

MODEL

RB WEIR GATES



GENERAL DESCRIPTION

The ORBINOX model RB Weir Gate is designed for downward opening applications where a more accurate flow control is required. The water flows over the top of the slide permitting a constant upstream water elevation. The RB model weir gate is available from sizes 6" x 6" (150mm x 150mm) up to 240" x 100" (6000mm x 2500mm).

The sealing system is incorporated on 3 sides (both laterals and bottom), resulting in a substantially watertight seal without the need of wedges on the gate. This unique design achieves bidirectional performance (seating and unseating pressure conditions). Additionally, a 4 side sealing system is available. The leakage rate on the model RB is lower than the maximum allowable recommended by AWWA (C513) under normal conditions.

ORBINOX also designs and manufactures the RB Weir Gate in larger sizes, for more demanding service conditions and maintains a leakage rate below the allowable standard from AWWA. For more information please contact an ORBINOX representative.

CONSTRUCTION DESIGN

The RB Weir Gate (3 side sealing) is manufactured in general accordance to:

- AWWA C513
- DIN 19569
- BS 7775

For the four side sealing system, the gate is manufactured in general accordance to AWWA C561.

The standard RB model is manufactured in stainless steel which has a higher corrosion resistance in many applications which results into a longer life cycle with little or no maintenance. Other materials of construction are available upon request, such as AISI 904L, Duplex stainless, etc.



ORBINOX reserves the right to change specifications without notice

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RB_1

DESIGN FEATURES

The design and sealing system of the RB Weir Gate model is similar to the MU Slide Gate model. The main design features are:

- Stainless steel fabricated modular design allows for both Open Frame and Self Contained configurations
- Option of Rising or Non-Rising Stem configurations
- Option of 3 side or 4 side sealing configurations
- Suitable for actuation with manual, electric, pneumatic or hydraulic actuators
- Self adjusting seal design
- ORBINOX Weir Gates are completely factory assembled and tested eliminating the need for on site adjustment

Allowable Leakage:

The leakage rate on the model RB (3 side sealing) is lower than the maximum allowable defined by AWWA under normal conditions for both seating an unseating head pressures:

- AWWA standard leakage rate: 0.1 USGPM per foot of perimeter (1.24 l/min per meter)
- ORBINOX standard leakage rate: 0.05 USGPM per foot of perimeter (0.62 l/min per meter) under seating head conditions and 0.1 USGPM per foot of perimeter (1.24l/min per meter) under unseating head conditions up to 20 feet (6m) of head pressure

Seating and Unseating Design Head:

The RB model is designed to withstand a water pressure equal to the height of the slide and can withstand seating and unseating pressure conditions (bidirectional). Additionally, ORBINOX offers a 4 side sealing system for applications having higher water head pressures.

Seal design:

The RB model has a unique self-adjusting seal design, ensuring a substantially watertight performance. The UHMWPE guides ensure no metal-to-metal contact reducing the friction during operation and extends seal life.

Seating / Unseating Design Head:

Model	Seating Head Pressure	Unseating Head Pressure
3 SIDE SEALING 6" x 6" - 48" x 48" (150mm x 150mm - 1200mm x 1200mm)	Slide Height	Slide Height
3 SIDE SEALING 52" x 52" - 60" x 80" (1300mm x 1300mm - 1500mm x 2000mm)	Slide Height	Slide Height
4 SIDE SEALING 6" x 6" - 48" x 48" (150mm x 150mm - 1200mm x 1200mm)	6" x 6" - 40" x 40" (33 fwc) 150x150 - 1000x1000 (10 mwc) 44" x 44" - 48" x 48" (20 fwc) 1100x1100 - 1200x1200 (6 mwc)	6" x 6" - 40" x 40" (33 fwc) 150x150 - 1000x1000 (10 mwc) 44" x 44" - 48" x 48" (20 fwc) 1100x1100 - 1200x1200 (6 mwc)
4 SIDE SEALING 52" x 52" - 60" x 80" (1300mm x 1300mm - 1500mm x 2000mm)	20 feet of water column (6 meters of water column)	13 feet of water column (4 meters of water column)

MODEL

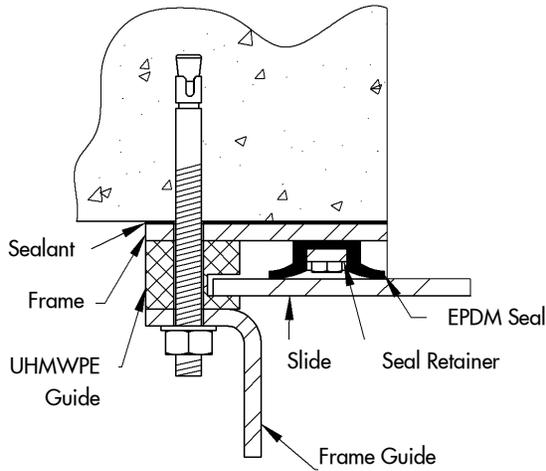
RB WEIR GATES



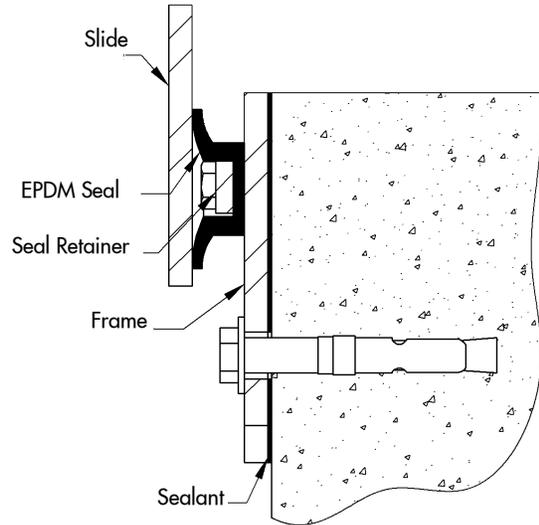
3 SIDE SEALING

Seal Design: sizes 6" x 6" (150mm x 150mm) to 48" x 48" (1200mm x 1200mm)

