

Introduction

Corrugated HDPE pipe, as with all buried pipe, functions as a buried structure where the performance of the structure is dependent on the quality of the embedment backfill and installation. Varying degrees of performance may be required depending on specific project details. This installation guide specifically addresses many common installation methods for corrugated HDPE in agricultural applications to ensure adequate performance is achieved. Since agricultural installations do not involve pipe buried under public roadways allowable pipe deflection may extend beyond what is typically acceptable in commercial applications.

The recommendations presented here, detail proper backfill and installation methods to achieve a dependable subsurface or groundwater control system. This document should not be used for commercial applications, for projects involving road crossings or where greater service performance is required. For any application conditions outside of these basic guidelines (poor soils, high loads, or other factors that affect performance), please contact your local Prinsco representative or visit www.prinsco.com for more comprehensive installation information.

Backfill Material Selection

The selection of proper backfill materials is critical to ensuring adequate pipe support.

- Native soil may be used provided it meets the classification descriptions provided in Table 1.
- Non-cohesive sand, sand/gravel mixes and other Class II or III materials must be compacted to remove voids.
- For pipe diameters smaller than 30" with burial depths less than 8'; compaction may not be necessary, provided the trench bottom is shaped in accordance with Figure 3.
- For pipe diameters greater than 24", Class IVA materials may be used provided the maximum burial depth is in accordance with Table 2 and Figure 2. Class IVA backfill shall be compacted in accordance with ASTM D2321 under the guidance of a licensed Geotechnical Engineer. Failure to achieve required density, in the pipe zone, may result in excessive deflection.

Trench Construction

- Trench or ditch should be just wide enough to place and compact backfill around the entire pipe-twice the nominal diameter of the pipe but less than nominal diameter plus 2 feet.
- For parallel pipe installations, allow space between pipes for proper compaction, minimum spacing shall be no less than 1/2 of the pipe diameter between the parallel pipe runs.
- As with any pipe, groundwater or seasonal high water tables may impede installation. De-watering is necessary for proper and efficient installation.
- Trench or ditch bottoms containing bedrock, soft muck or refuse, or other material unable to provide long-term pipe support are unacceptable and shall be removed and replaced with acceptable materials:
- Remove rock or unyielding material 1-foot below grade and 6-in on either side of pipe.
- Excavate soft areas approximately 2 feet below grade and three times pipe width.
- The trench bottom shall be as shown in Figure 2. The 90-degree "V" bottom is acceptable for pipe diameters less than 8". For pipe diameters greater than 6" and less than 30", a circular or trapezoidal bottom shall be used. For pipe greater than 24", a circular bottom should be used and should be cut to a depth of no less than 1/2 the outside diameter of the pipe. A circular trench bottom may be formed with the use of a half-circle shaped bucket, also referred to as a "spoon" or with the use of a shaped trencher, etc.
- For a flat bottom trench, the middle of bedding equal to 1/3 the pipe OD shall be loosely placed while the remainder shall be compacted in accordance with Table 1.
- In areas where soil migration is a concern a synthetic fabric (geotextile) shall be used to separate the backfill from the native soil.

Backfill Placement and Compaction

- Place and compact backfill in layers to meet requirements of ASTM F449 and as outlined in Table 1.
- Place and compact initial backfill in layers around pipe and at least 6" above the crown as shown in Figure 1.

Description	Soil Classification		Minimum Compaction Standard Density (%)	Maximum* Layer Height (in.)
	ASTM D2321	ASTM D2487		
Graded or crushed stone Crushed gravel	Class I	-	Dumped**	18
Well-graded sand, gravel, and gravel/sand mixtures; Poorly graded sand, gravel and gravel/sand mixtures; little or no fines	Class II	GW GP SW SP	85%	12
Silty or clayey gravel, Gravel/sand/silt or gravel and/clay mixtures, silty or clayey sands, sand/clay or sand/silt mixtures	Class III	GM GC SM SC	90%	9
Inorganic silts and low to medium plasticity clays; gravelly, sandy, or silty clays; some fine sands	Class IVA	ML CL	90%	9

*Layer Heights should not exceed one-half the pipe diameter. Layer heights may also need to be reduced to accommodate compaction method.
** Material shall be "knifed" into the haunch area of the pipe by use of a shovel or similar means

Diameter	Maximum Burial Depth
4"	22'
6"	20'
8"	17'
10"	17'
12"	17'
15"	16'
18"	14'
24"	13'
30"	8'
36"	6'
42"	6'
48"	6'
60"	6'

*Maximum burial depths for Class I, II, or III materials are greater than these listed in Table 2.



