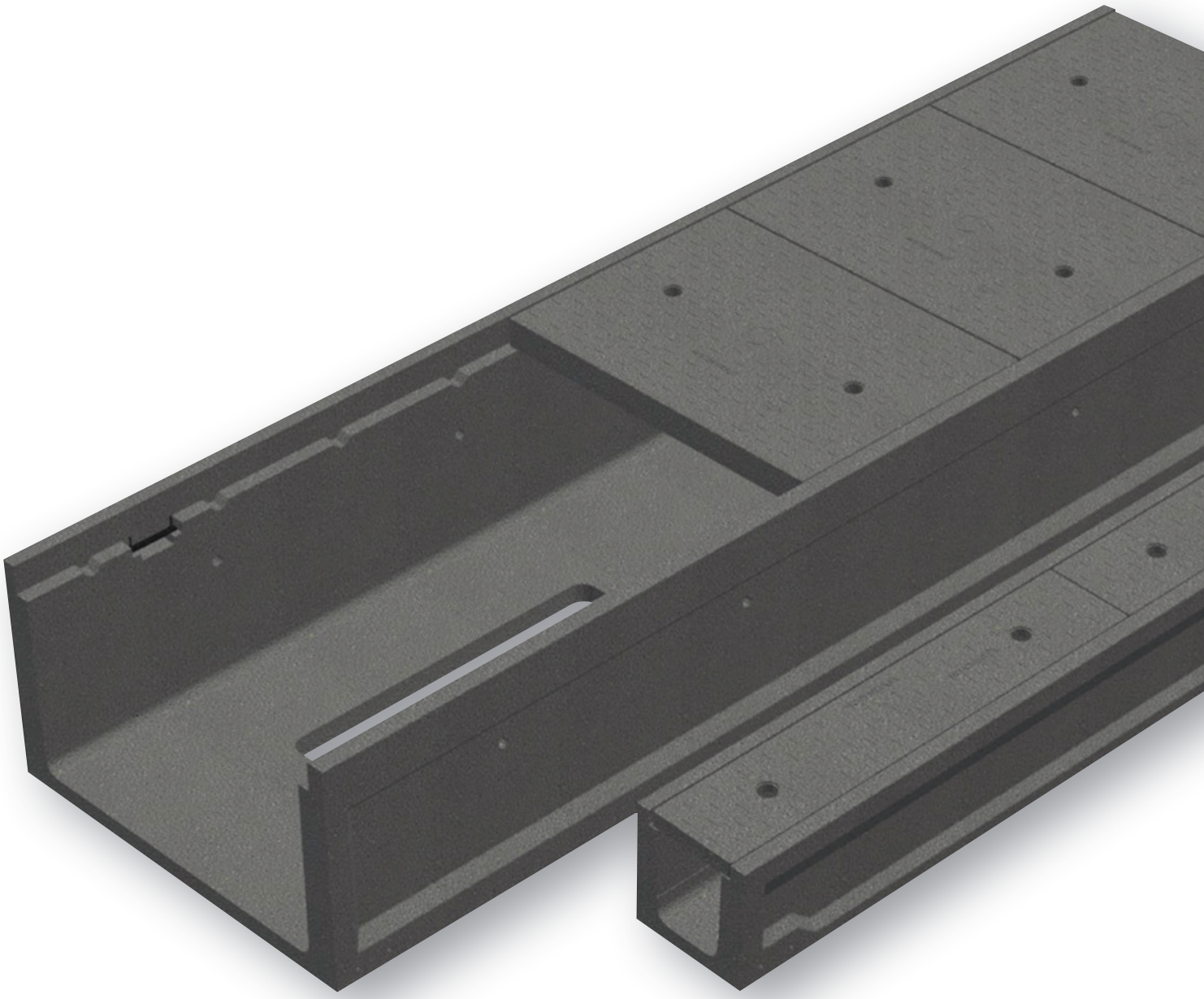
Plastibeton®

Installation Guide



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This Installation Guide provides preparation and installation requirements for the Plastibeton® products manufactured by Oldcastle Infrastructure. The Plastibeton® technology and design are proprietary to Oldcastle Infrastructure and this installation manual should not be used for any other products. For additional guidance, please review our installation video: https://youtu.be/Ajzr02n8ajI

If your project has a layout and plans supplied by Oldcastle Infrastructure it shall be referred to while using this Installation Manual. Any questions regarding installation of this product should be directed to a Plastibeton® technical support member at 888-868-5214 or email the address below.

1. Preparation and Setup

1.1. Equipment Required

- Back Hoe
- Nylon Slings with Hooks
- Shovels
- Tape Measure 16'/100'
- Wrecking Bar
- Sledge Hammer
- Cord Line
- Line Level
- Job site PPE, which may include hardhats, eye protection, high visibility vest, cut proof gloves, safety shoes, and/or any other site-specific personal protective equipment

1.2. Offloading and Storage

Trench, covers, and accessories are typically delivered by flatbed truck and offloaded with a fork loader. Trench will be bundled together with metal banding and delivered on wood blocks. Pay careful attention to how the trench are bundled. Ensure both forks align under the same bundle and are not split between two bundles or trench could be pushed off the bed. Carefully and evenly lift one bundle at a time. Covers and accessories are delivered on skids. Smaller items and hardware are packaged inside the leveling block skids. Store all product on solid, flat ground, and do not stack anything higher than how it arrives on the truck.

Typical flatbed delivery

Align fork loader carefully - lift one bundle at a time

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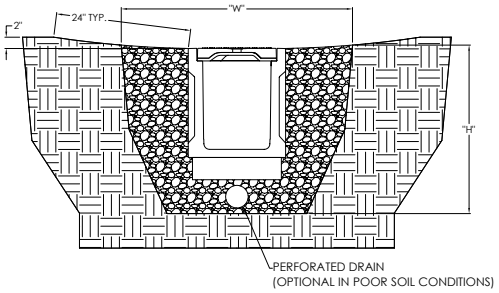
1.3. Trench Excavation

The customer is responsible for excavation of the trench area and disposal of all excavated material. Excavate the trench area with a back hoe using the chart to the right for minimum recommended dimensions.

