



Installation, Operation and Maintenance Manual

CC Channel Gate

INSTALLATION, OPERATION AND MAINTENANCE MANUAL		02-2010 Edition Rev.C
MODEL	CC CHANNEL GATES	 ORBINOX <small>VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES</small>

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INTRODUCTION

This manual describes the recommended procedures for installation, operation, maintenance and safety precautions for Orbinox CC model channel gates. Please read thoroughly all the instructions in the manual prior to installation, and contact an Orbinox representative in case of any questions. The manual makes reference to the “General Arrangement Drawing” (GAD). The GAD is the drawing that is sent to and approved by the customer prior to the production of the gate. **Orbinox assumes no responsibility or liability if the CC channel gate is not installed, operated and maintained in strict accordance to the procedures described in this manual.**

HANDLING AND STORAGE

Standard safety procedures should be followed to prevent personal injury or equipment damage. Additionally, the following instructions shall be followed during handling and storage to prevent any damage to the product:

- Stems have precision surfaces and should never be used as a means to lift the slide gate.
- Special care shall be taken on any machined surface when lifting the gate.
- Equipment shall be stored in a dry, clean and even area on a raised even wood surface to prevent distortion of the frame. Do not stack slide gates.
- Stems and extensions that are shipped separately shall be supported over their entire length to prevent any bending or distortion while in storage.

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INSTALLATION: EMBEDDED IN CONCRETE

Required Materials:

As a standard, Orbinox CC Channel Gates are mounted Embedded In Concrete (EC). Field adjustment hex bolts are required to center the gate in the appropriate recess prior to embedding in concrete. For detailed information about the type, size and quantity of the required bolts, or any other specific installation notes or materials, please refer to the notes on the "General Arrangement Drawing".

INSTALLATION PROCEDURE

Step 1: Concrete construction inspection

- The concrete construction shall be flat, level and plumb, and shall be in accordance to ACI 117-06 standard. If necessary, use non-shrink grout in order to meet the specified standard. The minimum concrete strength shall be 3,000 PSI (20.7 MPa).

Step 2: Align the channel gate in the wall recess

- Position and center the channel gate in the recess of the wall, using the field adjustment bolts screwed in the "Side Centering Fittings" and "Bottom Leveling Brackets" (see Figure 1). Make sure that the channel gate is centered in the channel.

NOTE: the smaller CC Channel Gates do not come with "Bottom Leveling Brackets". If this is the case, follow Step 2B (page 6) prior to starting with "Step 2" in order to be able to align the gate vertically.

- Align the gate vertically adjusting the bolts on the "Bottom Leveling Brackets" (see Figure 2). Make sure that the frame invert is flush with the invert of the channel.
- Align the gate horizontally adjusting the bolts on the "Lateral Centering Fittings" (see Figure 3). Make sure that the Frame Guide is flush with the channel side wall. Additionally, make sure that the gate is perpendicular to the side walls of the channel.

Step 3: Embed the channel gate in the wall recess

- Pour the second phase of concrete. Take special care not to damage the seals.

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INSTALLATION: EMBEDDED IN CONCRETE

