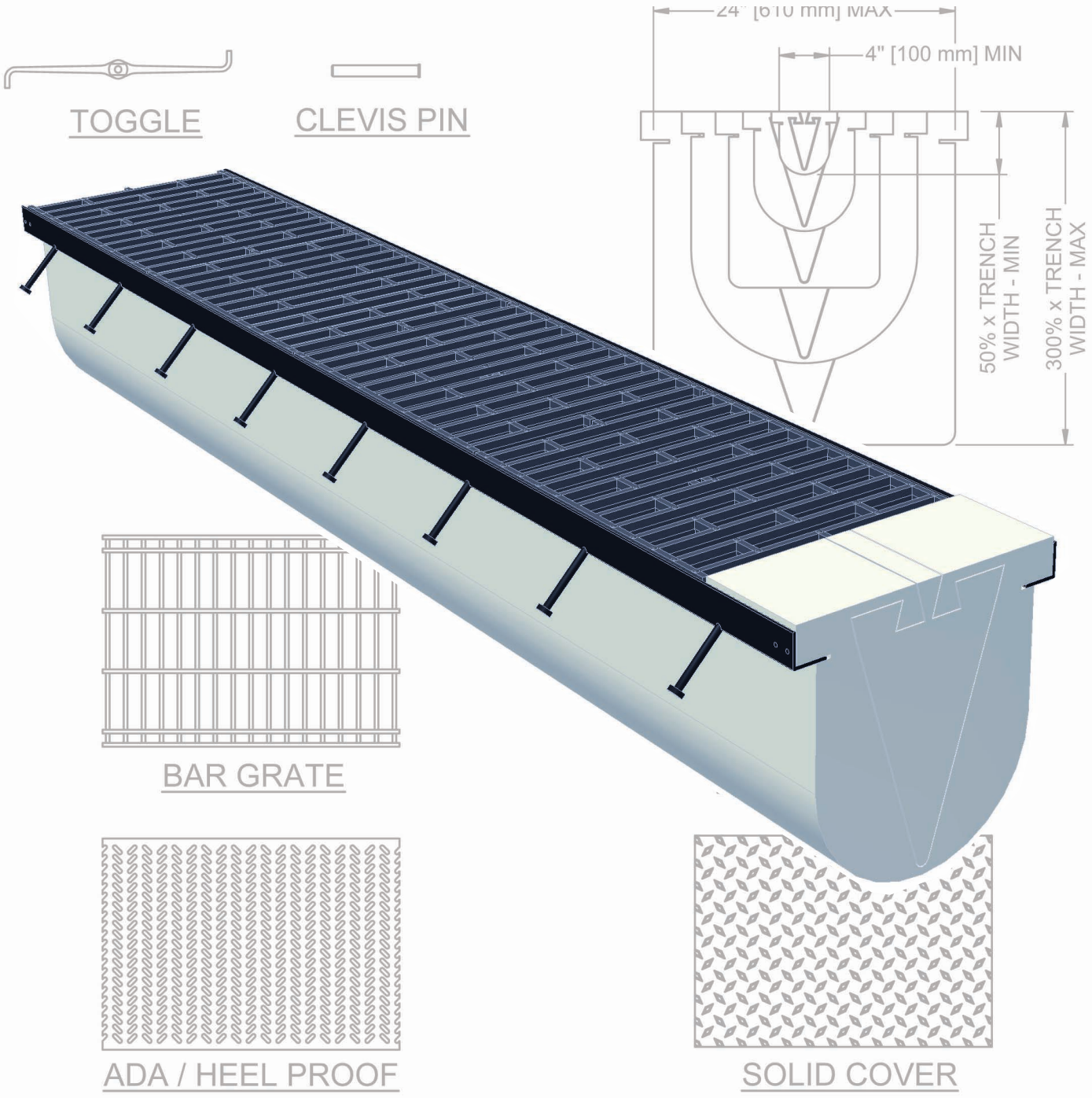
# Trench Former® TFX

## Pre-Engineered Concrete Forming System




ABT, INC.®

**Advanced Building Technologies**

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Today's Hydraulic Solutions

# Trench Former TFX

TFX is the pre-engineered concrete forming system which allows the designer or customer to select the trench width, depth, shape and slope as the hydraulic capacity or cross section area requires, and not from a limited product selection. It also creates a sound base for trench coating if concrete's chemical resistance is insufficient.