SIDE SEAL

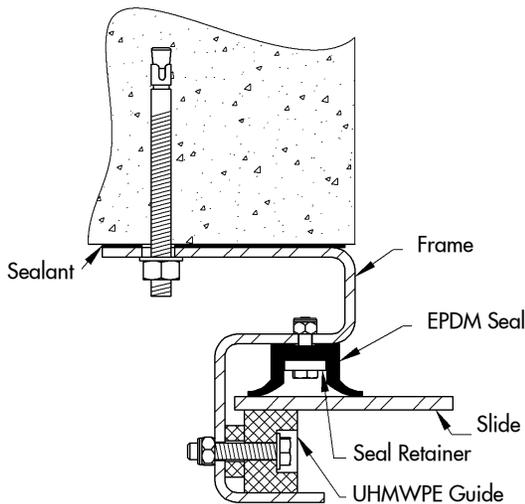


BOTTOM SEAL

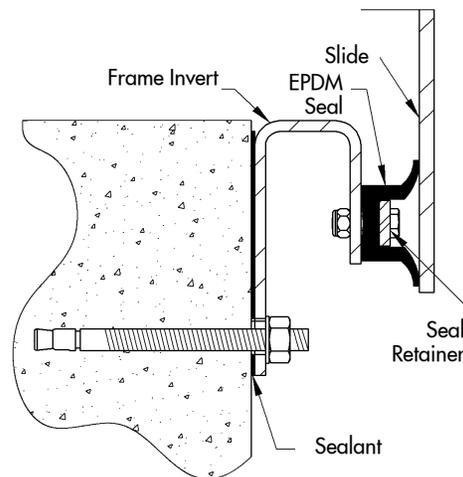


Seal Design: sizes 52" x 52" (1300mm x 1300mm) to 60" x 80" (1500mm x 2000mm)

SIDE SEAL



BOTTOM SEAL



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RB WEIR GATES

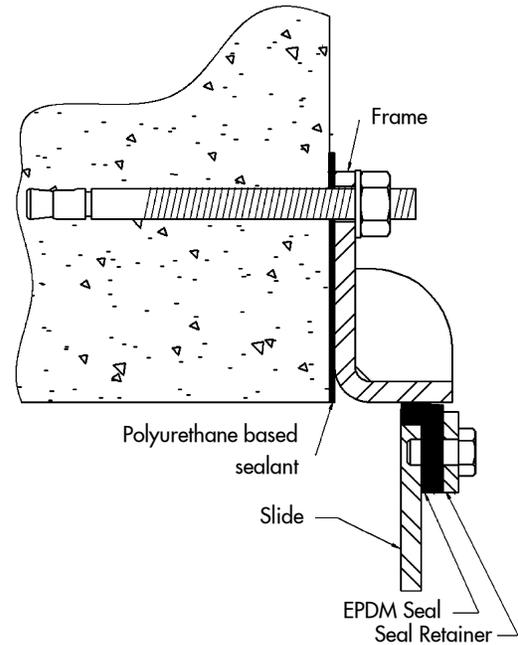


4 SIDE SEALING

Seal Design: sizes 6" x 6" (150mm x 150mm) to 60" x 80" (1500mm x 2000mm)

The side and bottom seal configuration for the RB-4 side sealing model is the same as for the RB 3 Side Sealing model up to 48" x 48" (1200mm x 1200mm)

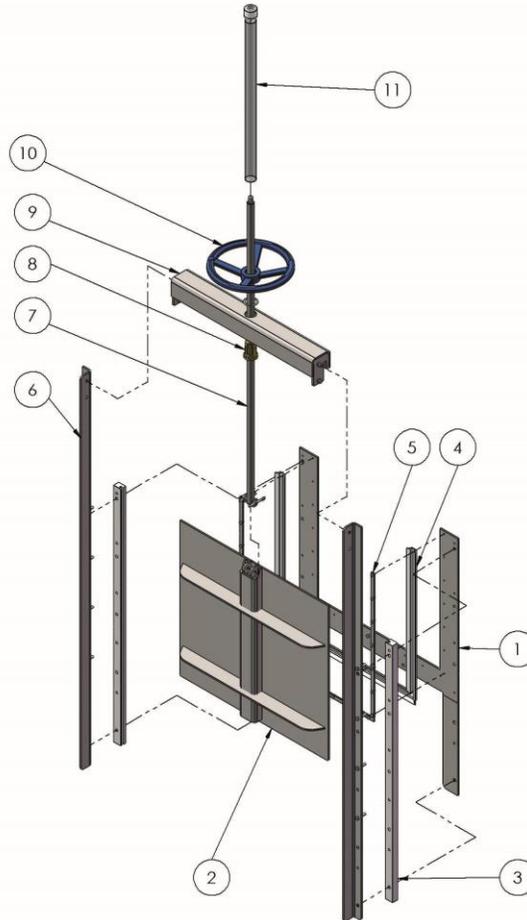
TOP SEAL



MODEL**RB WEIR GATES**

STANDARD MATERIALS OF CONSTRUCTION

Sizes 6"x 6" (150mm x 150mm) to 48"x 48" (1200mm x 1200mm)

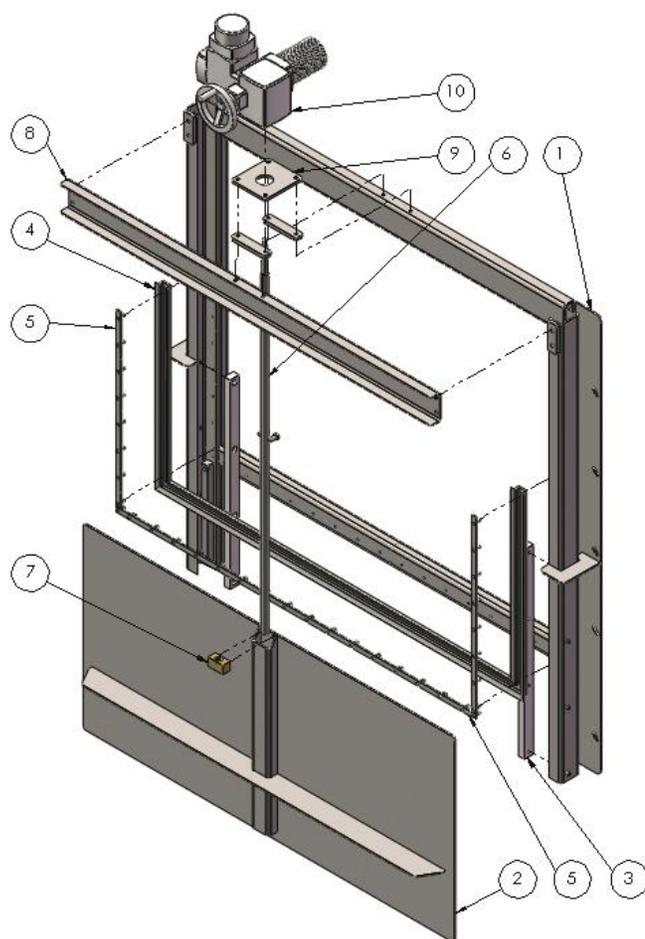


ITEM	DESCRIPTION	MATERIAL
1	Frame	Stainless Steel ASTM A-240 / Type 304L or 316L
2	Slide	Stainless Steel ASTM A-240 / Type 304L or 316L
3	Guides	Ultra High Molecular Weight Polyethylene (UHMWPE) ASTM D-4020
4	Seal	EPDM
5	Seal Retainer	Stainless Steel ASTM A-240 / Type 304L or 316L
6	Frame Guide	Stainless Steel ASTM A-240 / Type 304L or 316L
7	Stem	Stainless Steel
8	Stem Nut	Bronze
9	Yoke	Stainless Steel ASTM A-240 / Type 304L or 316L
10	Handwheel	Cast Iron
11	Stem Protector	Carbon Steel / Clear Polycarbonate

