

PolyDrain[®]

Pre-Engineered Surface Drainage Installation Manual



Installation Guide

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Sealants

When PolyDrain channels are meant only to handle rain water surface drainage, joint sealing may not be necessary. However, when the handling of corrosives or chemical solutions is a concern, sealants must be used. Moreover, it is essential that the type sealant used is appropriate for the application in order that fluid seepage be avoided.

ABT produces three such sealant products under the name, PolySeal. Each has particular qualities that make it best for certain drainage applications.

(NOTE: Roughen mating surfaces of PolyDrain channels with a wire brush or similar tool and clean with acetone prior to application of the sealant in order to assure proper adhesion.)

PolySeal 1 - This product is a flexible polyurethane sealant, ideal for dirty water (noncorrosive) applications. PolySeal 1 maintains flexibility after drying. It comes in a standard size caulking tube, immediately ready for application to PolyDrain channels.

PolySeal 2 - This two-part epoxy sealant comes in twin tubes and is applied using a special caulking gun and mixing nozzle. It is intended for limited corrosive application with either regular PolyDyn® or Poly-Champion® channels. It maintains flexibility after curing.

PolySeal 3 - This product is a two-part vinyl ester compound intended for highly corrosive applications or with channel fabrications (e.g. miter joint) when a rigid set is required in conjunction with our Poly-Champion channels.

Consult ABT sales support for recommendations concerning your installation.



Safety and Installation Tips

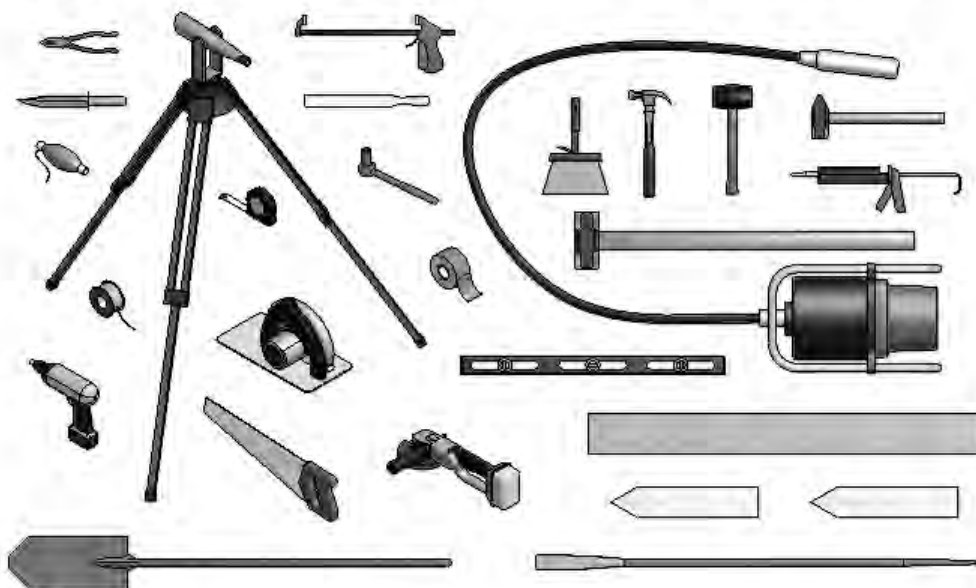
■ **IMPORTANT - READ ALL INSTALLATION NOTES** pertaining to your particular type of installation **BEFORE** starting the job. Avoid costly mistakes!

- If system is to carry corrosive solutions, refer to the "Sealants" section before installation or contact your PolyDrain dealer for more information.
- The trench excavation must allow for the placement of the concrete on both sides and the bottom of the channel(s) for the concrete thickness and reinforcement specified by the designer or structural engineer.
- Do not design slab where channels are the expansion joint.
- If concrete shrinks away from system, channel strength will be compromised.
- Lay out PolyDrain channels (in numerical sequence) alongside trench excavation prior to installation. Consult construction plans or shop drawings for correct numerical sequence.
- Make pipe connections and set catch basins prior to channel installation.
- Begin installation at outlet or discharge end of each run and work backwards (upstream). Each side of every channel has an arrow indicating the direction of flow.
- Prior to concreting, place 4 15/16" wide plywood strips channel's grate seat to maintain channel align-

ment and prevent concrete from spilling into the channel. Grates covered with plastic and with 1/16" side spacers can also be used.

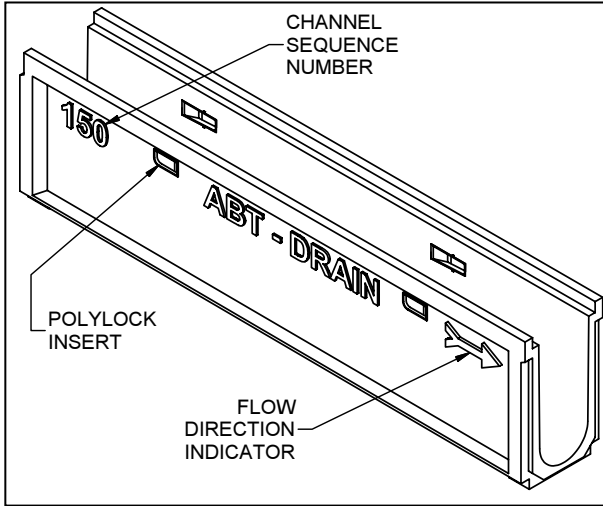
- All PolyDrain *frame & grate* systems are designed to fit on top of the PolyDrain channel. The additional height (**1.2"**) should be taken into account when setting the channels to insure the desired finished slab elevation will be equal to the top of the overlay frame or grating.
- Good concrete practices should be followed to control concrete shrinkage which can break channels and other related components. Intimate contact from the encapsulation concrete is also required for PolyDrain channels and catch basins to obtain full load capacity. Use good concrete practices to minimize and control slab expansion movement and forces from breaking PolyDrain components. Cold joints adjacent to PolyDrain components should be avoided or controlled. The encapsulation concrete shall be placed on both sides and under the channels. The strength, thickness, and reinforcement should be that recommended by the customer's structural engineer for the intended application.
- When butting female ends of channels at a high point, trim female ends flush.

