



## Smith Drainage Systems Technical Installation Guide Smith/ACO Fiberglass Trench Drain Systems

Easy Installation With The Smith/ACO Fiberglass, Interlocking Trench Drain Series



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## Getting Started

Smith Drainage Systems consists of a full range of modular channels with secured gratings. Systems include catch basins, end caps and other accessories.

When installed correctly, Smith Drainage Systems products are designed to withstand a variety of loadings as classified by DIN 19580/EN 1433 (The only standards specifically for trench drain systems.)

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Fiberglass products should be handled with care as they can be damaged by impact from other products or machinery.

Typical equipment necessary for installation may include:

### **Excavating equipment**

### **String line or laser level**

### **Measuring tools**

### **Drill, grinder and/or saw**

### **Sockets and ratchet**

### **Concrete – 3,000 psi minimum compressive strength**

### **Gloves, respirator and eye protection**

## Health and Safety

Fiberglass is produced from glass fibers woven together into matting that is bonded using a resin binder.

Main hazards include:

- Abrasive damage to hands
- Inhalation of dust from grinding, cutting or drilling.
- Grinding and cutting may project small fragments.

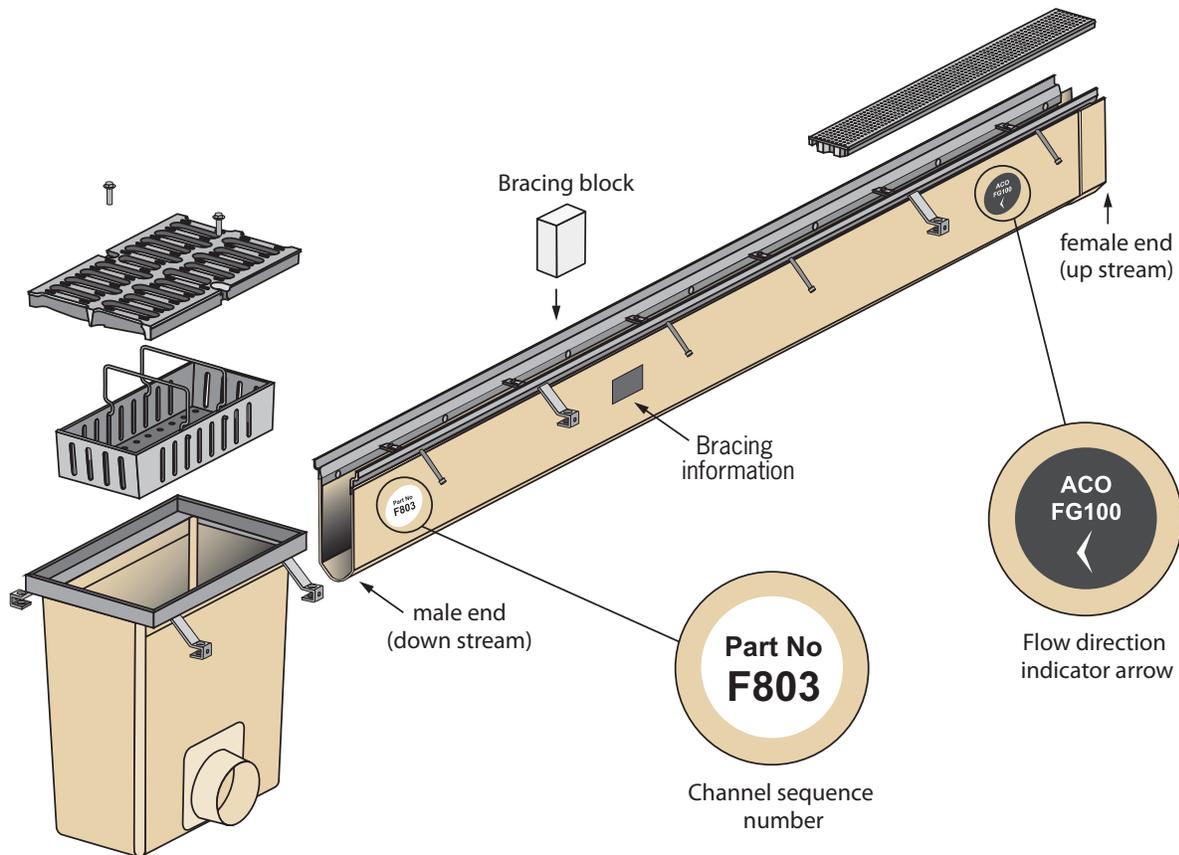
Gloves, eye protection and respirator should be worn to avoid these hazards. Operations should be conducted away from areas of fire or explosion hazard.

Grates are made from metals and can be cast or fabricated.

Main hazards include:

- Abrasive damage/cuts to hands.
- Inhalation of dust from grinding or cutting.
- Grinding and cutting may generate sparks; flammable items should be removed from the area.

Gloves, eye protection and respirator should be worn to avoid these hazards. Operations should be conducted away from areas of fire or explosion hazard.



**Make sure arrows molded on sides of channel all point in the intended direction of flow. (outlet point)**

# Commercial Trench Drains

## Installation Sections

An installed Smith Drainage System should incorporate the following:

- Correct grate type.
- Correct channel type and size
- Minimum grade 3,000 psi compressive strength cement concrete surround.

It is recommended that the cement concrete surround be durable and conform to minimum strength requirements as shown in the illustrations.

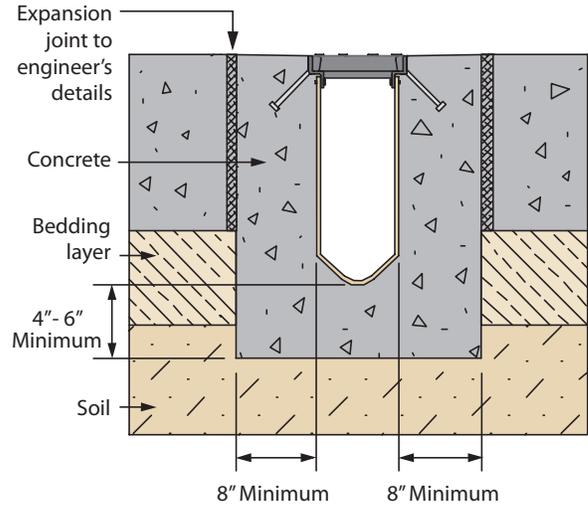
The cement concrete surround dimensions should be equal to or greater than the thickness of the surrounding slab.

Poor site conditions and low load bearing pavement will require an increase in these dimensions to meet the vertical and lateral loads.

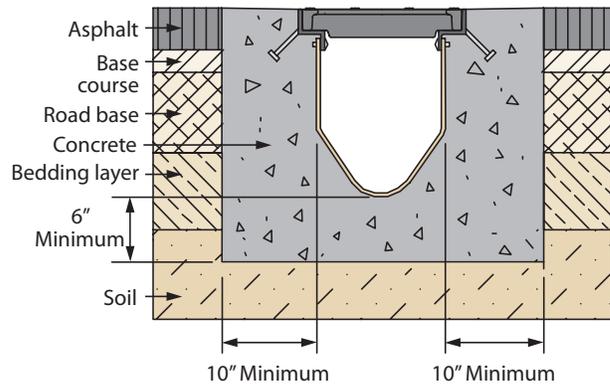
These illustrations are a guide for average ground conditions only. Engineering advice may be necessary.

