

SWP INSTALLATION GUIDE

INSTALLATION GUIDE FOR CORRUGATED POLYETHYLENE DRAINAGE PIPE (SWP)

Trench Construction

Construction of the trench should begin at the drain outlet, which should be the lowest point and proceed up grade. The trench should be designed in such a way that the pipe can be laid in as straight a line as possible. The width of the trench at the top of the pipe should be the minimum required to permit installation with a minimum of 3 inches of clearance on either side of the pipe. For trenches wider than 6 inches on each side of the pipe, consideration should be given to special backfills to protect the pipe.

The pipe should be laid in an earth foundation cradle that is shaped to fit the lower part of the pipe. This cradle may be in the shape of a semi-circle, trapezoid or a 90-degree V-groove (see Fig. 1). This cradle provides side and bottom support to the lower part of the pipe and can be formed in a number of ways.

The most common method with a trenching machine or drainage plow is to attach a device on the front of the finishing shoe that will plow out the groove during the trenching operation. Another method that is commonly used is to manually shape a semi-circle in the bottom of the trench with a shovel. When a semi-circle groove is going to be used, the groove must conform to the outside diameter of the pipe and envelope. The groove shall be circular shaped so that 120 degrees of the pipe will rest in the groove with a maximum clearance of .5 inch around the circumference. If this groove is not achieved, there will be insufficient support and pipe deflection will increase. The V-groove is recommended for 3 to 6 inch diameter pipe and the semi-circle curved bottom is recommended for 8-inch diameters and larger. Under no circumstances can the pipe be laid in a trench bottom that is flat or have the necessary groove as described above.

If the drain is to be laid in a rock cut, the trench should be over excavated to a depth of 6 inches below grade. This area should then be filled with sand, gravel or fine soil tamped enough to provide firm foundation. The trench bottom should then be shaped as noted above and leveled to grade.

If the trench bottom is unstable, the loose soil or sand should be removed and replaced with a suitable material (i.e. processed gravel) at sufficient depth to provide a firm foundation for the pipe to sit on. This layer of foundation material will also act as an impervious mat into which the unstable soil will not penetrate.

If the trench walls are unstable, they may cave in and cause pipe failure. This problem may occur where excavation is below groundwater level or in saturated sand. Some means should be used to protect the pipe until it has been laid and properly blinded and backfilled.

SWP INSTALLATION GUIDE

Installing The Pipe

The rolls or lengths of pipe should be unrolled out along the trench so any bends in the pipe will straighten out. This is especially important in cold weather where the pipe has a tendency to re-coil. The pipe should be free of clinging wet or frozen material so it can be laid on grade. Any couplings should be securely fastened to insure that the pipe sections do not pull apart when it is laid in the trench. The pipe can be laid manually into the trench or through the tile boot or shoe on the trencher. It is important that the pipe is laying in the groove in the trench. This insures the pipe is laid to grade and has the proper foundation. In hot weather care should be exercised in handling, so there is not stretching or pulling. The pipe can reach 100 to 150 degrees F on a hot bright day. The strength of the pipe decreases by about 40 to 50 percent when the pipe reaches this temperature. The pipe will regain its original strength when its temperature returns to that of the surrounding soil. This usually take five minutes or less after installation.

Blinding

Blinding is the placement of bedding material around and over the pipe. This bedding material should consist of loose mellow topsoil or other porous soil. All pipe should be blinded as soon as possible after installation to protect from ditch cave-ins and floating pipe. Sand should not be used as a bedding material unless non-perforated pipe or a filter envelope is installed on the pipe. Blinding with topsoil is not necessary when sand or gravel is the required backfill material.

There are a number of acceptable blinding methods. If a trencher is being used to install the pipe, a mechanical device can be installed to take spoil from the trencher and place it around and over the drain. The main advantage of this is that it blinds pipe immediately after laying it and reduces labor requirements. Another commonly used method is to manually blind the pipe with a shovel or spade. Whatever method of blinding is used it is important that the pipe remain in the groove until it is secured by the blinding. Careful soil placement on both sides of the pipe will provide good side support. No rocks, frozen soil chunks or other hard objects should be allowed to come into contact with the pipe. If you are installing pipe on a hot day, you should delay the blinding until the pipe reaches the soil temperature.

Backfilling

The backfilling should be done as soon as possible after installation or no later than the conclusion of each day's work. The end of the pipe should have an end plug installed in it. The backfill material should be placed in the trench in a manner that displacement of the pipe will not occur. It is preferable to place the material on an angle so that it flows down the front slope. Avoid large stones, frozen clods and heavy direct loads during backfill operations. Operators of heavy equipment should avoid putting the weight of the equipment on top of the trench.

