

# ADS<sup>®</sup> N-12<sup>®</sup> Flex Pipe

## Agricultural Installation Guide

The recommendations presented here detail how to install a dependable subsurface drainage or groundwater control system using ADS N-12 Flex lined corrugated polyethylene pipe. Installation with proper backfill materials and placement procedures are essential to achieve long-term system performance. These recommendations assume that the drainage designer used design criteria available from ASTM F449 and ADS. The designer should discuss installations involving conditions not covered by these documents (poor soils, high loads or other factors that may affect the performance of the system) with an ADS representative.

### Backfill Selection

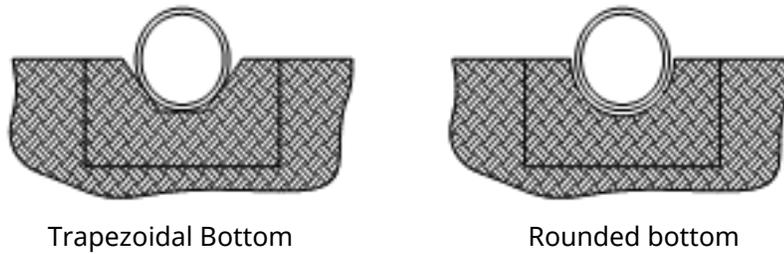
**Table 1 - Soil Classifications**

Soil Description	Soil Classification		Suitability as Backfill
	ASTM D2321	ASTMD2487	
Graded or crushed stone Crushed gravel	Class I	-	Acceptable
Well-graded sand, gravels and gravel/sand mixtures; Poorly graded sand, gravels and gravel/sand mixtures; little or no fines	Class II	GW GP SW SP	Acceptable
Silty or clayey gravels, gravels/sand/silt or gravels and clay mixtures, silty or clayey sands, sand/clay or sand/silt mixtures	Class III	GM GC SM SC	Acceptable
Inorganic silts and low to medium plasticity clays; gravelly, sandy or silty clays; some fine sands	Class IVA	ML CL	Acceptable
Inorganic silts and high plasticity clays, fat clays; fine sandy or silty soils; elastic silts	Class IVB	MH CH	Not Recommended

### Shaped Trench Bottom

A shaped trench bottom can be used, provided the native soils can be cut to a stable shaped trench. Trenches shall be overfilled to allow for consolidation or soils shall be compacted to reduce settling. Care shall be taken to ensure voids are filled in the haunch area. Failure to fill voids in the haunch area could result in additional stress on the pipe, which may reduce service life.

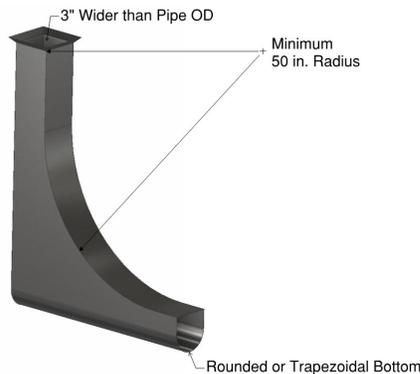
**Figure 1 – Shaped Trench Bottoms**



**NOTE:** Other trench types may be suitable. Contact an ADS representative for more information.

## Boot Design

Key components to consider when deciding on the boot design include boot width, cutting plate width, bend radius and boot shape. To reduce the friction and force exerted on the pipe during installation, the inside width of the boot should be about 3" (75 mm) wider than the outside diameter (OD) of the pipe. It is not recommended to use the same boot width for all pipe diameters. The cutting plate width is recommended to be about 6" (150 mm) wider than the pipe's OD to successfully break up and clear away soil, while leaving enough in place to properly support the pipe. The boot's recommended minimum bend radius is 50" (1250 mm), but a boot with a larger bend radius is acceptable. The pipe shall not experience a tighter radius than the recommended 50" (1250 mm) minimum bend radius of the boot. A boot with a rounded or trapezoidal bottom should be used to provide proper support under the pipe. A guide shall be used to avoid obstacles and assist the pipe from the ground into the boot during installation.



## Installation Recommendations

The maximum burial depth of plastic pipe is impacted by the quality of backfill and compaction of soil around the pipe. For plow installations, the recommended maximum cover height for N-12 Flex is 8' (2.4 m), which is measured from top of pipe to final grade. Deeper burial depths may be achieved by changing the trench shape, installation method, backfill material, compaction of backfill material or combinations thereof. See *ADS Installation Guide 1.03 "Agricultural Installation for N-12 Pipe"* for guidance on other trench construction methods and corresponding maximum cover height recommendations.

Care shall be taken to eliminate stretching during installation. Stretching of the pipe could lead to excessive deflection or buckling of the pipe. Where couplers are used, additional tape may be necessary to ensure the pipe coils do not separate during installation.