continued

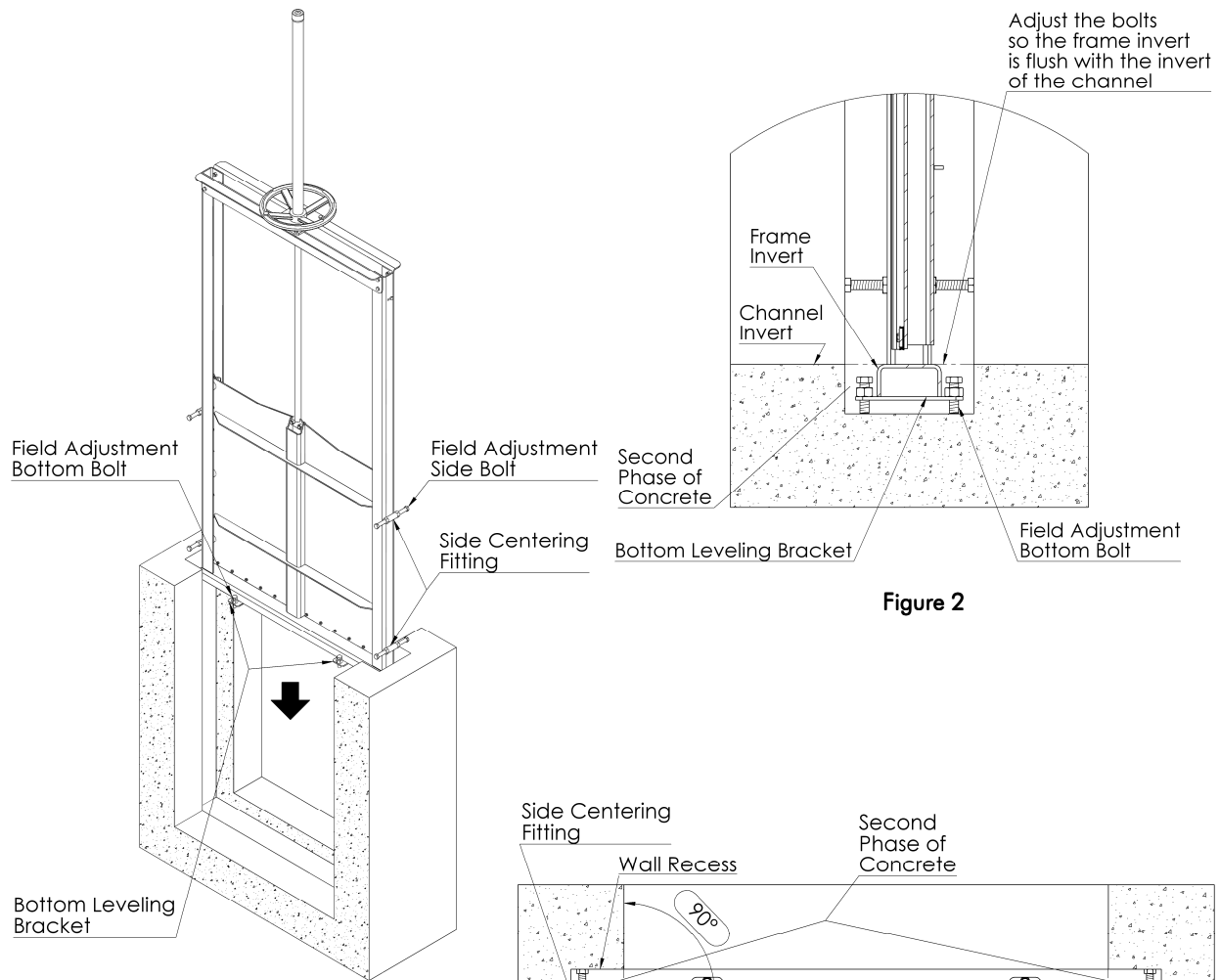


Figure 2

Figure 1

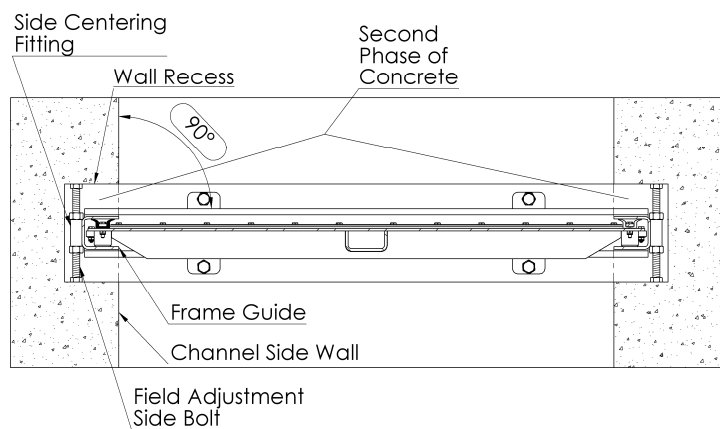


Figure 3

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INSTALLATION: EMBEDDED IN CONCRETE

continued

Step 2B: Align the gate vertically (without the Bottom Balancing Brackets)

Smaller CC Channel Gates do not come with "Bottom Balancing Brackets". Therefore, the following procedure shall be followed to align the gate vertically (After "Step 1").

- Get two pieces of wood or metal ("Supports").
- Rise the slide enough to fit the two supports and secure the supports by closing the slide (See Figure 4).
- Proceed with "Step 2". When the gate is positioned in the recess, the supports will maintain the frame invert flush with the invert of the channel (See Figure 5).

CAUTION: Do not use pieces of wood or metal with sharp edges or with a bad surface condition in order to avoid any damage to the bottom seal.

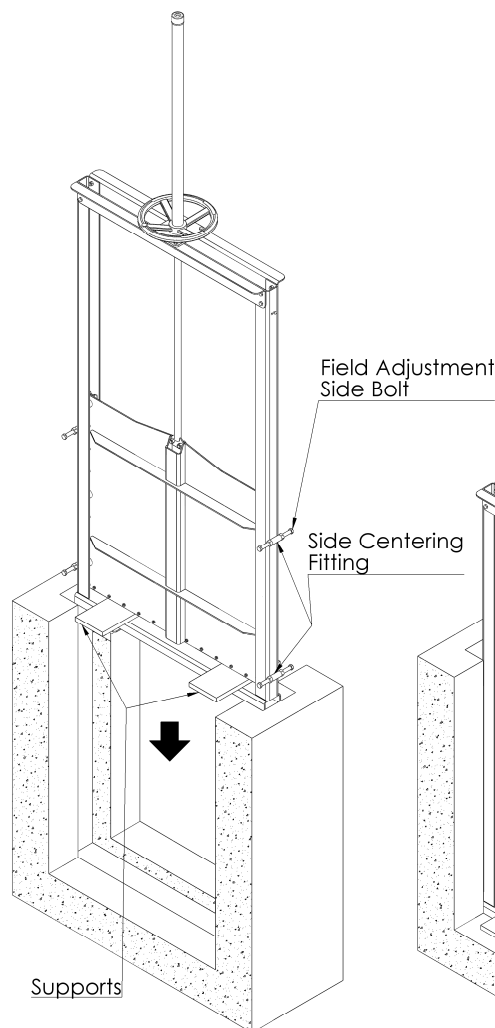


Figure 4

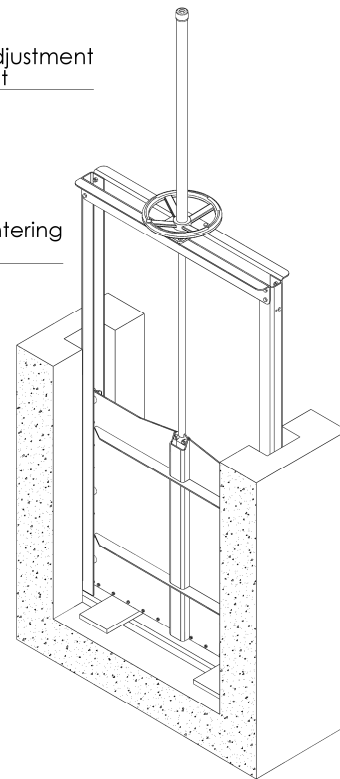


Figure 5

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INSTALLATION: FACE MOUNTED IN EXISTING CHANNEL

Required Materials:

For the Face Mounted In Existing Channel (FM) mounting option, the CC channel gate is installed by means of mechanical anchor bolts (Hilti Kwilt 3 or equivalent). All the gaps shall be grout filled afterwards and shaped in order to get a smooth transition.

