PENNSTATE
1855
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Agricultural Analytical Services Laboratory
The Pennsylvania State University
University Park PA 16802
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ANALYSIS FOR:	ADDITIONAL COPY TO:
Bill Wolfe Norlite 628 S. Saratoga St. Cohoes NY 12047	

LAB ID	SAMPLE ID	SAMPLE TYPE	DATE SAMPLED	DATE RECEIVED	DATE COMPLETED
SM06443	Norlite 3/16	Single-layer extensive	10/10/2016	10/17/2016	11/2/2016

Green Roof Media Analysis

Results on dry weight basis unless specified otherwise

Analysis	Units	Result	FLL Guidelines for Single Course Extensive Sites[1]
Particle Size Distribution (See accompanying report)[2]			
≤ 0.05 mm *(Fll reference value based on < 0.06 mm)*	mass %	0.9	≤ 10
Density Measurements[3]			
Bulk Density (dry weight basis)	g/cm^3	0.82	--
Bulk Density (dry weight basis)	lb/ft^3	51.11	--
Bulk Density (at max. water-holding capacity)	g/cm^3	0.98	--
Bulk Density (at max. water-holding capacity)	lb/ft^3	61.24	--
Water/Air Measurements[3]			
Moisture	mass %	11.0	--
Total Pore Volume	Vol. %	58.8	--
Maximum water-holding Capacity	Vol. %	16.9	20 - 65
Air-Filled Porosity (at max water-holding capacity)	Vol. %	41.9	≥ 10
Water permeability (saturated hydraulic conductivity)	cm/s	> 0.723	0.1 - 0.67
Water permeability (saturated hydraulic conductivity)	in/min	> 17.089	2.36 - 15.8
pH and Salt Content[4]			
pH ($CaCl_2$)		8.5	6.0 - 8.5
Soluble salts (water, 1:10, m:v)	mmhos/cm	0.10	--
Soluble salts (water, 1:10, m:v)	g (KCl)/L	0.48	≤ 3.5
Organic Measurements[5]			
Organic matter content	mass %	0.0	--
Organic matter content	g/L	0.0	≤ 40

GR02: Single Course Extensive

[1] *Forschungsgesellschaft Landschaftsentiwicklung Landschaftsbau (FLL). 2008. Guidelines for the Planning Execution and Upkeep of Green-Roof Sites*

[2] *Particle size determined by ASTM D422-63*

[3] *Media density, total pore volume, water-holding capacity, air-filled porosity, & water permeability determined by ASTM E2399*

[4] *Media pH & salt content determined by methods of the Assoc. of German Ag. Analytic & Res. Inst. (VDLUFA) Methods Book vol I, Soil Analysis*

[5] *Organic mater content determined by loss on ignition (500 C), as described by SM 2540 G*

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Green Roof Media
Particle Size Distribution

Particle Size Analysis		Sum of particles less than size specified				
Diameter -mm-	%		Diameter -mm-	Diameter -in-	Sieve size	% sum of particles
< 0.002	0.3	<	0.002	---	---	0.3
0.002-0.05	0.6	<	0.05	---	---	0.9
0.05-0.25	0.3	<	0.25	0.0098	60 mesh	1.2
0.25-1.0	0.2	<	1.0	0.0394	18 mesh	1.4
1.0-2.0	2.8	<	2.0	0.0787	10 mesh	4.3
2.0-3.2	35.2	<	3.2	0.125	1/8 inch	39.5
3.2-6.3	59.5	<	6.3	0.250	1/4 inch	99.0
6.3-9.5	0.8	<	9.5	0.375	3/8 inch	99.8
9.5-12.5	0.2	<	12.5	0.500	1/2 inch	100.0
> 12.5	0.0					

