Whipps, inc.
WATER CONTROL GATES

Aluminum Gates

Series 800 AWWA® Compliant

Contents

Introduction

Series 800 aluminum gates are engineered for robust performance and extended lifespans, suitable for various mounting configurations and flow conditions. These gates feature rugged, reinforced aluminum construction complemented by durable and flexible ultra-high molecular weight polyethylene (UHMW) seat/seals, ensuring a heavy-duty assembly. A resilient bottom seal enables a secure flush bottom closure. Whipps, Inc. offers rapid and cost-effective production of both standard gates and customized solutions for unique applications. Series 800 aluminum gates are constructed of material 1/4" or 3/8" thick.

Advantages

Superior Performance: Whipps, Inc. provides a leakage guarantee that surpasses the specifications outlined in AWWA C-501 for Cast Iron Sluice Gates or the most recent revision of AWWA C-560 for Cast Iron Slide Gates. Our commitment ensures leakage rates not exceeding 0.10 gpm/ft of seal perimeter under both seating head and unseating head conditions, even in high head service scenarios.

Cost: Fabricated aluminum gates usually provide a cost advantage over cast iron gates. The manufacturing process for aluminum gates is generally less expensive than that of cast iron, stainless steel, and fiberglass gates.

Durability: Aluminum has proved to be a suitable material to use in most water and wastewater. Our aluminum gates feature UV-stabilized UHMW seat/seals, which are field proven to maintain shape and integrity in demanding applications. Whipps, Inc. conducted rigorous testing on UHMW seat/seals. Subjecting them to 25,000 gate open/close cycles in an abrasive media to validate their ability to withstand continuous operation with minimal wear. (Test results available upon request.)

Reliability: The slide of the aluminum gate will not 'freeze' to the frame after extended periods of inactivity. This is achieved through the inclusion of UHMW seat/seals, which effectively eliminate metal-to-metal contact between the slide and the frame.

Delivery: The process of fabricating an aluminum gate from raw materials is notably quick, particularly because Whipps, Inc. keeps most materials in stock.

Self-Adjusting Seals: The aluminum gates that Whipps, Inc. offer are equipped with a self-adjusting seal system that eliminates the need for field adjustments. A solution particularly advantageous for gates installed in locations where such adjustments are impractical or unfeasible. This advanced system cannot be replicated by the imprecise method of adjusting wedges, which can lead to increased leakage, localized stress, and difficulty during gate operation. Our self-adjusting seal system consists of UHMW, much more durable than rubber J or P seals. While rubber seals can crack, flatten, and/or adhere to the slide, our UV stabilized UHMW seat/seals will not. Furthermore, the seal system boasts a lower coefficient of friction compared to rubber, reducing the effort required to operate the gate.

Low Maintenance: Aluminum gates do not need periodic painting and require less operator attention when compared to cast iron or stainless steel gates.

Ease of Repair: In the rare event of the seat/seals experiencing damage, they can be readily replaced in the field using common tools, without the need to dismount the gate from the wall. In contrast, the damaged seating surface of a cast iron gate necessitates the removal of the gate from the wall and must be shipped back to the manufacturer for re-manufacturing.

Range of Sizes: The process of designing and manufacturing fabricated gates offers the flexibility of producing a wide range of sizes, nearly without limits. In contrast, cast iron gates require the creation of new patterns or modifications to existing patterns to accommodate uncommon sizes.

Mounting Configurations: Gate frames can be either embedded in channel walls or mounted to a wall, pipe flange, or wall thimble. Wall thimbles are recommended for applications with high unseating head conditions. We offer flanged frames or flat frames for gates designed to cover square, rectangular, or round openings in concrete structures.

Design Features

The chart below displays the gate features associated with each model number. These models encompass the most frequently utilized configurations. For applications that fall outside the scope of these standard models, we offer additional arrangements.

Table 1: Features vs Model Number (Model Number Key)

Gate Features		Gate Model Numbers							
		821	823	823-C	823-D	823-D-I	824	825	825-I
Guide Frame Style	Embedded	X							
	Wall Mounted		X		X	X	X	X	X
	Channel Mounted			X					
Seals	Slide & Invert	X	X	X	X	X			
	Slide, Invert, & Top						X	X	X
Actuator Mounting	Yoke	X	X	X	X	X	X		
	Pedestal							X	X

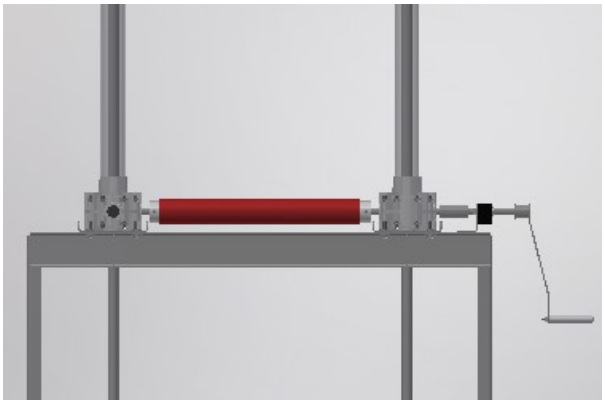
Optional Features

The gate configuration required for each application is determined by gate size and service conditions. The overall gate widths, side frame sections, and invert sections depicted in this literature showcase only a few examples of the numerous configurations available.

Downward Opening: Many gate models can be configured for downward opening service by simply adding a 'D' to the model number. These gates are ideal for situations with limited clearance where an upward opening gate is impractical, or when the gate is intended for use as an overflow weir. Downward opening gates may be supplied with or without a top seal.

Interconnected Actuators: All models can be equipped with two interconnected actuators by adding an 'I' to the model number. This setup is typically advisable for gates wider than 72" and with a width exceeding twice the height.

Non-Rising Stem: All models can be configured with non-rising stems by adding a 'N' to the model number. This operating stem arrangement is typically chosen for installations with limited headroom.



Gate Selection Criteria

Gate Size: In water and wastewater treatment plants, gates are typically sized to match pre-designed structures. In this respect, Whipps, Inc. aluminum gates provide exceptional flexibility to accommodate any round, square, or rectangular opening.

Gate Mounting: Series 800 gate frames may be embedded in channel walls, mounted on the face of a wall, mounted inside of an existing channel, installed on a wall thimble, or affixed to a pipe flange.

Gate Material: Series 800 gates are typically constructed from aluminum, alloy 6061-T6 with stainless steel steam and hardware.

Actuator Selection: The different types of actuators are detailed in the actuator section (page 21-23). Operating loads are calculated as illustrated in Figure 1 below.

Manual operators are chosen to guarantee that operating the handwheel or hand crank requires no more than 40 pounds of effort. For information regarding the selection of powered actuators, consult the factory.

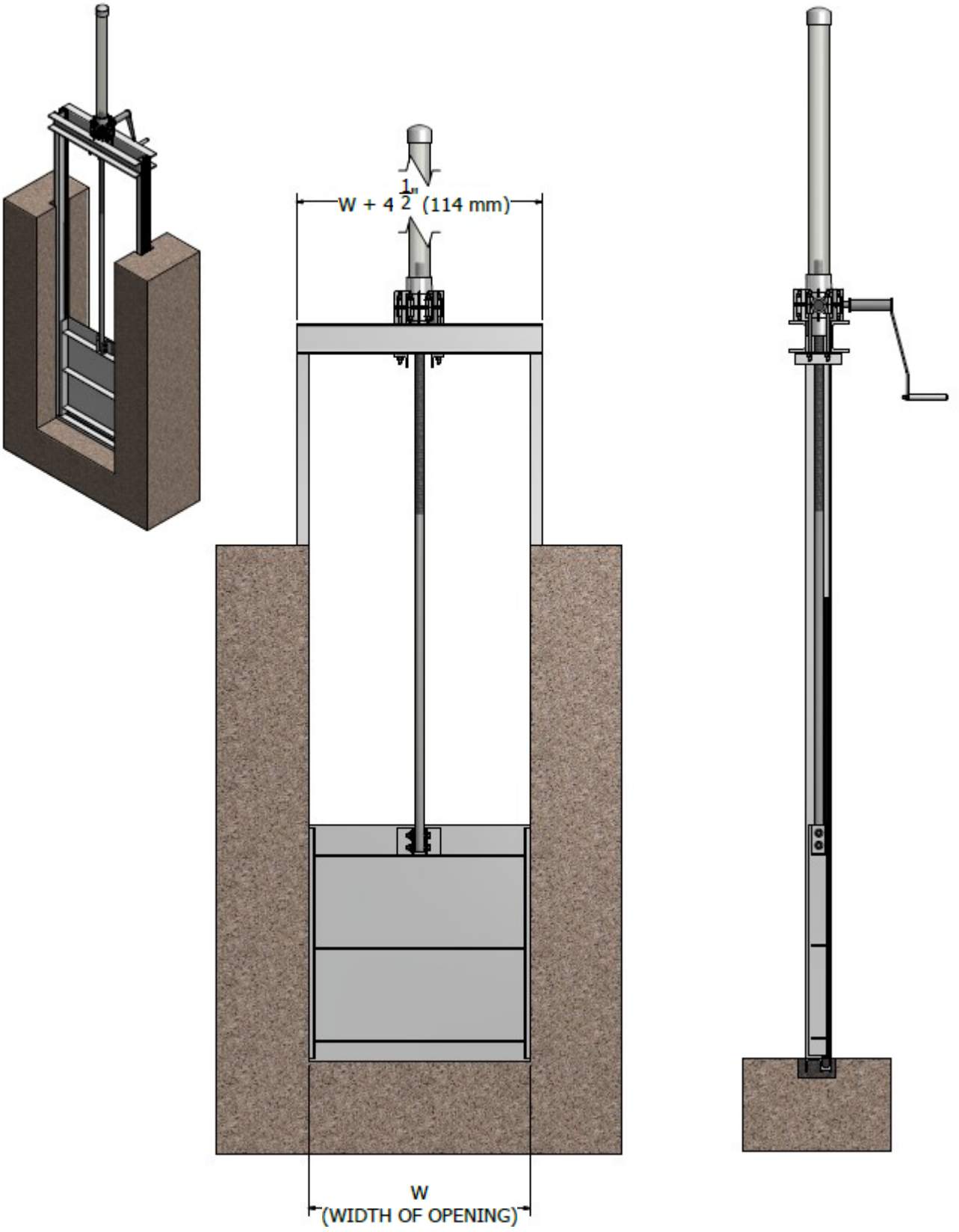
Actuator Loads Transmitted to Structures: On non-self-contained gates, pedestal mounted actuators transmit stem thrust to the structure supporting the gate and actuator. The structure must be constructed to withstand the actuator's maximum output (e.g. electric actuator at motor stall) which is necessarily greater than the operating load, sometimes significantly so. Powered actuators employ various mechanisms to restrict maximum output. However, manual actuators have their maximum output limited by the operating personnel's effort.