For detailed information about the type, size and quantity of the required anchor bolts or any other specific installation notes or materials, please refer to the notes on the "General Arrangement Drawing".

INSTALLATION PROCEDURE

Step 1: Concrete construction inspection:

- The concrete construction shall be flat, level and plumb, and shall be in accordance to ACI 117-06 standard. If necessary, use non-shrink grout in order to meet the specified standard. The minimum concrete strength shall be 3,000 PSI (20.7 MPa).

Step 2: Anchor the gate to the channel

- Position the channel gate in the existing channel. Make sure that the gate is perfectly aligned and centered in the channel (see Figure 6).
- Install the bottom anchor bolts, and then the lateral anchor bolts (see Figure 8). All Face Mounted Channel Gates incorporate bottom and lateral mounting brackets. For smaller sizes (typically under 60"), the channel gate includes lateral flexible brackets (as seen in Figure 8) that require no field adjustment. For bigger sizes (typically over 64"), the channel gate includes "Field Adjustment Brackets". In order to adjust the bracket, the following steps shall be followed (see Figure 7):
 - Untighten nut
 - Adjust the bracket until it is completely leaning against the wall
 - Tight the nut
 - Install the anchor bolt

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INSTALLATION: FACE MOUNTED IN EXISTING CHANNEL

continued

Step 3: Grout fill

- Grout fill the remaining voids (See Figure 8), both at the bottom (See Figure 9) and laterals of the gate (See Figure 10). Remember that the objective of the grout fill is twofold:
 - Fill the voids between the frame, frame invert and the channel.
 - Make a smooth transition for water flow. Therefore, the grout shall be built-up to the level of the frame as shown in Figures 9 and 10.

CAUTION! Make sure not to get grout or any other foreign material on the gate's seals, guides or stem as this may cause leakage or damage.