MODEL	WIDTH	HEIGHT	WEIGHT
68	36”	18”	402
128	45”	18”	595
1216	45”	27”	920
2012	50”	24”	922
2016	50”	27”	1030
3012	60”	24”	1260
3016	60”	27”	1400
4016	70”	27”	1535

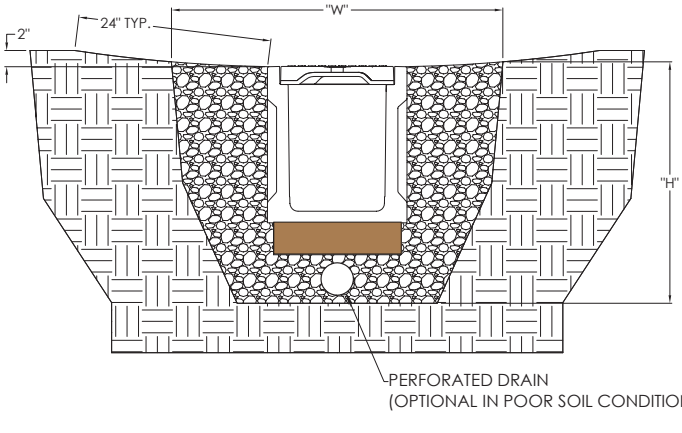
1.4. Bed Preparation

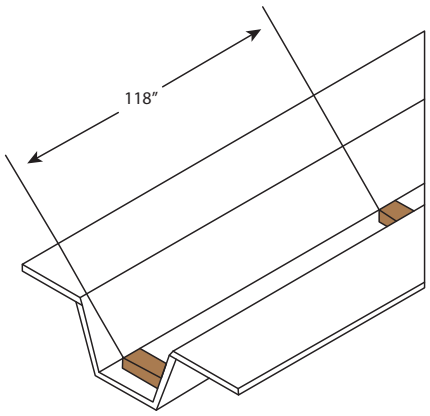
Install a layer of firmly compacted stone 6” thick to bring the side walls of the channel to stand 2” below the final finished grade level. Base material recommendations include 1/4” to 3/4” crushed stone, CLSM (Flowable Fill), or other. If CLSM is utilized as a base, the excavation width can be reduced to the trench width plus 4” inches on each side, minimum. In poor soil conditions, a perforated drain is recommended below the trench. Exact base preparation should always be determined by a project engineer based on the site soil conditions, materials, and traffic loads at the installed location. An example installation detail is shown to the right.



1.5. Leveling

Using a transit or cord line with a line level, prepare a line grade. Set the leveling blocks every 9’-10” (118”) and at every joint for smaller pieces. Fill and compact the top of the leveling blocks to the top of the stone. The entire trench must be fully supported by stone. (no span or gap from block to block) The top of the leveling blocks should be set to the height shown on the chart above.





1.6. Place geotextile fabric at all joints, placed over the leveling blocks up to grade on both sides.

1.7. For your safety and to ensure expected product performance, contact Oldcastle Infrastructure for repair guidance if damage occurs during the installation process.

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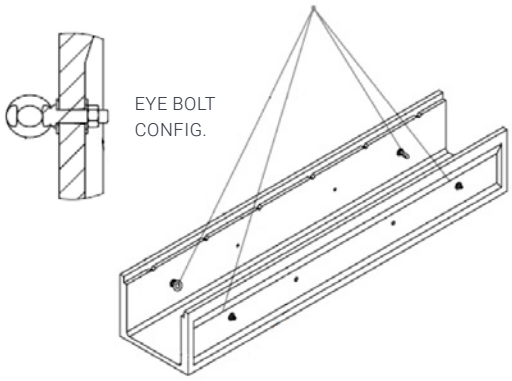
2. Handling and Installation

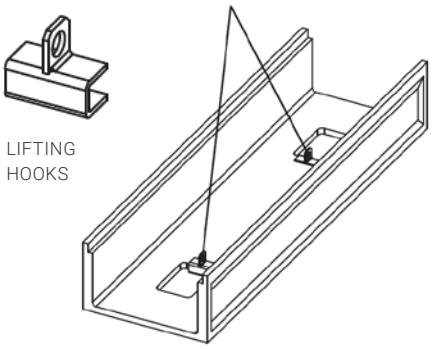
2.1. Harness Connection

Using mechanized equipment and a lifting harness or slings. Channels can be attached to the harness or slings at the bottom of the body (using lifting hooks as the lifting device) or the side walls (using eye bolt configuration as the lifting device). Eye bolts are the preferred method. The Lifting Hooks should only be used when trench configurations or accessories do not allow access for Eye Bolts.

Preferred Method: Eye Bolt



Alternate Method: Lifting Hooks



2.2. Eye Bolt Configuration Detail

1. Shoulder Nut Eye Bolt

2. Insert first flat washer

3. Insert eye bolt with eye toward inside of channel

4. Insert second flat washer

5. Install nut

6. Adjust the angle of the lifting device

IMPORTANT SAFETY INFORMATION

Proper configuration is required for safety. Loads may slip or fall if proper hook or eye bolt connection, and lifting procedures are not followed. A falling load can seriously injure or kill. Read, understand, and follow information in diagrams and charts before using eye bolt assemblies.

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2.3. Lifting and Placement

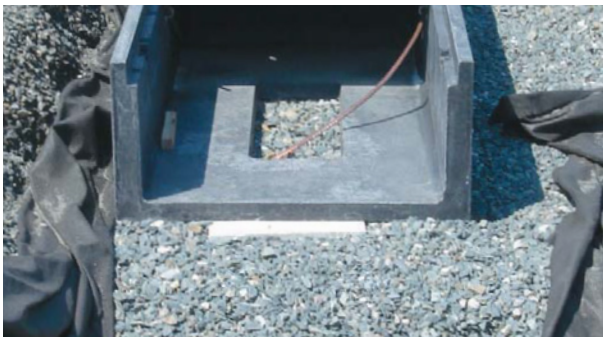
Once harness is secured, lift and set the channels in place. If applicable, use supplied plastic caps to plug eyebolt lifting holes.