Refer to <http://www.jrsmith.com> for more information.

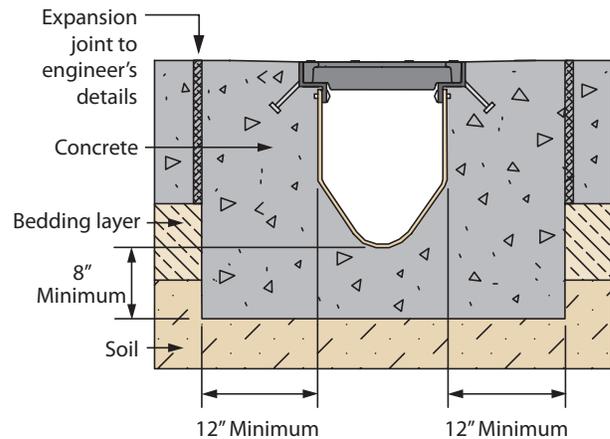
### Concrete - DIN 19580 Class A -C



### Asphalt - DIN 19580 Class A -C



### Concrete - DIN 19580 Class E



# Commercial Trench Drains

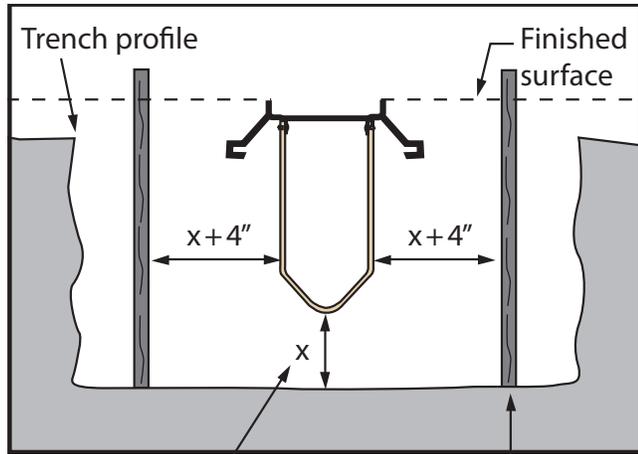
Fiberglass

## 1 Excavation

Excavate trench to accommodate drain system. Excavations must be made about the center line of proposed drainage run and catch basin.

Trench must be big enough to accommodate each of the following:

- A. Channel/catch basin width and depth dimensions.
- B. Concrete surround dimensions.



See table below for recommended dimensions

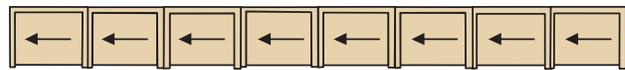
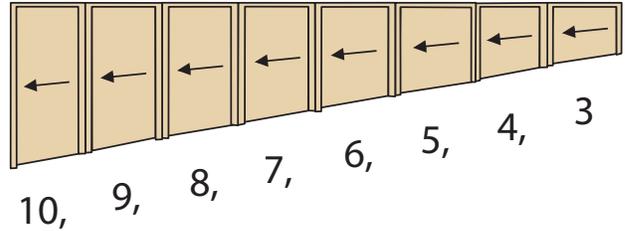
Form board if required

### Concrete Surround Dimensions\* (X)

Load Class	A	C	E	F
4" channel	4-6"	4-6"	6"	8"
8" channel	6"	6"	8"	8"
12" channel	6"	6"	8"	8"

\*These dimensions are recommended minimums only. Ground conditions may affect actual dimension required; engineering advice should be sought.

C. For sloped systems, excavate bottom of trench to roughly follow fall of trench run.



010,010,010,010,010,010,010,010

**Note: Check product literature for overall product depth. Add additional measurement for concrete surround from table at left.**

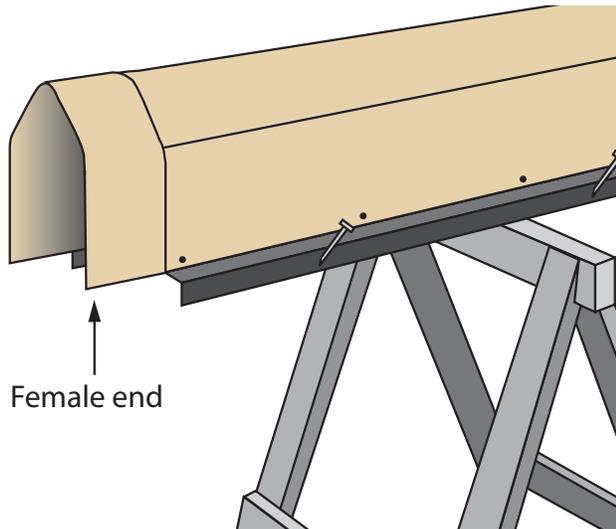
Ensure loose material is removed from trench and base is compacted.

Run string line, or laser, at finished surface level along full length of proposed trench run to ensure trench is installed at the correct grade.

In concrete pavements ensure an allowance is made for expansion/isolation joints, if necessary, to allow for movement due to expansion/contraction.

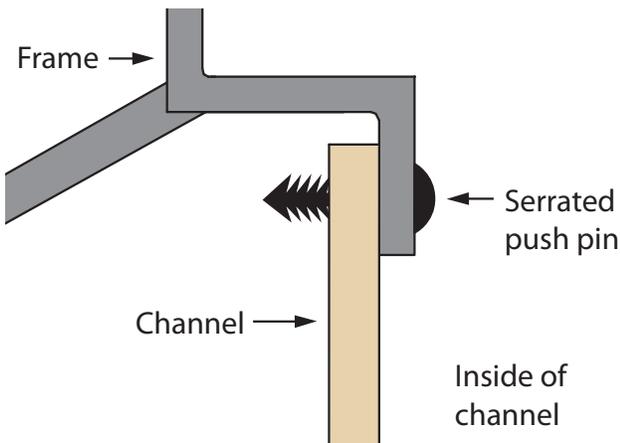
## 2 Channel/Frame Assembly

1. Set frame on sawhorses or flat level surface upside-down.
2. Push fiberglass channel onto frame. Frame fits inside channel.
3. The female end of the the channel should extend past the end of the frame approximately 2 inches. The male end of the channel is flush with the end of the frame.



Female end

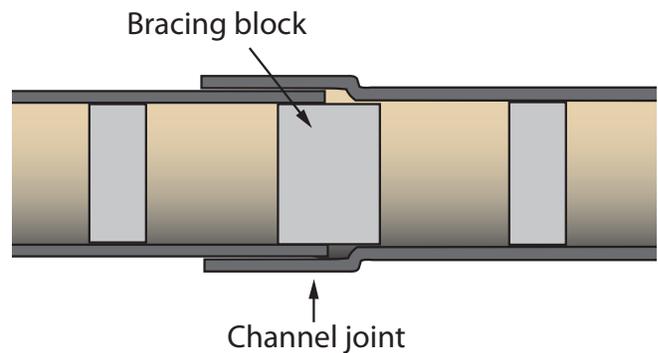
4. Align holes in frame and channel and fasten with push pins (supplied) from inside the channel.



## Channel Bracing

Refer to red sticker on the side of the channels for specified number of polystyrene blocks for each channel. Bracing deeper channels during concrete pour prevents bowing due to hydrostatic pressure from concrete.

