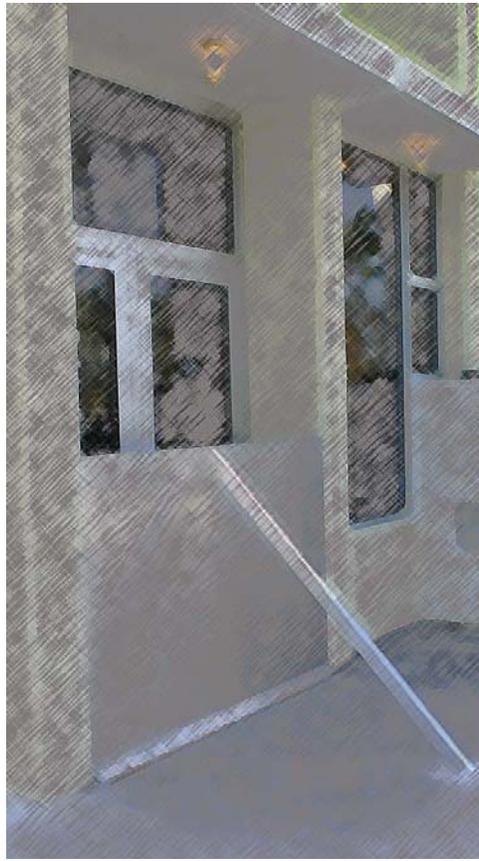


FLOOD BARRIER INSTALLATION & MAINTENANCE INSTRUCTION



INSTRUCTIONS FOR FLOOD BARRIER INSTALLATION

The following instructions will help guide you in the installation of the flood barriers to your structure. It is not difficult to install this system, but it is time consuming. A good rule of thumb is that it will take two people who are fairly strong and good with their hand approximately 45 minutes to 1 hour for each barrier. If this is the first time you are installing the barriers, allot twice as much time for the installation.

Because of this, we suggest that you install the barriers in a non-emergency period. This will give you a feel for how much time to allot for installation

TOOLS LIST

- PROVIDED INSTALLATION KIT
- CORDLESS DRILL (Recommended 18V)
- LARGE SCREW DRIVER BITS - STANDARD AND PHILLIP (SEVERAL OF EACH)
- LARGE SCREW DRIVERS - STANDARD AND PHILLIP
- SHOP VAC AND BROOM
- DOLLY OR CART
- NUT DRIVERS OR WRENCHES 5/16" & 7/16
- HAMMER
- MEASURING TAPE
- LARGE VISE-GRIP STYLE PLIERS

PREPARATION OF THE OPENINGS:

1. Start by laying out all flood-barriers in front of openings. Each barrier should be marked with a number, which corresponds with an opening number on the projects original shop drawings. Please note that some openings have more than one flood panel: in which case, the panel will be marked with an opening number and a letter. [Example: Opening one has 3 panels, they would be marked 1, 1A, and 1B.]

Lay each barrier next to the opening with the GASKETS facing up; this will prevent them from being damaged.

If the opening is greater than 8'-0" in width, it will also have a diagonal brace every 4'-0" on center. [A diagonal tube cut at 45 degree angels at both ends with feet on one side.] Most "cross braces" are interchangeable and are not marked, but some braces go in a specific location. If this is the case, both the barrier and the cross brace will have identifying markings of some kind to signify their location.

The original shop drawings will have a foot print of the structure, with the barrier numbers, quantities, size of each barrier, and number of cross braces. They also provide details that may aid in the installation.