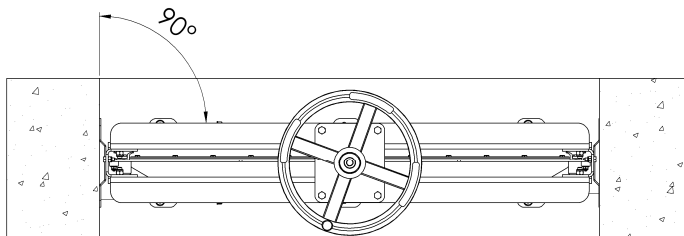


Figure 6

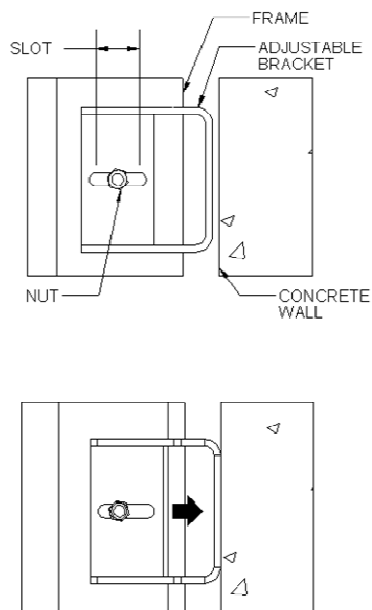


Figure 7

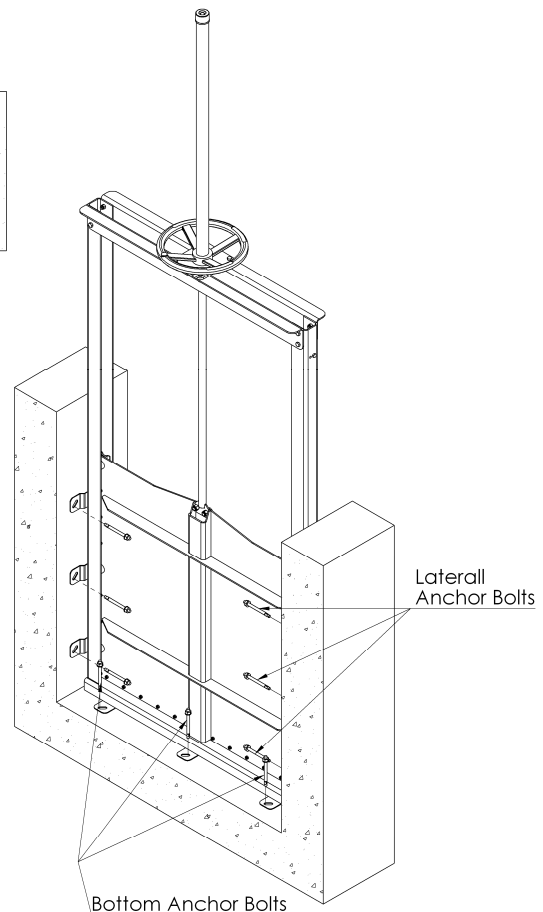


Figure 8

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INSTALLATION: FACE MOUNTED IN EXISTING CHANNEL

continued

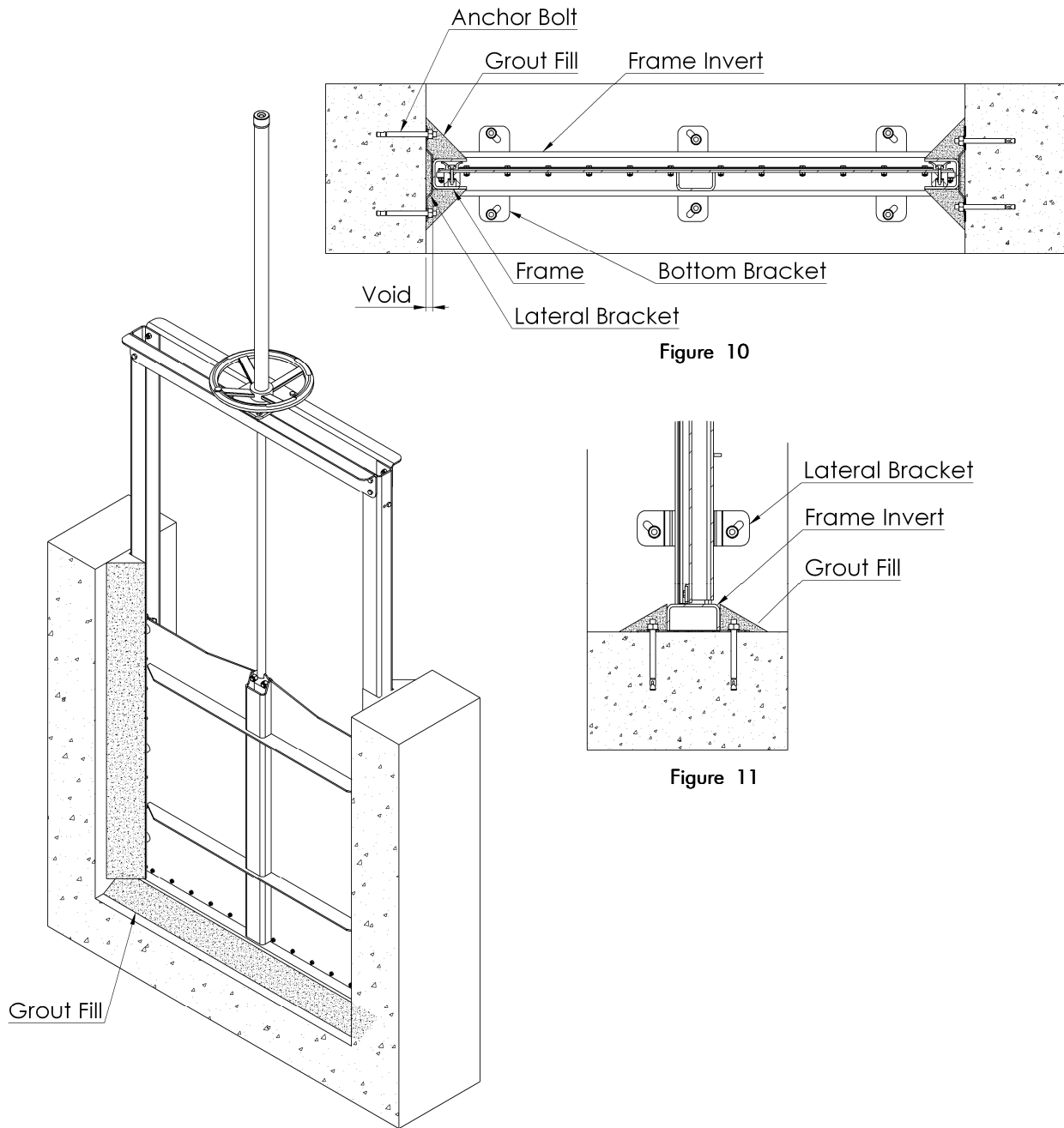


Figure 9

Figure 10

Figure 11

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INSTALLATION: WALL MOUNTED

Required Materials:

For the Wall Mount (WM) mounting option, the CC channel gate is installed by means of mechanical anchor bolts (Hilti Kwilt 3 or equivalent) and construction sealant (Sikabond or equivalent). Note that as standard, anchor bolts and construction sealant are not supplied with the gate.

For detailed information about the type, size and quantity of the required anchor bolts, or any other specific installation notes or materials, please refer to the notes on the 'General Arrangement Drawing'.

INSTALLATION PROCEDURE

Step 1: Concrete construction inspection:

- The concrete construction shall be flat, level and plumb, and shall be in accordance to ACI 117-06 standard. If necessary, use non-shrink grout in order to meet the specified standard. The minimum concrete strength shall be 3,000 PSI (20.7 MPa).
- The wall surface shall be dry.

Step 2: Pre-installation of the channel gate

- Position the channel gate against the wall and line up with the opening (See Figure 12). The gate shall be in the closed position.
- Drill and install an anchor bolt on each side of the gate. After installing the first anchor bolt, and prior to drilling the hole on the other side, make sure the frame is perfectly leveled (see Figure 13).