**NOTE:** Ensure blocks remain vertically centered between channel walls.



Once channels are positioned, add blocks at joints to maintain correct horizontal alignment.

## 3 On Site Fabrications

When cutting channels, and or grates, gloves, protective eyewear and respirator or mask are recommended.

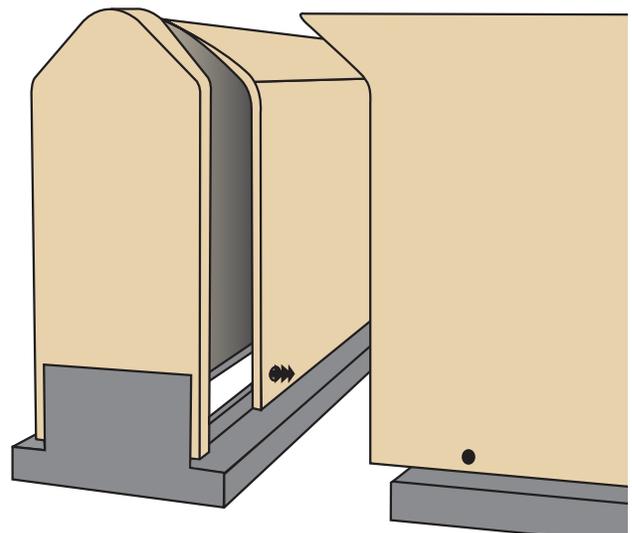
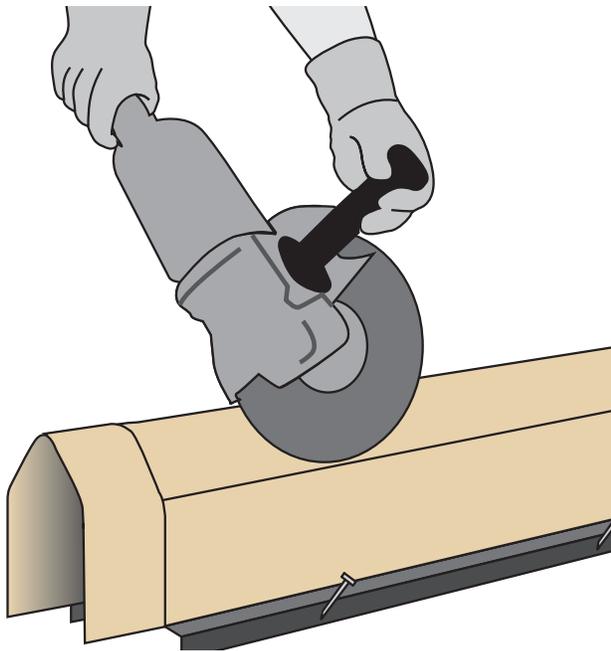
Cutting channels is required to form miters, tee junctions, and produce non-standard lengths. Contact Smith Drainage Systems for further information.

Cuts can be made with a cut-off tool, jigsaw or a hacksaw. They should be smooth and made perpendicular to the base of the channel. The saw should be of sufficient size to cut completely through one side wall of the channel at a time.

Gratings and frames can be cut with a band saw or similar tool with a suitable blade.

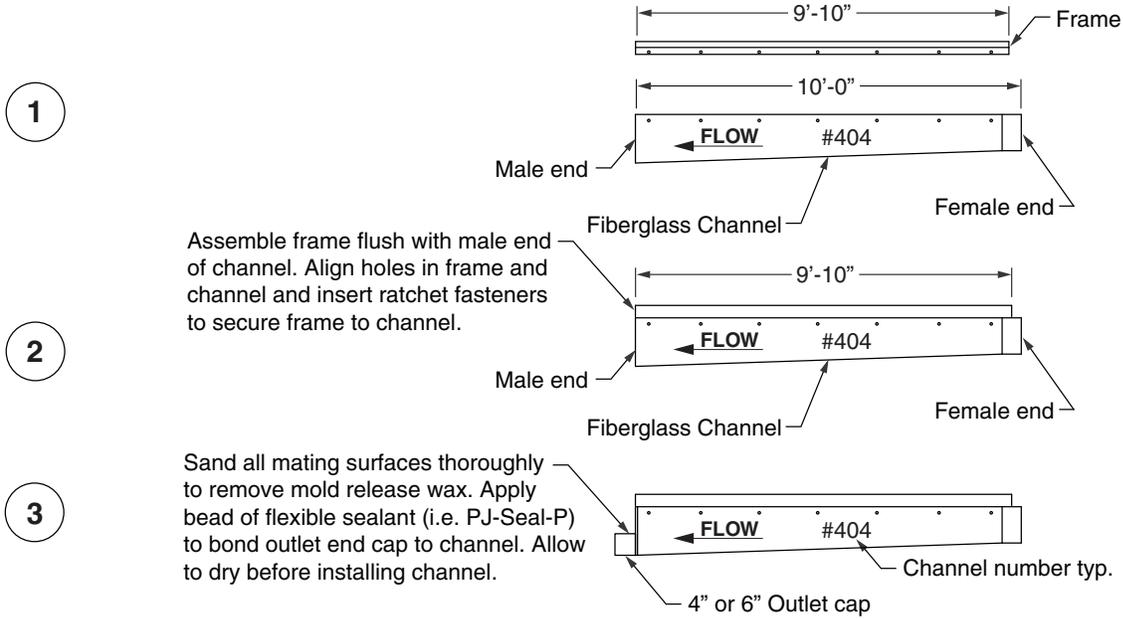
Tees and miters are a little more complex for fiberglass channels. Smith Drainage Systems recommends these fabrications be produced by the in-house fabrication department. If they are to be completed on site, the channels should be notched to ensure a complete fit at the joint.

Joints should be sealed using a fiberglass repair kit to give the joint maximum strength and durability.