SWP INSTALLATION GUIDE

References

USDA - SCS Drain Code 606

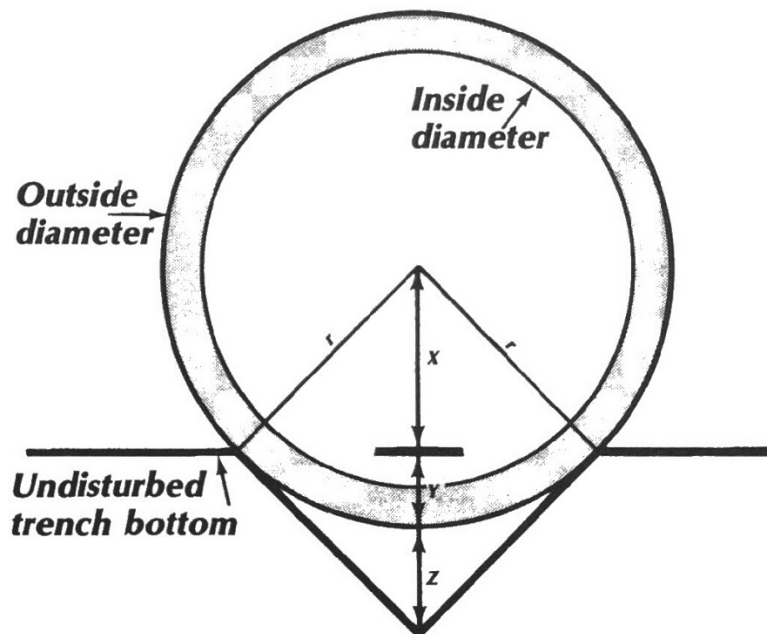
ASTM F449 - Installation of Corrugated Tubing for Agricultural Drainage

Illinois Drainage Guide

Figure 1- Dimensions For A 90-Degree V Groove

Diameter ^a (D)	r (D/2)	X (0.707r)	Y (0.293r)	Z (0.414r)
<i>inches</i>				
3	1.5	1.060	0.439	0.621
4	2.0	1.414	0.586	0.828
5	2.5	1.768	0.732	1.036
6	3.0	2.121	0.879	1.242
8	4.0	2.828	1.171	1.657

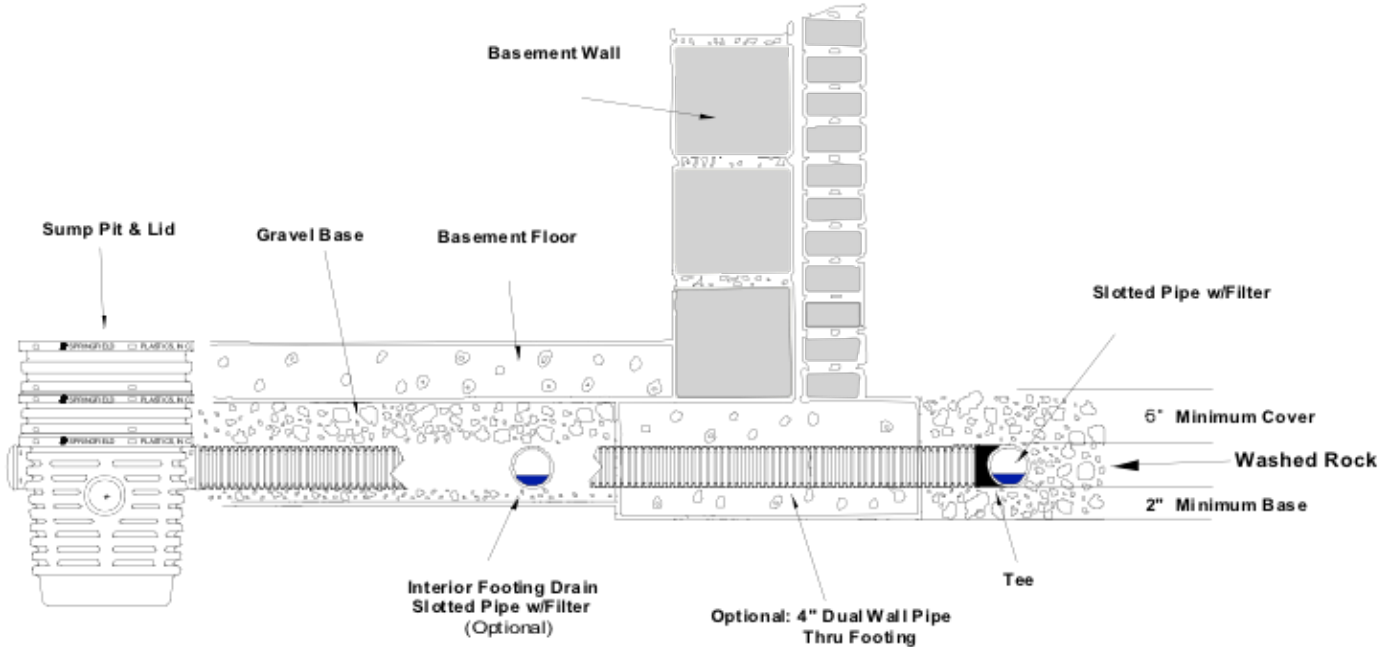
^aValues are based on typical outside diameters, which are assumed to be 20 percent greater than inside diameters.



SWP INSTALLATION GUIDE

Foundation Drain

SPI Foundation Drain Installation
Meets BOCA installation requirements



Downspout Drain