USEFUL OR REQUIRED TOOLS



System Layout

Each channel displays a number on the outside indicating its numerical sequence in the system as well as an arrow showing the direction of flow. Consult plans or shop drawings for the proper sequence. Channels should be laid out, in numerical sequence, alongside the completed excavation. Assure proper alignment and grade elevation with a stringline.

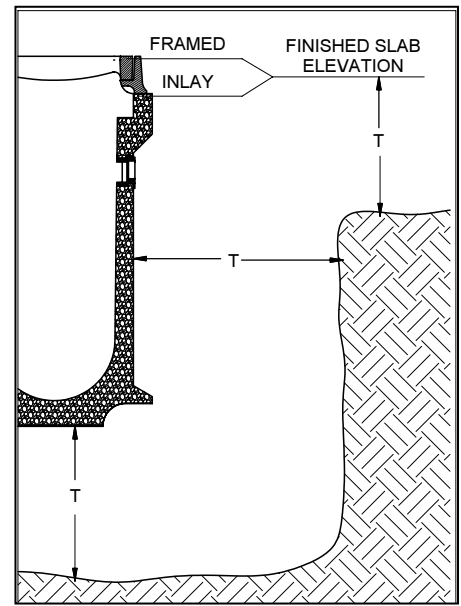


PolyDrain channel section

Excavation

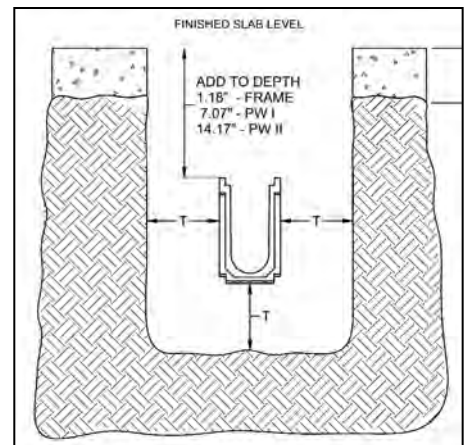
Excavation must provide for the thickness of the encapsulation concrete on ALL sides of the channel and should be sloped approximately 0.6% downhill toward the catch basin (the same approximate slope of the PolyDrain System itself). This determination must be made by the concrete design engineer.

The trench excavation must allow for the placement of the concrete on both sides and the bottom of the channel(s) for the concrete thickness and reinforcement specified by the designer or structural engineer.



T = Structural Engineer's Specification, Slab Thickness, or 4"; whichever is greater.

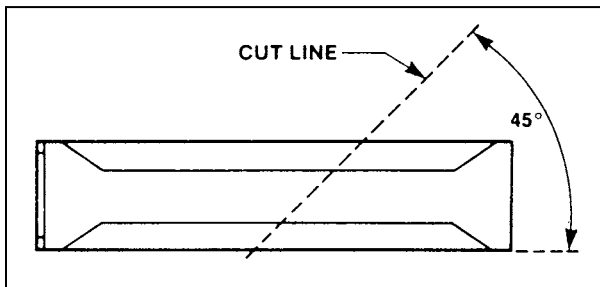
Channel Number	PolyDrain Channel Depths											
	Inlay			With Frame								
	Channel Only (In)	PolyWall I (mm)	PolyWall II (mm)	Channel Only (In)	PolyWall I (mm)	PolyWall II (mm)						
010	5.31	135	12.4	315	19.5	495	6.50	165	13.6	345	20.7	525
020	5.55	141	12.6	321	19.7	501	6.73	171	13.8	351	20.9	531
021	5.55	142	12.6	322	19.7	502	6.73	172	13.8	352	20.9	532
030	5.79	147	12.9	327	20.0	507	6.97	177	14.1	357	21.1	537
040	6.02	153	13.1	333	20.2	513	7.20	183	14.3	363	21.4	543
050	6.26	159	13.3	339	20.4	519	7.44	189	14.5	369	21.6	549
060	6.50	165	13.6	345	20.7	525	7.68	195	14.8	375	21.9	555
070	6.73	171	13.8	351	20.9	531	7.91	201	15.0	381	22.1	561
080	6.97	177	14.1	357	21.1	537	8.15	207	15.2	387	22.3	567
090	7.20	183	14.3	363	21.4	543	8.39	213	15.5	393	22.6	573
091	7.20	184	14.3	364	21.4	544	8.39	214	15.5	394	22.6	574
096	7.20	187	14.3	367	21.4	547	8.39	217	15.5	397	22.6	577
100	7.44	189	14.5	369	21.6	549	8.62	219	15.7	399	22.8	579
110	7.68	195	14.8	375	21.9	555	8.86	225	15.9	405	23.0	585
120	7.91	201	15.0	381	22.1	561	9.09	231	16.2	411	23.3	591
130	8.15	207	15.2	387	22.3	567	9.33	237	16.4	417	23.5	597
140	8.39	213	15.5	393	22.6	573	9.57	243	16.7	423	23.7	603
150	8.62	219	15.7	399	22.8	579	9.80	249	16.9	429	24.0	609
160	8.86	225	15.9	405	23.0	585	10.0	255	17.1	435	24.2	615
170	9.09	231	16.2	411	23.3	591	10.3	261	17.4	441	24.4	621
180	9.33	237	16.4	417	23.5	597	10.5	267	17.6	447	24.7	627
190	9.57	243	16.7	423	23.7	603	10.7	273	17.8	453	24.9	633
191	9.57	244	16.7	424	23.7	604	10.7	274	17.8	454	24.9	634
200	9.80	249	16.9	429	24.0	609	11.0	279	18.1	459	25.2	639
210	10.0	255	17.1	435	24.2	615	11.2	285	18.3	465	25.4	645
220	10.3	261	17.4	441	24.4	621	11.5	291	18.5	471	25.6	651
230	10.5	267	17.6	447	24.7	627	11.7	297	18.8	477	25.9	657
240	10.7	273	17.8	453	24.9	633	11.9	303	19.0	483	26.1	663
250	11.0	279	18.1	459	25.2	639	12.2	309	19.3	489	26.3	669
260	11.2	285	18.3	465	25.4	645	12.4	315	19.5	495	26.6	675
270	11.5	291	18.5	471	25.6	651	12.6	321	19.7	501	26.8	681
280	11.7	297	18.8	477	25.9	657	12.9	327	20.0	507	27.0	687
290	11.9	303	19.0	483	26.1	663	13.1	333	20.2	513	27.3	693
291	11.9	304	19.0	484	26.1	664	13.1	334	20.2	514	27.3	694
300	12.2	309	19.3	489	26.3	669	13.3	339	20.4	519	27.5	699



