# TF-14®

Trench Drain Forming System Installation Manual

# TF-14 Installation Guide

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## *General*



## *TF-14*



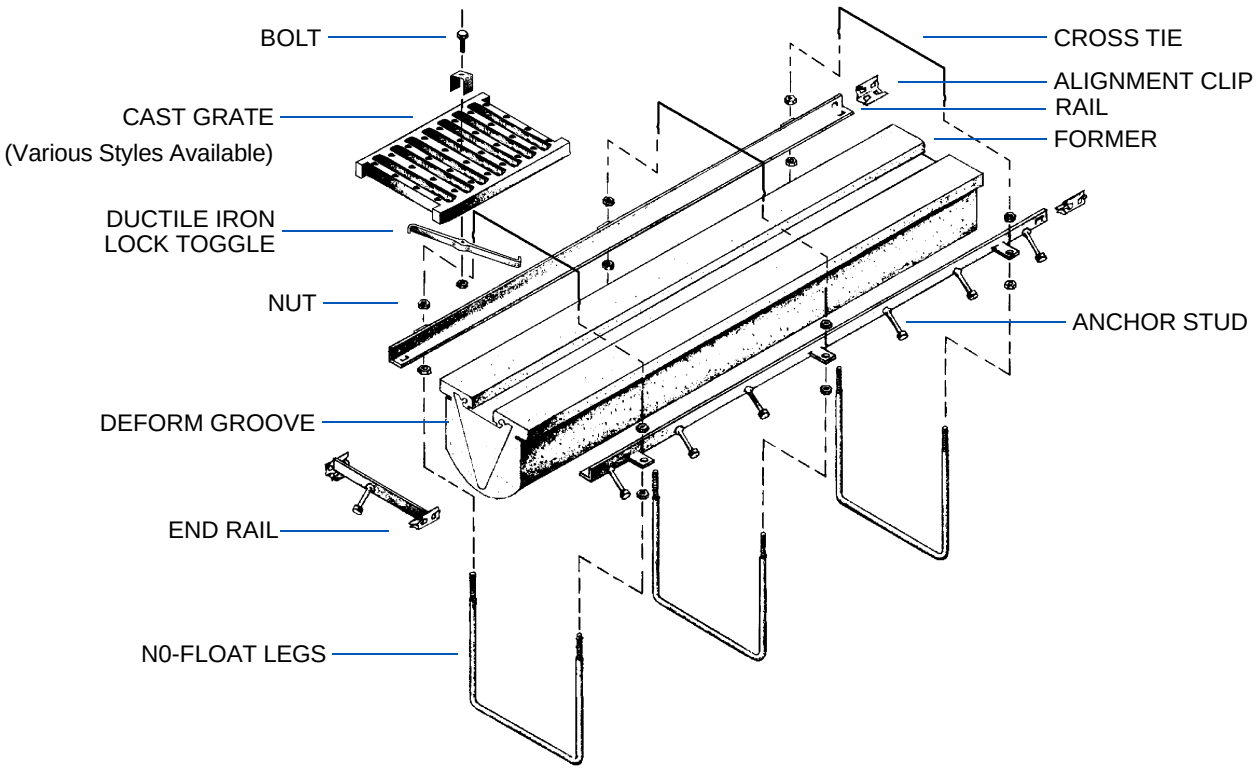
## *Special*

## *Installation Tips*

- Avoid costly mistakes! Read all installation notes pertaining to your particular type of installation before starting the job.
- Trench excavation must allow for a minimum of six inches of bedding concrete to be placed under and alongside theTrench Former. ***In all cases***, the thickness of the bedding concrete must be 6" or greater than that of the surrounding floor slab or pavement.
- Lay out the Trench Former sections (in numerical sequence) along the trench excavation prior to installation. Consult the construction plans or shop drawings for correct numerical sequence.
- Make the pipe connections and set the catch basins prior to Trench Former installation.
- Begin the installation at the outlet or discharge end of each run and work backwards (upstream). Each form has a label on the deep end indicating the direction of flow.
- If the Trench Former is to be installed in a structural or reinforced thick slab, follow the designer's or structural engineer's recommendations for bedding concrete and steel requirements.
- Apply form release with a brush.
- Consult engineer regarding expansion and control joints.
- Do not use a petroleum based form release, as it will severely attack the foam.