## Product Features:

**Formers -** Manufactured from expanded polystyrene (EPS), the light-weight and environmentally sound disposable formers create a high precision monolithic trench. Shape may be either flat or round bottom, whichever shape is best for the application. A full range of outlet options exist.

**Grate Options -** A wide range of grate and cover options exist for pedestrian to airport applications. Select the right strength, style, and corrosion resistance for the application.

**Frame Options -** Stainless steel, painted steel, galvanized steel, and FRP styles are available. Select the best rail material for your application. Rail size is determined by trench width and the specified traffic loads. All rails are independently anchored into the surrounding concrete for maximum service life.

**Grate Retention Systems -** For applications with substantial horizontal loads, pin locks are available and recommended. Toggle locks can be used when horizontal loads are low. No grate lock is an option where both horizontal loads and grate retention are not a consideration. ABT can assist you in making a suitable selection.

**Ease of Installation -** The system is installed by the suspension method using no-float legs. Installing the system does not require heavy equipment, expensive highly-skilled labor, keyways, or water stops saving 33% or more. Installed per instructions, the system will not float. Contact ABT for alternative methods.

**Eliminates Sub-Slab Barrier Penetration -** Geo-membrane penetrations during trench drain installation and monolithic pours are eliminated using no-float legs and anchor slab.

## Design Chart Instructions:

**Utility Trench -** Select from the table below the trench cross section area or width and depth sufficient to contain the application's wire or pipes for each run. Select materials and the style of cover desired.

**Containment or Storage Trench -** Lay out the length of trench for the site. Determine the maximum storage volume required for this trench run. Divide volume storage by trench length. In "Trench Storage Capacity" below, find the trench widths and depths that provide sufficient storage and select the one that is best for the application.

**Drainage Trench -** Simple drainage systems can be determined if the application's run length and hydraulic load are known. In the "Run Length vs. Slope" table, select width and slope whose run length equals or exceeds the required length. Add or subtract any site slope to the channel slope. Determine what trench width is required for this hydraulic load using the "Flat Site Flow" table below. Additional technical information is available in the "Hydraulic Design Guide" at www.abtdrains.com. For more complex hydraulic applications, contact ABT for assistance.

# Flat Site Flow Capacity at Maximum Channel Depth

| Invert Slope | 4 Inch | | | 8 Inch | | | 12 Inch | | |
|---|---|---|---|---|---|---|---|---|---|
| | GPM | CFS | FPS | GPM | CFS | FPS | GPM | CFS | FPS |
| 0.5% | 295 | 0.66 | 2.2 | 1,921 | 4.28 | 3.6 | 5,711 | 12.7 | 4.7 |
| 1.0% | 417 | 0.93 | 3.2 | 2,717 | 6.05 | 5.0 | 8,076 | 18.0 | 6.6 |
| 1.5% | 511 | 1.14 | 3.9 | 3,327 | 7.41 | 6.2 | 9,891 | 22.0 | 8.1 |
| 2.0% | 590 | 1.31 | 4.5 | 3,842 | 8.56 | 7.1 | 11,421 | 25.4 | 9.3 |
| 4.0% | 834 | 1.86 | 6.3 | 5,433 | 12.10 | 10.1 | 16,152 | 36.0 | 13 |
| 8.0% | 1,180 | 2.63 | 9.0 | 7,684 | 17.1 | 14 | 22,843 | 50.9 | 19 |
| 20% | 1,865 | 4.16 | 14 | 12,149 | 27.1 | 23 | 36,118 | 80.5 | 30 |
| 40% | 2,638 | 5.88 | 20 | 17,181 | 38.3 | 32 | 51,078 | 114 | 42 |

| Invert Slope | 18 Inch | | | 21 Inch | | | 24 Inch | | |
|---|---|---|---|---|---|---|---|---|---|
| | GPM | CFS | FPS | GPM | CFS | FPS | GPM | CFS | FPS |
| 0.5% | 12,755 | 28.4 | 6.0 | 17,249 | 38.4 | 6.5 | 22,501 | 50.1 | 7.1 |
| 1.0% | 18,038 | 40.2 | 8.4 | 24,394 | 54.4 | 9.3 | 31,821 | 70.9 | 10.0 |
| 1.5% | 22,092 | 49.2 | 10 | 29,876 | 66.6 | 11 | 38,972 | 86.8 | 12 |
| 2.0% | 25,510 | 56.8 | 12 | 34,498 | 76.9 | 13 | 45,001 | 100 | 14 |
| 4.0% | 36,077 | 80.4 | 17 | 48,788 | 108.7 | 19 | 63,642 | 142 | 20 |
| 8.0% | 51,020 | 114 | 24 | 68,997 | 154 | 26 | 90,003 | 201 | 28 |
| 20% | 80,670 | 180 | 38 | 109,093 | 243 | 41 | 142,307 | 317 | 45 |
| 40% | 114,085 | 254 | 53 | 154,281 | 344 | 59 | 201,252 | 448 | 63 |