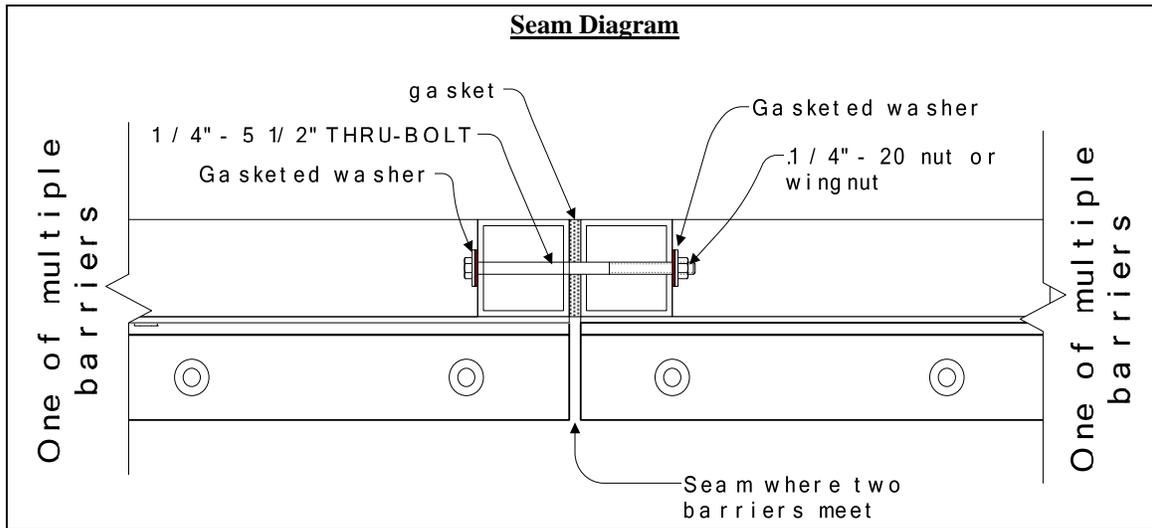
2. It is very important to clean and sweep around each opening. This will prevent any dust or dirt from clogging the fasteners. If dirt or debris get into the fastener, it is almost impossible to get the screw to set.
If this happens the fastener will have to be cleared or changed, [SEE Section- What to do with a clogged or cross threaded fastener]
Once the opening has been cleaned, installation can then begin.
3. Remove all screw and put aside, making sure to note any difference in screw size. Generally, the same size and length screw is used on the entire barrier. In some instances, due to existing conditions it is necessary to use different size screw for different holes. If this is the case, the screw that comes out hole, must be the one to go back into the hole.
4. Start the installation by assembling the entire barrier for each opening. If there is only one flood-barrier for the opening, skip this step and move on to the next.

Lay each flood panel face down on the ground [The side with the exposed tube should be showing] next to the corresponding section, [1 to 1A to 1B etc.], making sure that each barrier is perfectly aligned and square to its mate.

It is best to align the panels directly in the position they are to be installed. To do, this start by placing the first panel upright in front of opening, approximately ± 4 " from the edge of masonry opening. Note where the fastener holes are located on the wall and align them with the corresponding holes in the barrier. Then, gently lay the panel face down in front of its position. Next, place each additional panel face down, beside the first panel in corresponding order.

If you have to walk on the panels, be sure to step on the tubing and not the skin.

Once the panels are aligned, you will see $\frac{1}{2}$ " holes 6 " on center along each seam. Each hole gets the one $\frac{1}{4}$ " diameter screw - $5 \frac{1}{2}$ " long, two gasketed washers, and one $\frac{1}{4}$ "-20 nut or wing nut.



Assemble the barriers together as shown in the above diagram, with each bolt, washer and nut as shown. Using a two wrenches or a screw gun with a $\frac{7}{16}$ " nut driver (one is provided in the kit); tighten all the bolts, until the gasket material is completely compressed. (Approximately $\frac{1}{8}$ ") To achieve this, tighten all the bolts firmly. Then go back over each bolt, tightening a little more (Quarter to half turn of the wrench). Repeat this procedure until the gasket is equally compressed. Once all panels sections have been attached, you are ready to complete the installation.