## *Tools*

- Large and small hammer
- Stringline
- Level
- Wood or steel grade stakes
- Hack saw
- Hand saw
- Pliers
- 16 GA tie wire
- Form release agent (not petroleum-based)
- Brush and stir stick for form release
- Wire cutters
- Spade or flat shovel
- Pry bar
- 2x4 lumber




**TF -14 COMPONENTS**

- Verify that all necessary components are on site before beginning the installation.
- Refer to the shop drawing for Trench Former and rail layout numbers.

## Former

Trench Former profiles arrive in a protective, expanded polystyrene (EPS) billet which serves as their shipping container. Forms are removed by pulling out nails and breaking off glue spots at top, then pushing on the shallow end. Part numbers and flow direction are marked on the deep end of each section with a color coded label.

Minor damage to the Trench Former profiles on the top and end surfaces is of no consequence. If, during handling, Trench Former sides or bottom should be damaged, repairs can be done on site. Pieces of the EPS dunnage or scrap can be fitted to damaged area and taped or glued in place, or aerosol foam insulation can be applied, then trimmed to conform to the original shape. Test adhesive on a scrap piece to be sure that it does not attack the foam.

## Rails

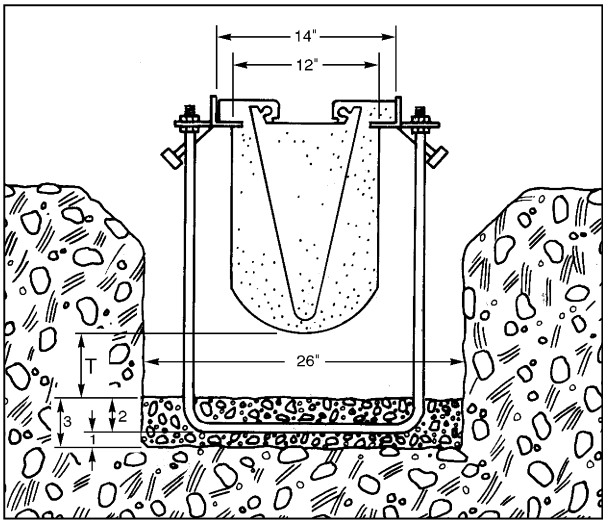
For each Trench Former section, two rail sections are used. Right and left rails are identical and are not distinguished from each other. Each eight foot rail has anchoring studs on 11 inch centers and three tabs for attaching no-float legs. Each section receives three equal length no-float legs. Only when a trench enters a catch basin, is an additional catch basin leg used in place of the last trench leg. Depending on the specific layout, shorter length rails may be used and rail and Trench Former lengths may not match. Refer to shop drawings for detailed instructions.

## Accessories

Check that the appropriate quantities of grates and grate locking devices are present. If trench end frames are provided, locate those pieces.

Toll Free: **800-438-6057**

# Excavation




T = Thickness of slab design

Excavation must provide for a minimum of six inches on both sides of the Trench Former and nine inches on the bottom. Bottom allowance includes a one inch clearance for the no-float legs, a non-structural anchoring slab which covers the no-float legs with two inches of concrete, and a six inch thick trench floor. Structural design considerations may dictate a greater amount of encasement concrete. Eg: 15" slab - 15" of encasement concrete. Please consult your structural engineer. In this case, longer no-float legs may be required. Consult plans, specifications and shop drawings for actual excavation depth.

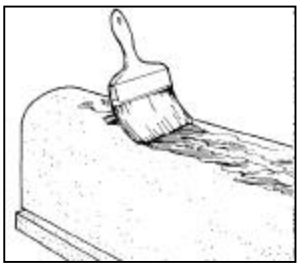
Slope the bottom of the excavation to match the Trench Former profiles provided. Remember, each eight foot section has three equal length no-float legs. Therefore, the excavation should be a series of twenty-four foot (24') long step-down sections, each section being slightly deeper than the distance from the top of the rail to the bottom of the no-float legs, unless neutral sections are used.

Where soil conditions allow, trench walls may be excavated vertically, eliminating shoring for deeper trenches.