Bottom Lift

Side Wall Lift

2.4. Setting the Channels

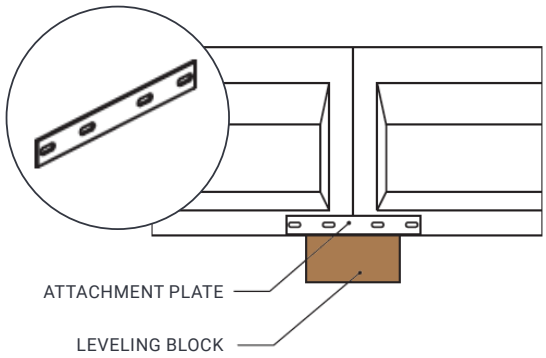
Set the channels on the leveling blocks so that each joint is supported by a minimum of 4” and that the channel top sits 2” below the final grade.

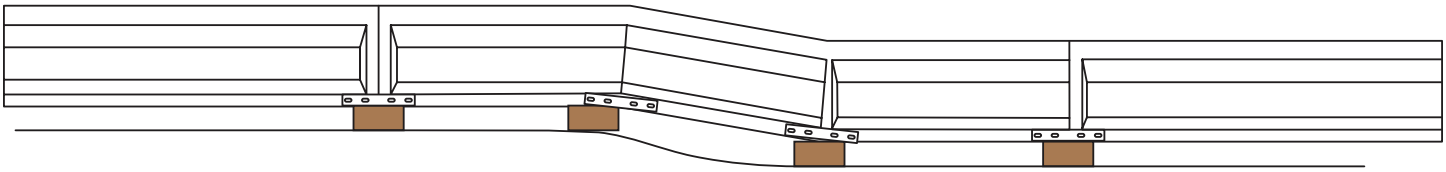


2.5. Aligning and Connecting Channel Sections

The channels are butted-joined to each other. At each joint, the channel is supported by the leveling block an equal amount on each channel section. Channel sections can be connected using optional attachment plates. See configuration examples. When lining up your connections, it is recommended to set each channel from a center line.

NOTE: Trench supports may be required at certain transitions. Project drawings should always be reviewed. Contact customer service if your drawing was not included.





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3. Backfilling

3.1. Once the channels are in place, finish tamping the earth against the channel side walls with finish stone. 1/2" to 3/4" crushed stone is recommended. Asphalt and concrete aprons can also be used around the trench if the site requires (following construction best practices, e.g. use of expansion joints). Exact backfill material should always be determined by a project engineer based on the site soil conditions and traffic loads at the installed location. Back filling is done simultaneously on both sides of the channel in successive layers of 8" and compacted.

4. Covers

4.1. Cover Support Installation

Materials and Tools

- (4) 3/8" x 2-1/4" wedge anchors with bolts
- Drill with a 3/8" carbide or diamond drill bit
- Trench Cover Support
- Hammer

Step 1: Center the support, making sure it's flush with the trench cover sitting area. The following procedure will ensure the wedge anchors will fit perfectly in their holes. (figure 1)

Step 2: Use a 3/8" carbide or diamond drill bit to drill approx. 1-1/8" deep in one of the top holes of the support. (Left or Right) (figure 2)

Step 3: Insert a 3/8" x 2-1/4" wedge anchor in the drilled hole. (figure 3)

Step 4: After installing the washer and nut, hammer the wedge anchor in place. (figure 4)
NOTE: the wedge anchor may go through the wall and this is OK.

Step 5: Repeat steps 2-4 for the second top hole.

Step 6: Use a 3/8" carbide or diamond drill bit to drill through the bottom holes of the support. (figure 5)

Step 7: Insert a 3/8" x 2-1/4" wedge anchor in the drilled hole. After installing the washer and nut, hammer the wedge anchor in place. (figure 6)

Step 8: Tighten the nuts on all wedge anchors.

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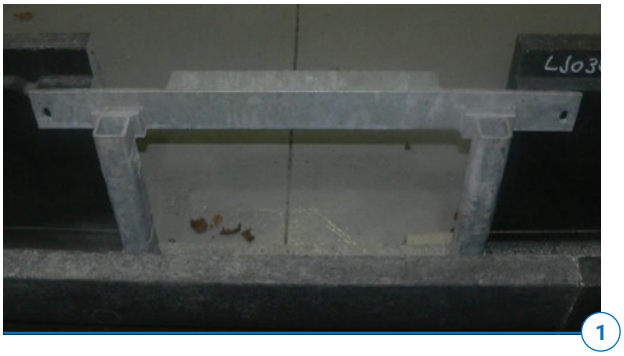

1


2


3

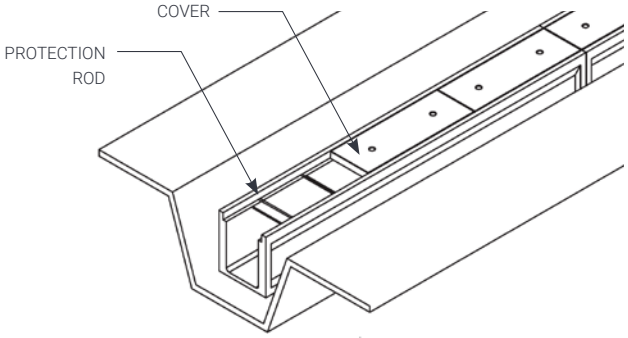

4


5


6

4.2. Protection Rods and Covers

Install (optional) protection rods. Using cover lifting hooks or chain lift technique, cover channels with HDPC covers. Covers should never overlap a trench seam. Plug lifting holes with provided plastic caps.