- Avoid impacting pipe with compaction equipment.
- The final minimum cover shall be 2' over the crown of the pipe where live vehicular or equipment loading is present and shall be no less than 1' in areas not subjected to live loading.
- Class IVA materials provide reduced structural support, compared with Class I, II, III, therefore, additional pipe deflection may be experienced in applications utilizing Class IVA backfill materials. This additional deflection is anticipated and shall not compromise service performance provided the compaction and maximum burial depth criteria is followed as outlined in this document and in ASTM F449.

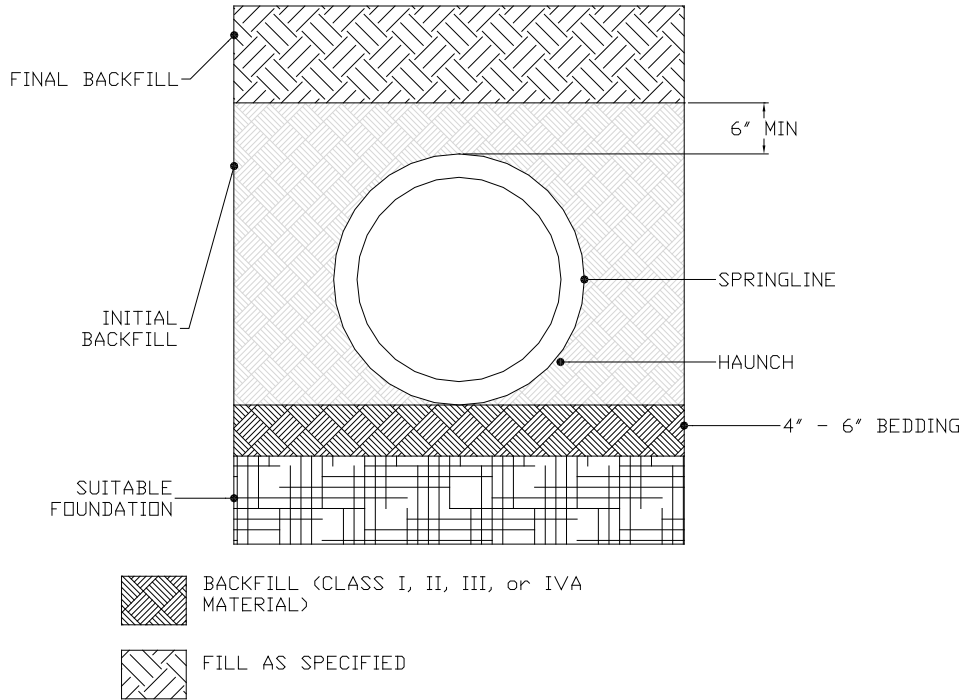


Figure 1.

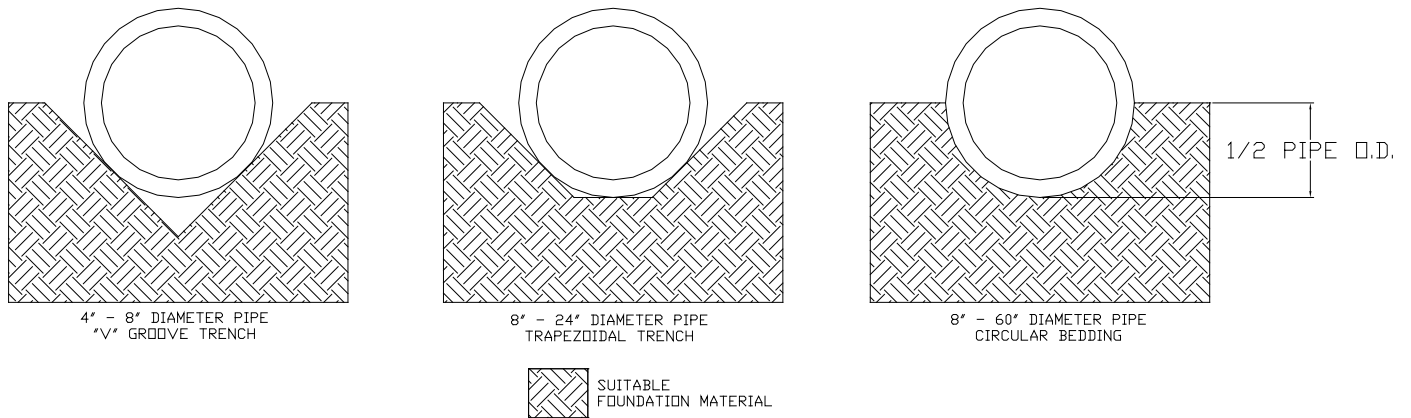


Figure 2.