Note: Basis is channel flowing full, no site slope, full radius channel bottom, Manning's roughness coefficient of 0.013, no flow in grate area, and rail size ranging from 1" to 3" proportional to trench width.






# Run Length vs. Width & Slope

| Channel Slope | 4" W x (2→12)" D | | 8" W x (4→24)" D | | 12" W x (6→36)" D | | 18" W x (6→42)" D | | 24" W x (6→48)" D | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Max Run Length | | Max Run Length | | Max Run Length | | Max Run Length | | Max Run Length | |
| | Feet | Meters | Feet | Meters | Feet | Meters | Feet | Meters | Feet | Meters |
| 0.0% | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |
| 0.5% | 164 | 50 | 328 | 100 | 492 | 150 | 558 | 170 | 689 | 210 |
| 1.0% | 82.0 | 25 | 164 | 50.0 | 246 | 75.0 | 279 | 85.0 | 344 | 105 |
| 2.0% | 41.0 | 12.5 | 82 | 25.0 | 123 | 37.5 | 139 | 42.5 | 172 | 52.5 |
| 4.0% | 21.3 | 6.5 | 41 | 12.5 | 62 | 19.0 | 71 | 21.5 | 87 | 26.5 |
| 8.0% | 9.84 | 3.0 | 21 | 6.5 | 31 | 9.5 | 34 | 10.5 | 43 | 13.0 |
| 20% | 4.92 | 1.5 | 8.2 | 2.5 | 13 | 4.0 | 15 | 4.5 | 18 | 5.5 |
| 40% | 1.64 | 0.5 | 4.9 | 1.5 | 7 | 2.0 | 6.6 | 2.0 | 8.2 | 2.5 |

Note: Trench widths, depths, and slopes shown are the standard size and range for typical applications. Additional widths, depths, and slopes are avaliable for special applications but may have restrictions. Contact ABT for additional information.

# Trench Storage Capacity and Cross Section Area

| Trench Depth | | 4" Width | | 8" Width | | 12" Width | | 18" Width | | 24" Width | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | Inch | Gal/Ft | Sq In | Gal/Ft | Sq In | Gal/Ft | Sq In | Gal/Ft | Sq In | Gal/Ft | Sq In |
| 50 | 2.0 | 0.41 | 7.87 | 0.82 | 15.7 | 1.23 | 23.6 | 1.84 | 35.4 | 2.45 | 47.2 |
| 100 | 3.9 | 0.82 | 15.7 | 1.64 | 31.5 | 2.45 | 47.2 | 3.68 | 70.9 | 4.91 | 94.5 |
| 150 | 5.9 | 1.23 | 23.6 | 2.45 | 47.2 | 3.68 | 70.9 | 5.52 | 106 | 7.36 | 142 |
| 200 | 7.9 | 1.64 | 31.5 | 3.27 | 63.0 | 4.91 | 94.5 | 7.36 | 142 | 9.82 | 189 |
| 300 | 11.8 | 2.45 | 47.2 | 4.91 | 94.5 | 7.36 | 142 | 11.04 | 213 | 14.73 | 283 |
| 450 | 17.7 | 3.68 | 70.9 | 7.36 | 142 | 11.04 | 213 | 16.57 | 319 | 22.09 | 425 |
| 600 | 23.6 | 4.91 | 94.5 | 9.82 | 189 | 14.73 | 283 | 22.09 | 425 | 29.45 | 567 |
| 800 | 31.5 | 6.54 | 126 | 13.09 | 252 | 19.63 | 378 | 29.45 | 567 | 39.27 | 756 |
| 1000 | 39.4 | 8.18 | 157 | 16.36 | 315 | 24.54 | 472 | 36.81 | 709 | 49.08 | 945 |
| 1200 | 47.2 | 9.82 | 189 | 19.63 | 378 | 29.45 | 567 | 44.18 | 850 | 58.90 | 1134 |

Note: Basis is square bottom and full trench depth but not rail seat area.


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