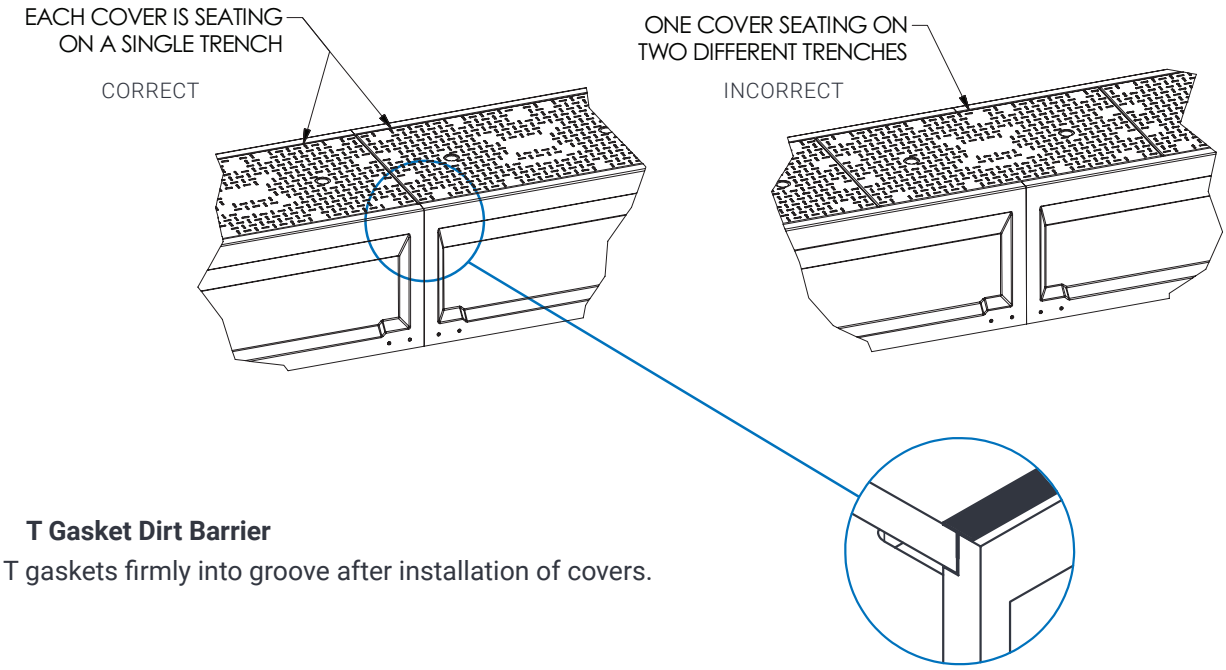


Two-person cover lift with lifting hooks

Cover lift with chains and forklift

4.3. Proper Cover Installation

Each cover should be situated on a single trench frame. Covers should not overlap two different trenches.



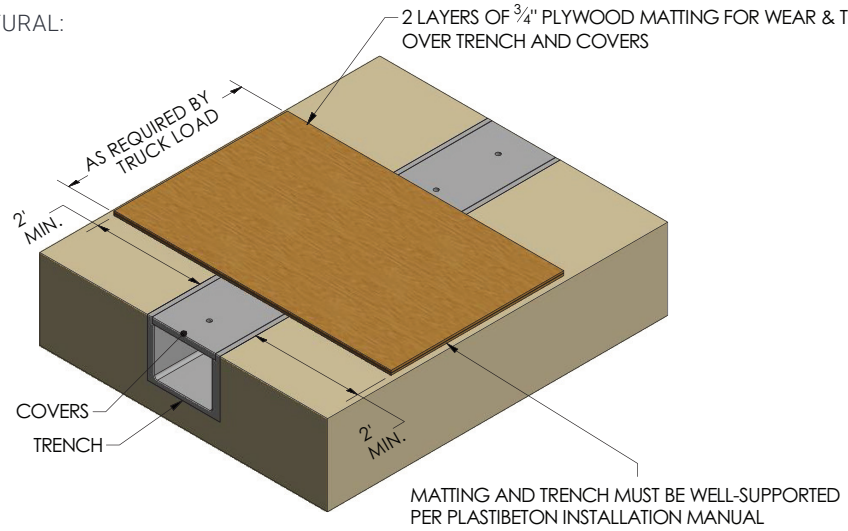
4.4. T Gasket Dirt Barrier

Press T gaskets firmly into groove after installation of covers.

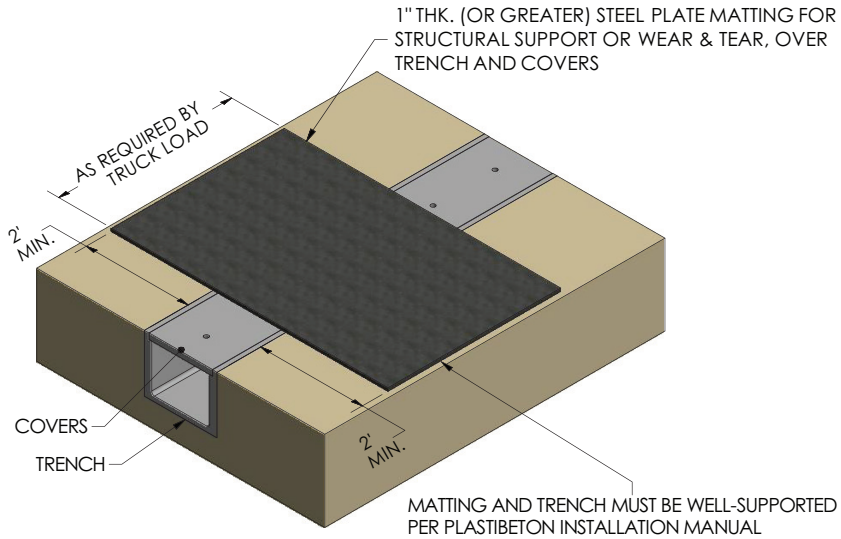
4.5. Additional Trench Protection

In temporary cases of repetitive traffic or special vehicle loads, matting must be placed over the trench for additional protection. Special Vehicle loads are defined as any vehicle loading that exceeds AASHTO H & HS Design Vehicles e.g., large excavators, wheel loaders, cranes, etc. whose axle load or wheel bearing pressure surpasses AASHTO live load design limits. The following "structural" load distribution diagram is provided to mitigate the impact of these high-load vehicles. Other methods and materials may be used based on site-specific soil conditions, trench orientation, vehicle loads, etc. **NOTE:** the protective matting must be installed such that the trench is not exposed to excessive loading during the installation.