5. The flood-barrier is now ready to be installed on the opening. Lift the barrier into place in front of the opening. This might take a little time and labor, because the barrier will have to be shifted so that the holes in the barrier line up with the fasteners in the ground and walls. It may help to tilt the barrier forward when trying to shift it; this also helps the gasket for being torn. If you can not get the holes to line up [SEE Section- What to do if holes don't line up], and if gasket gets torn [SEE Section- How to fix gasket]

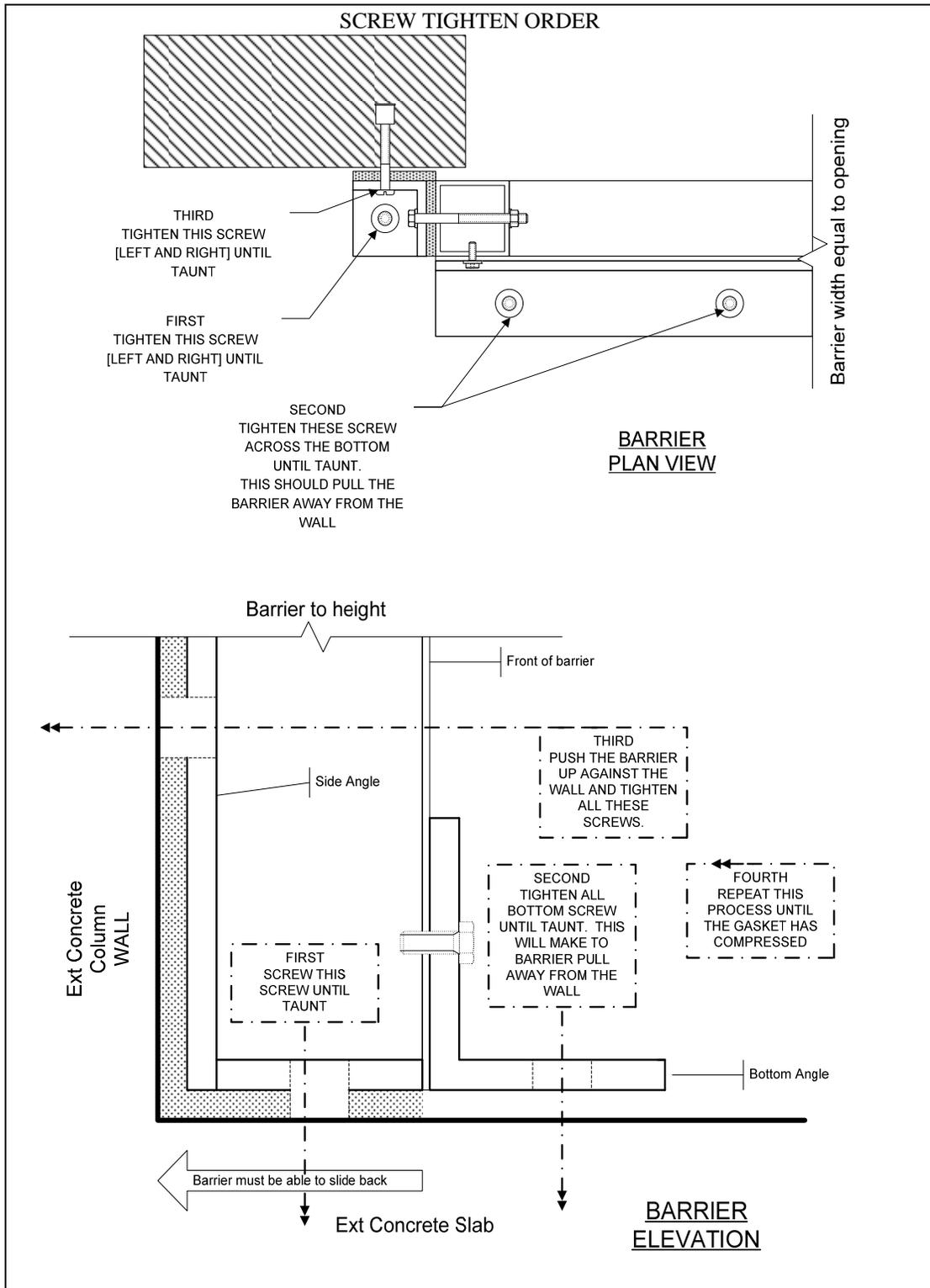
WHEN FIRST RE-INSTALLING THE SCREW ONLY LIGHTLY TIGHTEN EACH SCREW.
THIS IS IN CASE THE BARRIER MIGHT HAVE TO ADJUSTED TO LINE UP ALL THE
SCREW HOLES