Note: for materials other than the above, please contact an ORBINOX representative

MODEL**RB WEIR GATES****STANDARD MATERIALS OF CONSTRUCTION**

Sizes 52" x 52" (1300mm x 1300mm) to 60" x 80" (1500mm x 2000mm)



ITEM	DESCRIPTION	MATERIAL (standard)
1	Frame	Stainless Steel ASTM A-240 / Type 304L or 316L
2	Slide	Stainless Steel ASTM A-240 / Type 304L or 316L
3	Guides	Ultra High Molecular Weight Polyethylene (UHMWPE) ASTM D-4020
4	Seal	EPDM
5	Seal Retainer	Stainless Steel ASTM A-240 / Type 304L or 316L
6	Stem	Stainless Steel
7	Stem Nut	Bronze
8	Yoke	Stainless Steel ASTM A-240 / Type 304L or 316L
9	Stem Coupling	Stainless Steel ASTM A-240 / Type 304L or 316L
10	Motor*	

Note: As standard, ORBINOX Weir Gates include a manual operator (handwheel or bevel gear)

MODEL

RB WEIR GATES



MOUNTING OPTIONS

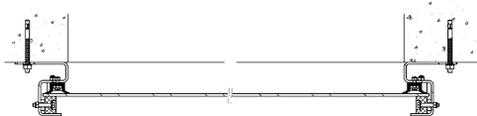
The following drawings show the most common mounting options for RB Weir Gates. For other mounting options, please contact an ORBINOX representative

WALL MOUNT

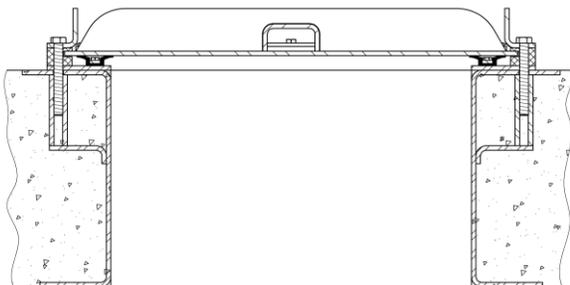
Sizes 6" x 6" (150mm x 150mm) to
48" x 48" (1200mm x 1200mm)



Sizes 52" x 52" (1300mm x 1300mm) to
60" x 80" (1500mm x 2000mm)

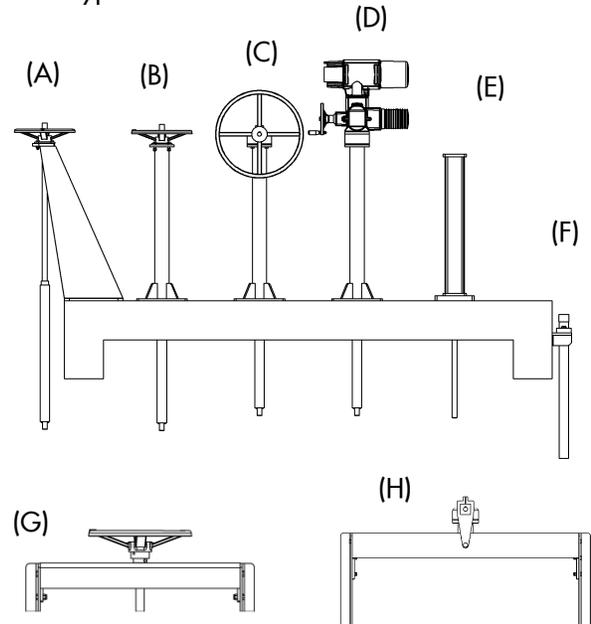


THIMBLE MOUNT



ACTUATORS

All ORBINOX actuators can be yoke or pedestal mounted, below are some examples of the most common types.



Various types of actuators as shown above:

- (A) Handwheel on inclined floor stand
- (B) Handwheel on straight floor stand
- (C) Gear operator on straight floor stand
- (D) Electric actuator on straight floor stand
- (E) Hydraulic or pneumatic actuator
- (F) 2" square nut operator (For Non-Rising stem)
- (G) Yoke mounted handwheel
- (H) Yoke mounted gear and crank (crank installed in 2" square nut)

Accessories:

- Mechanical stops
- Actuator manual overrides
- Locking devices
- Solenoid valves
- Positioners
- Limit / Proximity switches

MODEL

RB WEIR GATES



INSTALLATION, OPERATION AND MAINTENANCE (IOM)

This section briefly describes the installation, operation and maintenance of RB Weir gates. For more detailed information please refer to the "IOM Manual"

Installation:

ORBINOX RB Weir Gates are installed by means of Anchor Bolts. Depending on the size and working conditions they shall be either of the mechanical or chemical type. For detailed information about the type, size and quantity of the required anchor bolts for installation, please refer to the notes on the "General Arrangement Drawing".

In order to avoid leakage between the concrete wall and the frame, ORBINOX recommends the use of construction sealant equivalent to Sikabond (200ml per meter of opening perimeter).

The minimum concrete strength shall be 3,000 PSI (20.7 MPa). The tolerance of the concrete construction (flatness, levelness and plumbness) shall be in accordance to ACI 117-10 standard.

Maintenance and Operation:

The ORBINOX RB Weir Gates need practically no maintenance. The stem should be kept lubricated and seals should be replaced if damaged. The RB Weir Gate is closed by applying a clockwise rotation.