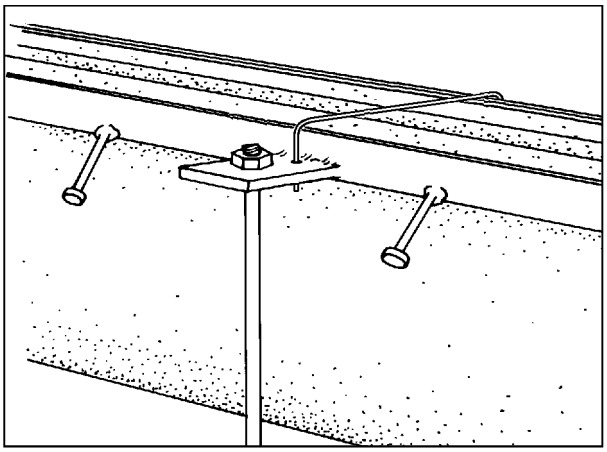
# System Pre-Assembly

Lay out the Trench Former and rail sections along the excavation. Trench Former sections should be laid out in the proper numerical sequence. Trench Former and U-legs are color-coded for easy assembly.

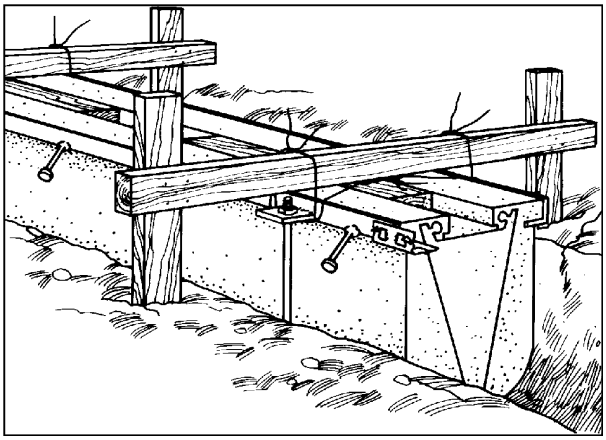
Match the color of the thread caps on the no-float legs to the color of the part number marked on the end of the form. Attach the legs to the rails by running a nut to the end of the threads, inserting threads through opposing rail brackets and then firmly securing with another nut, ensuring top nut is flush with top of leg.

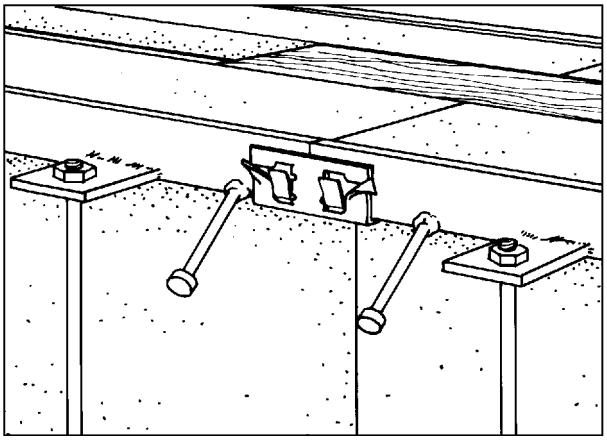


Apply the Trench Former Release to bottom and sides of the Trench Former. Do not use a petroleum based form release – it will severely attack the foam. Spread the rails open, position the Trench Former between them and insert the flange of the rail into the groove on each side of the Trench Former. Trench Former cross ties are inserted into holes in flange and tapped into place. For secure snug fit, bend cross tie under flange with pliers. This will help ensure a uniform and parallel grate seat area.



# Component Placement





The suspended method is the most widely used installation. This method involves suspending the Trench Former assemblies in the excavation using 2 x 4 lumber and wooden or steel grade stakes. Using tie wire, attach a length of supporting lumber across either end of the first Trench Former assembly. The lumber should be long enough to reach the grade stakes which are driven into the soil outside the excavation. Place the assembly into the excavation, set the top of the angle rail to finish grade and attach the supporting lumber to the grade stakes.

The no-float legs should be suspended just above the floor of the excavation. They should not rest on the soil. They are designed as anchoring devices, not as support legs.