NON-STRUCTURAL:



STRUCTURAL:



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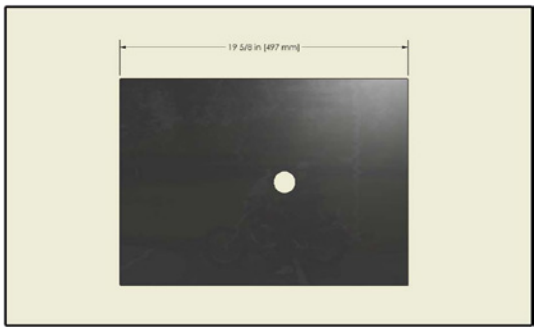
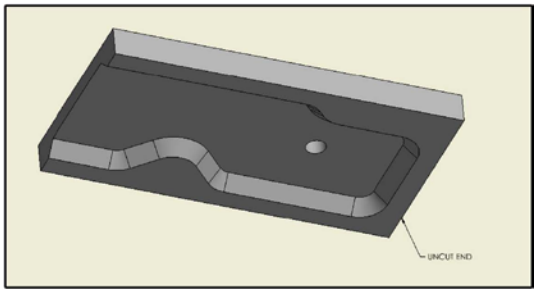
5. Cover Cut Parameters

5.1. All Covers, General Requirements

Shortest nominal / center length of cover is half of the nominal length. See table below. Valid for straight and angle cut.

COVER MODEL	SHORTEST CENTER LENGTH
C6	19-5/8” [497 mm]
C12	19-5/8” [497 mm]
C20	19-5/8” [497 mm]
C30	11-5/8” [297 mm]
C40	11-5/8” [297 mm]



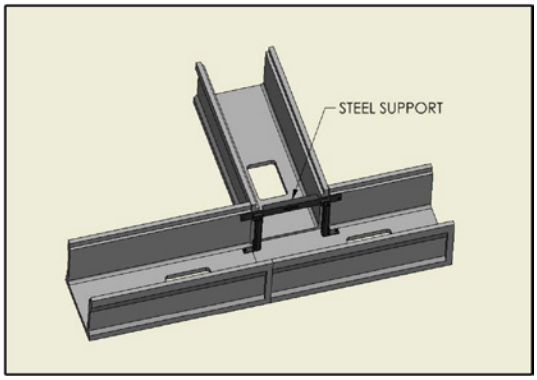


Where possible, cuts and trench intersections should be limited. Contact Oldcastle to develop an optimized layout of the trench

Only cut at 1 end of the cover, not at both, to keep one of both end intact.

All “T” configurations need steel support, except for the C6/ trench 68 model.

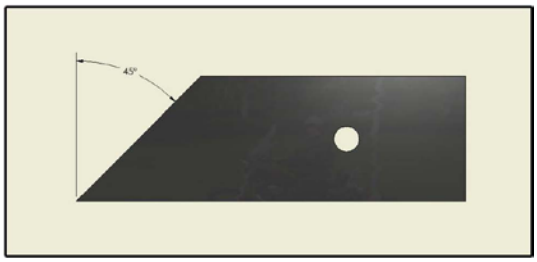
(Typical “T” configuration, 2016 trench model shown)



5.2. Cover Model C6, for 68 Trench Model

No additional requirement for straight cuts.

Cover can be cut at all angle, up to 45°, without the need of a steel support.



Consult with Oldcastle Infrastructure if an angle above 45° is required.

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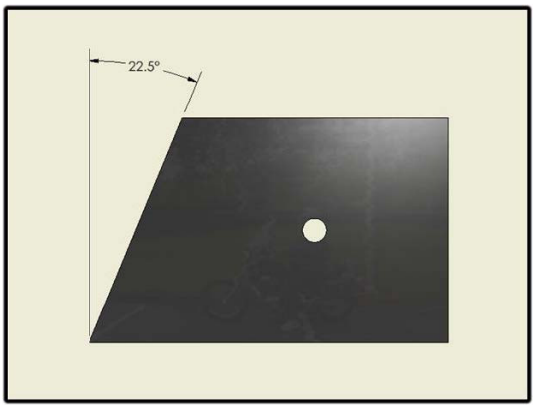
5.3. Cover Model C12 and C20, for Trench Model 128, 1216, 2012 and 2016

No additional requirement for straight cuts.

Cover can be cut at an angle up to 22.5°, without the need of a steel support for C12 covers.

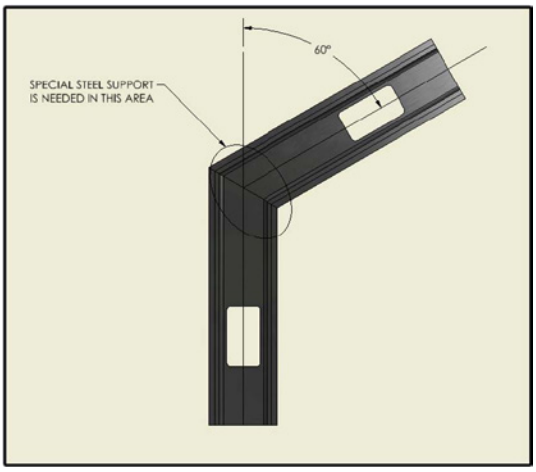
(22.5° cut on a C12 cover shown)



Cover can be cut at an angle up to 7.5 (degree symbol), without the need of a steel support for C20 covers.

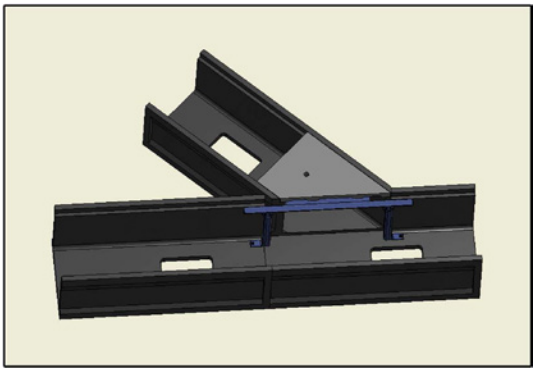
Unless stated above, a special steel support is required for cut angled covers.

