the gate. Mastic is recommended to form a seal between the front face of the thimble and the back of the gate frame. Gate frame and thimble should be tightened for metal to metal contact, squeezing mastic to a thin film for a watertight joint. Standard lengths to match to the structure are 12" and 18".







HOW TO SPECIFY WATERMAN AWWA CAST SLUICE / SLIDE GATES

To make it convenient for you to size and specify a Waterman Cast Sluice / Slide Gate, we have provided charts of the standard available sizes and design head ratings available.

Multiple design head options are presented for different sizes to allow selection of the most effective and economical solution for your project.

If you have an application for a gate that is not met by the available sizes listed here, please contact us for additional information and practical solutions.

GENERAL SELECTION AND SPECIFICATION

Size:

- The size of the gate (width and height) and the head rating (design and operating) are used to specify the gate required.

Design and Operating Head:

- The design head shown in the tables is the maximum head that the gate has been engineered to withstand. Waterman's engineers use tools such as Finite Element Analysis to verify the design.
- The operating head is the head under which the gate is to be opened and closed. The operating head is used to size the hoist mechanism and the stem requirement.
- Include both design and operating head in your specifications.

Installation Clearance:

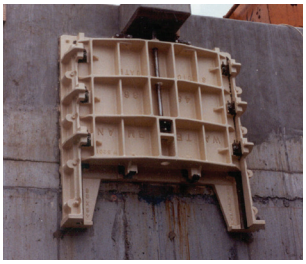
- The minimum installation clearance on sides and bottom shall be at least 1".

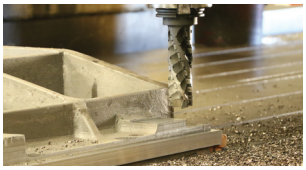
Notes:

- Dimensions provided are for selection and are based on standard Waterman drawings. Waterman will furnish gates only for applications where the head is equal to or less than the design and operating heads indicated.



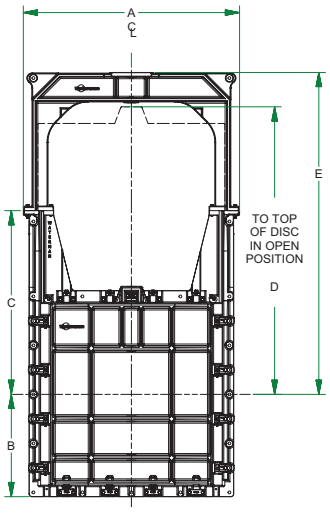




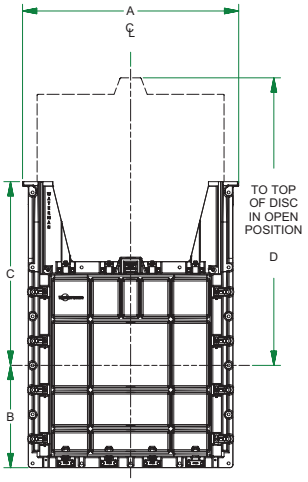


CAST GATE SIZES 6"–120"