MODEL

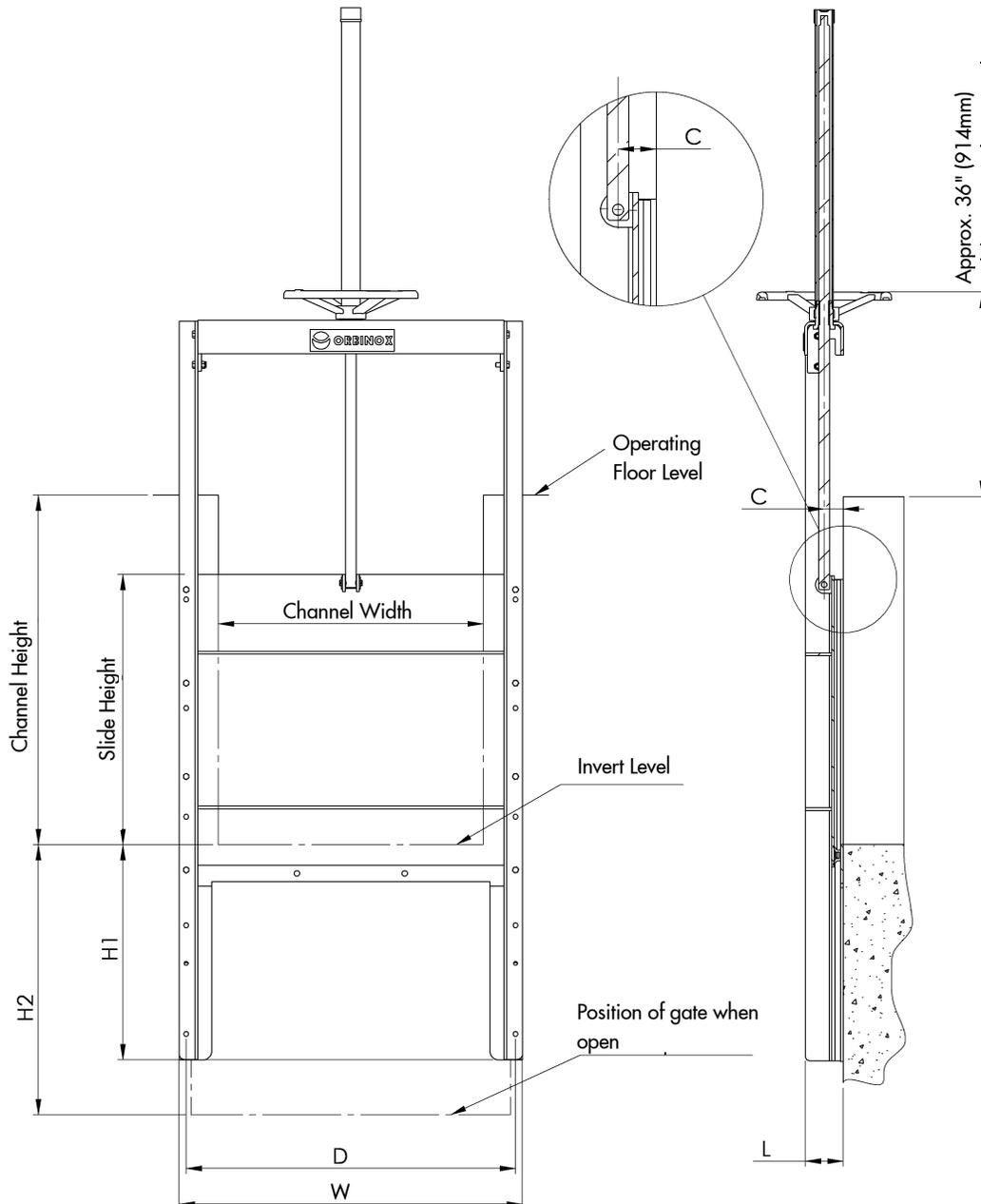
RB WEIR GATES



RB - RISING STEM - SELF CONTAINED - DIMENSIONS

The following drawings show the most common frame and stem configurations and their dimensional chart. Note that any frame (Open and Self Contained), stem (Rising and Non Rising) and actuator combination can be manufactured for RB Weir Gates.

SIZES: 6" x 6" (150mm x 150mm) to 48" x 48" (1200mm x 1200mm)



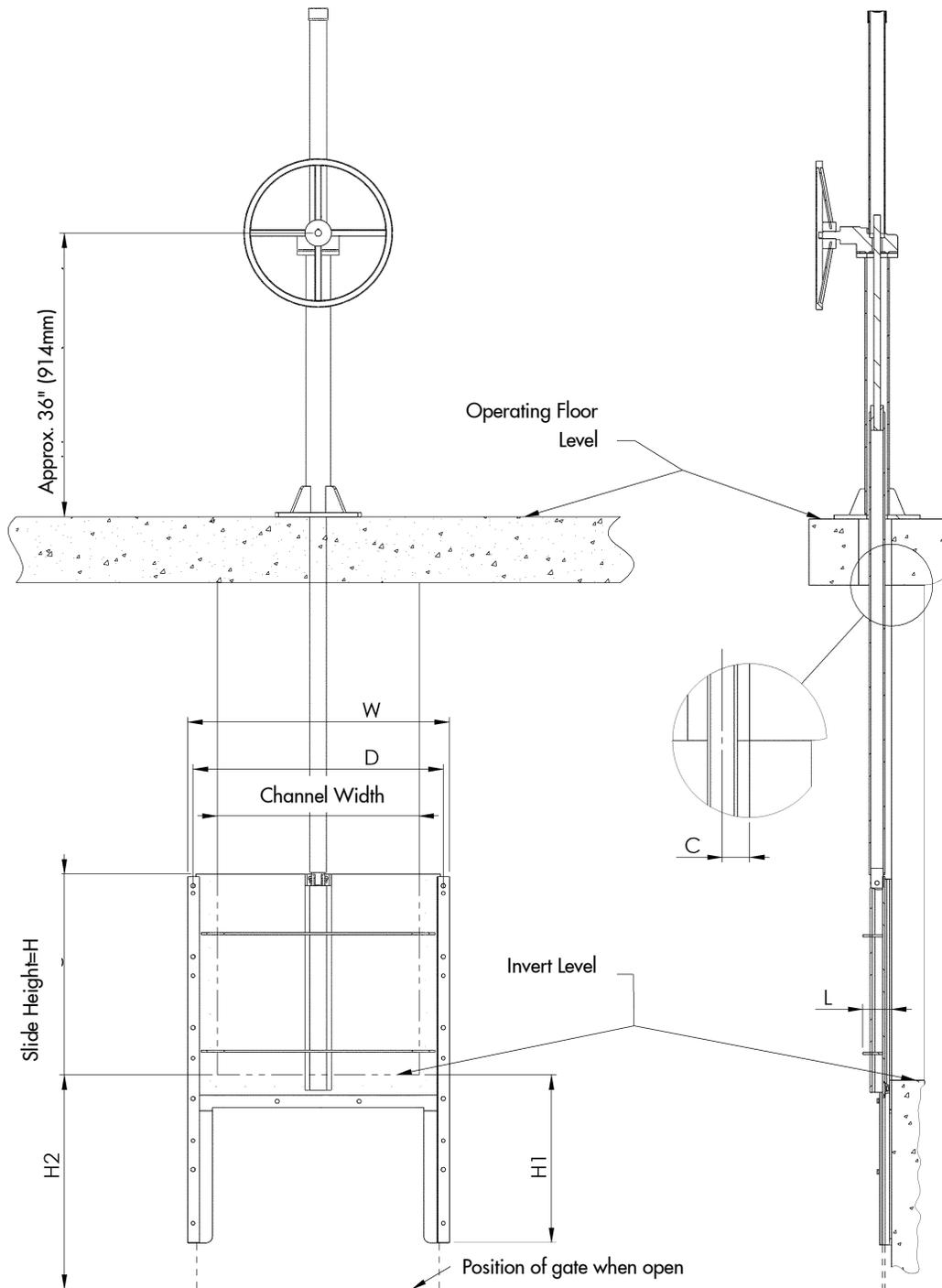
MODEL

RB WEIR GATES



RB - RISING STEM - OPEN FRAME - DIMENSIONS

SIZES: 6" x 6" (150mm x 150mm) to 48" x 48" (1200mm x 1200mm)