(Example of a layout that would require a special steel support)

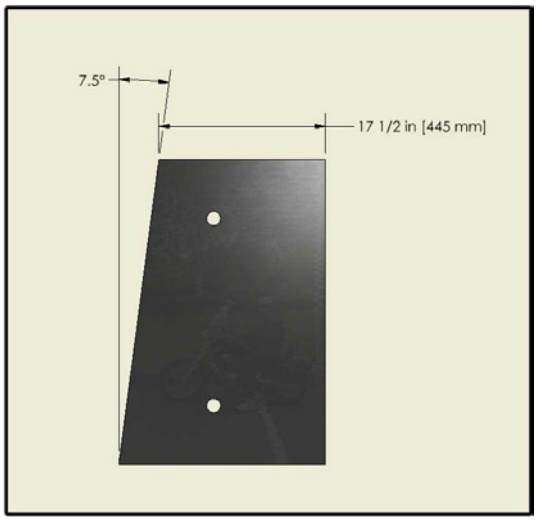


In the "T45" configuration use a standard steel support as specified on the standard deviation BOM and an angled steel cover. Consult with Oldcastle Infrastructure for alternatives.

("T45" deviation, 2016 model. Steel support in blue.)



5.4. Cover Model C30, for Trench Model 3012 and 3016



For straight cuts, we do not recommend cutting between the values below. In these areas, steel rebar are present, making the cutting step more complex.

- 15-5/8” and 17-3/8” [398 mm and 443 mm]
- 21-7/8” up to full length [557 mm and longer]

Cover can be cut at an angle up to 7.5°, without the need of a steel support. Shortest edge must be at least 17-1/2” [445 mm] long.

(7.5° cut on a C30 cover shown)

Unless stated above, a special steel support is required for cut angled covers.

(Example of a layout that would require a special steel support)

For a trench deviation of 45° exactly, resulting in cut cover with an angle of 22.5°, a standard steel support is available. Please see on the specific drawings.

A cut cover at 45°, in the “T45” configuration use a standard steel support as specified on the standard deviation BOM.

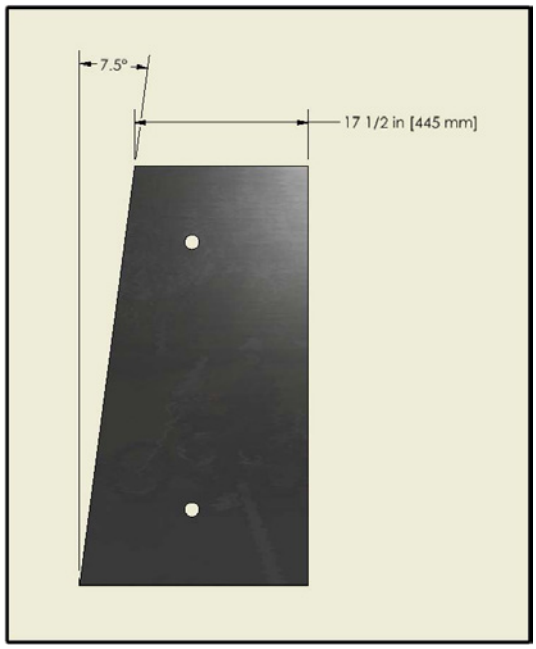
5.5. Cover Model C40, for 4016 Trench Model

For straight cuts, we do not recommend cutting between the values below. In these areas, steel rebar are present, making the cutting step more complex.

- 14-1/2” and 16-3/4” [370 mm and 425 mm]
- 20-7/8” up to full length [530 mm and longer]

Cover can be cut at an angle up to 7.5°, without the need of a steel support. Shortest edge must be at least 17-1/2” [445 mm] long.

(7.5° cut on a C40 cover shown)



Unless stated above, a special steel support is required for cut angled covers.

(Example of a layout that would require a special steel support. Trench 3012 is shown, but this apply to 4016 trench model)

For a trench deviation of 45° exactly, resulting in cut cover with an angle of 22.5°, a standard steel support is available. Please see on the specific drawings.

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6. Trench Body Cut Parameters

6.1. All Trench Models, General Requirements

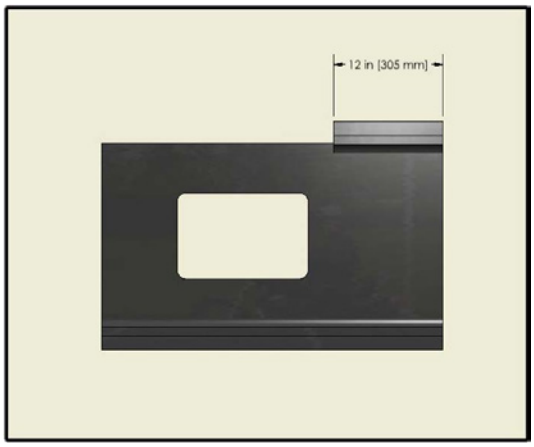
Recommended Tool: Saw with a carbide or diamond tipped blade.

Shortest nominal / center length of 23-5/8” [600 mm].

(Shortest nominal length)

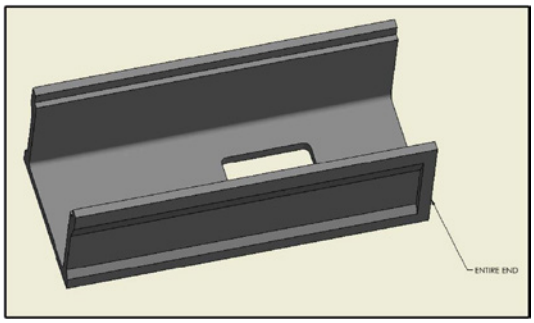
Shortest single wall length of 12” [305 mm].

(Shortest single wall length)



Whenever possible, only cut at 1 end of the trenches, not at both, to keep one of both end entire.

(Cut at 1 end only, not both)



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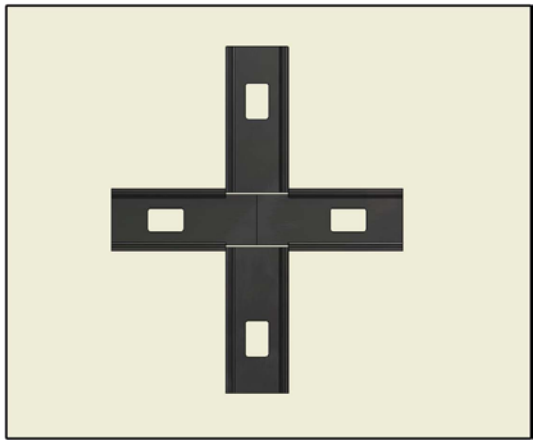
6.2. All Trench Models, “Door” Cuts

When a door is aligned with the cable exit opening in the bottom of the trench, a minimum distance of 6” [152 mm] is required between the end of the trench and the cable exit opening.
(Minimum distance)

On a trench with a door cut, if the end of the trench pass thru the cable exit opening in the bottom of the trench, maximum length of 6” [152 mm] is acceptable between the end of the trench and the cable exit opening.
(Maximum length)

For Four-way / cross trench connection, cut the doors on both side of trenches.