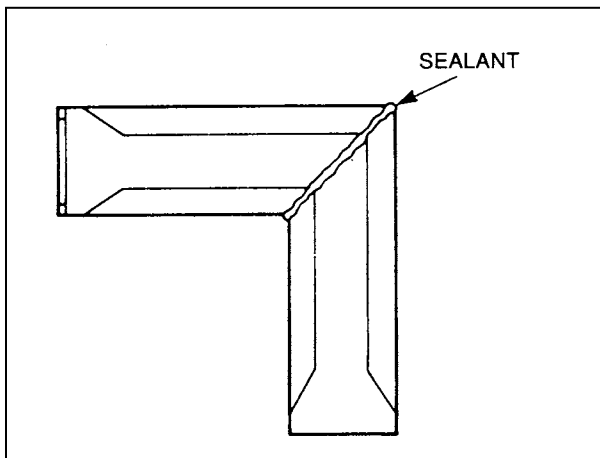
Cutting Polymer Concrete and Forming Miter Joints

Miter joint cuts are made by sawing the channels to the desired angle and butting them together. A suitable adhesive can be used to bond the two sections together. If the channels are to transport a corrosive solution, an appropriate adhesive or sealant should be used.

Cutting polymer concrete for miter joints or length adjustments may be accomplished using a standard masonry or concrete saw. Water-cooled diamond encrusted blades or dry cutting abrasive masonry blades may also be used.



Underside of channel indicating cut line for miter



Underside of channel illustrating how to form joint

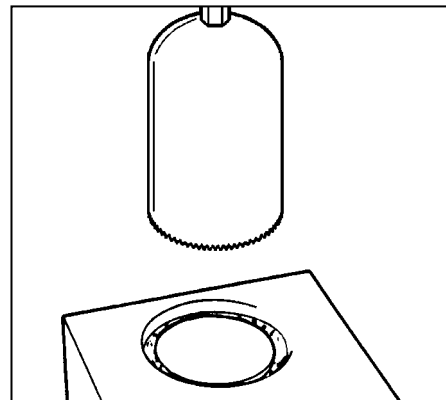
! WARNING

When sawing sections of polymer concrete channel, wear gloves, protective eyeglasses and a respirator mask. Avoid breathing the airborne silica particles (created when sawing) as it may be harmful to your health.

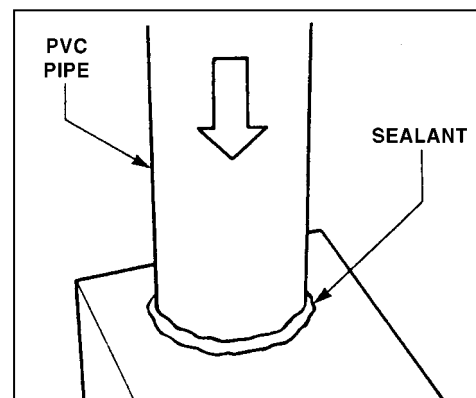
Piping Connections and PreFormed Cutout Removal

All catch basins and outlet channels are equipped with preformed cutouts for piping connections and channel/catch basin connections. These connections are prepared as follows:

1. Determine the cutout to be removed and mark with pencil or felt marker.
2. A core drill provides the best quality hole. If one is not available, use a 1/4" or 3/8" masonry drill bit and drill holes around perimeter on 1/2" - 3/4" centers.
3. Remove the remaining fins using a hammer and a cold chisel. A grinder may be used to dress or enlarge the hole for proper pipe or channel insertion.
4. Fit pipe or channel end into hole and apply a suitable sealant. If corrosive materials are to be transported in the trench, use the appropriate sealant.



Drilling cutout with core drill



Fitting PVC pipe into catch basin

Catch Basin Installation

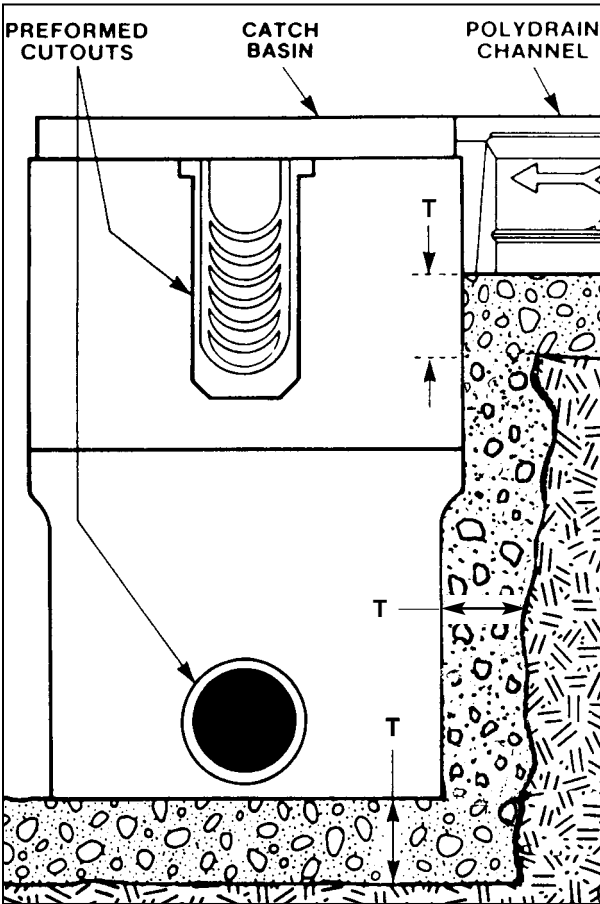
Locate positions for catch basins and excavate. Remember, the depth of the bedding concrete must be at least equal to the slab thickness but not less than 4". Please consult structural engineer.

Determine which preformed cutouts are to be used and remove prior to placing catch basin in position. Larger than 6" diameter piping may be installed by fabricating larger diameter holes.