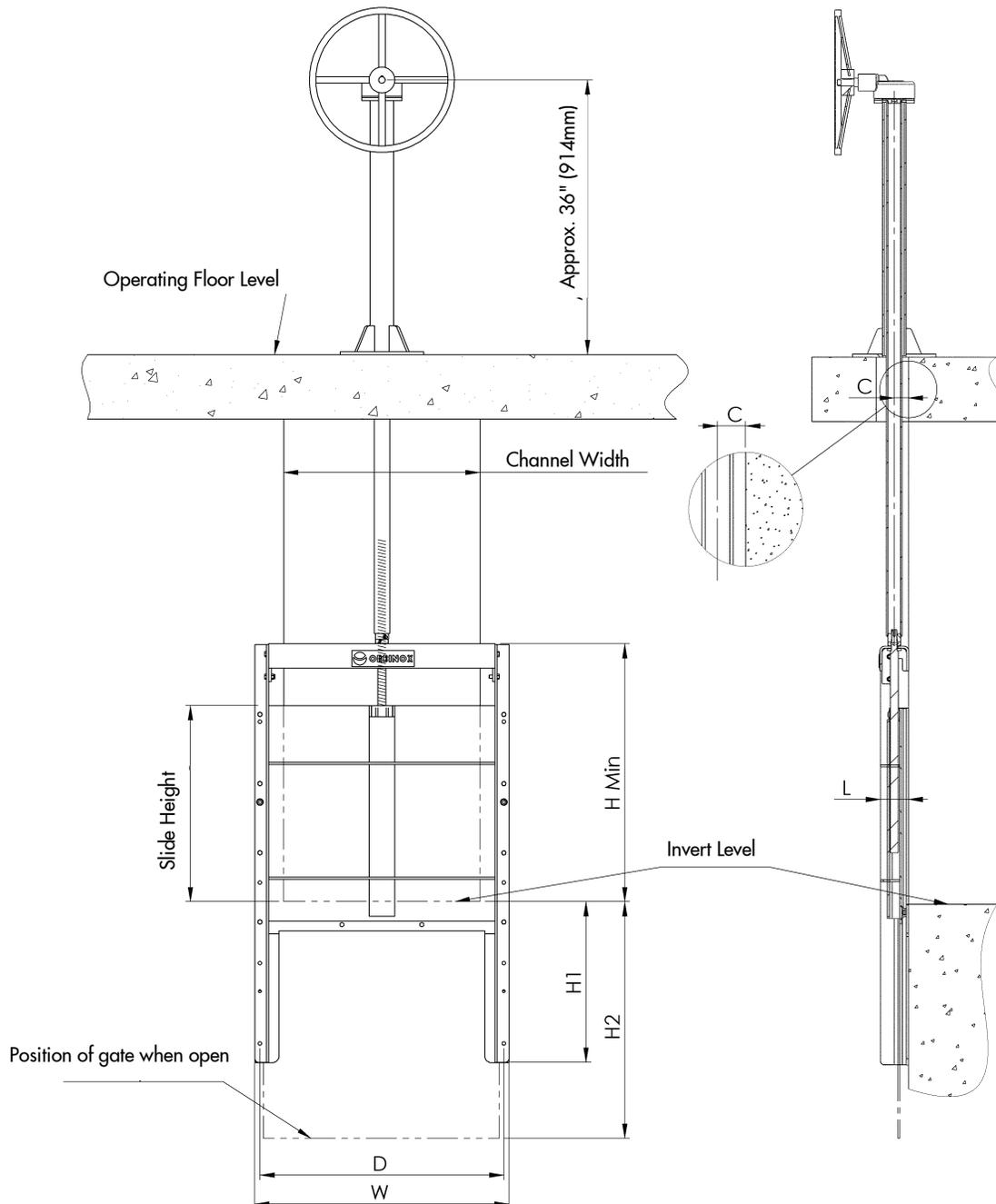
MODEL

RB WEIR GATES



RB - NON RISING STEM - SELF CONTAINED - DIMENSIONS

SIZES: 6" x 6" (150mm x 150mm) to 48" x 48" (1200mm x 1200mm)



MODEL**RB WEIR GATES****RB - DIMENSIONAL CHART (3 Side Sealing)****SIZES: 6" x 6" (150mm x 150mm) to 48" x 48" (1200mm x 1200mm)**

SIZE (Channel Width x Slide Travel)	W	H Min (Self- contained)	H (Open Frame)	H1	H2	D	L	C
6" x 6"	13 1/16	11 7/8	6	3	8 3/8	11 13/16	2 5/16	1 11/16
8" x 8"	15 1/16	13 7/8	8	4	10 3/8	13 13/16	2 5/16	1 11/16
10" x 10"	17 1/16	15 7/8	10	5	12 3/8	15 13/16	2 5/16	1 11/16
12" x 12"	19 1/16	17 7/8	12	6	14 3/8	17 13/16	2 5/16	1 11/16
14" x 14"	21 1/16	19 7/8	14	7	16 3/8	19 13/16	3 7/16	1 3/4
16" x 16"	23 1/16	21 7/8	16	8	18 3/8	21 13/16	3 7/16	1 3/4
18" x 18"	25 1/16	23 7/8	18	9	20 3/8	23 13/16	3 7/16	1 3/4
20" x 20"	27 1/16	25 7/8	20	10	22 3/8	25 13/16	3 7/16	1 3/4
24" x 24"	31 1/16	29 7/8	24	12	26 3/8	29 13/16	3 7/16	1 3/4
28" x 28"	35 1/16	33 7/8	28	14	30 3/8	33 13/16	3 7/16	1 3/4
30" x 30"	37 1/16	35 7/8	30	15	32 3/8	35 13/16	3 7/16	1 3/4
32" x 32"	39 1/16	37 7/8	32	16	34 3/8	37 13/16	3 7/16	1 3/4
36" x 36"	43 7/8	41 7/8	36	18	38 3/8	42 5/8	5 13/16	2 5/16
40" x 40"	47 7/8	45 7/8	40	20	42 3/8	44 5/8	5 13/16	2 5/16
42" x 42"	49 7/8	47 7/8	42	21	44 3/8	48 5/8	5 13/16	2 5/16
44" x 44"	51 7/8	49 7/8	44	22	46 3/8	50 5/8	5 13/16	2 5/16
48" x 48"	55 7/8	53 7/8	48	24	50 3/8	54 5/8	5 13/16	2 5/16

Note: "H1" is equal to half slide travel. If the width of the slide is greater than 4 times the height, then H1 is equal to the slide travel

For dimensions other than above, please contact an ORBINOX representative
 These dimensions are for information only. Do not use for installation or submittal purposes