ENGLISH UNITS	METRIC UNITS
1. $P_1 = 35\ h$ where P_1 = operating load (pounds) h = gate height (inches)	$P_1 = 6129\ h$ where P_1 = operating load (pounds) h = gate height (inches)
2. $P_2 = 12.48 * A * H$ where P_2 = operating load (pounds) A = area of opening (sq. feet) H = head on gate centerline (feet)	$P_2 = 1961 * A * H$ where P_2 = operating load (pounds) A = area of opening (sq. feet) H = head on gate centerline (feet)

Figure 1: Operating Load Formula

Note: *Maximum operating loads occur in the initial few inches of gate travel during opening and the final few inches during gate closure. Loads diminish quickly from these extremes.*

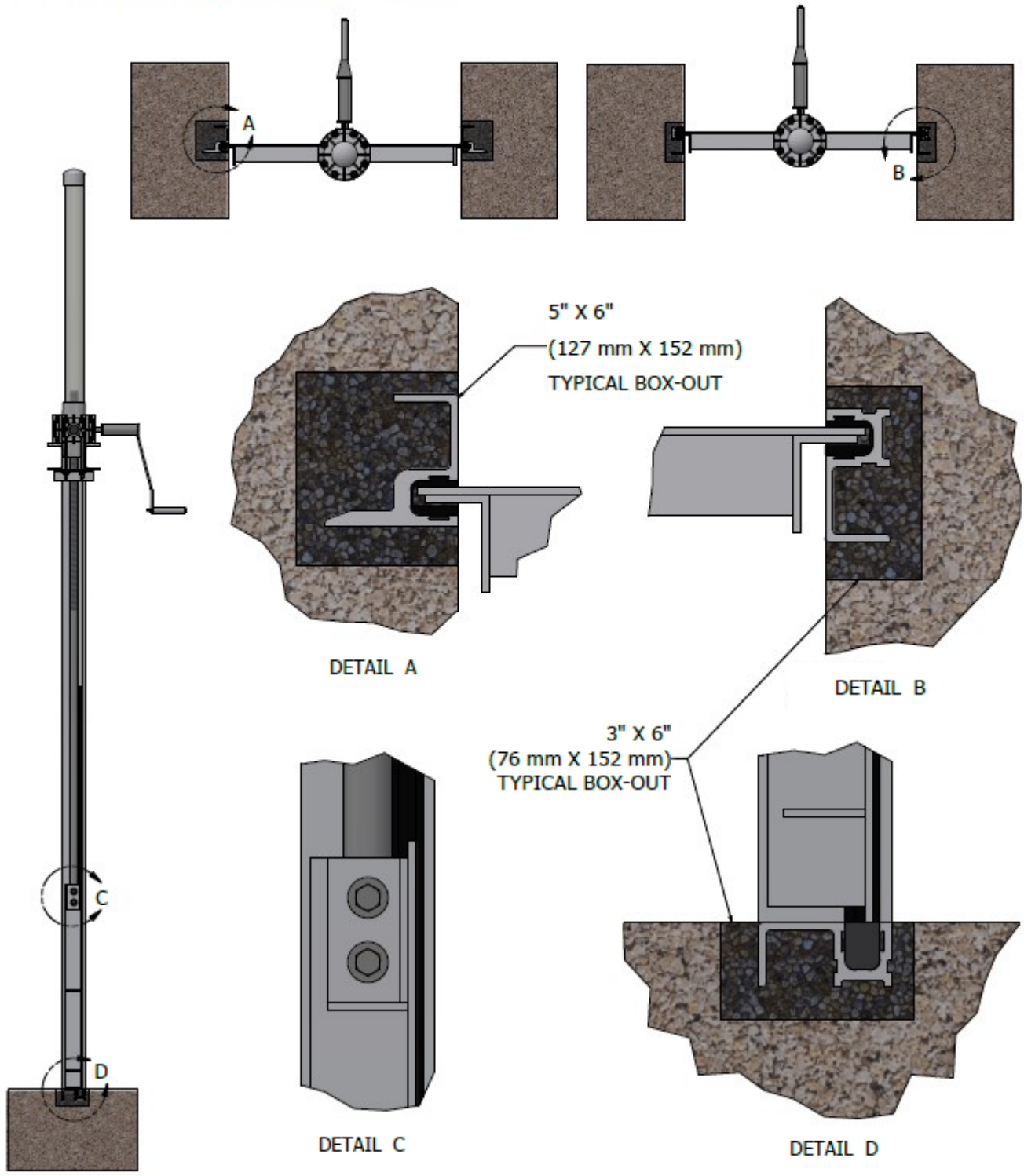
Model 821 Slide Gate



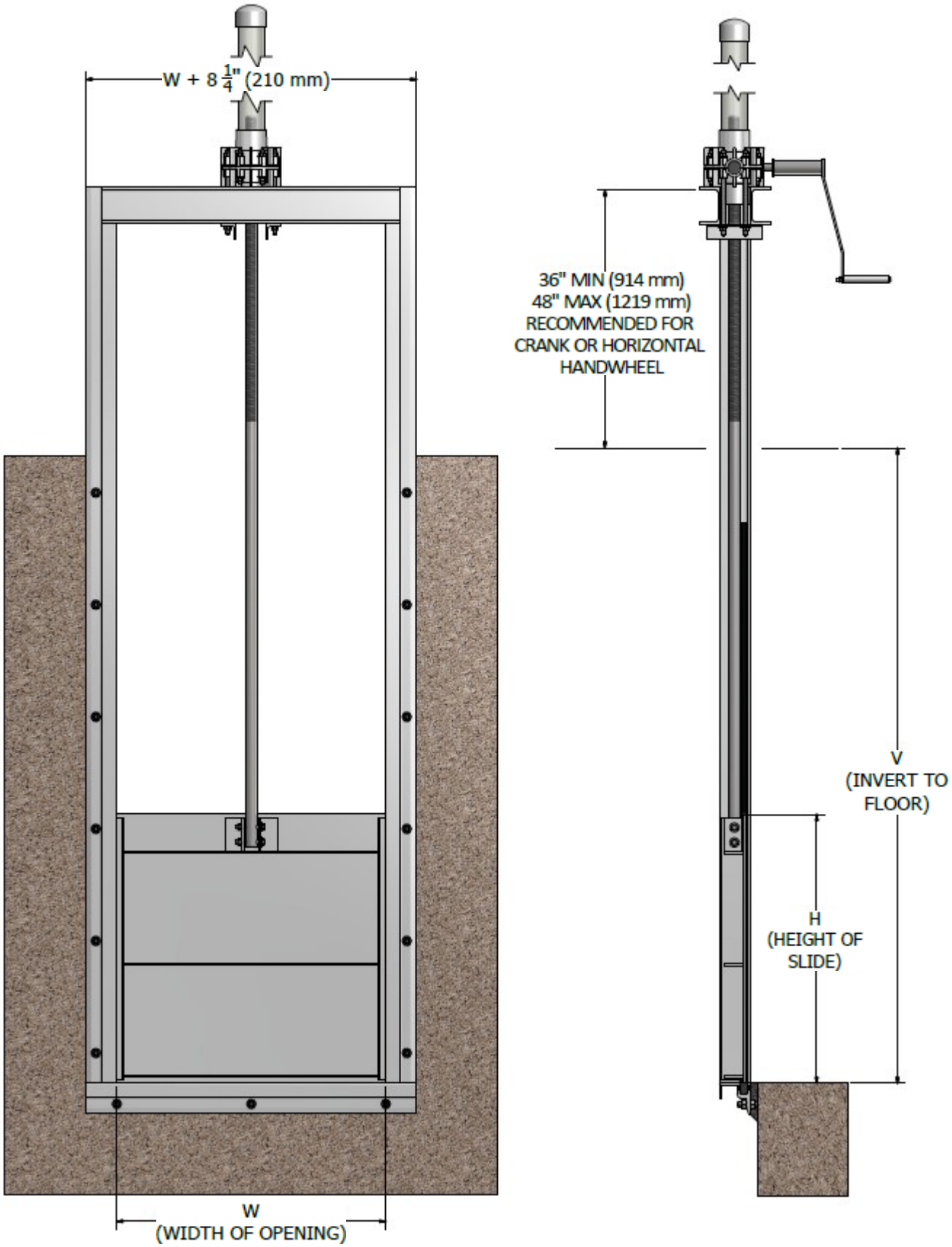
GATE ILLUSTRATED: 36" (W) x 36" (H) x 84" (V)
SEE ACTUATORS SECTION FOR OTHER ARRANGEMENTS

Model 821 Features

°UHMW SEAT/SEALS
°LEAKAGE ≤ AWWA SLIDE GATE STANDARDS
°EMBEDDED FRAMES
°OPEN CHANNEL - NO TOP SEAL
°YOKE MOUNTED ACTUATOR
°RESILIENT INVERT SEAL (FLUSH BOTTOM CLOSURE)