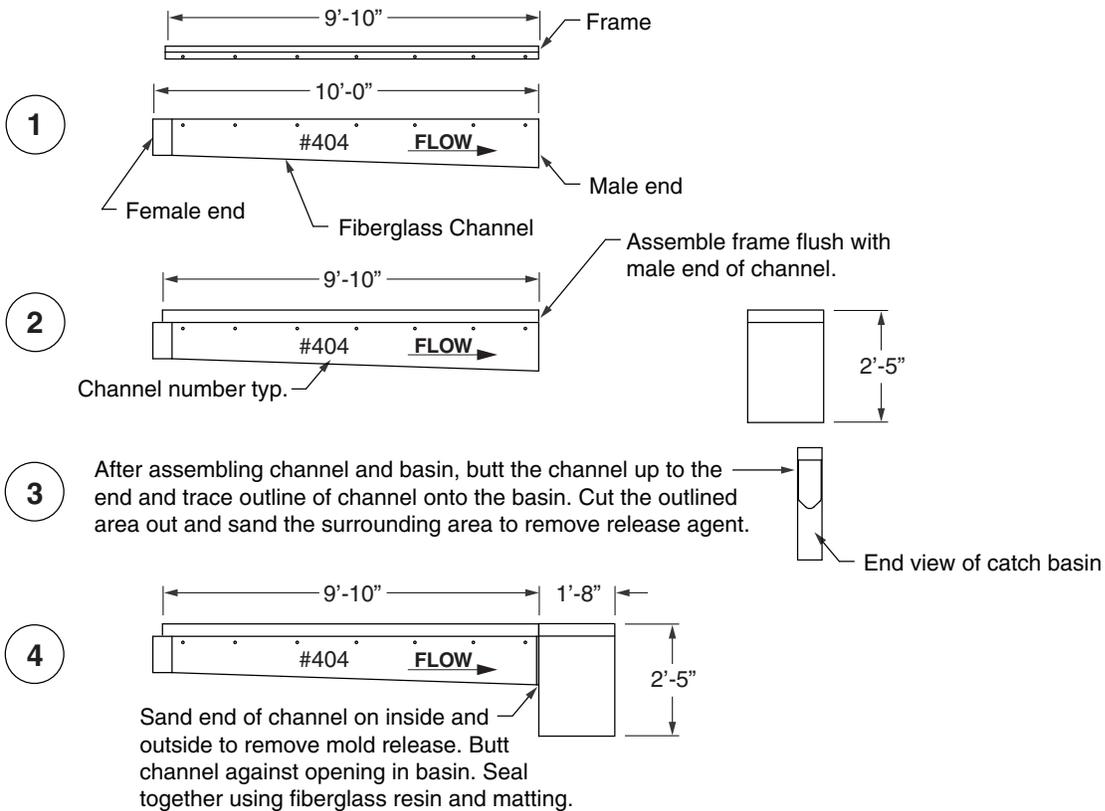


## 3 On Site Fabrications

### 9810 SERIES OUTLET END CAP ASSEMBLY DETAIL

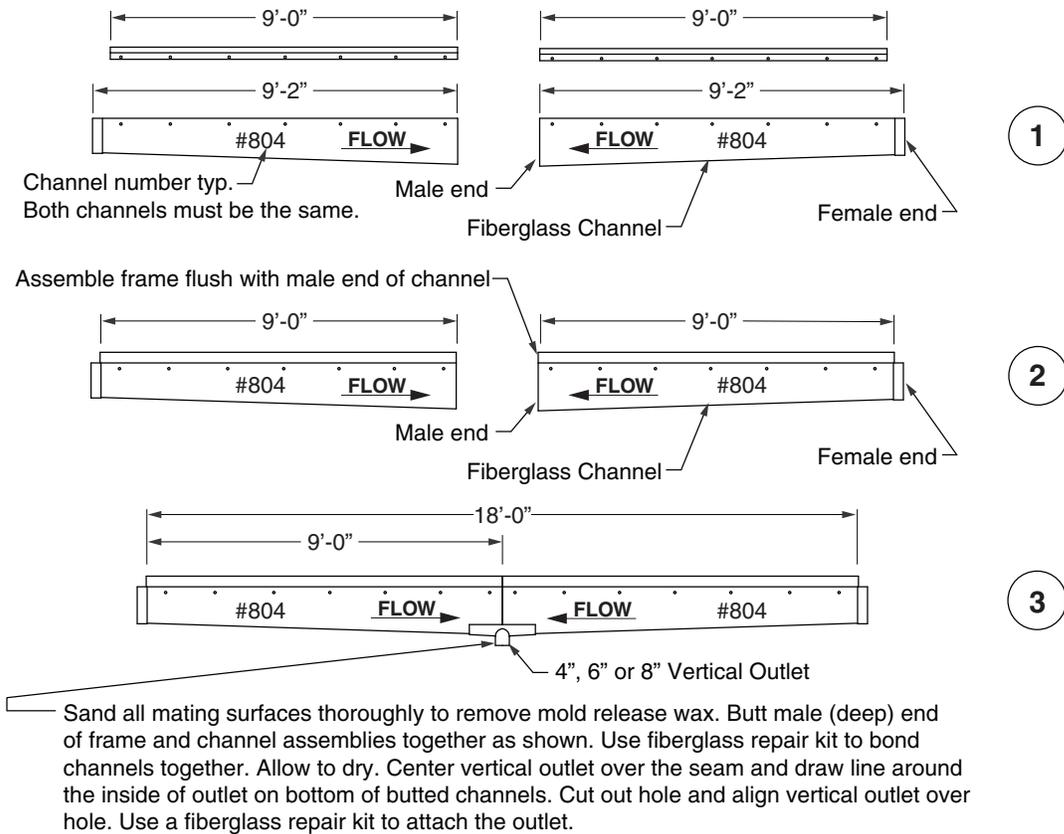


### 9810 SERIES END CATCH BASIN ASSEMBLY DETAIL

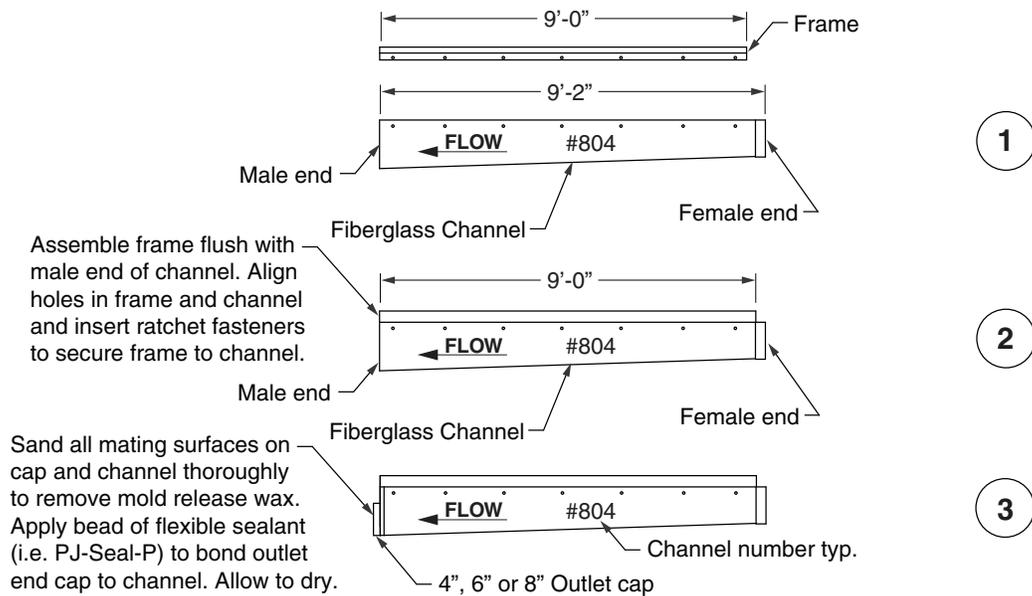


# 3 On Site Fabrications

## 9812 SERIES CENTER VERTICAL OUTLET ASSEMBLY DETAIL



## 9812 SERIES OUTLET END CAP ASSEMBLY DETAIL



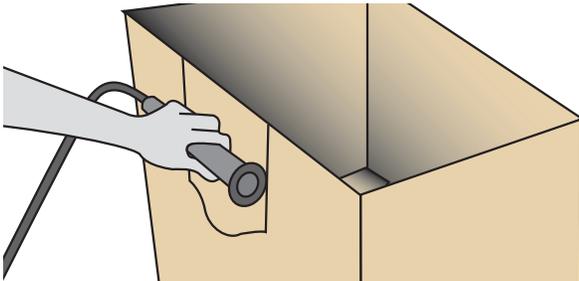
## 4 Channel Adaptors

Channel adaptors are designed to create a female flange to help support channels or pipe when connecting into fiberglass catch basins.

