



Typical sub-base considerations when calculating base depth for site specific retention & detention needs of your TRUEGRID Project. Utilize space....save money!

Sub-base considerations

Crushed aggregate meeting ASTM No. 57 is commonly used for open-graded sub bases along with ASTM No. 2 to No. 4. These materials are widely available and they are recommended for most TRUEGRID Permeable Paver applications. These materials will have a nominal porosity (volume of voids/total volume of base) over 0.32 and a storage capacity in the void space (volume of voids/volume of aggregate) approaching 40%. A 40% void space provides 0.4 cubic feet of storage capacity for each cubic foot of aggregate (the volume of the base will need to be 2.5 times the volume of water to be stored).

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How to figure sub base drainage aggregate depth

Minimum Infiltration Rate (0.50) ÷ Soil Type Infiltration Rate (x) = Storage Time Required

Storage Time Required x Minimum IR (0.50) x 2.5 = Required Depth of Subsurface Base

Required Depth of Subsurface Base – Depth of Permeable Paver = Depth of Sub base

Notes:

2.5 is the factor equal to the volume of base required for the volume of water to be stored in stone base and sub-base greater than ¾" in diameter

Minimum Infiltration rate of 0.50" is typical of most Infrastructure Design Manuals

Example: Clay in-situ soil @ 3% slope; 1.8" Paver Depth; #57 rock base & fill aggregate; 0.5"/hr required IR

0.5"/hr ÷ 0.13"/hr = 3.85 hrs retention

3.85 hrs x 0.5"/hr x 2.5 = 4.80" depth of sub-surface drainage storage

4.8" - 1.8"(grid height) = 3" subsurface base required

Chart A: Permeable Base

AASHTO #57 permeable sub base material defined as:

Sieve Size		Percent Passing	
mm	In.	#57	Typical
37.5	1-1/2	100	100
25	1	95-100	97
19	3/4		75
12.5	1/2	26-60	45
9.5	3/8		25
4.75	#4	0-10	5
2.36	#8	0-5	2

Chart B: Infiltration Rate (IR) Inches/Hour

Soil Texture, Type	Percent of Slope				
	0-4%	5-8%	8-12%	12-16%	Over 16%
Coarse Sand	1.25	1.00	.75	.50	.31
Medium Sand	1.06	.85	.64	.42	.27
Fine Sand	.94	.75	.56	.38	.24
Loamy Sand	.88	.70	.53	.35	.22
Sandy Loam	.75	.60	.45	.30	.19
Fine Sandy Loam	.63	.50	.38	.25	.16
V. Fine Sandy Loam	.59	.47	.35	.24	.15
Loam	.54	.43	.33	.22	.14
Silt Loam	.50	.40	.30	.20	.13
Silt	.44	.35	.26	.18	.11
Sandy Clay	.31	.25	.19	.12	.08
Clay Loam	.25	.20	.15	.10	.06
Silty Clay	.19	.15	.11	.08	.05
Clay	.13	.10	.08	.05	.03

Derived from U.S. Department of Agriculture information