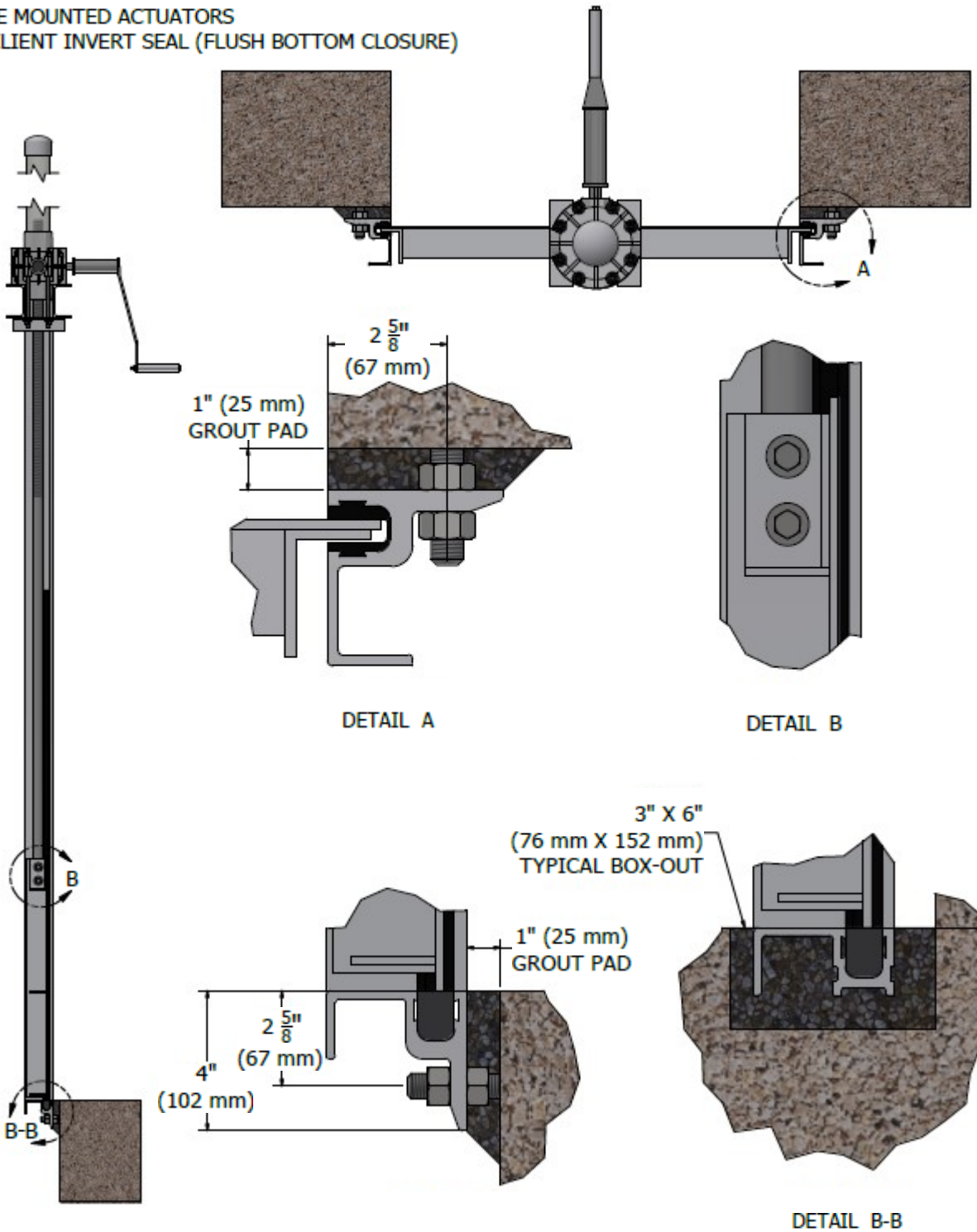
Model 823 Slide Gate



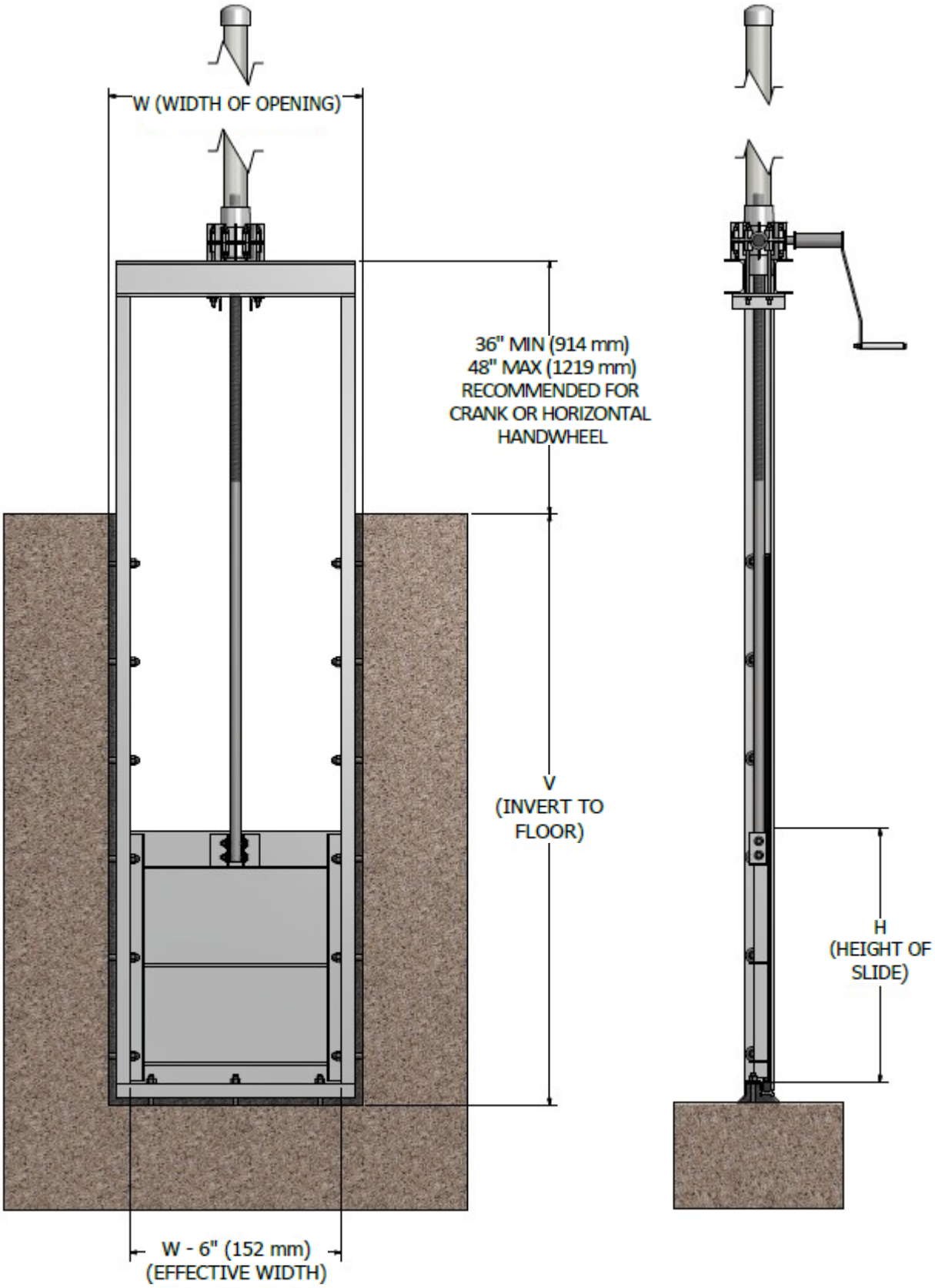
GATE ILLUSTRATED: 36" (W) x 36" (H) x 84" (V)
SEE ACTUATORS SECTION FOR OTHER ARRANGEMENTS

Model 823 Features

- UHMW SEAT/SEALS
- LEAKAGE ≤ AWWA SLIDE GATE STANDARDS
- WALL MOUNTED SIDE FRAMES
- OPEN CHANNEL - NO TOP SEAL
- YOKE MOUNTED ACTUATORS
- RESILIENT INVERT SEAL (FLUSH BOTTOM CLOSURE)