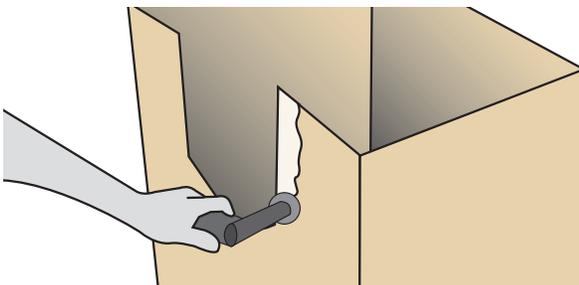
1. Cut collar to match required channel height and test fit adaptor onto the side of the catch basin. Trace around the inside of the collar onto the catch basin.



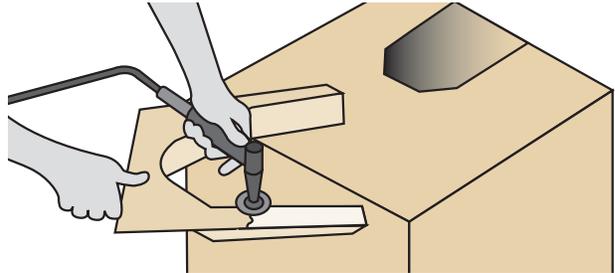
2. Use cutoff tool, jigsaw, or hacksaw to remove marked channel shape



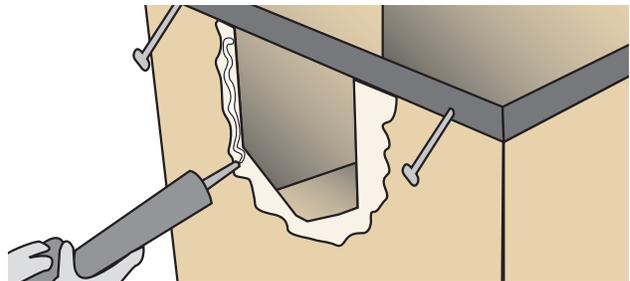
3. Use sandpaper, grinder or similar to roughen surface around opening. Clean with air or dry brush.



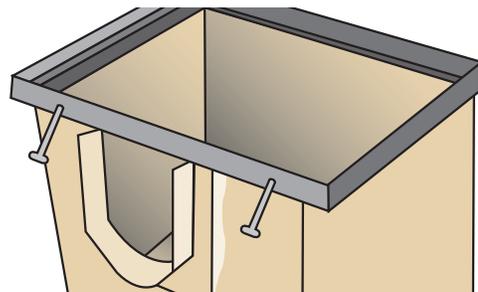
4. Use sandpaper, grinder or similar to roughen adaptor flange. Clean with air or dry brush.



5. Apply flexible sealant (polyurethane or urethane) to roughened surface of basin.



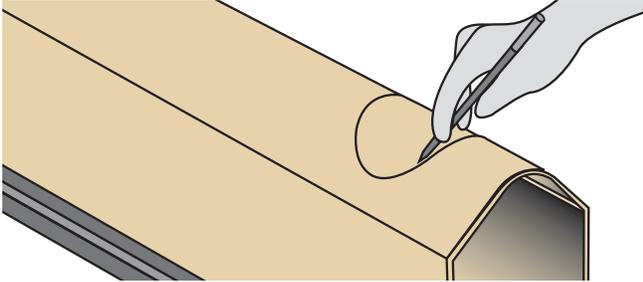
6. Apply collar to basin. Ensure joint is properly sealed and remove excess sealant. Place channel into collar.



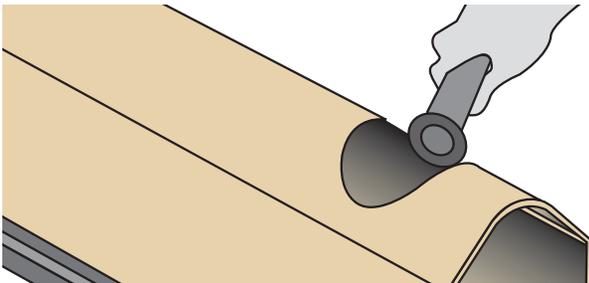
**NOTE:** For additional stability, use screws to attach adaptor to basin. Cut off screws from inside of basin once concrete has been poured.

## 5 Pipe Connections/ Vertical Outlet Adaptors

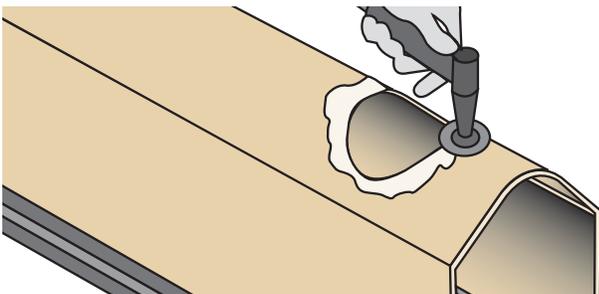
Vertical outlets provide vertical bell end for easy attachment to the drainage pipe.



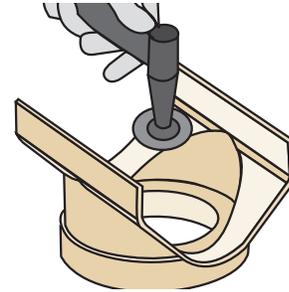
1. Set adaptor at the desired location on the channel. Mark the inside of the collar on the channel with marker.



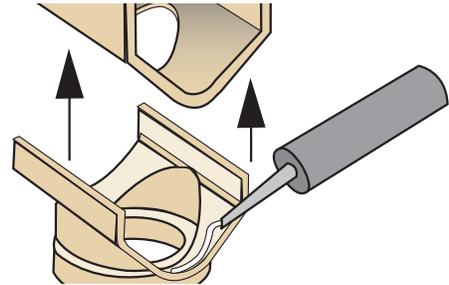
2. Using a cut-off tool, jigsaw or hacksaw, cut out the marked shape on the channel.



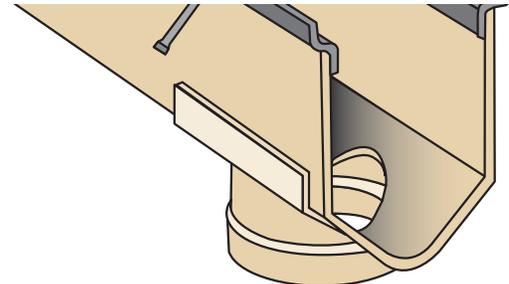
3. Use sandpaper, grinder or similar to roughen surface around opening. Clean with air or dry brush



4. Use sandpaper, grinder or similar roughen adaptor flange. Clean with air or a dry brush.



5. Apply flexible sealant (polyurethane or urethane) to roughened surface of adaptor.



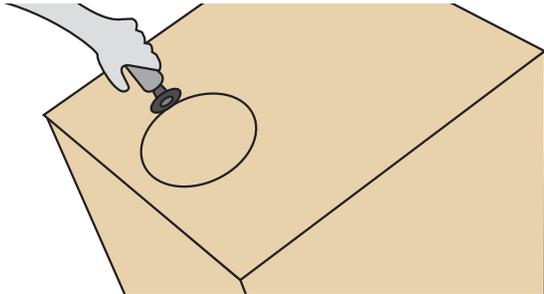
6. Secure adaptor to bottom of channel. Ensure joint is properly sealed and remove any excess sealant.

