MAXIMUM ALLOWABLE TRENCH DEPTHS FOR CORRUGATED PLASTIC TUBING

Corrugated plastic drainage tubing should be installed so that it does not deflect more than 20 percent of its nominal diameter. The width of the trench should be at least 6 in. (152mm) wider than the outside diameter of the tubing to permit placement of the supporting backfill along the lower sides of the tubing. Very narrow trenches may result in bridging of the backfill material above the tubing leaving the sides unsupported. Installation of corrugated plastic tubing in a narrow flat trench with uncompacted side support is not recommended. To prevent overloading in deep and wide trenches, it is sometimes feasible to construct a subtrench, either with a trenching machine or by hand, in the bottom of a wide ditch that has been excavated by a bulldozer, dragline, power shovel, or backhoe. The width of the subtrench measured at the top of the tubing determines the allowable load. The width of the excavation above this point is not important.

The maximum trench depths for tubing buried in loose, fine textured soils are listed in Table IA14-1. Table IA14-1 is based upon the following assumptions:

E' = 50 psi (345 kN/m^2)
D_1 = 3.4
K = 0.096 (90^0 bedding angle)
W = 109 pcf (1,750 kg/m^3)
Y = 1.1 x

For Standard Tubing, pipe stiffness = 13 psi (90 kN/m^2) for 20% deflection.
For Heavy-duty Tubing, pipe stiffness = 18 psi (124 kN/m^2) for 20% deflection

TABLE IA14-1
MAXIMUM TRENCH DEPTHS FOR TUBING BURIED IN LOOSE, FINE-TEXTURED SOILS
(90-degree 'V' groove bedding or better)

Nominal diameter of tubing (inches)	Tubing Quality ASTM	Trench width (inches) at top of tubing 12	16	24	32 or greater
3	Standard	12.8	6.9	5.6	5.2
	Heavy-duty	....[1]	9.8	6.9	6.2
4	Standard	12.8	6.9	5.6	5.2
	Heavy-duty	....[1]	9.8	6.9	6.2
5	Standard	11.5	6.9	5.6	5.2
	Heavy-duty	....[1]	9.6	6.7	6.2
6	Standard	10.2	6.9	5.6	5.2
	Heavy-duty	....[1]	9.5	6.6	6.2
8	Standard	....	7.2	5.6	5.2
	Heavy-duty	....	9.8	6.9	6.2
10	*	....	9.2	6.6	6.2
12	*	....	...	6.6	6.2
15	*	....	...	6.9	6.2

[1]Any depth is permissible for this width.

* All tubing of this size meeting ASTM specifications is heavy-duty.

Note: The commercial tubing supplied by the various manufacturers varies in corrugation design and pipe stiffness. These variations as well as differences in soil conditions may change the assumptions of this table and make the maximum depths more or less than those stated here. These depths are based on limited research and should be used with caution.

Reference: ASAE Practice Standard ASAE EP260.3, Design and Construction of Subsurface Drains in Humid Areas.