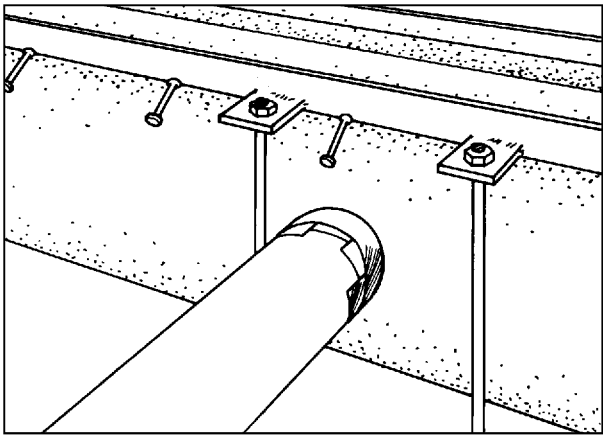
Note, that the ends of all rail sections of standard TF 14 are punched to accept an alignment clip. Use of these alignment clips ensures correct and accurate longitudinal alignment of adjacent rails. To position subsequent sections, tap clips onto the rail ends of one section, then push rail end of the next assembled section into these clips until the rails lock into place. When clips are locked, the sections will be butted together.

Suspend the free end of the assembly from another 2 x 4 board, adjusting to finish grade.

To assist in longitudinal alignment, 2 x 4's can be fitted to alignment groove in the top of the Form, preferably at joint locations.

When all sections are in place, install the closing end frames provided by tapping the clips firmly onto both rail ends until they are completely seated.

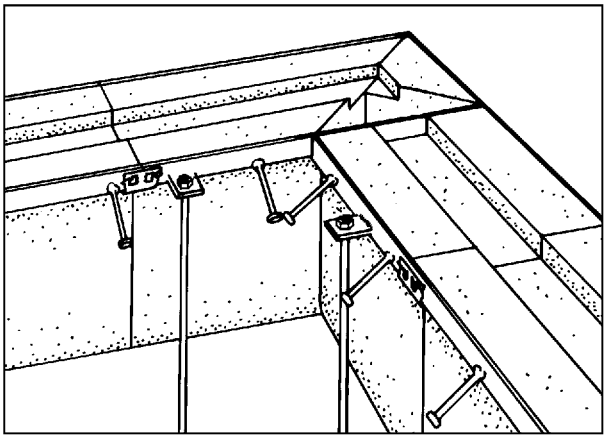
## Pipe Connections



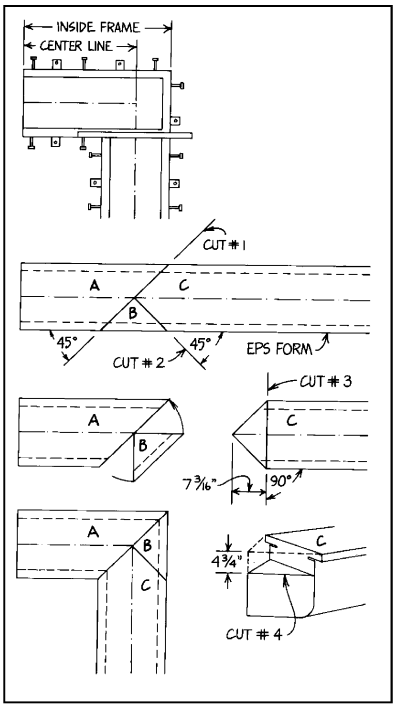
Vertical discharge piping should be installed at this time. Horizontal discharge or inlet piping may be installed after the anchoring slab is poured.

Trace the outside of the pipe at the proper location on the Trench Former profile and cut a hole approximately 1.5" deep in the foam. Remove the plug and shape the inside to accommodate the end of the pipe. To prevent concrete from entering the pipe, cover the end with duct tape and embed it in the Trench Former profile. Insert the pipe firmly into the recess.

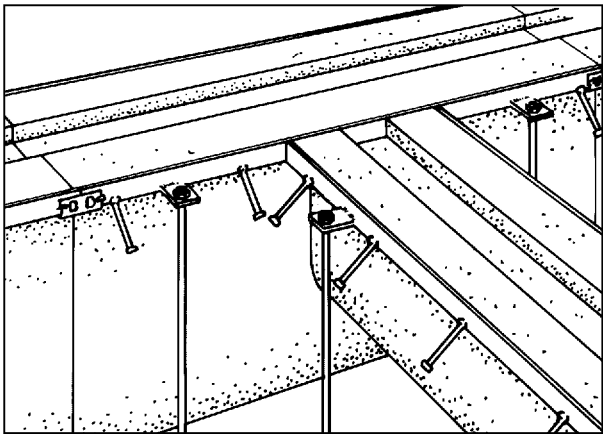
## 90° Miters with L-Rails



The L-rail is used for right or left turns in a continuous trench run. The part incorporates an integral grate "bridge" for carrying the loads across the open trench span and is designed to use four feet of Trench Former. Cut the appropriate Trench Former section according to the diagram (left) and fit the Trench Former into the L-rail before assembling the L-rail to adjacent rails. Note that foam section C is notched to allow this section to slide under the grate bridge. All three cut foam sections should be captured by the rails when in the proper position, eliminating the need for gluing or taping the sections together. This cutting method will provide a proper transition at the radius bottom of the miter.

