

Technical Note

TN 5.01 Recommended Use for Trench Boxes

Introduction

Trench boxes provide a safer work area to install pipe in deep trenches, restricted right-of-ways, or in soils that have insufficient stability. This technical bulletin provides guidelines on how to maximize the structural stability and alignment of the ADS 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 or different techniques.

General Considerations

OSHA regulations should be carefully followed for all aspects of pipe installation, including those that involve trench boxes. If information contained in this document conflicts in any way with OSHA or other safety regulations, those requirements must take precedence.

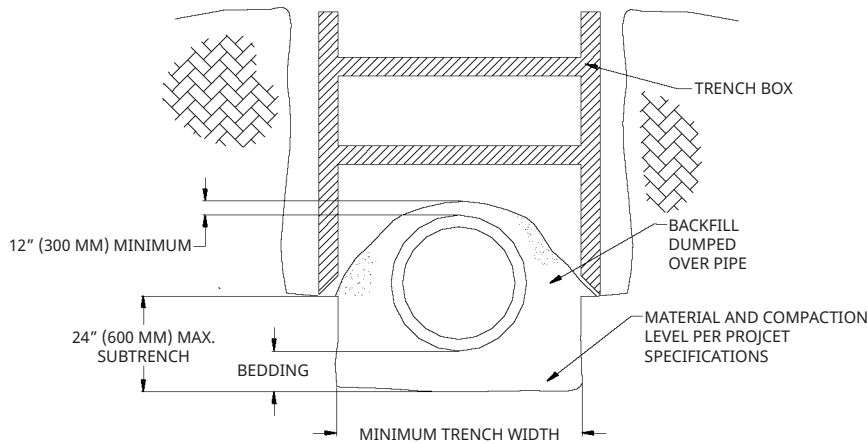
Some installations may not require trench boxes if the trench sidewall can be sloped adequately. The design engineer should provide specific guidance on acceptable slopes, but in no case should the trench wall slope be greater than the angle of repose of the native soil.

The length of the trench box should be suitable for the pipe length. Standard length for ADS N-12® IB is 19.7 ft (6 m) although it may be possible to supply shorter lengths 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 bottom of the trench box should be placed no more than 24" (600 mm) from the bottom of the work surface, in accordance with OSHA regulation 1926.652(g)(2). This may require the trench box be raised during pipe installation to conform with both OSHA requirements and to properly backfill and compact the soil around the pipe. Backfill and compact according to the design specifications within the subtrench. When possible, without disturbing the pipe or backfill, the trench box can be pulled along the top edge of the subtrench. In some cases, it may be necessary to move the trench box multiple times to obtain the required compaction of the material in the soil envelope. In either case, it is paramount to achieve the necessary backfill placement and compaction for a quality installation. Refer to Figure 1 for a typical sub trench installation.

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 raise the box more than 24" (600 mm) above the work surface.

Another alternative for when the box will be dragged is to use a well-graded granular backfill material at least two diameters on either side of the pipe and compact it to a minimum of 90% standard Proctor density before moving the box. After the trench box is moved, 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, their use requires some precautions be taken to ensure a structurally sound finished installation.

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