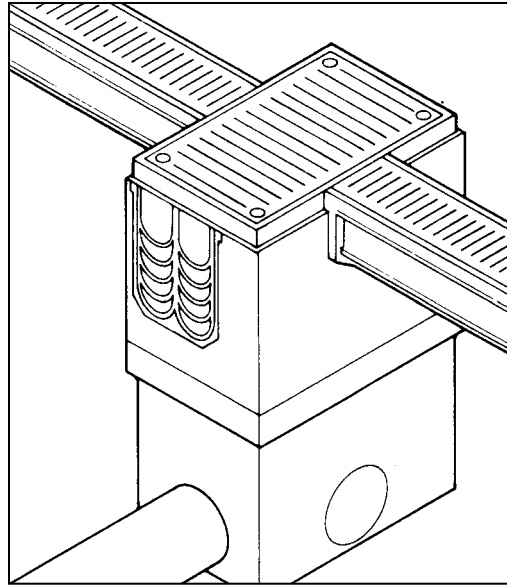
Pour bedding concrete and set catch basin on top as soon as concrete is stiff enough to support it. Set catch basin to proper grade and alignment using stringline or level. Proper sealant may be required at joints.

Install pipe connections.

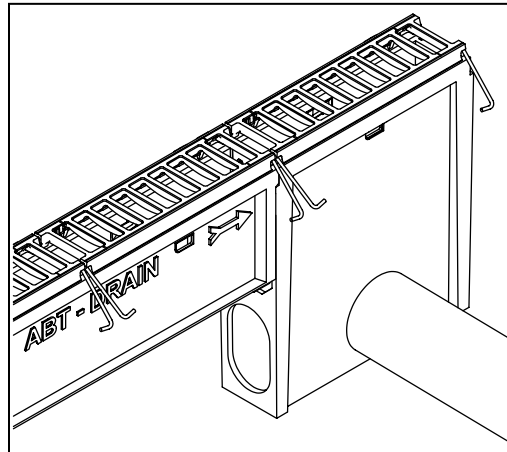
Backfill with concrete around the sides of the catch basin up to the channel excavation level.



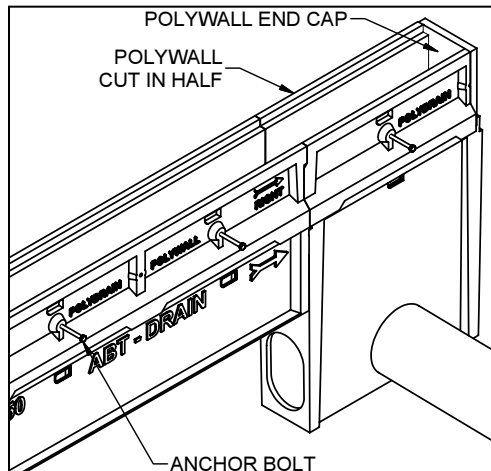
T= Structural Engineer's Specification, Slab Thickness, or 4"; whichever is greater.



Typical 600 series catch basin installation

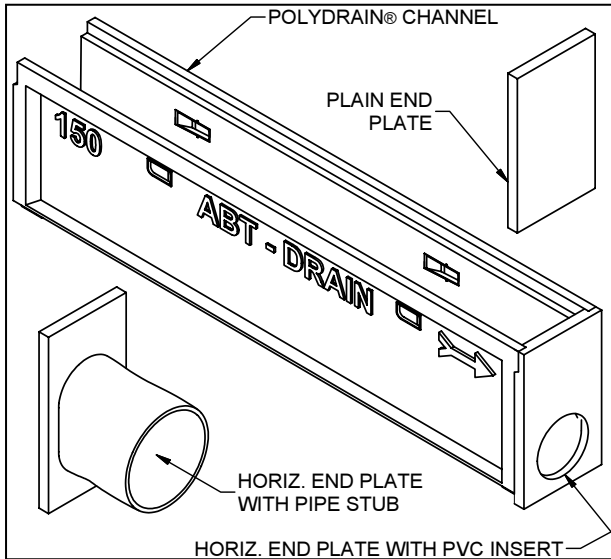


Typical 900 series catch basin installation



900 series catch basin installation with PolyWall Sidewall Extensions

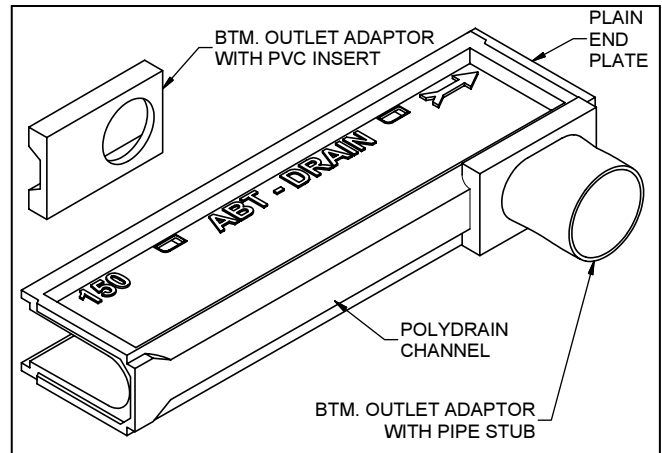
Horizontal and Vertical Outlet End Plates and Closed End Plates



Placement of a horizontal outlet end plate on a channel

Horizontal and Vertical Outlet End Plates with PVC outlets cast into them are constructed to fit the downstream end of outlet channels. Inlet plates are available and fit on upstream end of appropriate channels.

Closed End Plates fit either the upstream or downstream end of the channels by simply reversing the plate. All inlet and outlet plates may be held in place using ABT sealants.



Placement of vertical outlet plate on underside of channel.

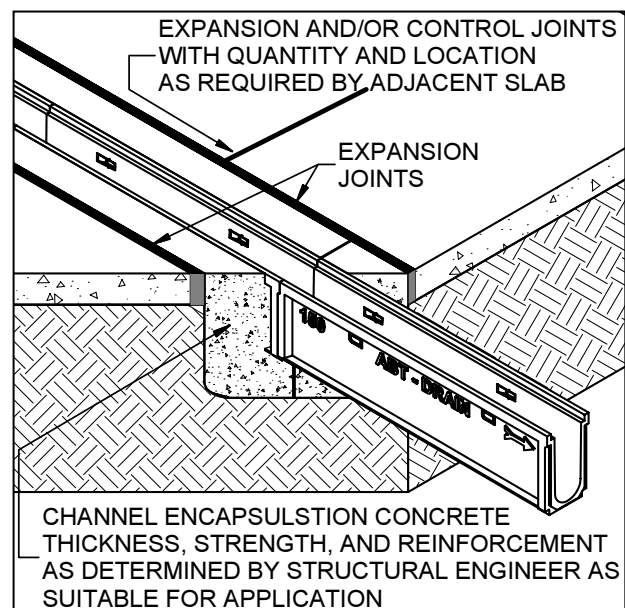
NOTE: When using PolyClips with vertical outlet adapter, install PolyClip closer to center of channel so as not to interfere with outlet plate.