Once all of the screws are lightly tightened into all of the holes, follow this tightening pattern:

IT IS VERY IMPORTANT TO ONLY TIGHTEN THE SCREWS UNTIL TAUNT. WHEN ALL THE SCREWS ARE TAUNT, START BACK AT THE FIRST AREA AND RE-TIGHTEN EACH SCREW UNTIL THE GASKET HAS BEEN COMPRESSED. IF THE SCREWS ARE TIGHTENED TO MUCH AT ONE TIME WITH EVENLY DISTURBTING THE LOAD, THE ACHOR IN THE WALL WILL FAIL. THIS WILL COMPROMISE THE SYSTEM.

- The two screws at on the side angles into the ground need to tighten first.
- The screws along the bottom of the barrier are tightened next. This should cause to barrier to pull away from the wall, and will require some force to push it against the wall so the next screws can be tightened.
- The final screws to be tightened are the ones on the side angles, left and right.
- Repeat this process until the gasket is firmly compressed around the entire barrier.
- The final step is to use a 7/16 nut driver and a screw to tighten the 1/4-20 through bolts holding the side angles onto the barrier, left and right. Tighten only until taunt.

IF THE GASKET DOES NOT COMPRESS SEE SECTION- NON COMPRESSION



The barrier should now be compressed at all locations and watertight, but if you cannot get the screws to go back in or the gasket cannot compress because the walls or floor are not level please reference are help sections.

6. Installing the cross brace is the last step in installation. These are only used if your opening is greater than 8'-0" in width. Not all openings have cross braces.

Generally, every cross brace is the same, so any of the cross braces provided will work at any given location. In some instances, a cross brace is specially made to be used in a specific location. If this is the case, the special cross brace and the barrier it is used on will be marked accordingly.

The cross braces are installed with two 1/4"-20 bolts 3" long with nuts or wing nuts at the top, and 4-8 screws at the bottom.

It might be noted that installation of cross braces to the barrier can occur at any time after step 4, and may aid in helping to keep the barrier standing during installation.

TROUBLE SHOOTING

What To Do With A Clogged or Cross Threaded Anchor.

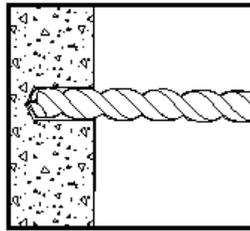
If the fastener is clogged with debris, it will have to be cleared or drilled out and replaced

- **TO CLEAR THE ANCHOR:** Use a 1/4-20 tap and slowly re-tap the fastener. Being sure to remove the tap on every turn, and clean out the debris for both the fastener and the tap.
- Once the entire fastener has been re-tapped, use a straw or a puffing device (like a turkey baster) to blow out the hole. Once the hole has been cleaned out, add a little lubricant to the screw and re-install.

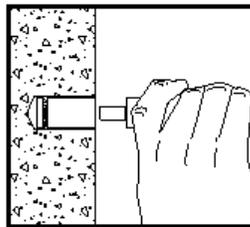
If this fails to clear the threads, the anchor will have to be replaced.

- To replace the fastener use a 1/2" diameter high speed drill bit and drill the fastener out of the hole. This is not a precise art, and if the drill bit hits the concrete, it will immediately dull requiring another. Go very slowly and carefully as you bore out the fastener, try not to enlarge the hole in the concrete.
- Once the anchor has been completely drilled out of the hole, then clean out the hole with a straw or puffing device. Be sure to remove all debris.
- Insert a new anchor [star tamp-in 1/4-20 or equal], using a setting tool and a hammer re-set the anchor.
- See Diagram

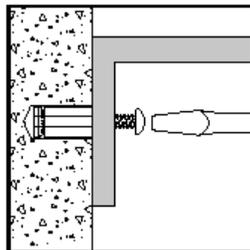
INSTALLATION PROCEDURES



Drill a hole into the base material to the required depth. The tolerances of the drill bit used should meet the requirements of ANSI Standard B212.15.