(Typical Four-ways / cross connection. Steel support are required but not shown for clarity.)



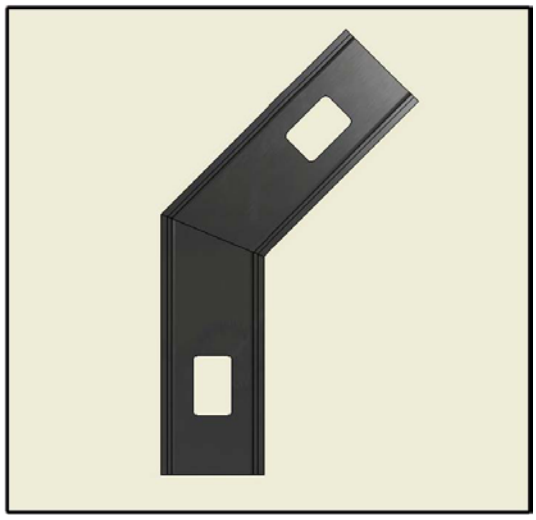
6.3. All Trench Models, Angle Cuts

Both trenches should be cut to result in a perfect fit.

(Typical angle deviation)

On 1 trench, the maximum cut angle is 45°. Consult factory for any situation require angle above 45°.

(Maximum angle cut on a trench)

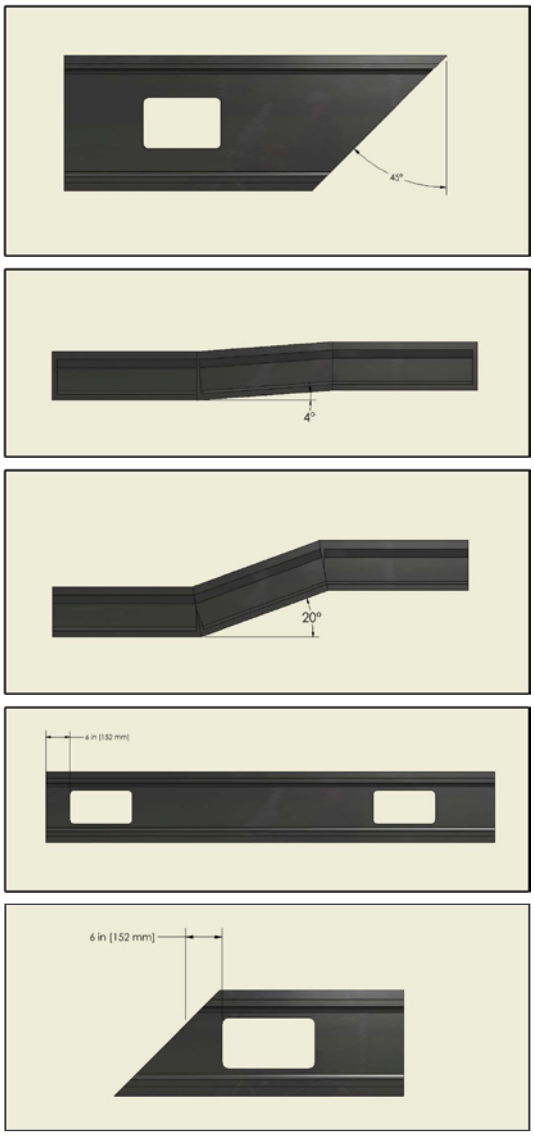


6.4. All Trench Models, Vertical Deviation

Typically, up to 5° of vertical deviation, only 1 trench is cut. A small offset is resulting from that under the trench but is relatively small so trenches can be installed without issue. Above 5° of vertical deviation, both connecting trenches should be cut, resulting in a perfect fit.

(Typical vertical deviation, side view, only the trench in the middle is cut at 4° angle, both ends)

(Typical vertical deviation, side view, all the 3 trenches are cut with a 10° angle)



6.5. 68 Trench Models

No additional specific cut parameter.

6.6. 128 and 1216 Trench Models

For straight and angle cuts, a minimum distance of 6” [152 mm] is required between the end of the trench and the cable exit opening.

(Minimum distance between end of trench and cable exit opening - Straight cut)

(Minimum distance between end of trench and cable exit opening – Angle cut)

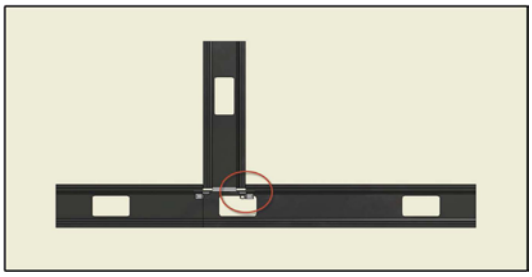
For straight and angle cuts, where cuts pass thru the cable exit opening, the maximum distance between the end of the trench and the end of the opening is 12” [228 mm].

(Maximum distance between end of trench and end of cable exit opening – Straight cut)

(Maximum distance between end of trench and end of cable exit opening – Angle cut)

For doors cuts, care should be taken to avoid having a steel support leg aligned with cable exit opening in the bottom, resulting in improper steel support rest.

(Example of a situation to avoid. The steel support is not properly resting on the trench bottom)



6.7. 012, 2016, 3012 and 3016 Trench Models

No additional specific cut parameter.