Expansion/Control Joints in Floor Slab

Follow this procedure when installing a channel across an expansion/contraction joint in a floor slab:

Isolate channel encapsulation concrete from adjacent slab, when possible. If expansion/control joint crosses the trench, follow this procedure:

1. Locate the expansion/control joint between two channels.
2. Separate the two channel pieces by a width equivalent to the width of the expansion/contraction joint itself.
3. Fill this space with flexible joint material. See "Sealants" Section for recommendations on which type of caulk to use for your particular situation.
4. Control joints are best located at channel joints to reduce channel cracking.

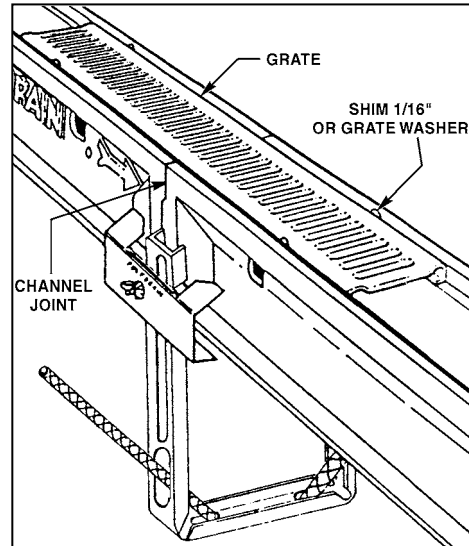


Channel installed across an expansion/control joint

Grating Installation Prior to Concreting

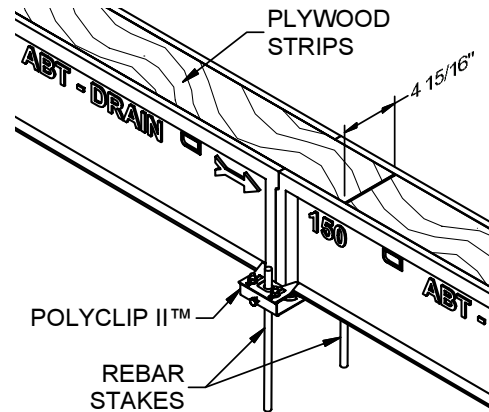
NOTE:
THE GRATES AND FRAMES MUST BE IN PLACE PRIOR TO CONCRETING SINCE THEY AID IN MAINTAINING ALIGNMENT AND JOINT SMOOTHNESS.

Wrap the grates in Poly or mask with duct tape and place them in the channel grate lip so that they span the channel joints as shown at right or place grates upside down. Locking the grates in place will help secure channel alignment. A 1/16" shim placed between the grate and the upright edge of the channel grate lip is necessary for the grate to fit properly after concreting.



Alternate to Grating Installation Prior to Concreting

As an alternate to placing covered gratings in the channel prior to concreting, strips of 3/4" plywood "ripped" to 4-15/16" wide can be used. Since this width is slightly wider than the grate itself, it is not necessary to place shims in the upright edge of the channel/sidewall grate lip as before. As with the gratings, the plywood strips must also span the channel joints. These strips provide a complete cover for the trench during concreting, thus eliminating having to clean concrete spillage out of the trench before final grate installation.



Placement of plywood strip across the channel joint

The plywood strips may be oiled for reuse on future installations.

Channel Installation (General)

Note: Always begin installation at outlet or discharge end of each run and work backwards (upstream). Each side of every channel has an arrow indicating the direction of flow. The arrow always points toward the outlet (downstream). See illustration.

Before actually installing the channels, you must follow the procedures for:

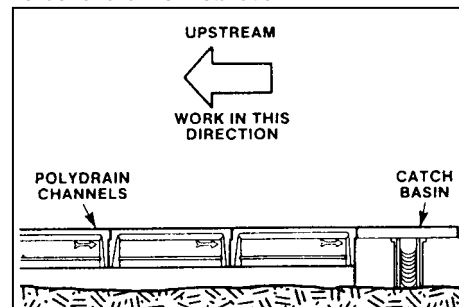
- * Piping connections and preformed cutout removal;
- * Catch basin installation; and
- * Cutting polymer concrete and forming miter joints.

There are three (3) basic methods of PolyDrain channel installation discussed in these notes:

- 1) PolyClip installation devices;
- 2) Suspended installation; and
- 3) Bedding slurry installation.

The method you choose will depend on soil type, whether or not it is a retrofit installation, and other various factors.

Order of channel installation



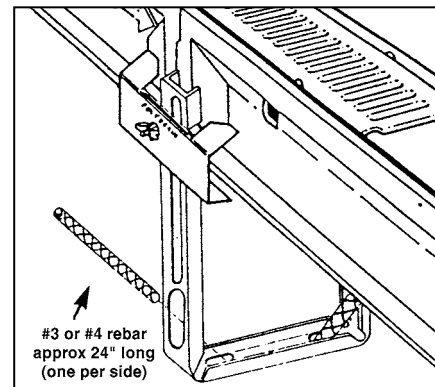
Channel Installation with PolyClip I™

The PolyClip consists of; **1)** two securing clips (one for each side of the channel); **2)** a "U"-shaped, no-float support leg that maintains proper channel height and prevents channel flotation during the concrete pour; and **3)** a threaded crossrod that keeps the PolyClip secured to the channel. PolyClip installation aids, when properly attached to channels, will maintain proper channel alignment and assist in drawing the channel joints together.