Blow the hole clean of dust and other material. Insert the anchor into the hole. Position the setting tool in the anchor.



Using the tool, set the anchor by driving the lead sleeve over the cone using several sharp hammer blows. Be sure the anchor is at the required embedment depth so that anchor threads do not protrude above the surface of the base material. Position the fixture, insert screw or bolt and tighten.

The Holes Do Not Line Up:

If the holes on the barrier do not line up with the holes in the structure, do the following:

- Since the holes are literally drilled into the structure through the barrier during the original installation, they should be in line. So, check to make sure that you have the right barrier at the right location.

If that does not solve the problem.

- Check to make sure one or more of the screws are too tight to allow the barrier to be manipulated. Generally, movement of under a 1/4" will throw off the alignment of the screws.

If neither of these solutions work.

- Aluminum is a soft metal and is easily drilled through. Use a drill and either make a new hole or enlarge the existing hole(s) until they do line up.

The Gasket has been torn.

The toll kit provided has lengths of extra gasket material.

- Using a sharp knife and a straight edge cut out the torn area at a 45-degree angle on each side.
- Cut a new piece of gasket to match the removed section.
- Using a high grade adhesive (Sika Flex 11A, 3M 4200, or equal) cover area liberally and attach new gasket.

The type of gasket used on the barrier is a 1/4" closed cell Neophran.

The Gasket Will Not Compress.

If the gasket does not firmly compress to the structure, make sure you have followed the screw tightening sequence properly. If the order is out of sequence it can cause the barrier not to compress properly.

If this is not the case and the barrier does compress in some areas and does not in others, this is most likely the structure being out of square/plumb/level. If the defect is in the construction and finish of the structure there is little to be done to the barrier. We can only suggest trying to add additional gasketing pieces, or using a fast setting epoxy to fill the voids.

ANNUAL MAINTENANCE OF FLOOD BARRIERS

The maintenance of the floodbarrier system is carried out in two phases. The first phase is the maintenance of the fasteners and anchors that are installed on the building. The second is the physical inspection of the actual barriers, themselves.

FASTENER & ANCHORS:

Twice a year the anchors should be inspected for damage and fouling. First a visual inspection of the screws should be made to determine if any screws are missing or any damage has occurred. If any screw are found missing, they can be replaced with a ¼"-20 stainless steel machine screw 1 ¼" long. The common screw type used on most installation is referred to as a "sidewalk style bolt", this is due to it wide head and low profile.

Once a visual inspection has been completed, the screws should then be checked for fouling. A random number of screws should be removed from each opening to determine if they have been fouled by debris. If damage is to the anchor or screw is found, all the fasteners should be checked. The damaged fasteners should either be cleaned or repaired. Please reference Page 7 for instructions.

Note: Do not use any oil based lubricant when servicing the fasteners. This will only promote fouling by sand or dirt.

BARRIER INSPECTION:

Once a year the barriers should be inspected for damage. Each barrier should be visual inspected, looking at two areas. The first is the condition of the gasketing. The gasketing should be ¼" thick and able to be compressed, then quickly return to it normal thickness. If gasket does not return to its designed thickness then it will need to be replaced. This is accomplished by cutting the entire length of gasketing off the barrier and replacing with a new piece of ¼" closed cell neoprene. The gasket should be attached with Sika-Flex 11A adhesive. It is important to replace any torn or cut gasketing as this will allow water penetration.

The barrier themselves will need to be checked for any structural damage. The barriers are of sturdy construction and minor damage should not affect their performance. If any denting has occurred, it is important to make sure that any sealed connections around that area have not been affected. This can be tested by pouring water over the area and observing if any water has leaked through to the other side.

The manufacturer will need to be notified if any major damage or compromised seals have been found. The barrier can be repaired, or replaced based on its condition.