

Alternative HSTS Soil Absorption System Using Enviro-Septic Pipe

What is it??

The product itself consists of a specially-designed 12-inch diameter pipe surrounded by a mat of coarse, randomly oriented plastic fibers contained within an outer layer of geotextile fabric.

How does it work??

The plastic pipe is designed to function as a radiator to promote cooling of effluent, which will in turn aid in separation of suspended solids. The skimmer tabs on the inside of the pipe are designed to retain some of these suspended solids as the liquid leaves through the holes.

The layer of coarse, randomly oriented plastic fibers provide a large surface area for bacteria to colonize and enhance treatment of the wastewater as it flows past. The biomat that forms on the infiltrative surface of a conventional leaching trench system instead forms within the plastic fibers and on the inside of the geotextile fabric. The wastewater is slowly released through the geotextile fabric into the surrounding sand, and eventually to the soil infiltrative surface.

Oxygen is introduced into the piping network through differential venting. In a gravity fed system, a low vent allows air to enter the system from the far end of the absorption field and travel through the pipe and septic tank and out through the house plumbing vent. When the system is dosed, the same low vent is used, and a high vent connected to a distribution box after the dosing tank is used in place of the house plumbing vent. This ventilation encourages aerobic digestion of accumulated suspended solids during unsaturated periods.

What advantages does it offer over other systems??

The separation of suspended solids and bacterial treatment of the effluent in the pipe retains the biomat within the material around the pipe, releasing an effluent that is similar to that produced by many of today's advanced pre-treatment units (2 mg/L TSS, 2 mg/L BOD, 2,300 fecal coliform/100 mL). When site topography permits, this level of treatment is attained without the use of any mechanical components. When gravity distribution is not possible, effluent is pumped to the absorption system using simple demand dosing.

The high level of treatment provided by the specially-designed pipe has led to reductions in absorption area in states where the system has been used previously. The tables on the following page compare sizing of three different types of systems for a 3 or 4 bedroom home on the same property.

Comparison of Absorption Areas of Conventional Trenches With and Without Pre-Treatment

	Leaching Trenches		Leaching Trenches w/ Pre-Treatment	
Soil Texture	c		c	
Soil Structure	sbk		sbk	
Soil Grade	2		2	
Slope	0-1%		0-1%	
Infiltration Distance	14"		14"	
# of bedrooms	3	4	3	4
design flow (gal/day)	360	480	360	480
Soil Loading Rate (gal/day/sq. ft)	0.2		0.3	
Linear Loading Rate (gal/day/ft)	2.5		2.5	
Absorption area length (feet)	144	192	144	192
Absorption area width (feet)	12.5	12.5	8.333333	8.333333
Total absorption area (sq. ft.)	1800	2400	1200	1600

Sizing of Enviro-Septic System Using Indiana Manual

Soil Texture	c	
Soil Structure	sbk	
Soil Grade	2	
Slope	0-1%	
Enviro-Septic Soil Class	G	
# of bedrooms	3	4
design flow (gal/day)	450	600
Line Length (ft.)	90	100
Bed Width (ft.)	13	16
Min. Total Length of Pipe	210	280
Total Length of Absorption Field (ft.)	92	102
Total absorption area (sq. ft.)	1196	1632