1. Excavate trench as previously described, allowing enough room under channels for the specified slab thickness (minimum 4").
2. Set a stringline to the finished slab height at the outside edge of the proposed channel location.
3. Layout channels in numerical sequence upside-down alongside the trench.
4. If sealant is to be used, apply it to channel joints at this time.
5. Starting at the deep end, butt channel sections together. Assemble the two brackets to the sides of channel ends as shown, by backing the wingnuts to the end of the threaded crossrod and spreading the clips to their limit. Temporarily hand tighten the wingnuts after installing them on the channel.
6. Position channel sections in the trench right side-up. Starting at the discharge end, adjust the channel sections to the correct slab height as shown by the stringline by sliding the no-float leg up or down on the PolyClip. Tighten the wingnuts to secure final position.
7. Connect a PolyClip to the upstream end of the last channel positioned. Position the next channel, and spread the clip assembly so the next upstream channel can be attached. Continue this procedure until all upstream channels have been properly positioned.
8. Before initiating the concrete placement, insure that all channels are properly positioned for slab height and alignment in the trench.
9. To guarantee that channels will not float, several methods can be used to secure them to the sub-grade:

- A. **Rebar anchoring** - If the site has suitable conditions, drive a length of #3 or #4 rebar diagonally through the holes provided in the no-float leg on both sides of the channel.
- B. **Two stage concrete placement** - Anchoring concrete should be placed over the no-float legs (minimum two inch depth) across the entire width and length of the excavation. Allow the concrete to set hard.
- C. Weld, nail or screw the no-float legs to form work.

(Caution should be taken to chute concrete under the channels and not directly against the sides.)



Attach the PolyClip at the joint of butting channels
 NOTE: PolyClips may be required to be shimmed up depending on design thickness of structural slab.

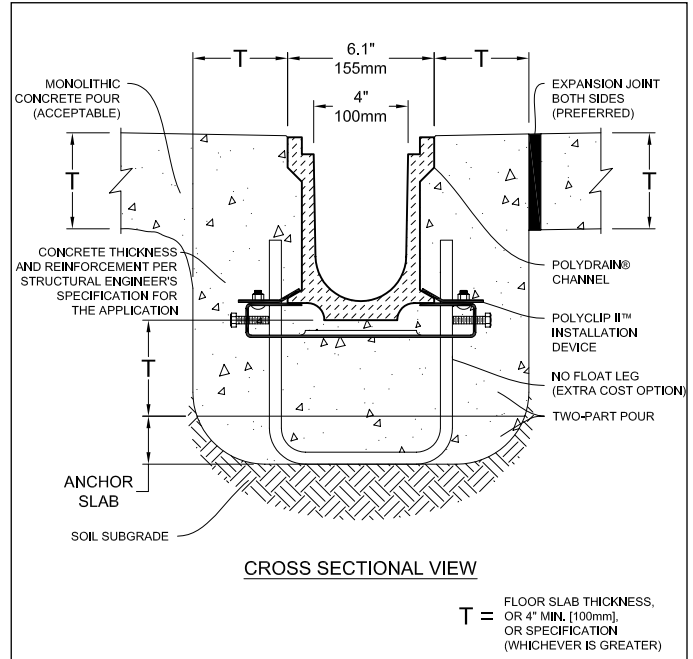
Channel Installation with PolyClip II™

The PolyClip II consists of a base bracket which vertically locates and supports the channel. Two securing clips (one on each side of the channel) laterally locate and vertically secure the channels to the base bracket. When properly attached to the channel, the PolyClip II will maintain channel alignment and elevation during the concrete pour.

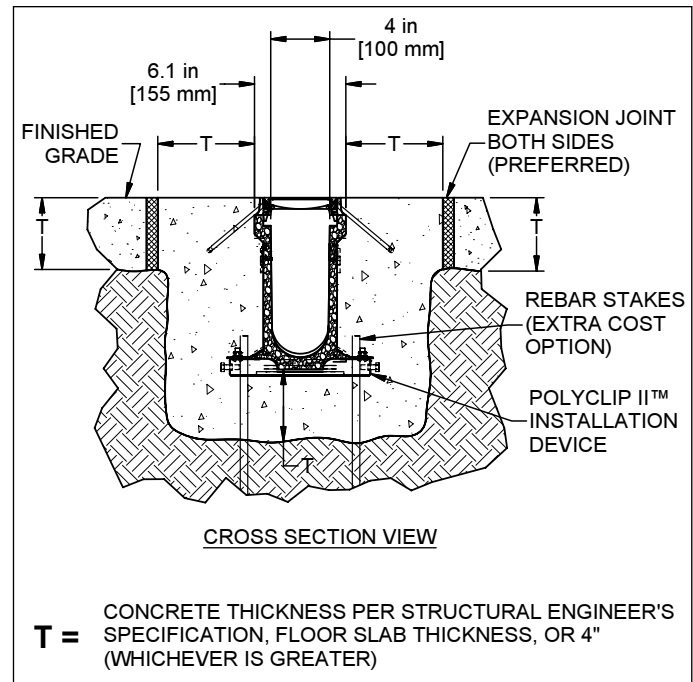
1. Excavate trench as previously described, allowing enough room under and around channels for the slab thickness specified (minimum 4" of slab thickness, which ever is greater).
2. Set a stringline to the finished slab height at the outside edge of the proposed channel location.
3. If rebar stakes are to be used in lieu of rebar u-legs, lay out the rebar stake location using a story pole (if unfamiliar with a story pole, see detail page and/or please visit website http://www.abtdrains.com/Downloads/Installation_Guides/ and click "story pole").
4. Lay out channels in numerical sequence upside-down alongside the trench.
5. Drive the rebar stakes into the slots on the story pole and attach the PolyClip II base to the rebar at the general finish elevation.
6. Place channels on the PolyClip II base and make final vertical adjustments.
7. Secure base to rebar with the lock bolts.
8. Align channels laterally and longitudinally on base.
9. Slide securing clips against channels.
10. Tighten securing clip lock bolts.
11. Place and finish concrete.

***Note:**

If frames or sealant are to be installed, this must be done before concrete placement.



Anchor Slab



Rebar Stakes

PolyWall® Sidewall Extension Installation

Polywall Sidewall Extensions allow channel runs of up to 90 meters (294 feet) without the use of non-sloping channels and greatly increase the flow capacity of the system.