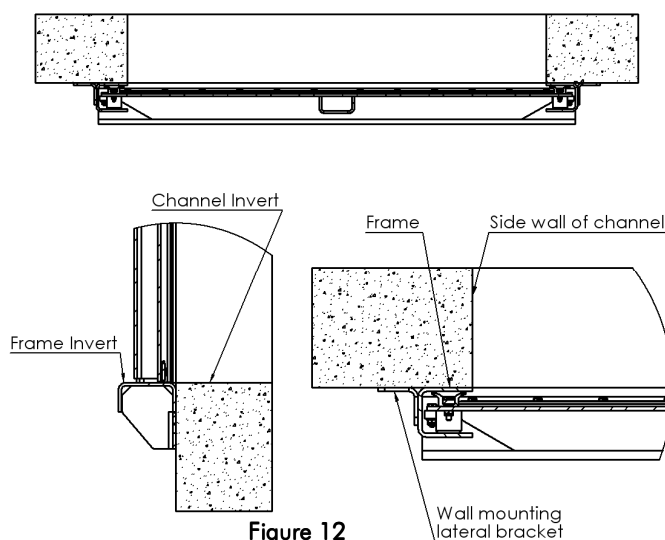


Figure 12

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INSTALLATION: WALL MOUNTED

continued

Step 3: Construction sealant application (Sikabond or equivalent)

In order to avoid leakage between the frame and the wall, construction sealant shall be applied on the back side of the frame:

- Remove the channel gate from the wall (first remove the nuts of the anchor bolts).
- Apply construction sealant all around the perimeter of the frame, where it will be in contact with the wall. Sikabond (200 ml/m) or equivalent construction sealant shall be used (See Figure 14). Be sure not to get sealant on the gate's seals, guides, and/or stem, as this may cause leakage or damage.

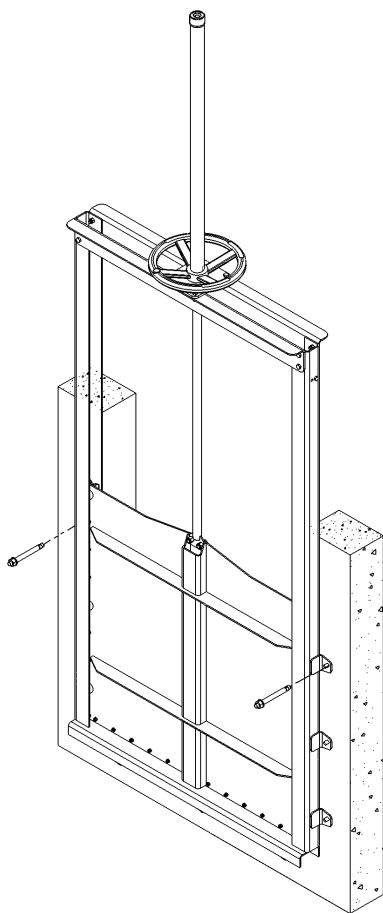


Figure 13

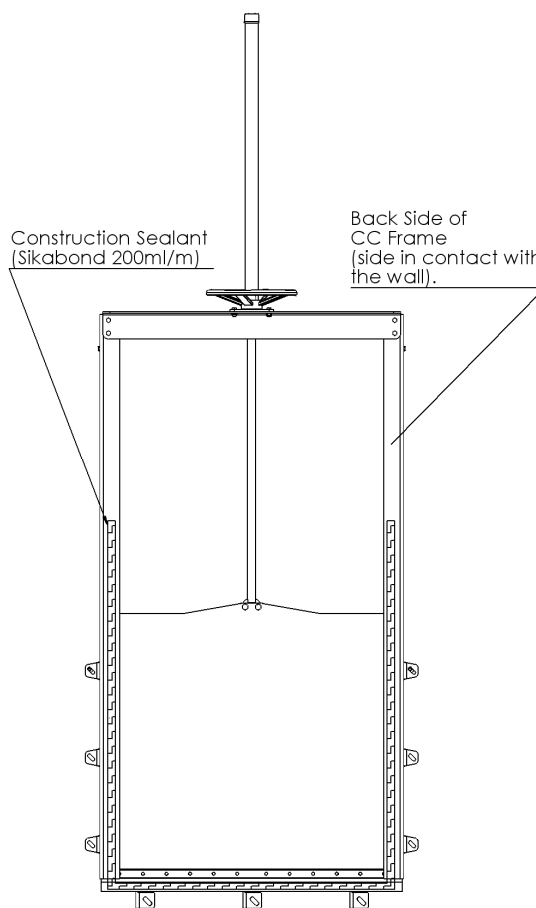


Figure 14

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INSTALLATION: WALL MOUNTED

continued

Step 4: Final installation of channel gate

- Drill and install the rest of the anchor bolts (see Figure 15).

CAUTION! If the channel gate is not completely in contact with the wall, do not over-tighten the anchor bolts. Over tightening may bend or distort the frame. If the wall flatness and levelness is according to the specified standards, the construction sealant will fill in the remaining void (see Figure 16).

- Apply construction sealant around the frame in order to fill in any existing gap between the wall and the frame (this step is only for esthetics). Wipe away the excess sealant to leave a smooth finish.