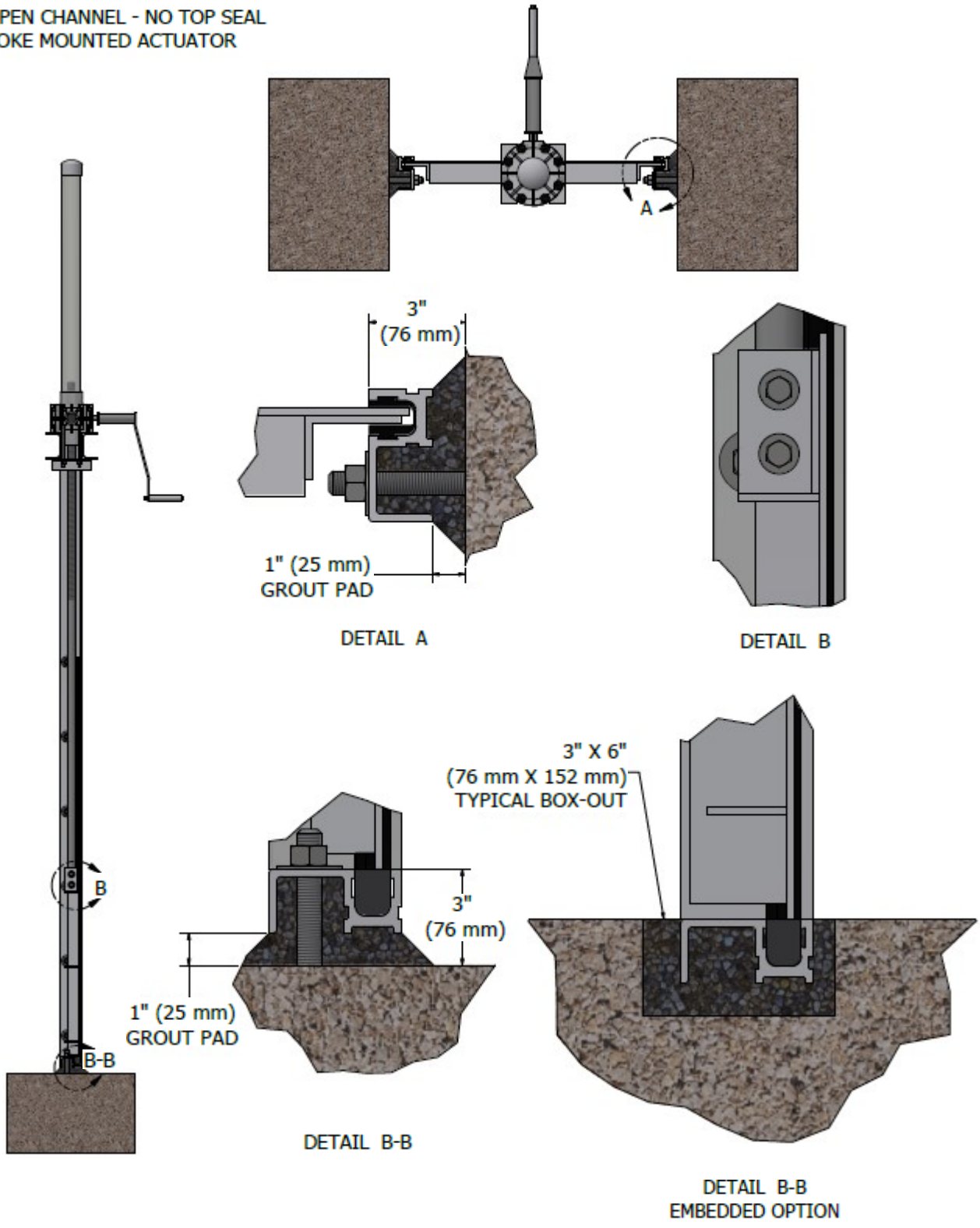
Model 823-C Slide Gate



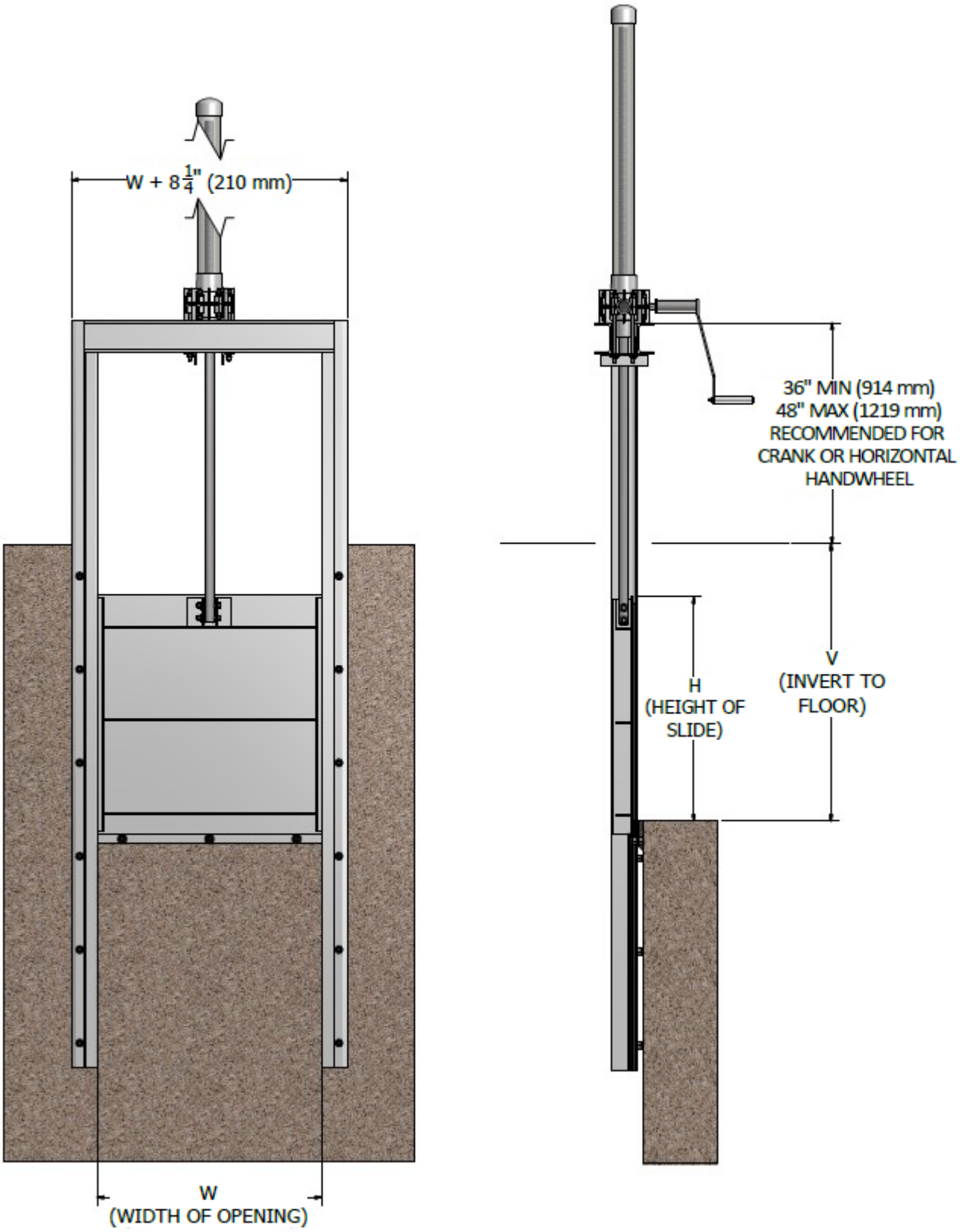
GATE ILLUSTRATED: 36" (W) x 36" (H) x 84" (V)
SEE ACTUATORS SECTION FOR OTHER ARRANGEMENTS

Model 823-C Features

- UHMW SEAT/SEALS
- LEAKAGE ≤ AWWA SLIDE GATE STANDARDS
- FRAME MOUNTS IN EXISITING CHANNEL
- OPEN CHANNEL - NO TOP SEAL
- YOKE MOUNTED ACTUATOR