**NOTE:** For additional stability, use screws to attach adaptor to channel. Cut off screws from inside of channel once concrete has been poured.

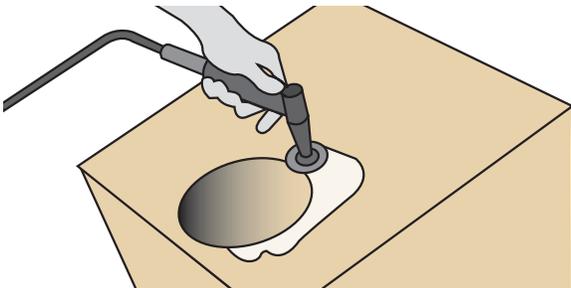
## Fiberglass **5** Pipe Connections – Pipe Adaptors

Pipe adaptors are designed to provide a transition for 4", 6" or 8" schedule 40 pipe.

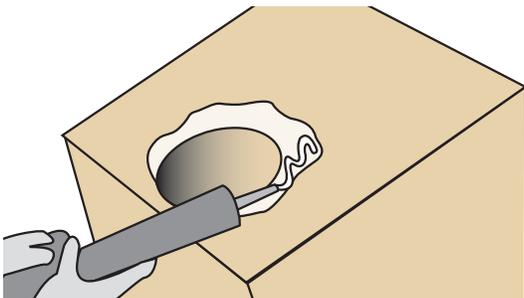
1. Hold pipe adaptor in required position and mark the inner diameter of the outlet.



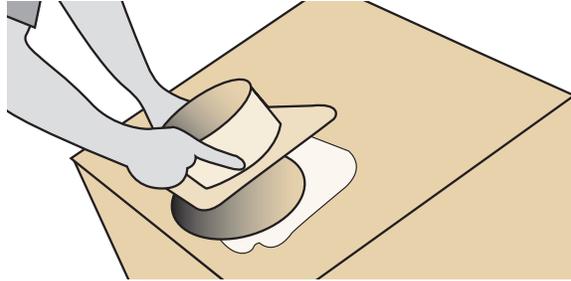
2. Use sandpaper, grinder or similar roughen surface of basin and pipe adaptor on flange. Clean with air or dry brush.



3. Apply flexible sealant (polyurethane or urethane) to roughened surface of basin.



4. Place pipe adaptor on basin. Ensure joint is properly sealed and remove excess sealant.



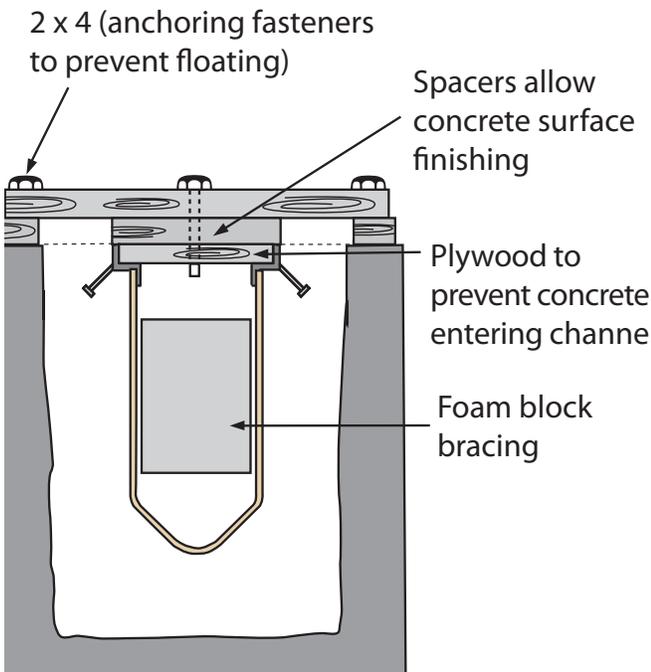
**NOTE:** For additional stability, use screws to attach adaptor to basin. Cut off screws from inside of basin once concrete has been poured.

## 6 Positioning of Channels:

### Hanging Method

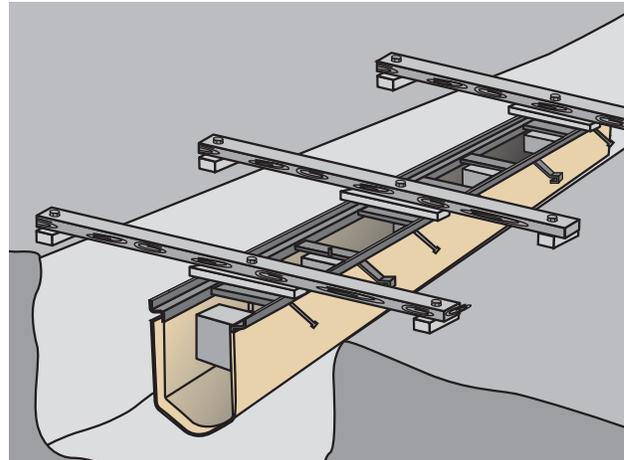
Lay channels in the excavated trench beginning at the outlet point where the pipe stub or catch basin is located.

1. Cut 2 x 4's to appropriate width to span excavated trench or form boards.
2. Attach 2 x 4's to channels using j-hooks for 9810 series or 3/8" all-thread for 9812 (attach to frame cross members.)



**CAUTION: Do not overtighten fasteners as the crossmember may deform, causing problems fitting the grates.**

3. Place outlet channel (deepest or highest channel number) and ensure it is aligned properly. Fasten 2x4 to the form boards or surrounding slab, This prevents movement or floating of channels during the concrete pour.



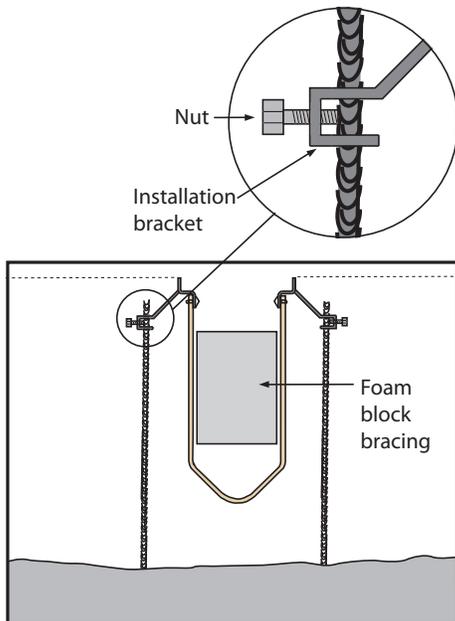
Fiberglass

4. If channels are to be sealed, lightly sand then wipe clean next female collar and male end. Apply 1/8" bead of polyurethane joint sealant approximately 1" from end of channel.
5. To position next channel, slide male end into female end of previous channel. Push channels together until frames are butted together. Smooth joint sealant with a putty knife if necessary.
6. Fasten 2x4 to form board or slab. Check level and straighten if necessary. Repeat steps 4 and 5 until trench run is assembled.
7. Check security of 2 x 4's; system will float in wet concrete, Re-attach if necessary.