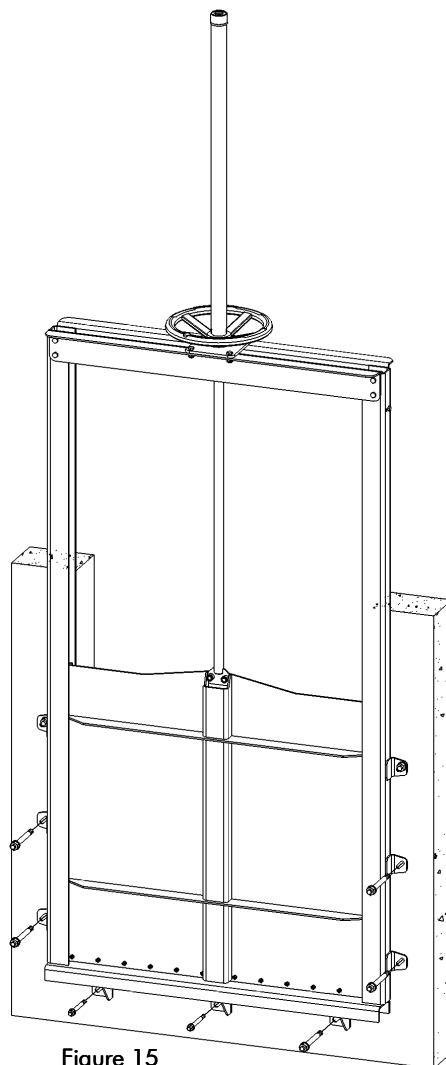


Figure 15

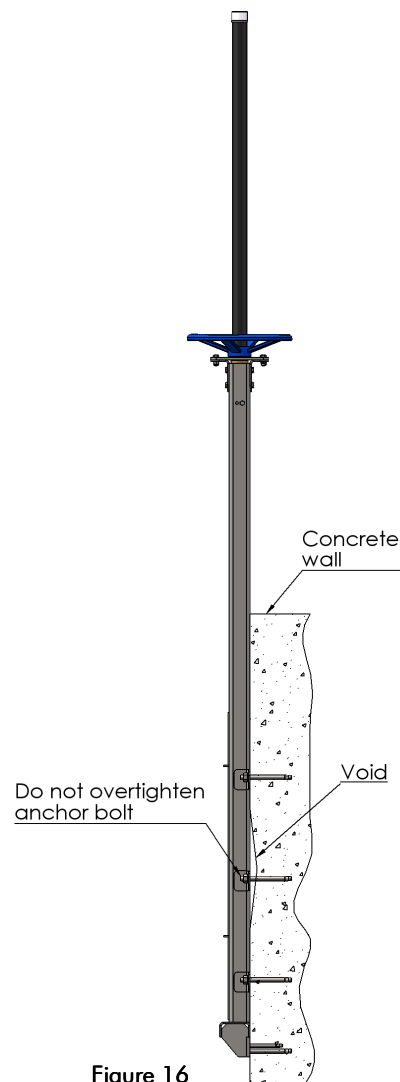


Figure 16

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OPERATION

Initial Operation:

Before cycling the channel gate, make sure there are no foreign deposits or materials on the seals, guides or sealing area. Gate seals could be damaged if the area is not cleaned and coated with a light grease. Please refer to section "Materials needed for maintenance and seal replacement" on page 14 for detailed information about required the grease type.

- **Manual Operation:**
 - Apply a light grease on the stem before initial operation after the installation. If the operation is difficult due to high torque, stop operation of the gate and check stem alignment.
- **Electric Motor:**
 - Refer to the Electric Motor Instruction Manual section before cycling the slide gate. Manually open the gate approximately 5" before the initial electric motor operation. Check the motor rotation to assure proper direction of the slide travel according to the motor operation switch (open/close).
 - Special attention should be taken when the gate is almost fully open or fully closed. If the gate does not stop once the fully open or fully closed position is reached, stop immediately and adjust the limit and torque switches (Refer to motor manual).

Operation:

- **CAUTION! Do not force the operator to close the gate, as it may cause damage to the stem and it does not improve the sealing system.**
- The CC Channel Gate is closed by a clockwise rotation, and opened by a counter-clockwise rotation of the operator.
- The CC Channel Gate's frame incorporates a slide stopping device to stop the slide when it reaches the fully opened position.
- The CC Channel Gate is designed to be self-locking, so that the slide maintains its position in open, close or intermediate positions.

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MAINTENANCE: CLEANING AND LUBRICATION

Orbinox model CC Channel Gates need practically no maintenance. In order to assure maximum performance of the channel gate, the following maintenance inspections shall be carried out periodically every 6 months:

- Stem and stem nut shall be cleaned and greased. For non-rising stem configurations, the stem may be in contact with water and dirt. Under these conditions, the threads of the stem and/or stem nut may wear, and they shall be checked every 3 months.
- Clean the gate with clear water and remove any deposits, especially on the seals and in the guides.
- Check the seals and make sure they are not damaged. Seals shall be replaced if damaged. See section 'Maintenance: Seal Replacement' for detailed procedures about seal replacement.
- **Seals shall be wet while operating.** If the slide gate has not been used for a long period of time under dry conditions, the seals shall be wetted with clear water before operating the channel gate. Operating the gate with dry seals may damage the seals. Additionally, more torque may be required to operate the channel gate.

Spare parts:

Orbinox does not recommend stocking any spare parts by the owner of the equipment as the channel gates are designed for a very long life cycle. If a repair part is required, please contact an Orbinox representative and provide the following information:

- Orbinox S/O number.
- "Orbinox General Arrangement Drawing" number.
- Project name (if applicable).
- Vendor's company name.

Materials needed for maintenance and seal replacement:

Material	Type	Recommended or equivalent
Grease	Silica-Gel Silicone Grease	Verkosil G-2
Glue	Instant adhesive	Loctite 495

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MAINTENANCE: SIDE SEALS AND BOTTOM SEA REPLACEMENT

The following procedure describes how to replace the CC Channel Gate's lateral seal, bottom seal or both seals. Note that in any case, first the slide shall be removed from the frame. The frame does not need to be removed.