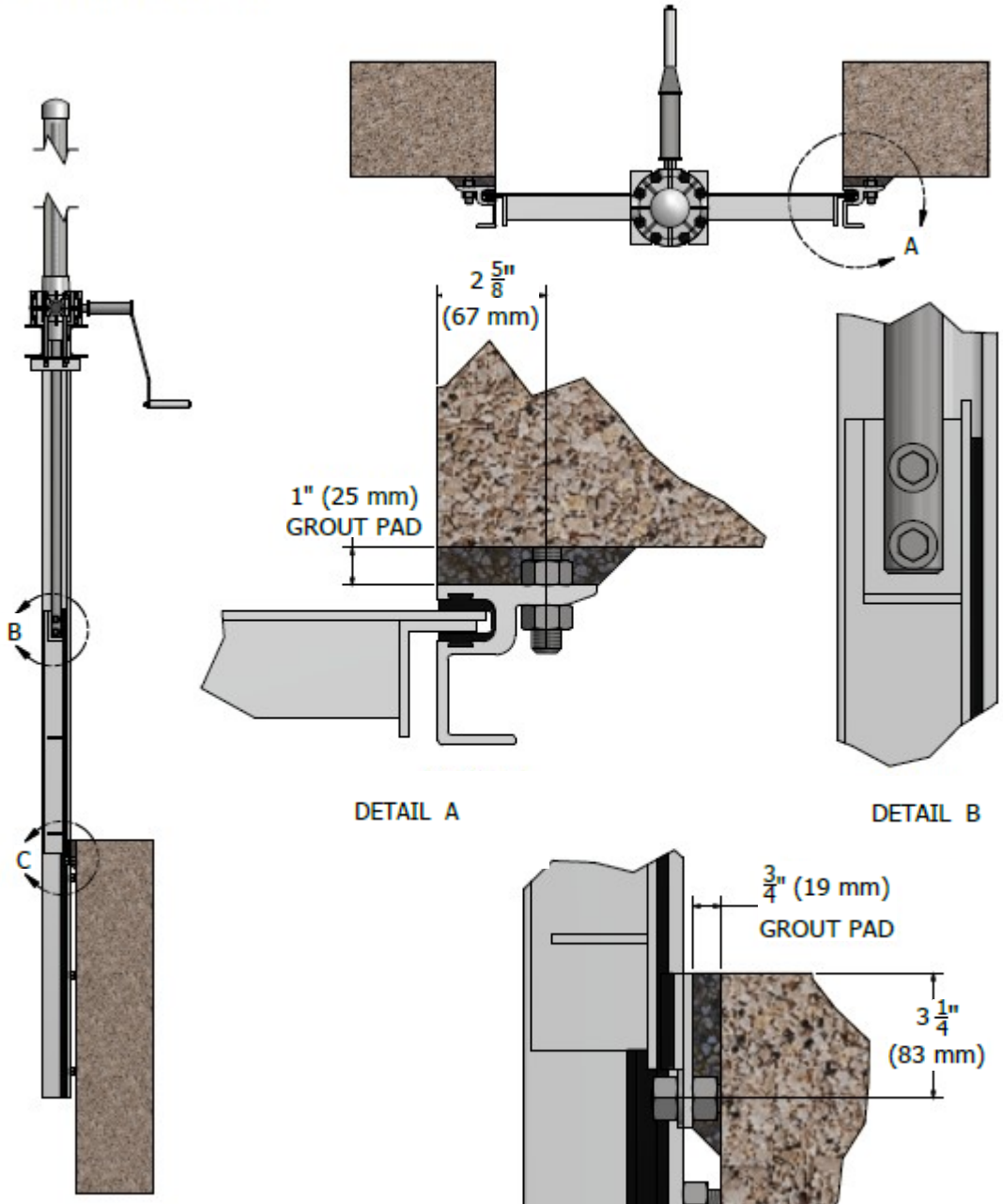
Model 823-D Slide Gate



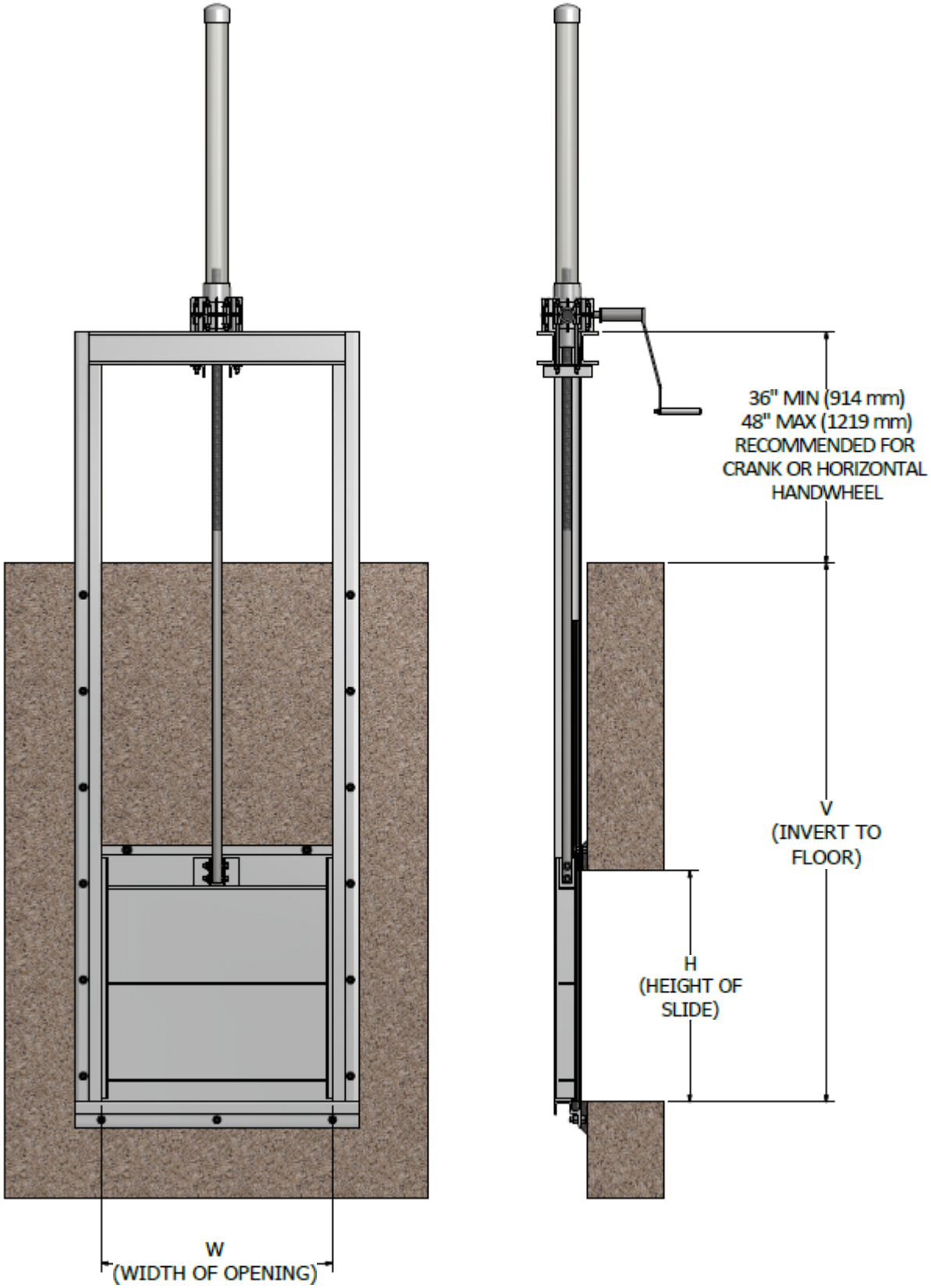
GATE ILLUSTRATED: 36" (W) x 36" (H) x 44" (V)
SEE ACTUATORS SECTION FOR OTHER ARRANGEMENTS

Model 823-D Features

°UHMW SEAT/SEALS
°LEAKAGE ≤ AWWA SLIDE GATE STANDARDS
°WALL MOUNTED SIDE FRAMES
°DOWNWARD OPENING
°OPEN CHANNEL - OPTIONAL TOP SEAL
°YOKE MOUNTED ACTUATORS



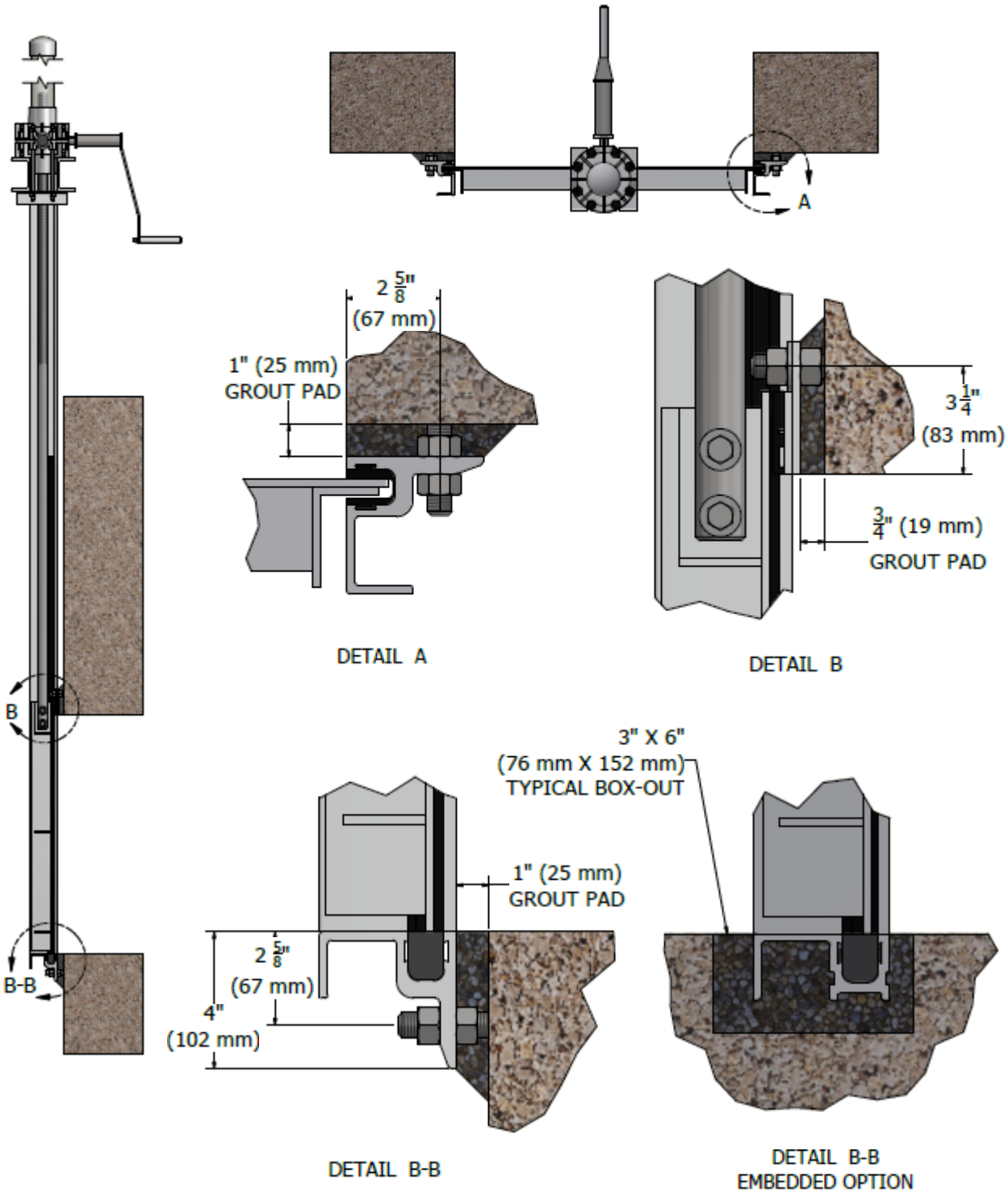
Model 824 Sluice Gate



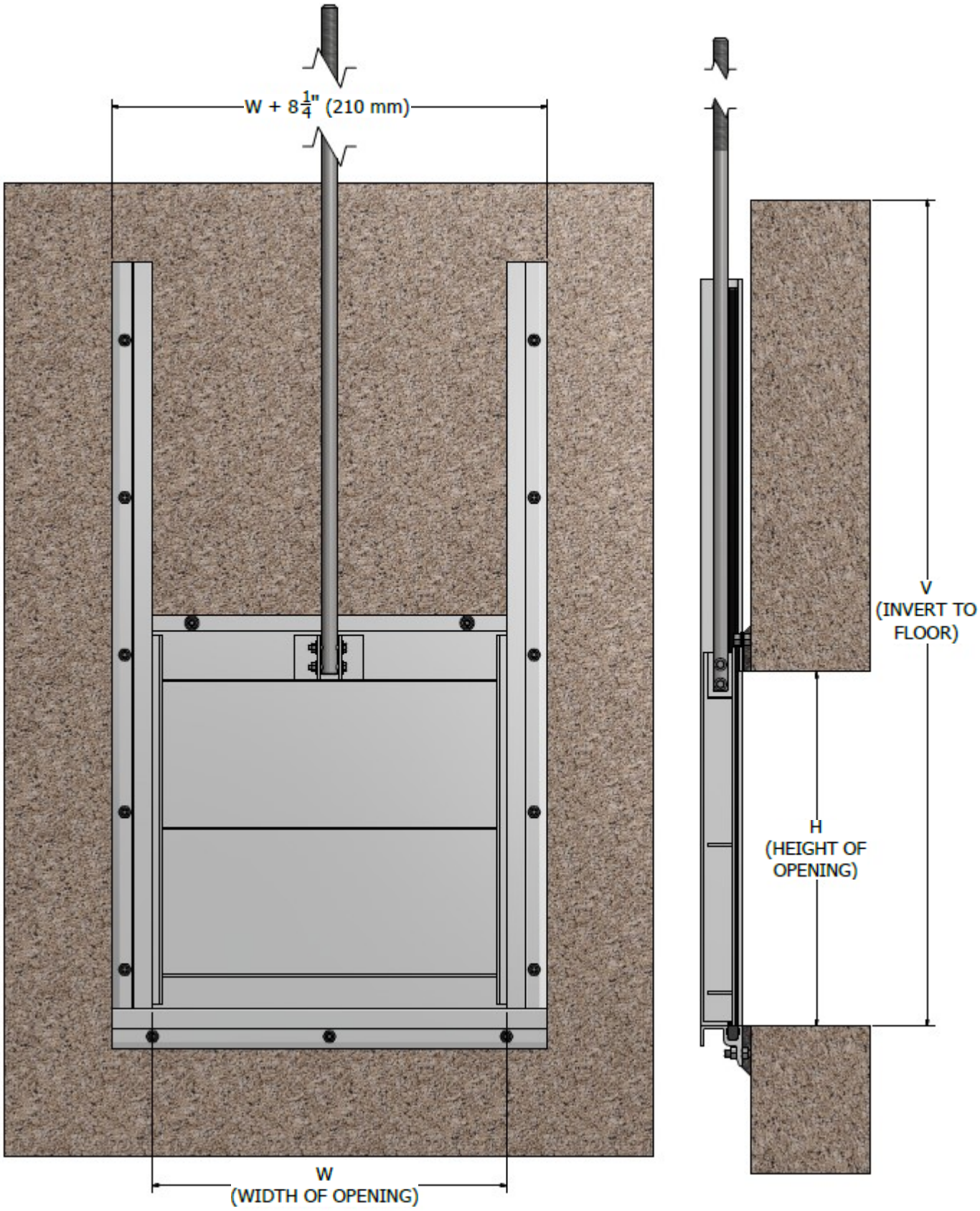
GATE ILLUSTRATED: 36" (W) x 36" (H) x 84" (V)
SEE ACTUATORS SECTION FOR OTHER ARRANGEMENTS