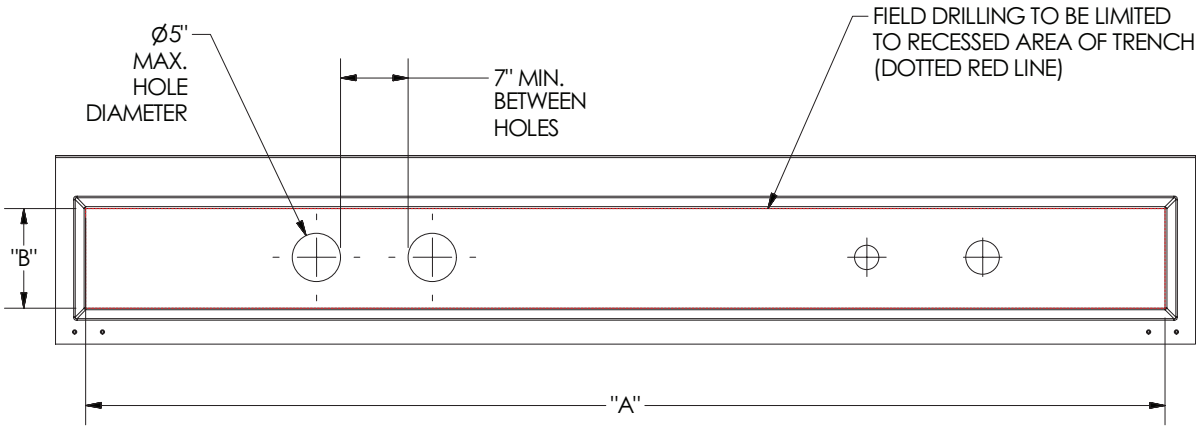
7. Field Drilling

7.1. The sidewall area should not be reduced more than 100 SQ.IN.

7.2. Oldcastle Infrastructure Engineering should be consulted for field modifications that do not conform with this document.

7.3. Recommended Tool: Drill with a carbide or diamond drill or boring bit.

MODEL	A	B
68	112 3/8”	4 3/8”
128	111 1/2”	2 3/16”
1216	112”	10 1/4”
2012	110 7/8”	5 1/16”
2016	111 3/4”	9 1/4”
3012	110 7/8”	5 9/16”
3016	111 3/4”	10 5/16”
4016	111 3/4”	8 1/8”



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8. End Plate Installation

8.1. Materials and Tools

- (4) 1/4" x 2-1/4" wedge anchors with washers and nuts
- Hammer Drill with a 1/4" carbide or diamond drill bit
- Pneumatic Impact Wrench
- (1) End Plate
- Hammer
- (1) Fire Plate

8.2. Procedure

Step 1: Square the end plate vis-a-vis the place where it should be installed.

Step 2: Drill the end plate and the trench in the four predetermined locations.

Step 3: Insert the anchors into the holes and firmly press them with a hammer.

Step 4: Tighten the nuts using a pneumatic impact wrench.


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9. Fire Stop Installation

9.1. Materials and Tools

- (4) Washers 1/2”
- (4) Washers 1”
- (4) Zamacs 3/4”
- (2) Unistrut
- (1) Fire Plate
- Circular saw with Diamond Blade
- Hammer Drill with a 1/4” carbide or diamond drill bit
- Pneumatic Hammer

9.2. Procedure

Step 1: Install Unistrut (figure 1)

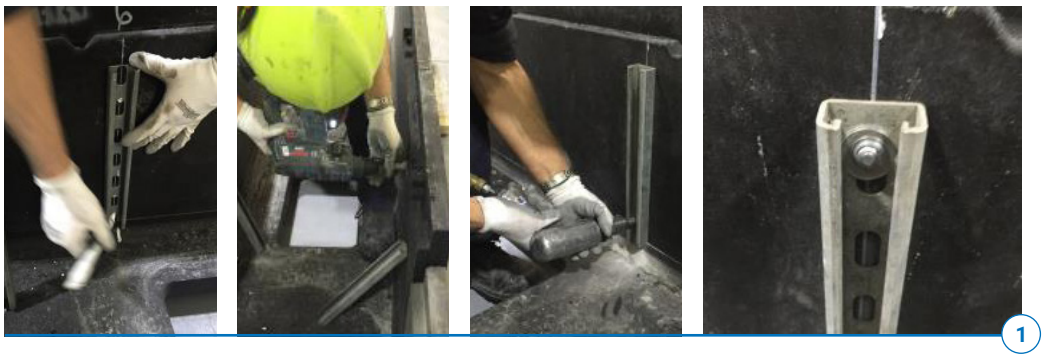
a. Place Unistrut perpendicular to the trench in the desired location.

b. Drill holes 3/4” deep to insert the Zamacs.

c. Drive Zamacs using a pneumatic hammer.

Step 2: Cut the fire stop according to the cables present in the trench.

Step 3: Insert the fire stop in the Unistrut. (figure 2)



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10. Divider Installation

Dividers are 59 inch [1500 mm] standard lengths. Two dividers are used to fully separate the 118 inch [3000 mm] Plastibeton® Trench. Refer to the following table for typical divider heights and maximum quantity per trench model.

Trench Model	Divider Height inch [mm]	Max Rows Per Trench
T68	6 [150]	1
T128	6 [150]	2
T1216	12 [300]	2
T2012	9 [225]	5
T2016	12 [300]	5
T3012	9 [225]	7
T3016	12 [300]	7
T4016	12 [300]	10

10.1. Materials and Tools

- (8) Zamac (Nail Drive Anchor)
- (2) Plastibeton®
- Divider
- Hammer Drill with a ¼" carbide or diamond drill bit
- Hammer

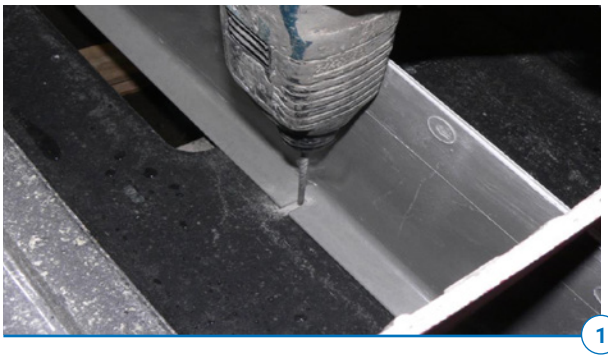
10.2. Procedure

Step 1: Place Divider in desired location.

Step 2: Using the divider as a template, drill four holes in the anchoring slot locations. Drill approximately 1" deep, taking care not to go through the trench bottom. (figure 1)

Step 3: Insert the Zamac anchor into the hole and hammer until flush. (figure 2)

Step 4: Repeat anchoring in four places to fully secure each divider.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