



## Gravel-less system sizing

Sample methods for estimating sewage flow, required soil treatment area and system sizing for Poly-Drain® gravel-less are listed in the three tables below. Table 1 provides average design flow rates for residential dwellings. Table 2 lists lineal footage sizing requirements of 10" Poly-drain® gravel-less based on the percolation rate of soils. Table 3 lists the lineal footage sizing requirements based on detailed soil descriptions.

For multiple dwelling units, the estimated design sewage flow shall consist of the sum of the flows of each individual unit. If there is a discrepancy between the soil texture and the percolation rate, the larger soil sizing factor should be used.

Ten inch Poly-Drain® gravel-less is equivalent to a three foot wide, rock-filled trench with six inches of rock below the distribution pipe. Eight inch Poly-Drain® gravel-less is equivalent to a two foot wide rock-filled trench with six inches of rock below the distribution pipe.

Average Design Flow (ADF) should be used to size soil treatment systems. The estimated flow shall be based on a minimum of 2 bedrooms with an ADF of 150 gallons/day/bedroom. Table 1 listed below should be used in determining ADF.

Although the guidelines found within this report are a good reference guide, it is very important that any purchaser and/or installer of Poly-Drain® gravel-less contact their local and state government entities to request local and state guidelines and sizing requirements. As with all Baughman Tile Company, Inc. products, it is important that all products are installed according to all OSHA and local safety standards. For more information on safe work practices, reference the OSHA website at [www.osha.gov](http://www.osha.gov)

Table 1: AVERAGE DESIGN FLOW- TYPE I HOMES

# of Bedrooms	Gallons per Day
2	300
3	450
4	600
5	750
6	900

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Table 2: LINEAL FOOTAGE OF 10" POLY-DRAIN® GRAVEL-LESS USING PERCOLATION TESTS

Percolation Rate (MPI)	Soil Texture	Soil Treatment Area Sq.Ft./Gallon	2 Bedroom 300 gal ADF	3 Bedroom 450 gal ADF	4 bedroom 600 gal ADF	5 bedroom 750 gal ADF
Faster than 0.1*	Course Sand	-	-	-	-	-
0.1-5**	Sand					
	Loamy Sand	1.27	130'	190'	260'	320'
0.1-5	Fine Sand	1.67	170'	250'	340'	420'
6.0-15	Sandy Loam	1.27	130'	190'	260'	320'
16-30	Loam	1.67	170'	250'	340'	420'
31-45	Silt Loam		200'	300'	400'	500'
46-60	Silt Loam	2.00				
	Sandy Clay					
	Loam, Silty Clay	2.20	220'	330'	440'	550'
	Loam, Clay					
61-20	Loam Silty Clay					
	Sandy Clay	-	-	-	-	-
	Clay					
	Clay					

\* Soil Treatment systems placed in soils with percolation rates of less than one-tenth minute per inch or in a texture of course sand must provide at least one of the the following treatment techniques: a. Mound system, or b. a trench system with at least one foot of clean sand placed between the excavation bottom and the sidewalls. You must distribute the effluent by pressure over the entire absorption area or divide the total soil treatment system into at least four parts with no part larger than 25% of the area required and the parts constructed for serial application.

\*\*Soil Absorption area with a soil percolation rate of 0.1 to 5 minutes per inch that is not a fine sand or a soil texture of sand or loamy sand must use at least one of the following treatment techniques: a.) distribute the effluent by pressure over the absorption area, or b.) divide the total soil treatment system into at least four parts with no part larger than 25% of the area required and the parts constructed for serial application. This soil type has also used a sizing factor of 0.83. If this or any sizing factor is used, make every effort to determine that the soil characteristics are correct.

If you are using 8" Poly-drain gravel-less, multiply the lineal footage by 1.5 to determine the necessary lineal footage.

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Table 3: LINEAL FOOTAGE OF 10" POLY-DRAIN® GRAVEL-LESS USING DETAILED SOIL DESCRIPTION

Soil Texture	Soil Structure	Soil Treatment Area	2-Bedroom	3 Bedroom	4 Bedroom	5 Bedroom
		Sq.Ft./Gallon	300 gal ADF	450 gal ADF	600 gal ADF	750 gal ADF
Course Sand*	Single Grain	-	-	-	-	-
Sand, Loamy Sand	Single Grain	1.27	130'	190'	260'	320'
Fine Sand, Loamy Fine Sand	Single Grain	1.67	170'	250'	340'	420'
Very Fine Sand, Loamy Very Fine Sand	Single Grain	2.00	200'	300'	400'	500'
Sandy Loam	Moderate to Strong	1.27	130'	190'	260'	320'
Sandy Loam	Weak or Platy	1.67	170'	250'	340'	420'
Sandy Loam	Massive	2.00	200'	300'	400'	500'
Loam	Moderate to Strong	1.67	170'	250'	340'	420'
Loam	Weak or Platy	2.00	200'	300'	400'	500'
Loam	Massive	2.50	250'	375'	500'	625'
Silt Loam	Moderate to Strong	2.00	200'	300'	400'	500'
Silt Loam	Weak or Platy	2.50	250'	375'	500'	625'
Silt Loam	Massive	3.00	300'	450'	600'	750'
Sandy Clay Loam	Moderate to Strong	2.20	220'	330'	440'	550'
Sandy Clay Loam	Weak or Platy	3.20	320'	480'	640'	800'
Sandy Clay Loam	Massive	-	-	-	-	-
Clay Loam	Moderate to Strong	2.20	220'	330'	440'	550'
Clay Loam	Weak or Platy	-	-	-	-	-
Clay Loam	Massive	-	-	-	-	-

\* Soil Treatment systems placed in soils with percolation rates of less than one-tenth minute per inch or in a texture of course sand must provide at least one of the the following treatment techniques: a. Mound system, or b. a trench system with at least one foot of clean sand placed between the excavation bottom and the sidewalls. You must distribute the effluent by pressure over the entire absorption area or divide the total soil treatment system into at least four parts with no part larger than 25% of the area required and the parts constructed for serial application.

\*\*Soil Absorption area with a soil percolation rate of 0.1 to 5 minutes per inch that is not a fine sand or a soil texture of sand or loamy sand must use at least one of the following treatment techniques: a.) distribute the effluent by pressure over the absorption area, or b.) divide the total soil treatment system into at least four parts with no part larger than 25% of the area required and the parts constructed for serial application. This soil type has also used a sizing factor of 0.83. If this or any sizing factor is used, make every effort to determine that the soil characteristics are correct.

If you are using 8" Poly-drain gravel-less, multiply the lineal footage by 1.5 to determine the necessary lineal footage.

**END REPORT**