Model 824 Features

°UHMW SEAT/SEALS
°LEAKAGE ≤ AWWA SLIDE GATE STANDARDS
°WALL MOUNTED SIDE FRAMES
°FULL APERTURE SEALING
°YOKE MOUNTED ACTUATORS
°RESILIENT INVERT SEAL (FLUSH BOTTOM CLOSURE)



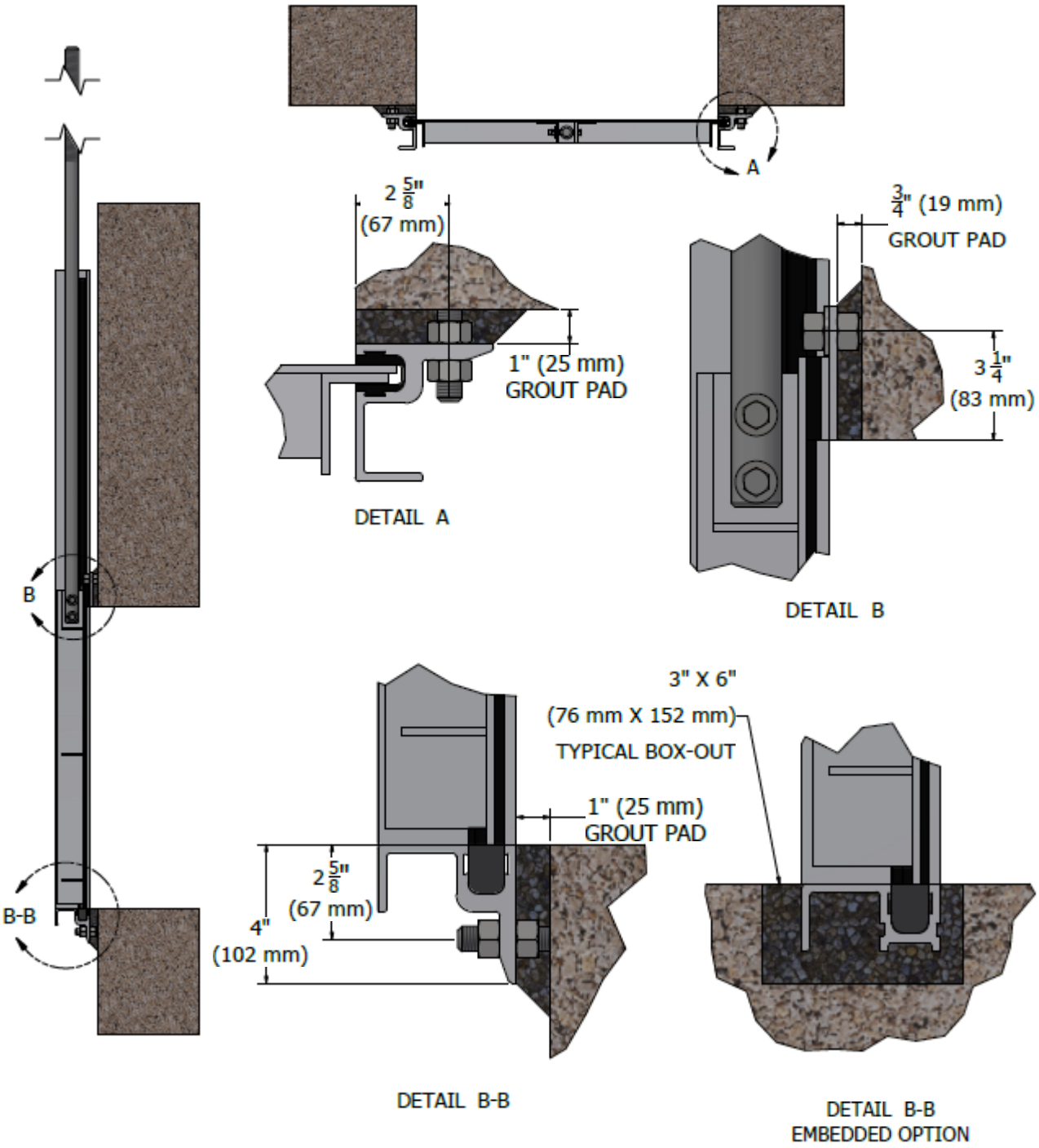
Model 825 Sluice Gate



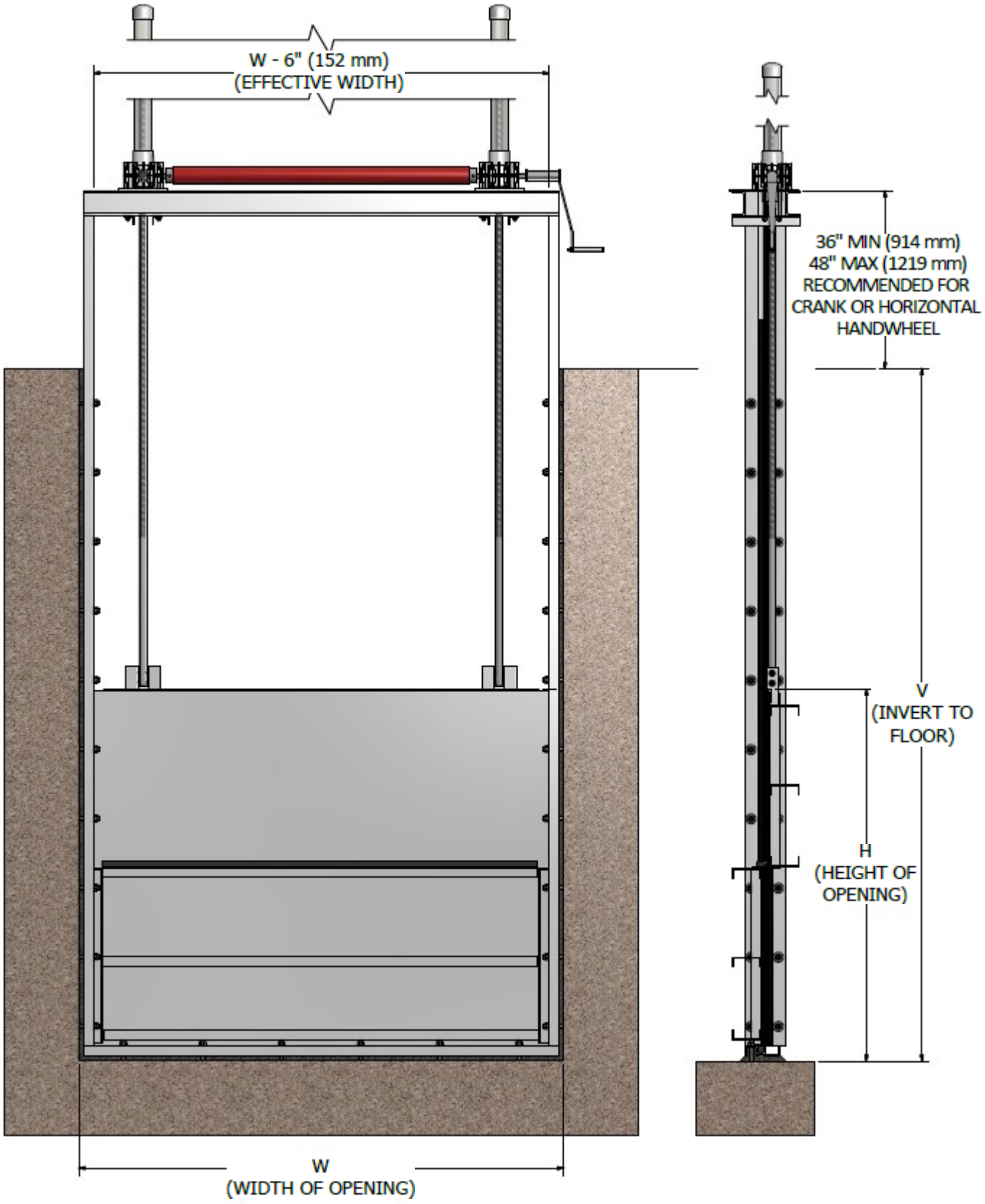
GATE ILLUSTRATED: 36" (W) x 36" (H)
SEE ACTUATORS SECTION FOR OTHER ARRANGEMENTS

Model 825 Features

°UHMW SEAT/SEALS
°LEAKAGE ≤ AWWA SLIDE GATE STANDARDS
°WALL MOUNTED SIDE FRAMES
°FULL APERTURE SEALING
°PEDESTAL, WALL BRACKET OR FLOOR BOX MOUNTED ACTUATOR
°RESILIENT INVERT SEAL (FLUSH BOTTOM CLOSURE)