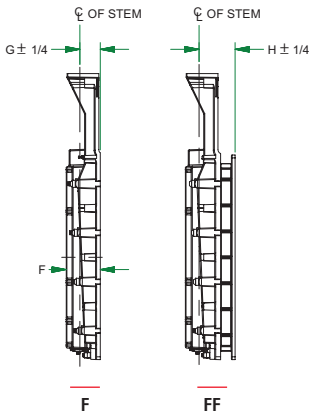
SIZE	DESIGN HEAD FT. (M)		DIMENSIONS							
WIDTH X HEIGHT INCHES (MILLIMETERS)	SEAT	UNSEAT	A	B	C	D	E	F	G ± 1/4"	H ± 1/4"
6x6 (150 x150)	618 (188)	233 (71)	15-3/4 (400)	6-1/2 (165)	9-15/16 (252)	15-5/16 (389)	17-1/4 (438)	7-3/16 (183)	4-1/2 (114)	7-1/2 (191)
8x8 (200 x 200)	575 (175)	210 (64)	18 (457)	8-1/2 (216)	10-9/16 (268)	18-1/4 (464)	20-7/16 (519)	7-1/8 (181)	4-1/2 (114)	7-1/2 (191)
10x10 (250 x 250)	304 (93)	117 (36)	20 (508)	9-1/2 (241)	12-3/8 (314)	21-1/4 (540)	24-1/2 (622)	7-5/8 (194)	5 (127)	8-1/2 (216)
12x12 (305 x 305)	228 (69)	72 (22)	22-1/4 (565)	10-1/2 (267)	14-1/2 (368)	24-1/2 (622)	29 (737)	7-1/2 (191)	5 (127)	8-1/2 (216)
14x14 (360 x 360)	255 (78)	145 (44)	24 (610)	11-1/2 (292)	16-5/8 (422)	27-9/16 (700)	31-11/16 (805)	7-3/8 (187)	5 (127)	8-1/2 (216)
15 x 15 (380 x 380)	250 (76)	42 (13)	25 (635)	12 (305)	17-1/2 (445)	29-5/16 (745)	33-1/8 (841)	7-3/4 (197)	5 (127)	8-1/2 (216)
16 x 16 (410 x 410)	256 (78)	71 (22)	26 (660)	12-1/2 (318)	19 (483)	30-7/8 (784)	35 (889)	7-3/4 (197)	5 (127)	8-1/2 (216)
18 x 18 (460 x 460)	263 (80)	85 (26)	28 (711)	13-1/2 (343)	20-15/16 (532)	33-3/4 (857)	37-3/4 (959)	8-5/8 (219)	6-1/4 (159)	10 (254)
20 x 20 (510 x 510)	144 (44)	45 (14)	30 (762)	14-1/2 (368)	24-1/16 (611)	36-3/4 (933)	41-1/8 (1045)	8-1/8 (206)	6-3/8 (162)	10-1/2 (267)
24 x 24 (610 x 610)	185 (56)	52 (16)	34-3/4 (883)	16-1/2 (419)	26-1/2 673)	44-3/4 (1111)	48-1/8 (1222)	9-7/8 (251)	7 (178)	11-1/2 (292)
30 x 30 (760 x 760)	220 (67)	68 (21)	42 (1067)	20 (508)	38-1/8 (968)	54 (1372)	57-1/4 (1454)	10 (254)	7 (178)	11-1/2 (292)
36 x 36 (910 x 910)	145 (44)	38 (12)	48 (1219)	22-1/2 (572)	41-9/16 (1056)	63-1/4 (1607)	69-11/16 (1170)	11-3/16 (284)	7 (178)	11-1/2 (292)
42 x 42 (1070 x 1070)	80 (24)	33 (10)	57 (1448)	26-3/16 (665)	47-3/8 (1203)	72-13/16 (1976)	77-13/16 (1976)	11-1/2 (292)	8 (203)	12 (305)
48 x 48 (1220 x 1220)	100 (30)	33 (10)	58-3/4 (1492)	28-1/2 (1313)	51-1/2 (1313)	80 (2032)	86-7/8 (2207)	12-1/8 (308)	8 (203)	12 (305)
54 x 54 (1370 x 1370)	70 (21)	27 (8)	69 (1753)	32-1/2 (826)	61-9/16 (1564)	89-3/8 (2270)	97-3/4 (2483)	11-1/16 (281)	6-1/2 (165)	12-5/8 (321)
60 x 60 (1520 x 1520)	72 (22)	29 (9)	75 (1905)	35-1/2 (902)	64-1/2 (1638)	99-3/4 (2534)	111-11/16 (2837)	11-13/16 (300)	7-1/16 (179)	12-1/2 (318)
66 x 66 (1680 x 1680)	39 (12)	23 (7)	81 (2057)	38-1/2 (978)	69-11/16 (1770)	109 (2769)	122 (3099)	13-7/8 (352)	9 (229)	12-1/2 (318)
72 x 72 (1830 x 1830)	100 (30)	30 (9)	88 (2235)	42 (1067)	74-3/8 (1889)	117-3/4 (2991)	133-3/4* (3399*)	16-3/4 (425)	9-1/4 (235)	13-1/4 (337)
84 x 84 (2130 x 2130)	70 (21)	32 (10)	100 (2540)	47-1/2 (1207)	87 (2210)	136-7/8 (3477)	149-7/8* (3807*)	18-1/2 (470)	9-1/2 (241)	13-3/4 (349)
96 x 96 (2440 x 2440)	65 (20)	21 (6)	117 (2972)	56 (1422)	100 (2540)	151 (3835)	171* (4343*)	18-1/2 (470)	11-1/2 (292)	15-1/4 (387)
120 x 120 (3050 x 3050)	59 (18)	17 (5)	140-1/4 (3562)	68 (1727)	124-1/2 (3162)	190-7/8 (4848)	206-7/8* (5255*)	20 (508)	12-3/4 (324)	17 (432)
900 x 2200	117 (36)	36 (11)	50 (1270)	49-1/4 (1250)	89-7/8 (2283)	139-1/2 (3541)	158-1/4 (4020)	14-3/8 (365)	8-1/8 (207)	N/A
1000 x 1000	66.6 (20)	26.1 (8)	48-7/16 (1230)	24-1/4 (616)	41-5/16 (1049)	65-1/8 (1654)	71-1/4 (1810)	8-3/4 (222)	5 (127)	8-3/4 (222)