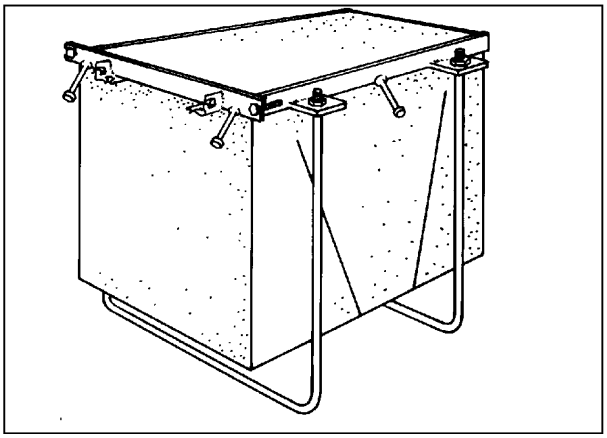


## T-Rails



A T-rail is typically used when an auxiliary run flows into the side of a main trench run. The T-rail can be inserted into the layout of a trench run at any point. It also utilizes the grate "bridge" for H-20 load carrying capability. The rail is four feet long and is used in conjunction with an opposing four foot rail (#1494) or another T-rail to create a crossing trench layout. Wherever possible, the intersecting form should be a minimum of six part numbers less than the main trench run. This will keep the intersection within the vertical sidewall of the main run and eliminate complex cuts. The leading edge of the intersecting run should be notched to fit under the rail of the main run. The notch is to be 1 3/4" deep and 1 1/4" long. (Factory assistance can be provided for more complicated layouts.)

## Catch Basins



Catch basins are installed by the same methods as the trench and are provided with deform grooves for easy removal. Pre-assemble the two foot long rails (#1492) with the appropriate no-float legs and insert the foam form as with the trench. Locate and install the end frames by aligning the clips with the punched rail ends and tapping the end rail until seated. In line catch basins (#1900 series) attach to trench sections in the same fashion as adjacent trench sections. When a large catch basin (#1600 series) is used as a termination point of a trench, be sure to install the special end rail with receiver clips on the upstream end of the catch basin. These clips are positioned to accept the downstream end of the trench rails.

Procedures for the anchoring slab and final concrete placement are the same as for the trench. Deforming of in line catch basins should be done last to facilitate access to the deep part of the catch basin. Stand alone catch basin forms should be removed starting at the center and working out toward the edges. The deform grooves will assist in releasing the form in large sections.

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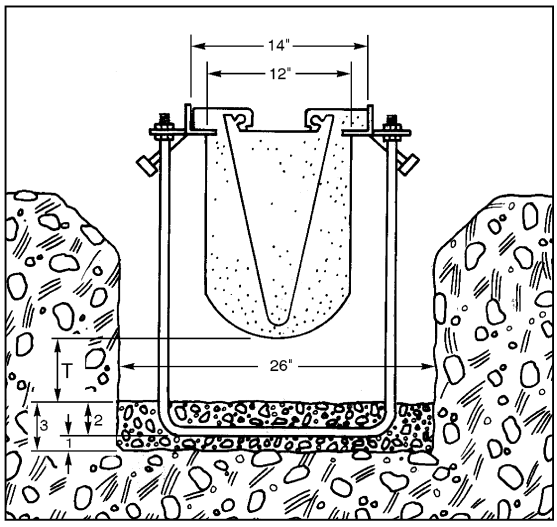
## Concrete Placement