## 6 Positioning Channels – Rebar Support Method

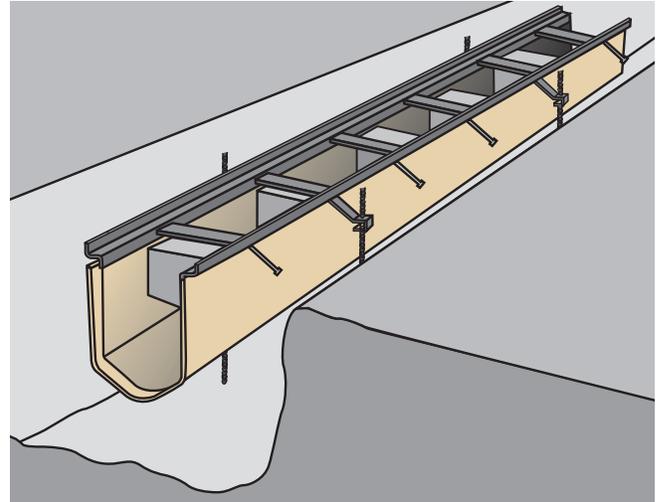
Lay channels in the excavated trench beginning at the outlet point; where catch basin/pipe is located.

1. Place outlet channel (deepest or highest channel number) at the required location. Place # 4 or #5 rebar through installation brackets (4 per channel) and drive into ground until secure.
2. Adjust channel assembly vertically to align with string line or laser. Once the channel assembly is set to the height desired, tighten the set screw bolts onto the rebar. Do not overtighten.



Note: foam block bracing to prevent channel crushing during concrete pour.

3. If channels are to be sealed, lightly sand then wipe clean next female collar and male end. Apply 1/8" bead of polyurethane joint sealant approximately 1" from end of channel.



4. To position next channel, slide male end into female end of previous channel. Push channels together until frames are butted together. Smooth joint sealant with a putty knife if necessary.
5. Place # 4 or #5 rebar through installation brackets (4 per channel) and drive into ground until secure. Position channel to required level, tighten bolts and repeat items 4 and 5 until trench drain run is complete.
6. Check security of rebar; trench will float in wet concrete if not sufficiently anchored.

**NOTE:** If rebar holding strength is questionable due to poor ground conditions, pour a 3"-4" slump of concrete around the base of the rebar, keeping base of channel clear from concrete.

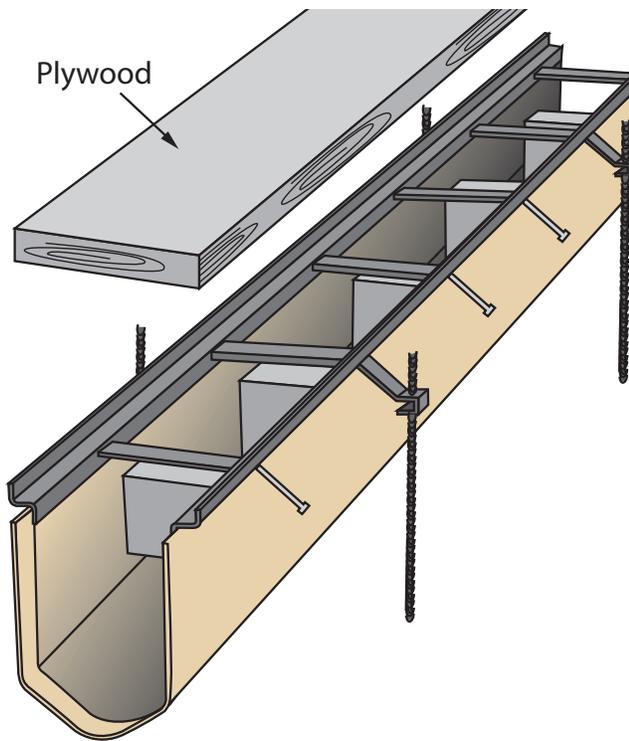
# Commercial Trench Drains

## 7 Concrete Pour

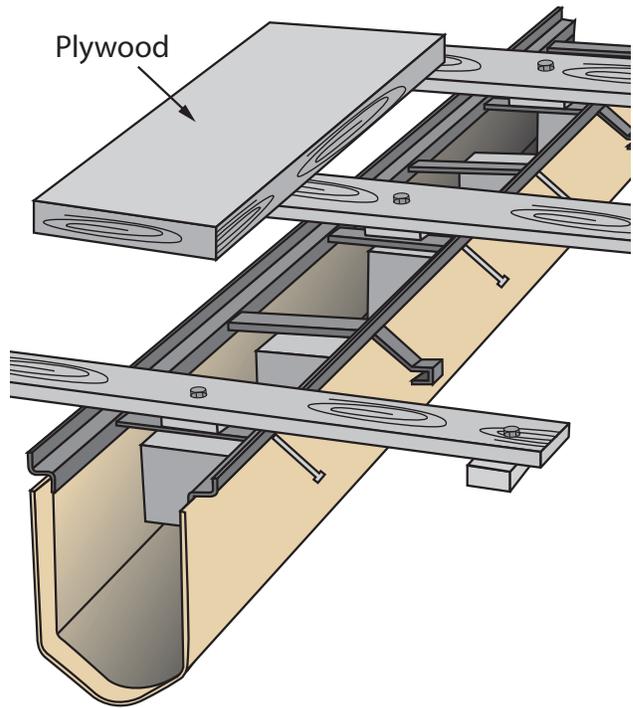
Concrete should have a minimum compressive strength of 3,000 psi.

A wand type vibrator should be used to ensure that the concrete distributes evenly underneath and around channels.

1. Place plywood in grate seat to prevent concrete from entering the channel.

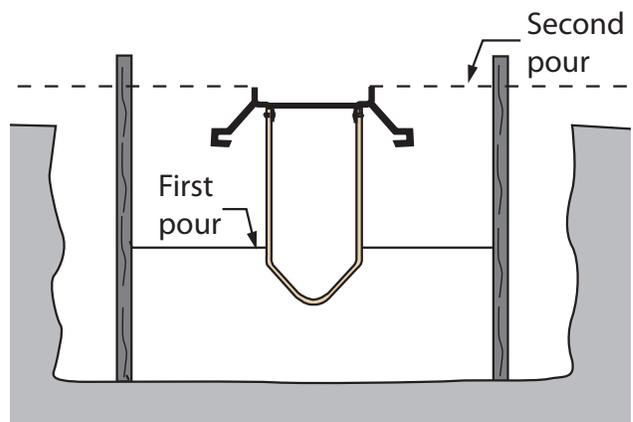


For the hanging method use plywood between the 2x4's.



Fiberglass

2. Place 3" to 4" concrete slump carefully around bottom of channels, taking care not to disturb channel position. Ensure that the "V" bottom is covered.



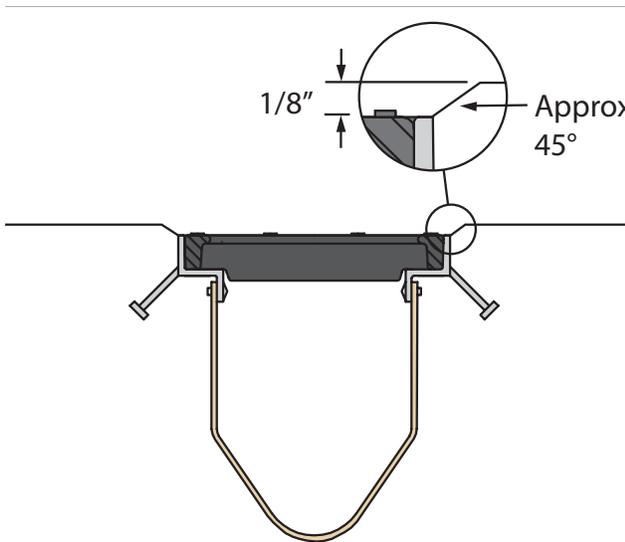
3. Second Pour should be to the finished level.