To install PolyWall Sidewall Extensions using the Suspended System:

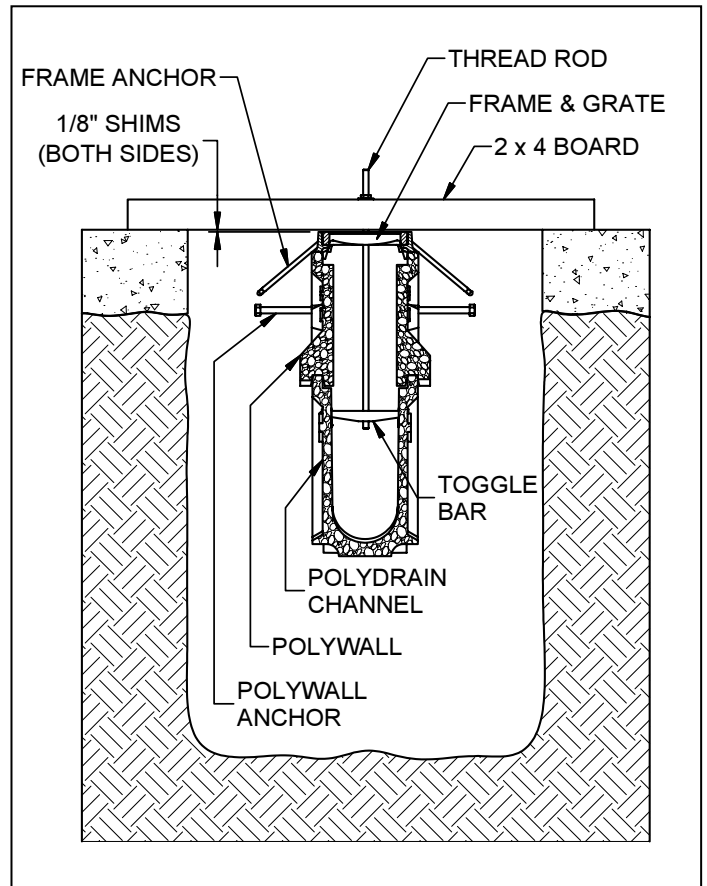
1. Attach 3 PolyWall anchor bolts on the outside of each PolyWall Sidewall Extension.
2. Set PolyWall on top of each side of the channel, fitting the preformed groove on the Polywall over the top edge of the channel.
3. Set frames on top of PolyWall if supplied for job.
4. Insert a 5/16"-18 UNC threaded rod, first, through a pre-bored 2 x 4 board (the board must be long enough to span the width of the trench) then, through a covered grate or a 4-15/16" wide, pre-bored plywood strip. Screw a toggle bar onto the end of the bolt. Place the 2 x 4, the grate or plywood, and the bolt assembly on the top edge of the PolyWall and turn the bolt until the toggle bar slips into the "Red Dot/Green Dot" PolyLock depression in the channel side and snugs the channel and PolyWall together.

Remember to insert shims (a flat washer 1/8" thick) between the top edge of the

PolyWall and the board to insure that the grating will be slightly lower than the level of the surrounding concrete. Also place shims between the grate and the upright edge of the PolyWall grate lip (if grates are used prior to concreting). This will insure that the grate will fit properly after concreting.

5. Lower the entire assembly into the trench, supported either by the existing floor slab or by a structure of form work.
6. Check for alignment and grade. Place bedding concrete as described in the section on "Concreting".

DO NOT CHUTE CONCRETE DIRECTLY AGAINST CHANNEL WALLS.



Channel Installation with Bedding Slurry

If the installation bracket or suspended installation method is not practical to use, you may install the PolyDrain channels using concrete bedding slurry. The thickness of the concrete bedding should be the designed thickness of the slab (minimum 4").

Place patties of stiff concrete under the channel joints only. Lay the channels in the bedding slurry and place concrete above the anchoring rib on each side of the channel. Check alignment and grade of the channel before the concrete stiffens.

Adjust the channel, sliding it forward or backward, to insure a tight connection between the tongue and groove butt joints at the channel ends. (Seal joints with appropriate sealant if required.) Once channels are locked in position, and the bedding slurry has set concrete can be placed to finished grade. **DO NOT CHUTE CONCRETE DIRECTLY AGAINST CHANNEL WALLS.**

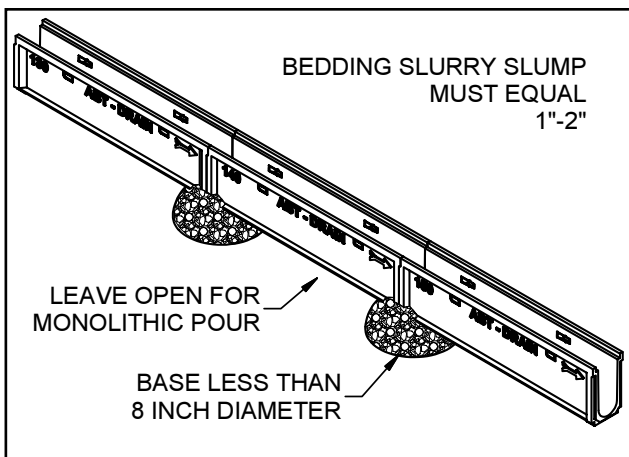
Concreting

NOTE: The trench excavation must allow for the placement of the concrete on both sides and the bottom of the channel(s) for the concrete thickness and reinforcement specified by the designer or structural engineer.

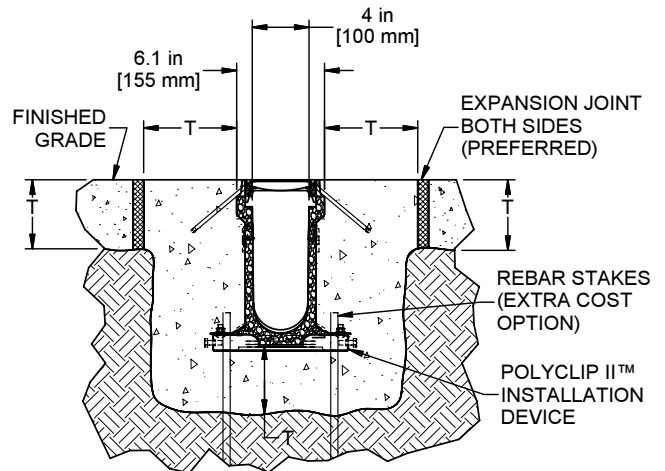
NOTE: It is recommended the finish level of the concrete be between 1/8" and 1/16" above or at least level with the top edge of the channel, sidewall, or frame.

A finished slope of 1/8" per foot for two feet on each side of the trench is also recommended. This will provide a positive drainage flow into the channel system.