T = Design thickness of slab design

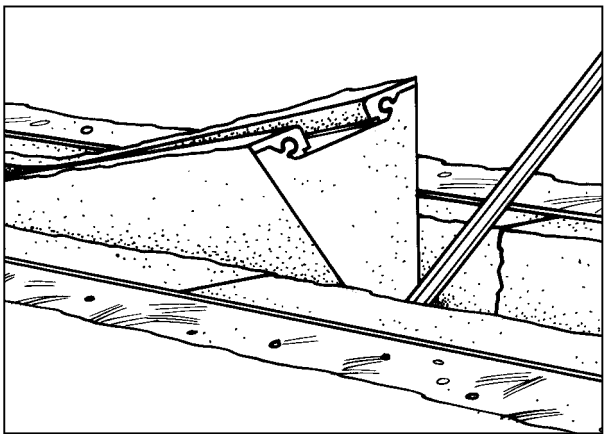
Pour an anchoring slab wall to wall in the bottom of the excavation. High slump or plasticizer enhanced concrete can be used to improve flowability. This concrete is not part of the structural slab. The slab should cover the no-float legs with two inches of concrete and should be the full length and width of the trench. Care should be taken to avoid chuting concrete against the Trench Former profiles as this can cause misalignment of the sections. Allow the anchoring slab to set hard. Note that the embedded no-float legs provide significant lateral stability. However, leaving some supporting lumber in place is desirable in order to eliminate lateral shift.

Concrete for trench bottom and sides can now be placed monolithically. Proper vibratory technique will assure a smooth trench wall finish and proper concrete support under the rails. If the no-float legs are properly anchored with an anchoring slab, the Trench Former is guaranteed not to float.

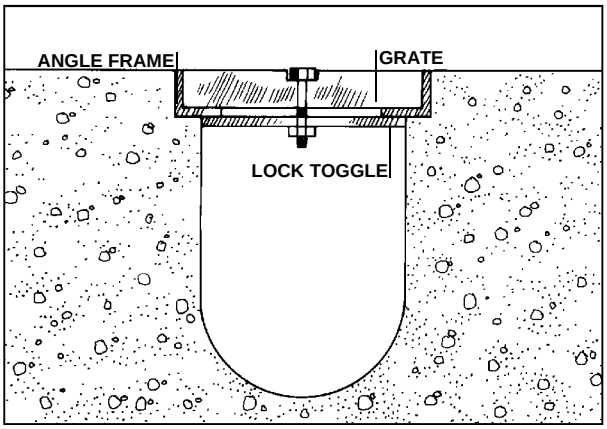
Cut and remove the cross ties. The top edge of the rails can be used as a screed point when finishing the adjacent concrete.

The concrete should set for 24 hours, but does not have to be fully cured before deforming.

## Deforming



Starting at the shallow end of the trench, plunge a large pry bar into the center of the form and pull towards you until the V-shaped section lifts free. Remove and discard this section. With a flat shovel or spade, remove the remaining side sections of the form.




Remove all the foam debris from the finished trench and install the gratings and locking devices.

NOTE: The Trench Former can be left in place until the trench is put in service. This will eliminate hazardous open pits onsite and will keep gratings clean until construction is completed. If fluids will be entering the trench during construction, deform the outlet end and open the masked end of the outlet pipe to avoid standing water.