Slide Removal (Figure 17)

- **Step 1:** Start from the closed position.
- **Step 2:** Remove bolts and nuts (items 3 and 4) that are used to join the stem (item 5) and slide (item 2). For the non-rising stem configuration, the stem nut shall be detached from the gate.
- **Step 3:** Remove bolts and nuts (item 9 and 10) with caution, as major components of the gate (yoke, operator and stem) are no longer secured. Remove the stem (item 5), yoke (item 8) and the operator (item 11) as one item.
- **Step 4:** Remove bolts and nuts (items 6 and 7) in order to be able to remove the slide.
- **Step 5:** Remove the slide (item 2).

Side seals replacement (Figure 18)

- **Step 6:** Remove bolts, washers and nuts (items 3, 4 and 7) from the gate and remove retainers (items 2), lateral UHMWPE guides (items 4) and front UHMWPE guides (items 5).
- **Step 7:** Remove side seals (item 8) and replace it by the new seal.

Note 1: Apply glue where the bottom seal and side seals join.

Note 2: After installing the new seal, apply grease on it to ease operation.

Bottom seal replacement (Figure 18)

- **Step 8:** Remove bolts and nuts (items 10 and 12) and remove bottom retainer (item 9).
- **Step 9:** Remove bottom seal (item 13) and replace it by the new seal.

Note 1: Apply glue where the bottom seal and side seals join.

Reassembly:

- Follow Steps 9 to 1.

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MAINTENANCE: SEAL REPLACEMENT

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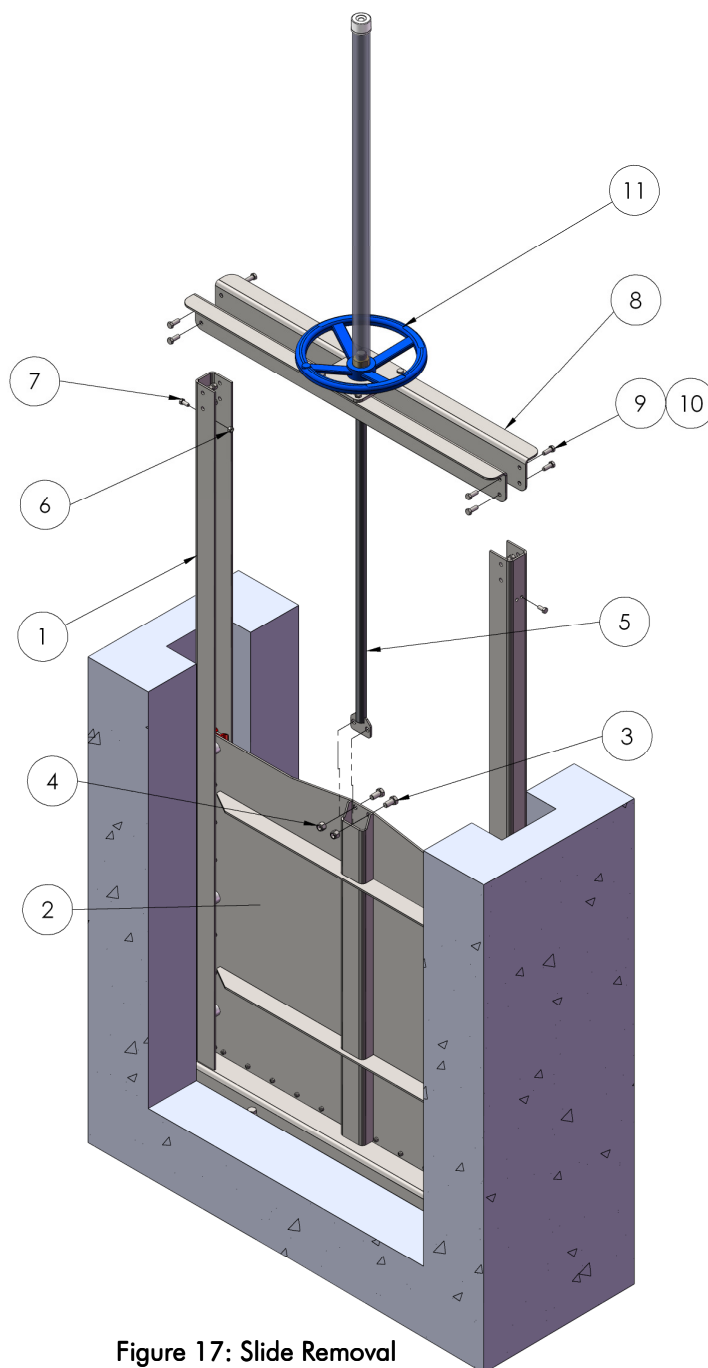


Figure 17: Slide Removal

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MAINTENANCE: SEAL REPLACEMENT

