



## Technical Bulletin

## Recommended Use of Trench Boxes

### Introduction

Trench boxes provide a safer work area to install pipe in deep trenches or in soils that have insufficient stability. This Technical Bulletin provides guidelines on how to maximize the structural stability and alignment of the pipe system while using a trench box. While these guidelines will work for most cohesive and noncohesive native soils, highly unusual soil conditions may require further investigation. Contact an Area Engineer or the Application Engineering Department for additional information on unique applications.

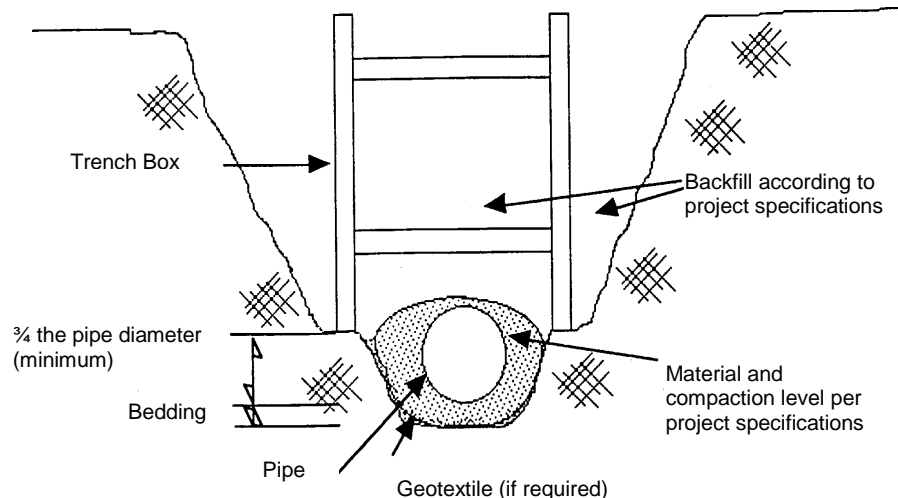
### General Considerations

Some installations may not require trench boxes if the trench sidewall can be sloped. The design engineer should provide specific guidance on acceptable slopes, but in no case should the trench wall slope be greater than the angle of repose of the native soil.

The length of the trench box should be suitable for the pipe length. Standard length for Hancor Sure-Lok<sup>®</sup> is 20 ft (6m) although shorter lengths can be supplied for use in shorter trench boxes.

### Subtrench Installations

The most effective way to maintain a sound system is to provide a 'subtrench' within which to place the pipe and backfill. The subtrench should extend at least three-fourths the nominal diameter of the pipe above the bedding. Backfill and compact according to the design specifications within the subtrench. As shown in Figure 1, the trench box can be pulled along the top edge of the subtrench without affecting the pipe or the backfill.



**Figure 1**  
**Subtrench Installation**

Subtrench installations also make it easier to use a geotextile around the backfill if it is required by the project specifications. Line the subtrench with the geotextile, place the pipe and backfill over the geotextile, and wrap the geotextile over the top of the pipe/backfill system.

### Regular Trench Installations

In installations not involving a subtrench situation, dragging a trench box should only be done if it does not damage the pipe or disrupt the backfill; otherwise, the box should be lifted vertically into its new position. If it is necessary for a trench box to be dragged through a trench, do not lower the box more than  $\frac{1}{4}$  of the nominal diameter below the crown (top) of the pipe. This allows the backfill material to flow out of the bottom of the box around the pipe so that backfill disturbance is kept to a minimum.

Another alternative for when the box will be dragged is to use a well-graded granular backfill material two diameters on either side of the pipe and compact it to a minimum of 90% standard Proctor density before moving the box. Immediately fill the area between the pipe/backfill structure and the trench wall with a granular material.

If the project requires a geotextile around the backfill, use a well-graded granular backfill material and compact it to at least 90% standard Proctor density. Do not drag the box; instead, lift it vertically. After the trench box is removed, immediately fill the area between the pipe/backfill structure and the trench wall with a granular material and compact according to project requirements. The geotextile manufacturer may be able to provide additional information regarding the suitability of specific geotextiles for use with trench boxes.

### Summary

While trench boxes increase worker safety in difficult site conditions, precautions are required to ensure a structurally sound pipe and backfill system.

Construction of a subtrench is the most effective means of maintaining a sound system. When a regular trench is used, techniques such as lifting the box, keeping the box about three-fourths the nominal diameter up from the trench bottom, and providing a wide granular backfill envelope will help provide a quality installation.