SELF CONTAINED



NON-SELF CONTAINED



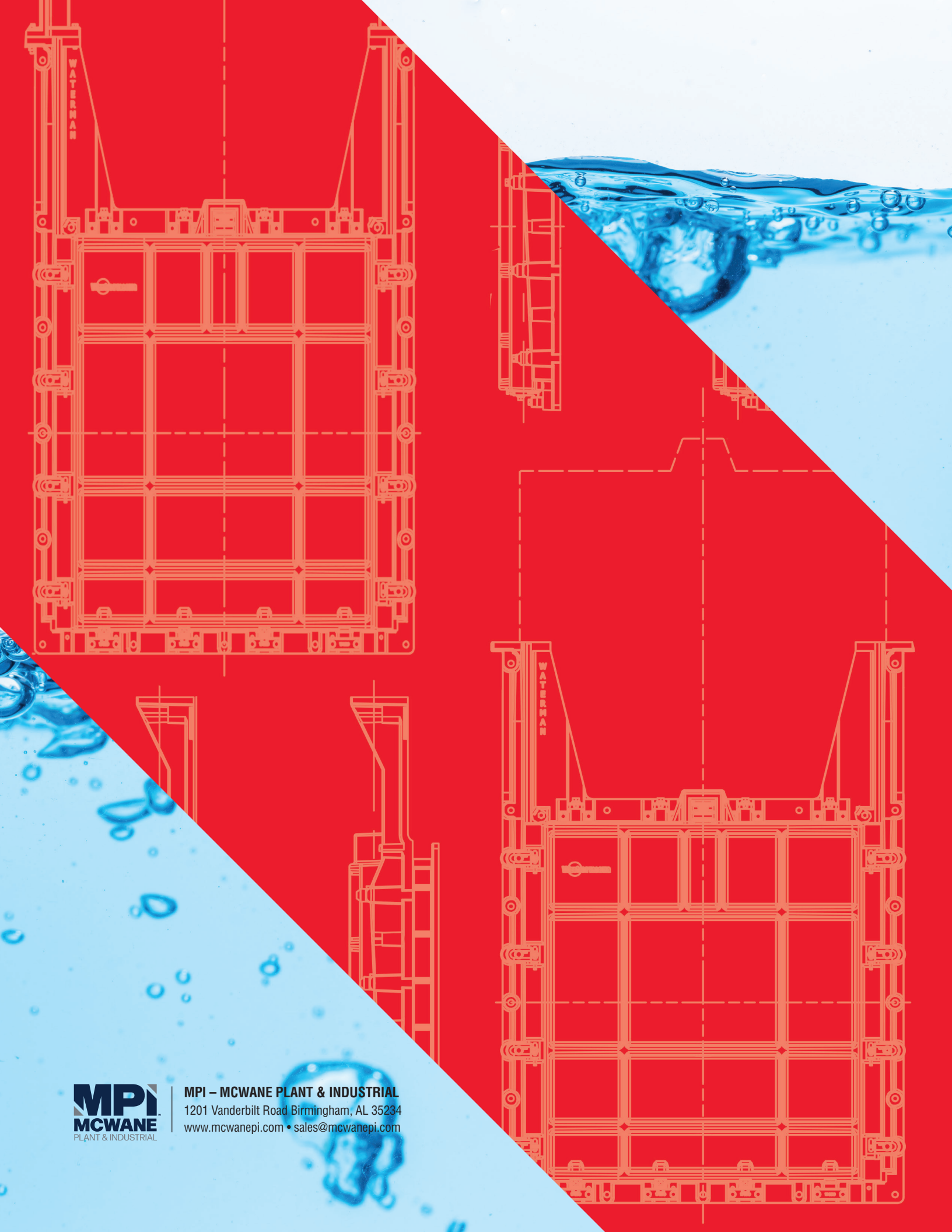
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NOTES:

* To top of fabricated yoke.
Seating and Unseating values are based on standard casting material, either Cast Iron ASTM A-536 Grade 65-45-12 Ductile Iron, depending on model. Consult factory for details. (Other material options may be available upon request).

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