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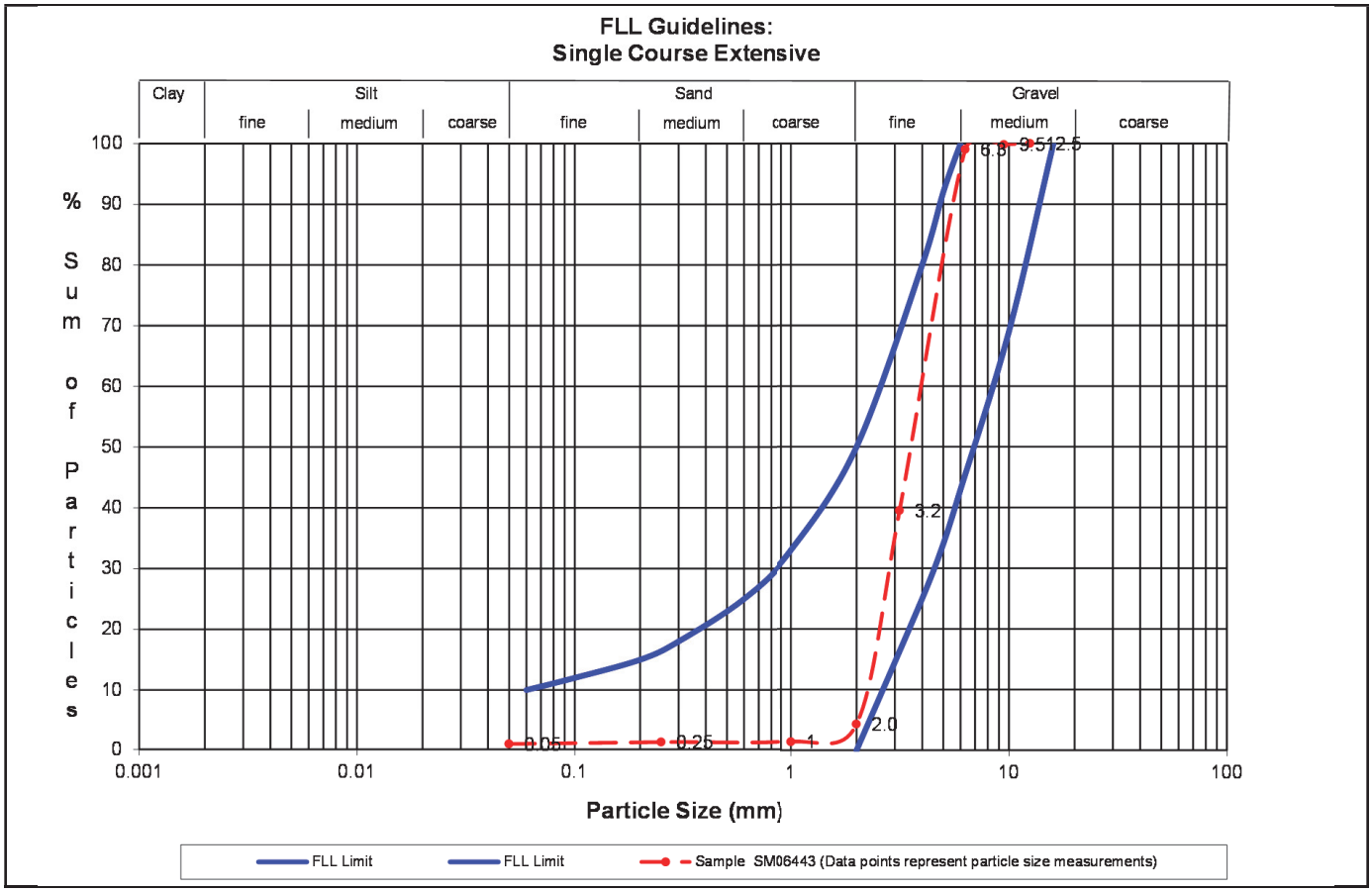
Green Roof Media

FLL[1] Particle Size Distribution Graph for Single Course Extensive Systems



[1]*Forschungsgesellschaft Landschaftsentiwicklung Landschaftsbau (FLL). 2008. Guidelines for the Planning Execution and Upkeep of Green-Roof Sites*