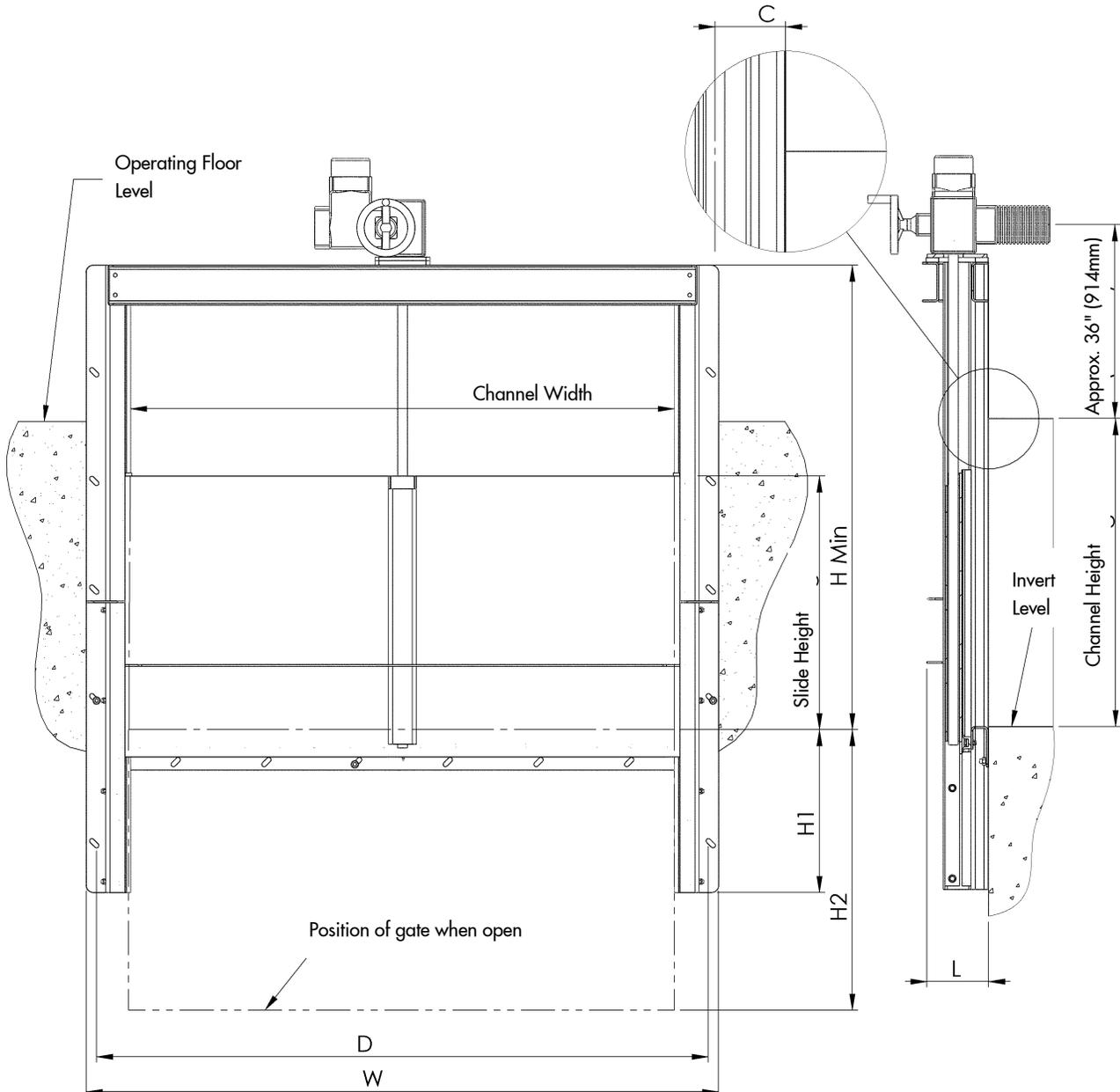
MODEL

RB WEIR GATES



RB - NON RISING STEM - SELF CONTAINED - DIMENSIONS

SIZES: 52"x 52" (1300mm x 1300mm) to 60"x 80" (1500mm x 2000mm)



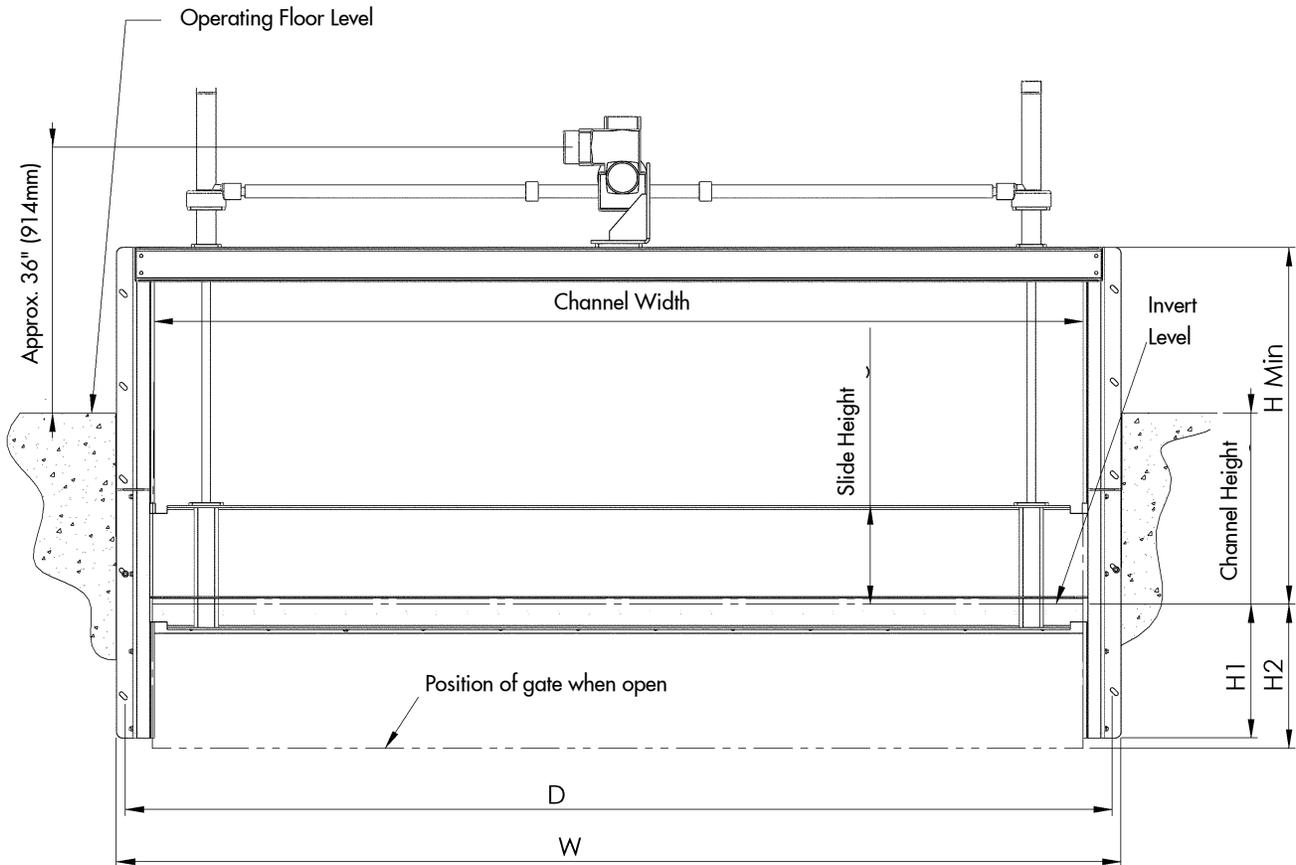
MODEL

RB WEIR GATES



RB - DUAL STEM - RISING STEM - SELF CONTAINED - DIMENSIONS

SIZES: 52"x 52" (1300mm x 1300mm) to 60"x 80" (1500mm x 2000mm)