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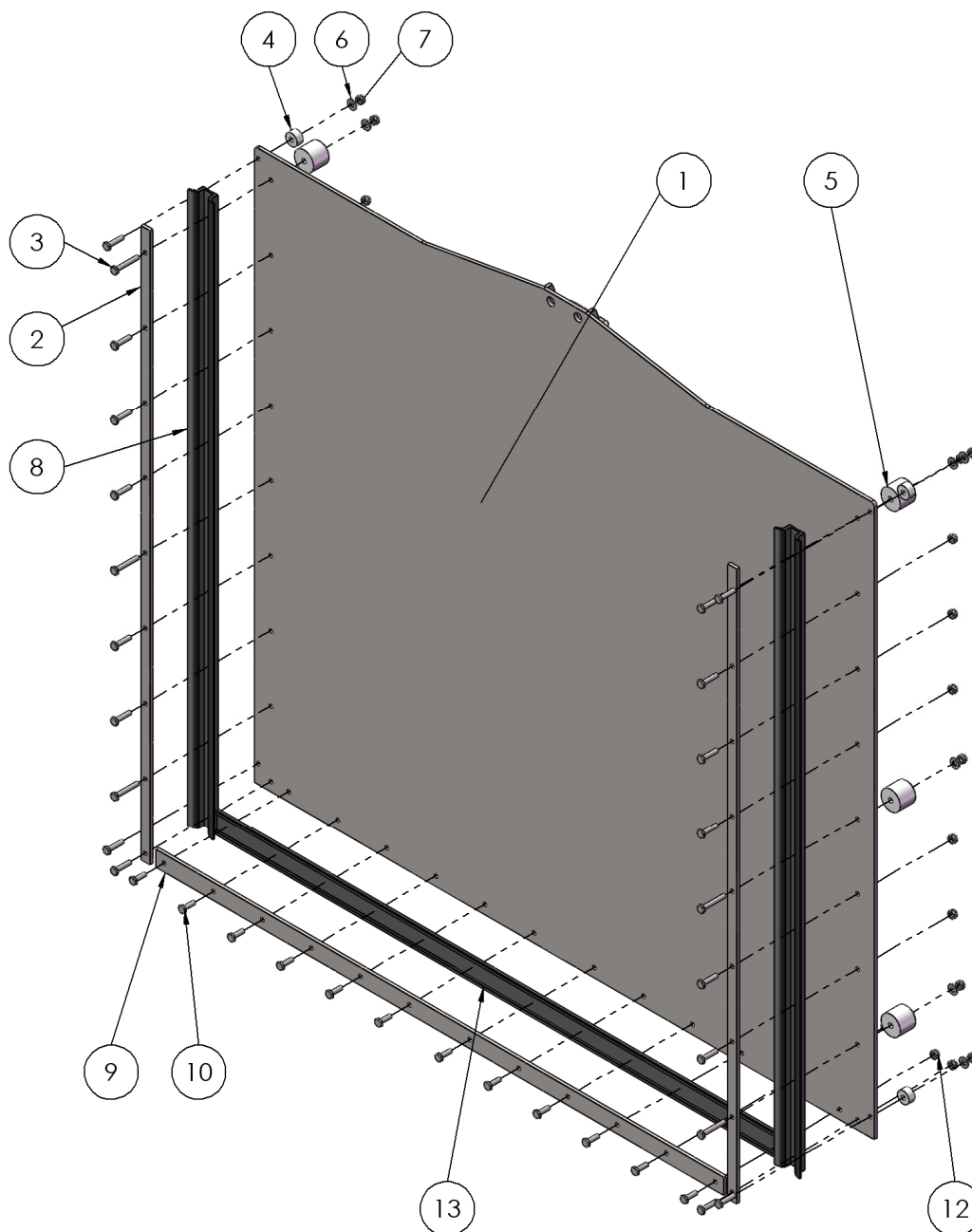


Figure 18: Side Seal and Bottom Seal replacement

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TROUBLE SHOOTING

SYMPTOM	CAUSE	SOLUTION
<ul style="list-style-type: none"> Leakage between channel gate and concrete wall (for Face Mounted In Existing Channel Configuration) 	<ul style="list-style-type: none"> Gaps between frame and face of wall due to miss-application of grout fill. 	<ul style="list-style-type: none"> Grout Fill remaining gaps.
	<ul style="list-style-type: none"> Loose anchor bolts. 	<ul style="list-style-type: none"> Tighten anchor bolts.
	<ul style="list-style-type: none"> Incorrect anchor bolts 	<ul style="list-style-type: none"> Check the 'General Arrangement Drawing' and make sure the right anchor bolts have been installed.
<ul style="list-style-type: none"> Leakage between channel gate and concrete wall (for Wall Mounted Configuration) 	<ul style="list-style-type: none"> Concrete wall does not meet the required std. 	<ul style="list-style-type: none"> Un-install the slide gate and fix the wall.
	<ul style="list-style-type: none"> Not enough construction sealant. 	<ul style="list-style-type: none"> Un-install the slide gate, clean the wall and apply a new layer of construction sealant.
	<ul style="list-style-type: none"> Loose anchor bolts. 	<ul style="list-style-type: none"> Tighten anchor bolts.
	<ul style="list-style-type: none"> Incorrect anchor bolts. 	<ul style="list-style-type: none"> Check the 'General Arrangement Drawing' and make sure the right anchor bolts have been installed.
<ul style="list-style-type: none"> Leakage through the side seals 	<ul style="list-style-type: none"> Damaged seal. 	<ul style="list-style-type: none"> Replace seal.
<ul style="list-style-type: none"> Leakage through the bottom seal 	<ul style="list-style-type: none"> Foreign material trapped between frame invert and slide. 	<ul style="list-style-type: none"> Remove the foreign material. Check if there is any damage to the seal.
	<ul style="list-style-type: none"> Damaged seal. 	<ul style="list-style-type: none"> Replace seal.
<ul style="list-style-type: none"> Excessive force required to operate the slide gate 	<ul style="list-style-type: none"> Misaligned stem extension, stem guide, or floor stand. 	<ul style="list-style-type: none"> Check and adjust alignment of stem extension, stem guide or floor stand.
	<ul style="list-style-type: none"> Dirty stem and/or stem nut. 	<ul style="list-style-type: none"> Clean and lubricate stem and/or stem nut.

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