**NOTE:** Care should be taken to place concrete equally on both sides of trench system to avoid moving channels. Too much concrete on one side may make channels twist. If 'cold joints' are a concern, **engineering advice should be sought** to determine alternative details.

## 8 Concrete Finishing

To finish installation, trowel concrete flat and taper down to channel edge. The top edge of the adjacent pavement must be above the grating level approximately 1/8" (3mm), this ensures all liquids drain into the channels.

Once the concrete has set, remove 2x4's (if used) bracing and/or grate protection. Fit the grates – see page 17.



## Expansion Joints

Transverse joints (cutting across channel haunch and base) to prevent cracking in the slab may be required. Ideally, such joints should be positioned at channel joints. Alternatively, a cut may be made at the appropriate location along the channel and sealed with flexible sealant.

Longitudinal expansion/isolation joints should be continuous and flexible. They must be provided between the concrete surround and the surrounding slab and may be varied to suit concrete surround width by up to a meter (3 feet) from the channel.

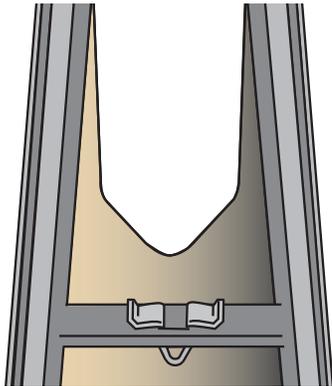
If a joint is dowelled, debonding should be provided. **Smith Drainage Systems recommends seeking engineering advice.**

## 9 Fitting the Grates

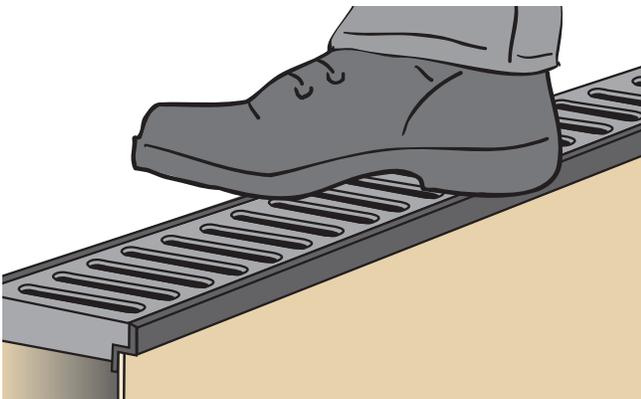
### QuickLok Gratings - 9810

Used on selected gratings, QuickLok provides secure boltless locking, which is quick to remove/replace for maintenance and cleaning.

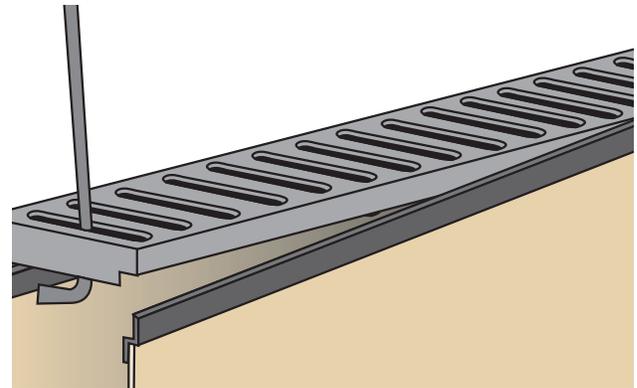
1. QuickLok locking mechanism is part of the crossbar on the frame.



2. To install the QuickLok grating, align the pin in the grate directly over the locking bar, centering it in the spring clip in the bar. Push down on or stand on the grate until it clicks into place.



3. To remove the grates, insert the grate removal hook under the grating bar and pull up sharply. Once the first grate is removed, the remaining grates can be removed by hand by gripping the end of the grate and lifting sharply. Use of gloves is recommended.

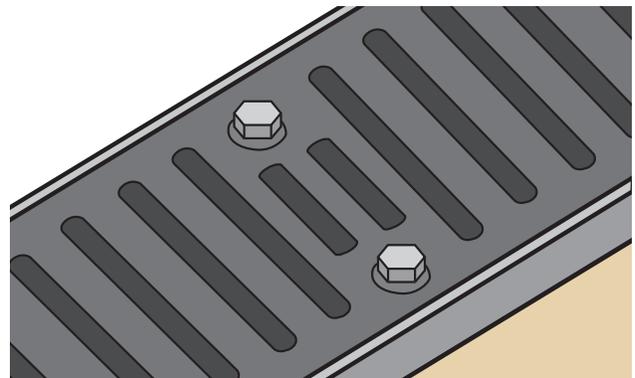


Fiberglass

### Bolted Grates-9812

Used on 9812 gratings, bolted grates are lockable with two or four  $\frac{1}{2}$ -13 x 1  $\frac{1}{2}$ " bolts threaded directly into the steel frame at 18" (457mm) intervals.

Do not overtighten.



# 10 Final Inspection

## Final Inspection

1. Remove any debris in the system and grate seat. Ensure outlet pipes are clear.
2. Install trash buckets in catch basins, if required.
3. Flush trench run to check for pipe blockages and unblock if necessary.
4. Empty trash buckets and clean out pipe connections, if necessary. Replace trash buckets.
5. Install gratings in proper position, ensuring they are securely locked down. (See page 17)

**Drainage system is now ready for use.**

## 11 Maintenance

Regular inspections of the trench drain system are recommended. Frequency will depend on local conditions and environment, but should be at least annually.

Inspections should cover:

- Grates and locking devices
- Catch basins and trash buckets
- Concrete surround and adjacent paving

All items should be inspected for damage, blockage or movement. Compare with site drawings if necessary.

1. Remove grates – see page 17.
2. Remove debris from channel.
3. Flush channels with water or high pressure washer.
4. Repair damaged surfaces, if necessary with an appropriate repair kit.
5. Renew joint seals as required.
6. Empty trash buckets and clean out pipe connections.
7. Reinstall trash buckets.
8. Reinstall grates, ensuring they are locked in place.

Systems with grates that have wide slots may be cleaned with the use of pressure washers applied through the grates – debris will be washed to the catch basin for removal. (Empty and replace trash bucket.)

**Note:** All of the Smith/ACO trench drain systems are designed for “**on grade applications only**” as there are no provisions for a flashing flange or flashing clamp. When a flashing flange or flashing clamp is required, please use the Smith/ACO 9837 series membrane trench drain.

## CALL FOR INSTALLATION ASSISTANCE

Jay R. Smith Mfg. Co.<sup>®</sup>, the provider of the Smith/ACO Trench Drain Series is a world leader in the development and production of fiberglass products, including trench drain systems, for a variety of drainage applications. Our service representatives and distributors are willing to work with you to plan your drainage needs and support you with installation assistance.



**JAY R.  
SMITH MFG. CO.<sup>®</sup>**

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