MODEL**RB WEIR GATES****RB - DIMENSIONAL CHART (3 Side Sealing)****SIZES: 52"x 52" (1300mm x1300mm) to 60"x 80" (1500mm x 2000mm)**

SIZE (Channel Width x Slide Travel)	W	H Min (Self- contained)	H (Open Frame)	H1	H2	D	L	C
52" x 52"	61 ⁵ / ₈	57 ⁷ / ₈	52	26	54 ¹⁵ / ₁₆	60 ³ / ₈	6 ⁵ / ₈	1 ¹¹ / ₁₆
56" x 56"	65 ⁵ / ₈	61 ⁷ / ₈	56	28	58 ¹⁵ / ₁₆	64 ³ / ₈	6 ⁵ / ₈	1 ¹¹ / ₁₆
60" x 60"	69 ⁵ / ₈	65 ⁷ / ₈	60	30	62 ¹⁵ / ₁₆	68 ³ / ₈	6 ⁵ / ₈	1 ¹¹ / ₁₆
60" x 64"	69 ⁵ / ₈	69 ⁷ / ₈	64	32	66 ¹⁵ / ₁₆	68 ³ / ₈	6 ⁵ / ₈	1 ¹¹ / ₁₆
60" x 68"	69 ⁵ / ₈	73 ⁷ / ₈	68	34	70 ¹⁵ / ₁₆	68 ³ / ₈	6 ⁵ / ₈	1 ³ / ₄
60" x 72"	69 ⁵ / ₈	77 ⁷ / ₈	72	36	74 ¹⁵ / ₁₆	68 ³ / ₈	6 ⁵ / ₈	1 ³ / ₄
60" x 76"	69 ⁵ / ₈	81 ⁷ / ₈	76	38	78 ¹⁵ / ₁₆	68 ³ / ₈	6 ⁵ / ₈	1 ³ / ₄
60" x 80"	69 ⁵ / ₈	85 ⁷ / ₈	80	40	82 ¹⁵ / ₁₆	68 ³ / ₈	6 ⁵ / ₈	1 ³ / ₄

Note: "H1" is equal to half slide travel. If the width of the slide is greater than 4 times the height, then H1 is equal to the slide travel

For dimensions other than above, please contact an ORBINOX representative
 These dimensions are for information only. Do not use for installation or submittal purposes

STANDARD SPECIFICATIONS

Model RB Weir Gate 6" x 6" (150mm x150mm) to 80" x 80" (2000mm x 2000mm)

GENERAL CONDITIONS

The equipment provided under this section shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with the drawings, specifications, engineering data, instructions and recommendations of the equipment manufacturer unless exceptions are noted by the engineer. Gates and operators shall be supplied with all the necessary parts and accessories indicated on the drawings, specified or otherwise required for a complete, properly operating installation, and shall be the latest standard product of a manufacturer regularly engaged in the production of fabricated gates. Gates supplied under this section shall be Model RB Stainless Steel Weir Gates as manufactured by ORBINOX.

GOVERNING STANDARDS. The gates specified in this section shall be manufactured in general accordance to AWWA C513, latest edition. For the 4 side sealing version, all gates specified in the section shall be manufactured in general accordance to AWWA C561, latest edition.

QUALITY ASSURANCE. The manufacturer shall have experience in the production of substantially similar equipment, and shall show evidence of satisfactory operation in at least 50 installations. The manufacturer's shop welds, welding procedures and welders shall be qualified and certified in accordance with the requirement of the latest edition of ASME, Section IX.

SUBMITTALS. The manufacturer shall submit for approval by the purchaser, drawings showing the principal dimensions, general construction and materials used in the gate and lift mechanism.

PERFORMANCE

LEAKAGE. RB Weir Gates shall be substantially watertight under the design head conditions. Under the design seating head, the leakage shall be 0.05 U.S. gallon per minute per foot (0.62 l/min per meter) of seating perimeter or better.

Under the design unseating head the leakage shall be 0.1 U.S. gallon per minute per foot (1.24 l/min per meter) of seating perimeter or better.

4 SIDE SEALING: LEAKAGE. For unseating heads greater than 20 feet (6m), the allowable leakage shall be the rate per foot (per meter) of perimeter specified by the following equations or better:

Maximum allowable leakage

Gallons per minute per meter of perimeter:

$$= 0.10 + (0.0024 \times (\text{unseating head in feet} - 20))$$

Liters per minute per meter of perimeter:

$$= 1.24 + (0.101 \times (\text{unseating head in feet} - 6.1))$$

Example: If we have a gate with 30 feet head, the leakage for the unseating head will be:

$$0.10 + (0.0025 \times (30 - 20)) = 0.125 \text{ US gpm/ft of perimeter.}$$

DESIGN HEAD. The Weir shall be designed to withstand the design head shown in the schedule.

PRODUCT (WEIR GATE)

GENERAL DESIGN. Gates shall be either self-contained or non self-contained of the rising stem or non-rising stem configuration as indicated on the gate schedule. All components of the gate shall be designed to withstand the maximum head indicated on the drawings in both seating and unseating directions and the maximum output of the actuator.

FRAME. The gate frame shall be constructed of structural members or formed plate welded to form a rigid one-piece frame. The frame shall be suitable for wall mounting or wall thimble mounting (4 - sided sealing only). The frame configuration shall allow the replacement of the seals without removing the gate frame from the concrete. The design stress shall not exceed the lesser of 50% of the yield strength or 25% of the ultimate strength of the materials for maximum load conditions.

STANDARD SPECIFICATIONS

PRODUCT (WEIR GATE)

SLIDE. The slide shall consist of a flat plate reinforced with formed plates or structural members to limit its deflection to 1/360 of the gate's span under the design head. The minimum thickness of the slide shall be 1/4". The design stress shall not exceed the lesser of 50% of the yield strength or 25% of the ultimate strength of the material for maximum load conditions.

GUIDES AND SEALS. The guides shall be made of UHMWPE (ultra high molecular weight polyethylene) and shall be of such length as to retain and support at least half (1/2) of the vertical height of the slide in the fully open position (downward). Seals shall be made of EPDM and the design shall be able to obtain the same leakage rate on both seating and unseating head pressure as per the schedule. The seal system shall maintain efficient sealing in any position of the slide and allow the water to flow only through the opened part of the slide.