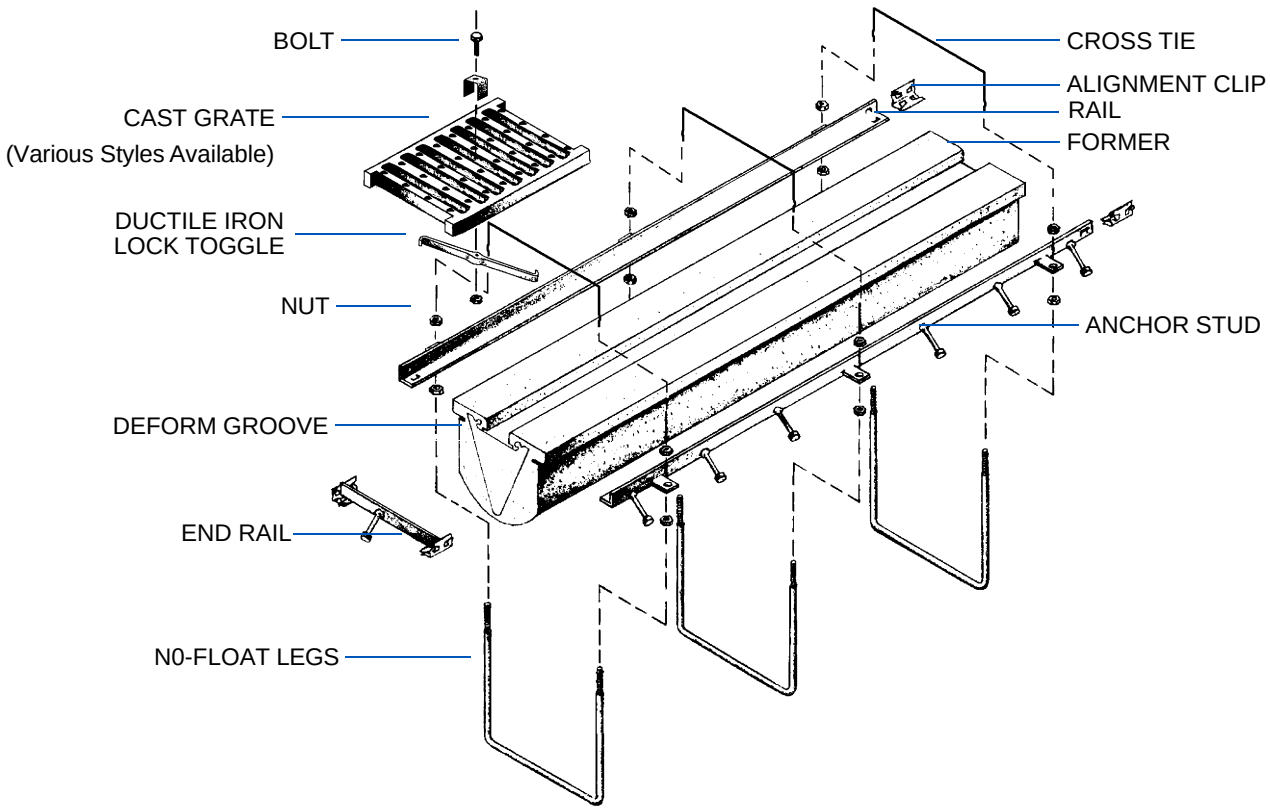
# TRENCH DRAIN COST BUILD-UP
# CAST-IN-PLACE vs TF-14

## Job size _____ lf

| ITEM | | CAST IN PLACE | TF-14 |
|---|---|---|---|
| **1. Excavation** | | | |
| a. Backhoe | _____ hrs @ $ _____ per hr | _____ | _____ |
| **2. Materials** | | | |
| a. 2” x 4” for handforming | _____ pcs @ $ _____ ea | _____ | NA |
| b. 5/8” plywood | _____ shts @ $ _____ ea | _____ | NA |
| c. 1 3/4” x 1 3/4” x 1/4” angle iron | _____ lf @ $ _____ per lf | _____ | NA |
| d. Waterstop, 4” x 3/16” ribbed w/bulb | _____ lf @ $ _____ per lf | _____ | NA |
| e. Concrete - in place, .074 cy/lf | _____ yds @ $ _____ per yd | _____ | _____ |
| f. Grates - _____ in wide | _____ lf @ $ _____ per lf | _____ | _____ |
| g. TF-14 System Complete | _____ lf @ $ _____ per hr | NA | _____ |
| h. 2” x 4” for suspending lumber | _____ pcs @ $ _____ ea | NA | _____ |
| **3. Labor - cast-in-place (rate = 50 lf/day)** | | | |
| a. Carpenters | _____ ppl x _____ hrs @ $ _____ per hr | _____ | NA |
| c. Laborers | _____ ppl x _____ hrs @ $ _____ per hr | _____ | NA |
| Form, hang rails, install waterstop, strip, set grates | | | |
| b. Finishers | _____ ppl x _____ hrs @ $ _____ per hr | _____ | NA |
| Patch and grout-in slope | | | |
| **4. Labor - TF-14 (rate = 320 lf/day)** | | | |
| a. Carpenters | _____1___ ppl x ___0.0__ hrs @ $ _____ per hr | _____ | NA |
| c. Laborers | _____1___ ppl x ___0.0__ hrs @ $ _____ per hr | _____ | NA |
| Assemble and set forming system, strip | | | |
| **TOTALS** | | **$** _____ | **$** _____ |
| | **Savings with TF-14** | | **$** _____ |

## NOTES

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




## TF -14 COMPONENTS



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