REMINDER: Concrete should be placed in a manner so as not to disturb the properly aligned channel system. **DO NOT CHUTE CONCRETE DIRECTLY AGAINST CHANNELS!!**



Bedding Slurry Method



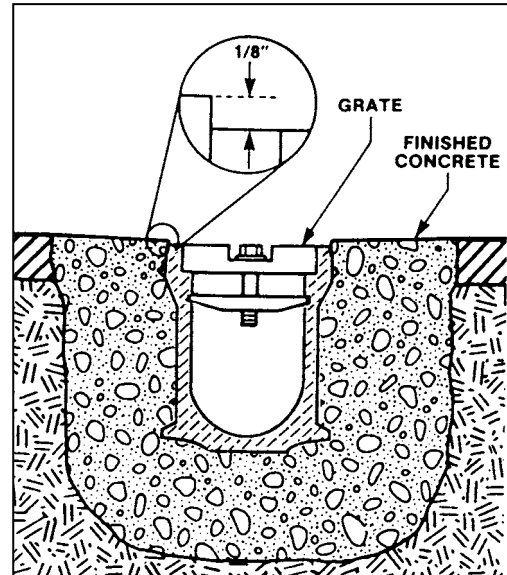
CROSS SECTION VIEW

T = CONCRETE THICKNESS PER STRUCTURAL ENGINEER'S SPECIFICATION, FLOOR SLAB THICKNESS, OR 4" (WHICHEVER IS GREATER)

Cleanup and Final Grate Installation

1. Remove and clean gratings as required.
2. Clean all debris and any concrete spillage out of trench and catch basins.
3. Insert the grate bolt through the hole provided in each grate.
4. Screw the toggle bar onto the bolt with two full turns.
5. Set the grate into the channel/sidewall grate lip. Hand tighten the bolt until the toggle bar slips into the "Red Dot/Green Dot" PolyLock depression in the side of the channel and snugs the grate into place.
8. Tighten lock bolt securely with a wrench.

The Polydrain System is now complete and ready for operation!



Final grate installation

Torque Spec Chart

Part No.	Bolt Dia. (In.)	Max. Torque (In. Lb.)	Tightening Procedure (Ballpark)	Part No.	Bolt Dia. (In.)	Max. Torque (In. Lb.)	Tightening Procedure (Ballpark)
S2211	5/16 - 18	3.0	Contact plus 1 turn	2452	5/16 - 18	3.0	Contact plus 1 turn
S2410	5/16 - 18	3.0	Contact plus 1 turn	2453	5/16 - 18	3.0	Contact plus 1 turn
2404	5/16 - 18	3.0	Contact plus 1 turn	2454	5/16 - 18	10	Contact plus 1 turn
2405	5/16 - 18	3.0	Contact plus 1 turn	2455	5/16 - 18	10	Contact plus 1 turn
2406	5/16 - 18	3.0	Contact plus 1 turn	2501	5/16 - 18	3.0	Contact plus 1/2 turn
2407	5/16 - 18	3.0	Contact plus 1 turn	2502	5/16 - 18	10	Contact plus 1/2 turn
2410	5/16 - 18	3.0	Contact plus 1 turn	2504	5/16 - 18	10	Contact plus 1/2 turn
2411	5/16 - 18	3.0	Contact plus 1 turn	2506	5/16 - 18	10	Contact plus 1/2 turn
2412	5/16 - 18	10	Contact plus 2 turns	2511x	5/16 - 18	10	Contact plus 1/2 turn
2413	5/16 - 18	10	Contact plus 2 turns	2512x	5/16 - 18	10	Contact plus 1/2 turn
2420	5/16 - 18	10	Contact plus 2 turns	2514x	5/16 - 18	10	Contact plus 1/2 turn
2421	5/16 - 18	10	Contact plus 2 turns	2515x	5/16 - 18	10	Contact plus 1/2 turn
2422	5/16 - 18	10	Contact plus 2 turns	2532	5/16 - 18	10	Contact plus 1/2 turn
2423	5/16 - 18	10	Contact plus 2 turns	2534	5/16 - 18	10	Contact plus 1/2 turn
2422.19	5/16 - 18	10	Contact plus 2 turns	2604	1/2 - 13	600	Contact plus 1/2 turn
2423.1	5/16 - 18	10	Contact plus 2 turns	2614	1/2 - 13	600	Contact plus 1/2 turn
2440	5/16 - 18	10	Contact plus 2 turns	2720	#8 - 32	1.0	Contact plus 1 turn
2441	5/16 - 18	10	Contact plus 2 turns	2721	#8 - 32	1.0	Contact plus 1 turn
2442	5/16 - 18	10	Contact plus 2 turns	2722	#8 - 32	1.0	Contact plus 1 turn
2443	5/16 - 18	10	Contact plus 2 turns	2723	#8 - 32	1.0	Contact plus 1 turn
2444	5/16 - 18	3.0	Contact plus 1 turn	2854	5/16 - 18	10	Contact plus 1/2 turn
2445	5/16 - 18	3.0	Contact plus 1 turn	1500.14	5/16 - 13	300	Contact plus 1/4 turn
2446	5/16 - 18	3.0	Contact plus 1 turn	1502.14	5/16 - 13	300	Contact plus 1/4 turn
2447	5/16 - 18	3.0	Contact plus 1 turn	1503.14	5/16 - 13	300	Contact plus 1/4 turn
				1504.14	5/16 - 13	300	Contact plus 1/4 turn

Notes:

1. Contact is when the PolyDrain toggle makes contact with the Red Dot or bottom of frame. Contact with PolySelf or Trench Former is when the toggle contacts the bottom of the grate.
2. If grate rocks after tightening per above, remove any debris from grate seat area or check for frame or grate warpage.
3. Over tightening of fasteners can permanently bend saddle or toggle and break fastener or components.



**For technical assistance contact
the ABT Sales Support Team
800-438-6057**

The information contained within is believed to be accurate but not guaranteed to be so. The customer should evaluate the suitability and safety of these products for any application. ABT assumes no liability for the end results since the conditions of installation and use are beyond the control of ABT. Concrete specifications, placement, reinforcement and structural considerations are the responsibility of the customer. ABT reserves the right to change the price, availability, specifications, and content of any of its products, literature or other information in all media at any time without notification.