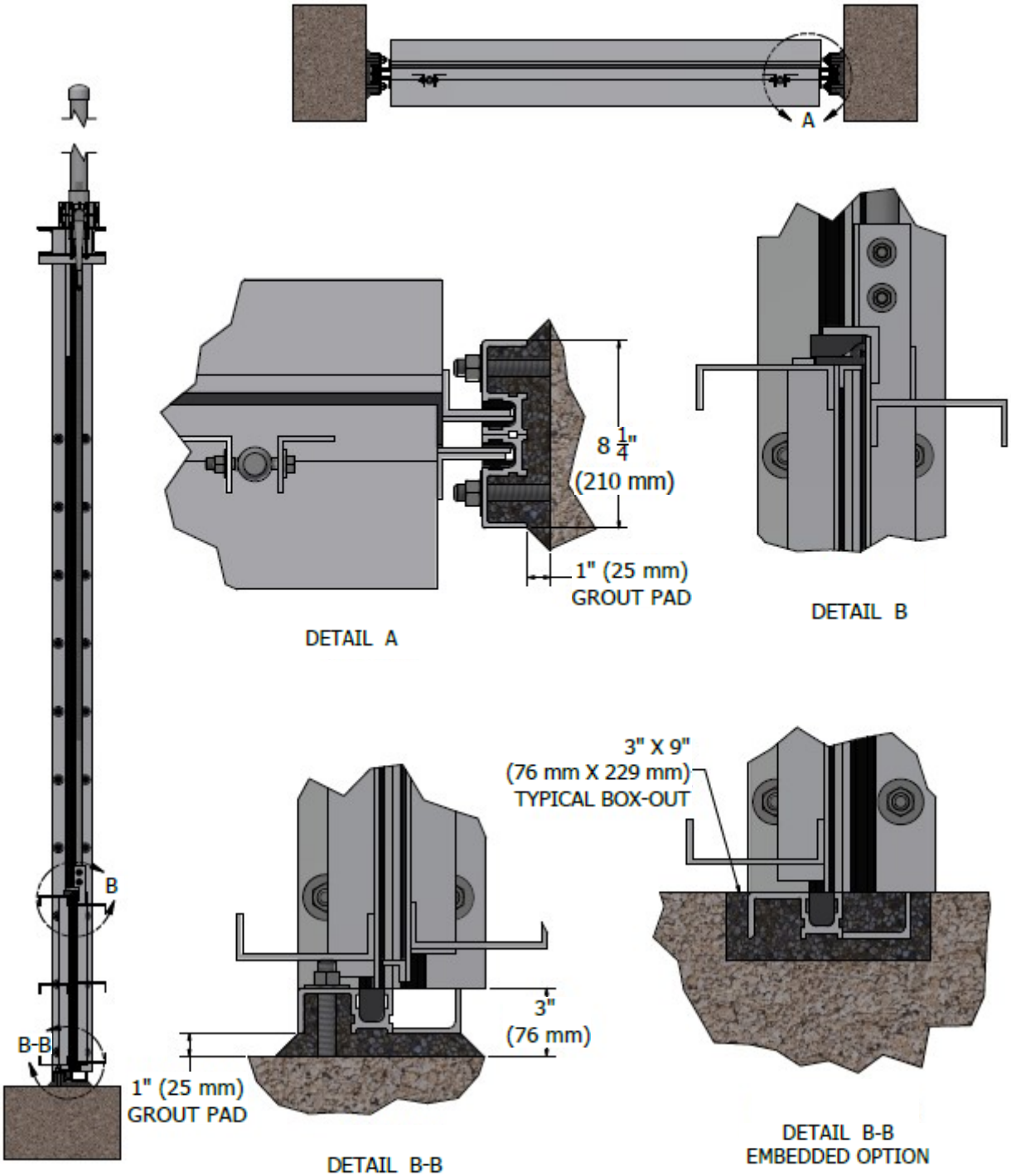
Model 823-C-I Multiple Disc Slide Gate



GATE ILLUSTRATED: 98" (W) x 75" (H) x 140" (V)
SEE ACTUATORS SECTION FOR OTHER ARRANGEMENTS

Model 823-C-I Multiple Disc Features

°UHMW SEAT/SEALS
°LEAKAGE ≤ AWWA SLIDE GATE STANDARDS
°FRAME MOUNTS IN EXISTING CHANNEL
°OPEN CHANNEL - NO TOP SEAL
°YOKE MOUNTED ACTUATOR
°RESILIENT INVERT SEAL (FLUSH BOTTOM CLOSURE)



Model 823-C-I Multiple Disc Positions

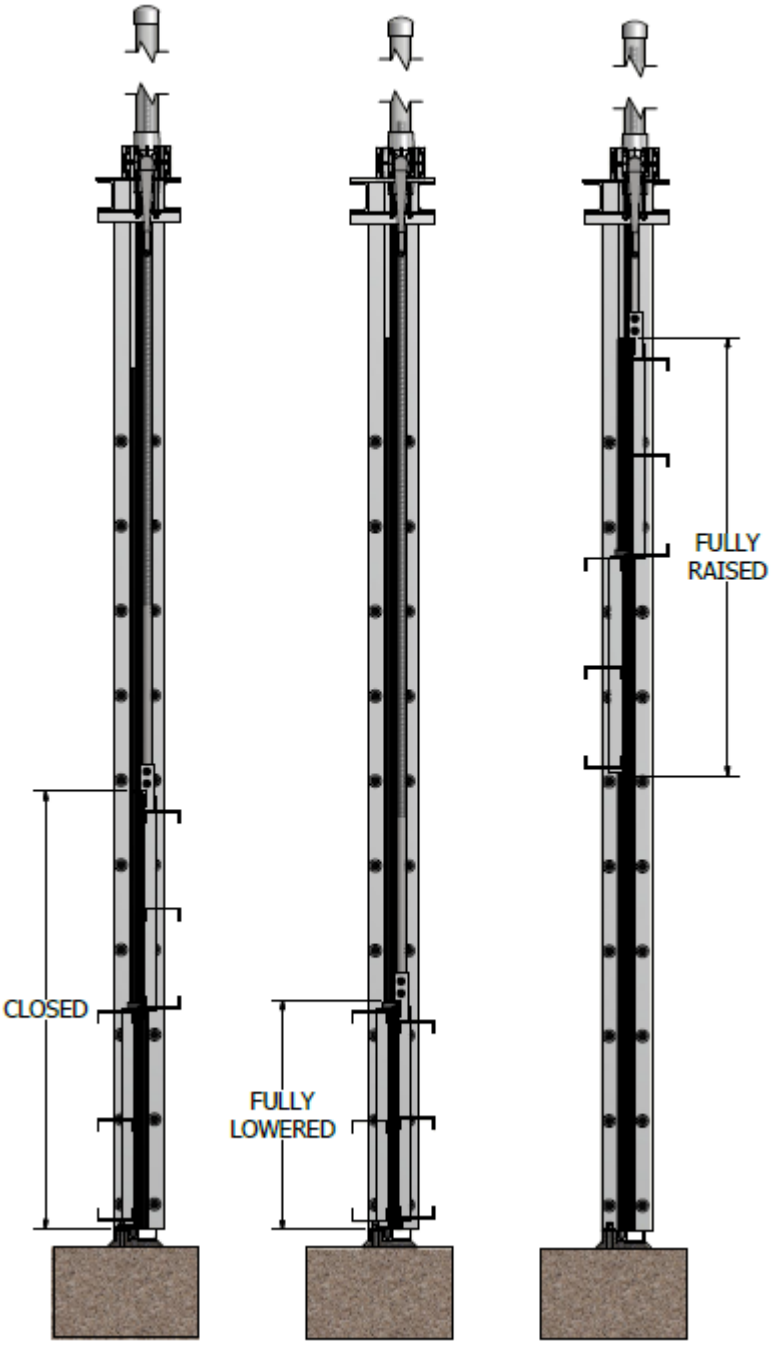
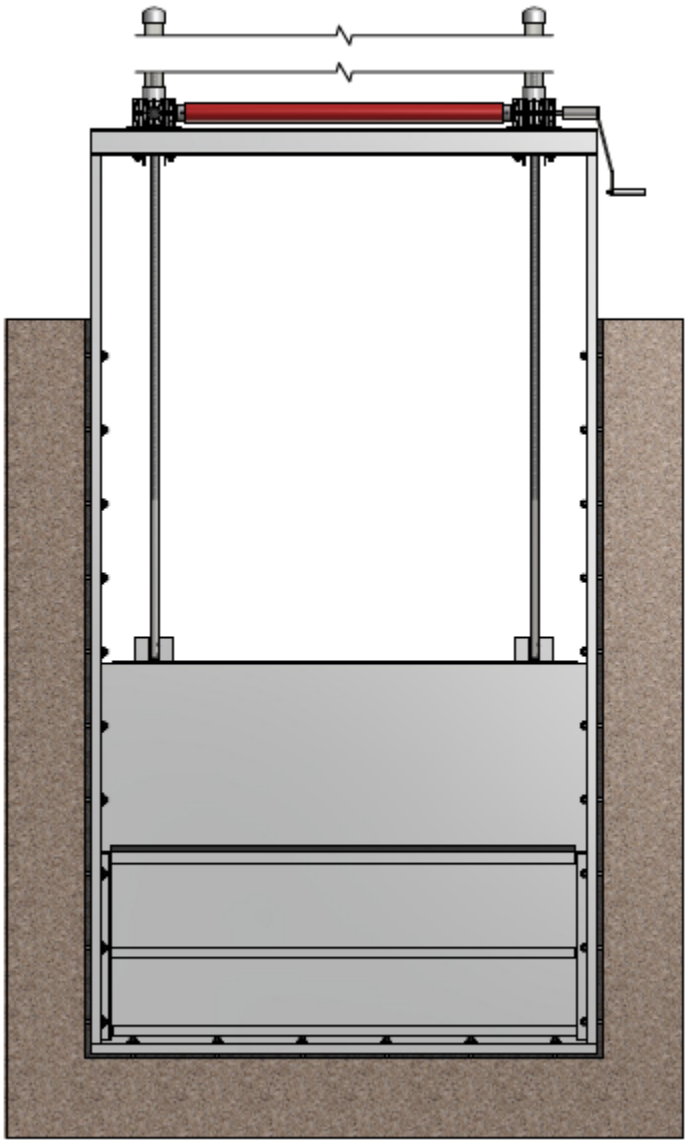