OPERATORS AND STEM

STEM AND COUPLINGS. The operating stem shall be of stainless steel designed to transmit in compression at least 2 times the rated output of the operating manual mechanism with a 40 lbs (178 N) effort on the crank or hand wheel. The stem shall have a slenderness ratio less than 200. The threaded portion of the stem shall have machined cut threads of the Acme type or equivalent. Where a hydraulic, pneumatic or electric operator is used, the stem design force shall not be less than 1.25 times the output thrust of the hydraulic or pneumatic cylinder with a pressure equal to the maximum working pressure of the supply, or 1.25 times the output thrust of the electric motor in the stalled condition. The stem extension shall be made of extension tubes and joined to the stem by a solid coupling. The couplings shall be of greater strength than the stem.

As a general rule, gates having a width greater than two times their height shall be provided with two lifting mechanism connected by a tandem shaft.

STEM COVER. Rising stem gates shall be provided with a carbon steel or a clear polycarbonate stem cover. The clear polycarbonate stem cover shall have a cap and condensation vents and a clear position indicating tape. The tape shall be field applied to the stem cover after the gate has been installed and positioned.

LIFTING MECHANISM. Manual operators of the types listed in the schedule shall be provided by the gate manufacturer. All bearings and gears shall be totally enclosed in a weather tight housing. The pinion shaft of the crank-operated mechanisms shall be constructed of stainless steel and supported by roller or needle bearings. Each manual operator shall be designed to operate the gate under the maximum specified seating and unseating heads by using a maximum effort of 40 lbs (178 N) on the crank or hand wheel, and shall be able to withstand, without damage, an effort of 80 lbs (356 N). The crank shall be removable and fitted with a corrosion resistant rotating handle. The maximum crank radius shall be 15 inches (381mm) and the maximum hand wheel diameter shall be 26 inches (650mm). Electric motors shall meet AWWA 542-09 Standard. Pneumatic and hydraulic actuators shall meet AWWA 541-08 Standard.

YOKE. Self-contained gates shall be provided with a yoke made of structural members or formed plates. The maximum deflection of the yoke shall be 1/360 of the gate's span.

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RB WEIR GATES



STANDARD SPECIFICATIONS

MATERIALS

Part	Material
Frame, Gate, Seal Retainer and Yoke	Stainless Steel ASTM A-240 / Type 304L or 316L
Guides	Ultra High Molecular Weight Polyethylene (UHMWPE) ASTM D-4020
Seal and Bottom Seal	EPDM
Stem	Stainless Steel ASTM A-240 / Type 304L or 316L
Stem Nut	Bronze
Stem Protector	Polycarbonate ASTM D-3935 or Carbon Steel ASTM A-501
Hardware	ASTM F593 and F594 GR1 for 304L Frame and GR2 for 316L Frame

SCHEDULE

Gate Identification

Size (Channel Width x Slide Height)

Invert Elevation

Operating Floor Elevation

Seating Head

Unseating Head

Mounting Type

- CM: Concrete Wall Mounted
- WTM: Wall Thimble Mounted
- RCM: Round Concrete Wall Mounted

Frame configuration

- SF: Self Contained
- OF: Open Frame

Stem configuration

- RS: Rising Stem
- NRS: Non Rising Stem

EXECUTION

INSTALLATION:

Gates and appurtenances shall be handled and installed in accordance with the manufacturer's recommendations

MODEL

RB WEIR GATES



RB WEIR GATE SELECTION FORM

Customer: _____ Tag No.: _____ Date: _____
Order Number: _____ Qty.: _____

WEIR GATE DESIGN (Size= Channel Width x Slide Height)

Units: mm 3 Side Sealing
inch 4 Side Sealing

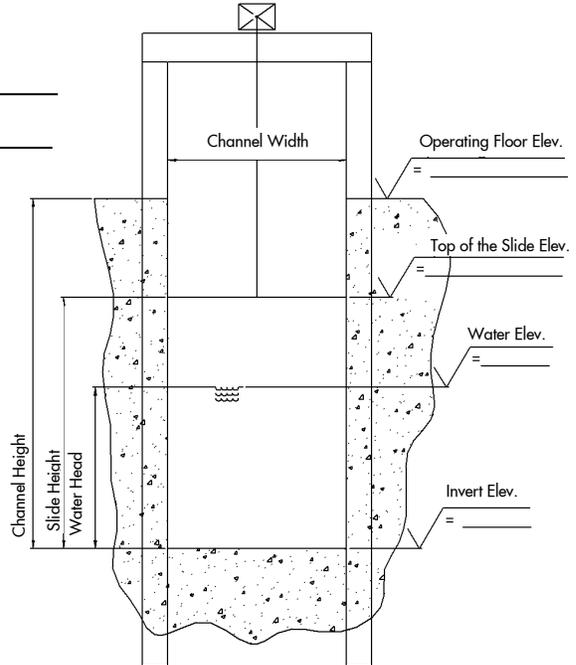
Channel Width: _____ Channel Height: _____

Slide Height: _____

Slide Travel: _____

Seating Water Head: _____

Unseating Water Head: _____



FRAME AND STEM CONFIGURATION

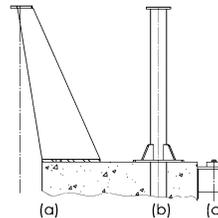
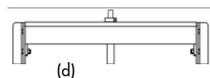
- Non Rising Stem (NRS)
- Rising Stem (RS)
- Open Frame + Extension
- Closed frame + Extension
- Closed Frame (with extended frame)

ACTUATORS

- Handwheel
- Crank (w/ B.Gear and 50 mmSqr. Nut)
- 2" Square Nut (NRS Only)
- Bevel Gear
- Electric Motor
- Pneumatic Cylinder
- Hydraulic Cylinder

Actuator Mounting:

- Inclined Floor Stand (a)
- Straight Floor Stand (b)
- Wall Bracket (for 2"Sqr.Nut) (c)
-)



Position Indicator:

- (For RS Only)
- Mylar Tape
 - Limit Switch
 - Proximity Switch

MATERIALS

- | | | | |
|---------------|---------------------------------------|--|--------------|
| Frame & Slide | <input type="checkbox"/> 304L SS | <input type="checkbox"/> 316L SS | Other: _____ |
| Stem | <input type="checkbox"/> 303 SS | <input type="checkbox"/> 316 SS | Other: _____ |
| Extension | <input type="checkbox"/> 304L SS | <input type="checkbox"/> 316L SS | Other: _____ |
| Floor Stand | <input type="checkbox"/> Carbon Steel | <input type="checkbox"/> 304L SS | Other: _____ |
| Seal | <input type="checkbox"/> EPDM | | Other: _____ |
| Stem Cover | <input type="checkbox"/> Carbon Steel | <input type="checkbox"/> Clear Polycarbonate | |

REMARKS

Name: _____

Signature: _____