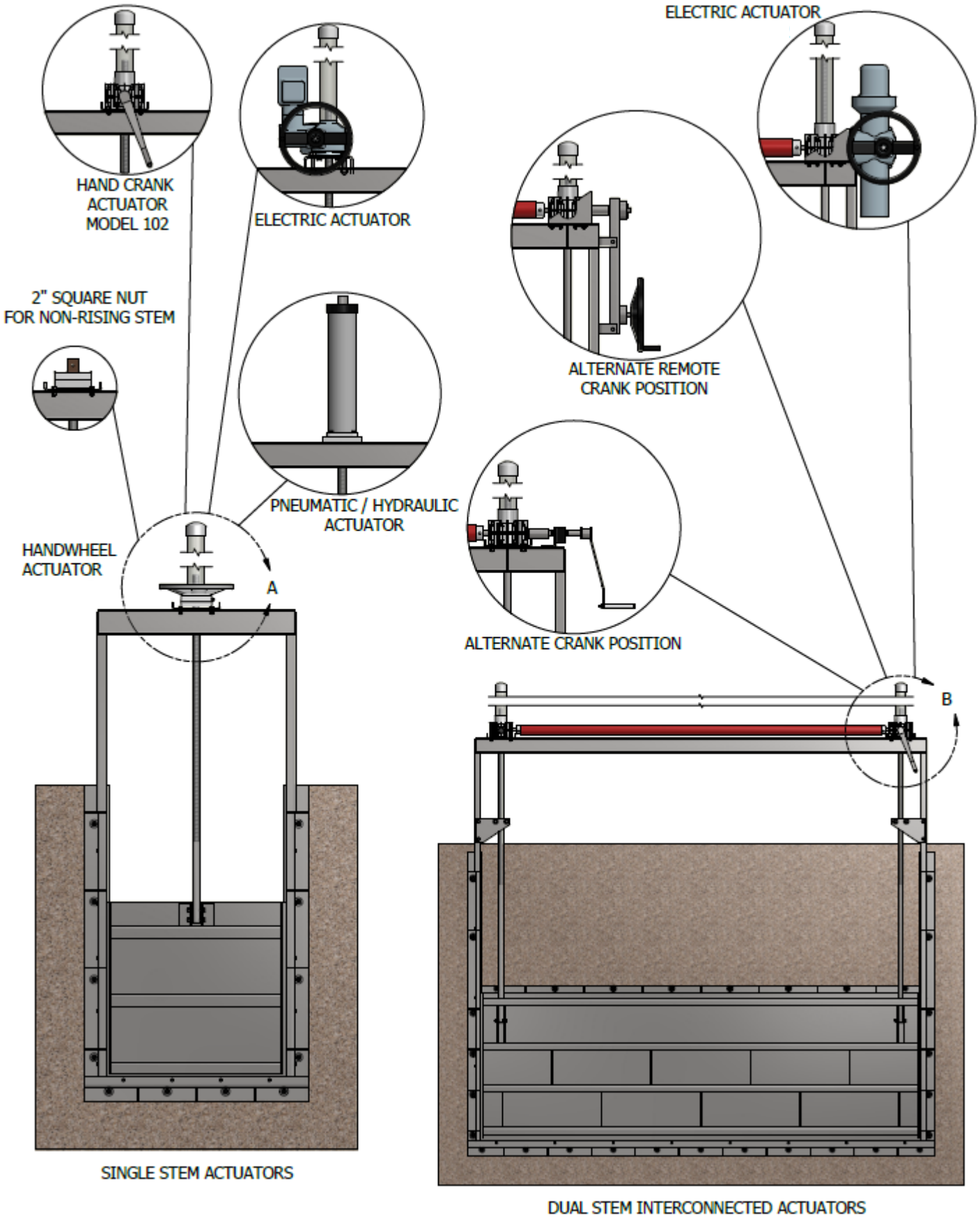
Figure 2: Disc Positions

Note: *Slide positions are illustrated by the stiffeners on each side.*

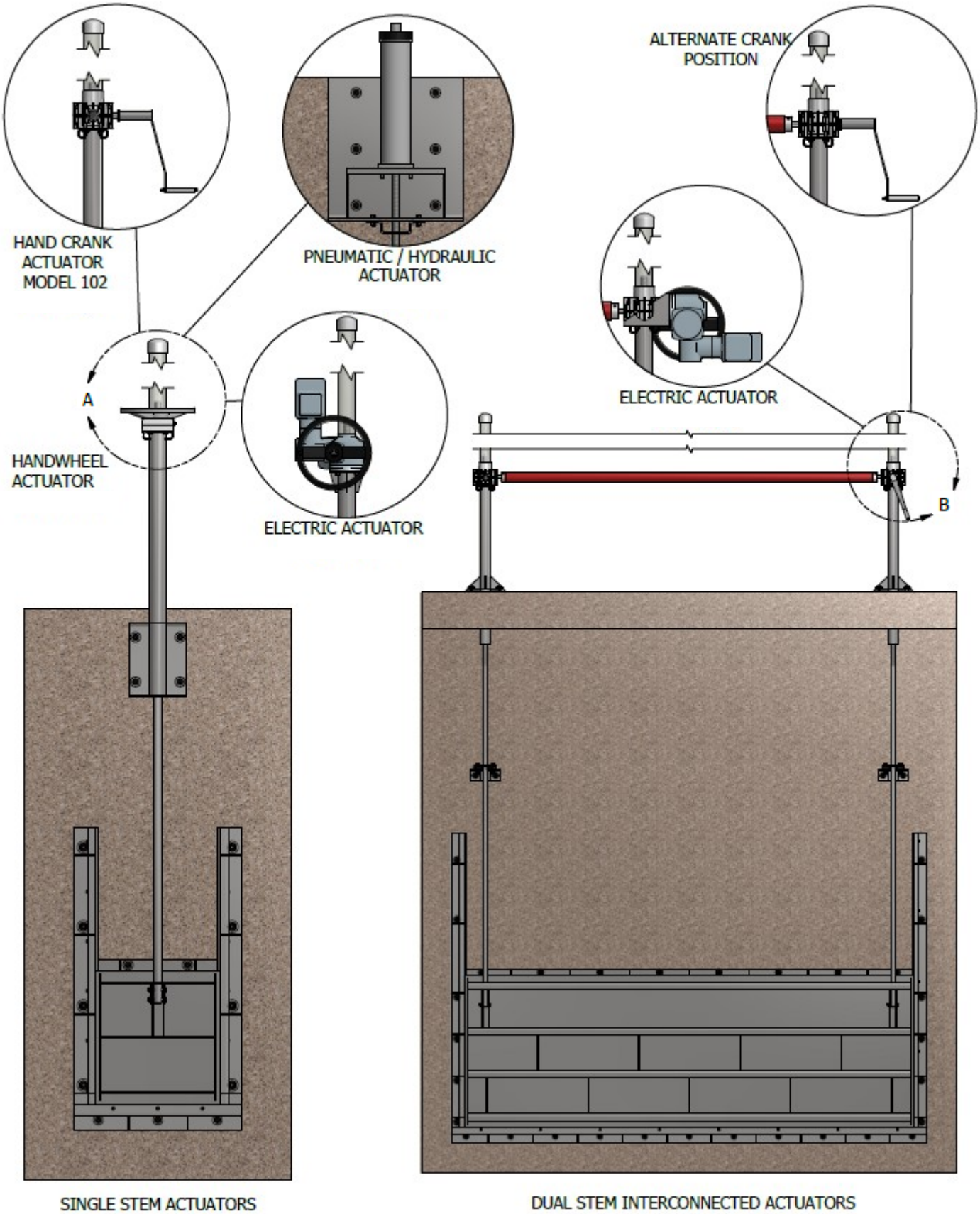
The multiple-disc slide gate is one example of our custom designs. This gate can serve two purposes. First, it can be used to control the level in a tank or pond. Second, both sides can be raised to flush the channel invert or completely drain the structure. Please consult the factory for assitance for gates designed for unusual applications.



Actuators: Self Contained Gates



Actuators: Non-Self Contained Gates



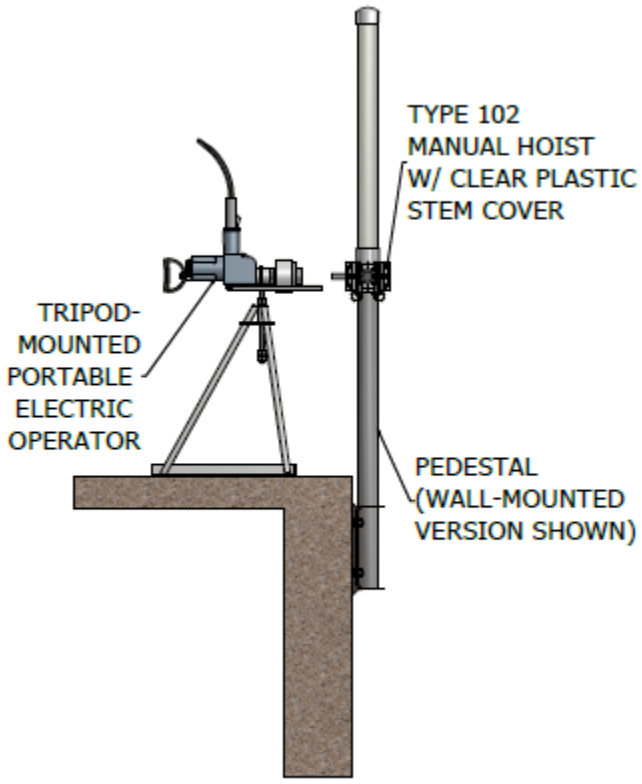
Actuators: General Information

Manual Actuators: Handwheel or hand crank actuators are appropriate when operating loads are relatively low, operation is infrequent, or electric power is unavailable. A handwheel actuator has a handwheel directly attached to the operating nut, concentric to the stem, providing a 1:1 drive ratio. Hand crank actuators have a horizontal input shaft that drives the operating nut through a right-angle gear set. Various drive ratios are available to operate virtually any gate. For high ratios (greater than 8:1), manually operating a large gate can be time-consuming and physically demanding. When hand crank manual actuators will be frequently used, or when they require numerous turns for full gate travel, portable operators should be considered.

Interconnected Actuators: For gates with a width significantly greater than their height, which is often the case with overflow weirs, interconnected crank actuators with a standard input provide accurate positioning and smooth operation. These assemblies may be operated manually or powered electrically.

Portable Operators: Portable operators powered by electricity or gasoline, available in various configurations, can be supplied to operate crank actuators. For further information, please contact the factory.

Electric Actuators: For increased loads, higher operating speeds (12" – 24" per minute), or gates that require frequent operation, electric actuators offer remote control of gate position and seamless integration into automatic control systems.



Hydraulic Cylinder Actuators: Hydraulic cylinders offer smooth and rapid operation, making them well suited for automatic control systems that require frequent gate cycling. They can also be designed to provide automatic gate positioning in the event of an electric power failure.