

Bioretention soil test demonstration

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Inspecting Construction of Bioretention Facilities



Basics

- Test the infiltration rate of the bioretention soil in the field using the material supplied to the job.
 - Make the test representative of the field condition.
 - Determine quickly if the contractor may have an issue with the material.
 - Assist the owner on getting the material specified.

Soil Media Mix

- Soil media mix is as specified. Quality of mix is confirmed by delivery ticket or on-site testing as appropriate to the size and complexity of the job.
- Mix is installed in lifts not exceeding 12".
- Mix is not compacted during installation but may be wetted thoroughly to encourage consolidation.
- Mix is smoothed to a consistent top elevation. Depth of mix (**18" minimum**) and top elevation are as shown in plans, accounting for depth of mulch to follow and required top reservoir depth.

Test Procedure - Setup

- Use 3-inch diameter plexiglass tube with bottom cap and holes in the cap. Secure cap tightly. OR
- Leave caps off
- Scribe lines at 6 inches, 16 inches, and 18 inches from the bottom of the tube.
- Place between 1 to 1.5 inches of Class II Permeable rock at the bottom of tube. Fill remainder with Bioretention Soil to 6 in line.

Test Procedure - Test

- Fill tube with water. Allow the soil to saturate completely and begin draining through the
- Refill the tube above the 18 inch mark and record the time for water to drop from 18 inches to 16 inches. Repeat.
- Allow all of the water to fully drain at least one time to simulate field hydrocompaction. Repeat test with at least one other sample.

Spreadsheet for calculations

Soil Source															
Sample No.															
Sample Location															
Test Procedures															
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Allow all of the water															
Reference Calcs															
k (l), infiltration rate (in/hr)		2	3	4	5	6	7	8	9	10	15	20	30	40	50
L, soil depth (inches)		5.0"	5.0"	5.0"	5.0"	5.0"	5.0"	5.0"	5.0"	5.0"	5.0"	5.0"	5.0"	5.0"	5.0"
h₀, starting H₂O level	18.0"	17.00"	17.00"	17.00"	17.00"	17.00"	17.00"	17.00"	17.00"	17.00"	17.00"	17.00"	17.00"	17.00"	17.00"
h₁, ending H₂O level	16.0"	15.00"	15.00"	15.00"	15.00"	15.00"	15.00"	15.00"	15.00"	15.00"	15.00"	15.00"	15.00"	15.00"	15.00"
dt₁, test time (minutes)		18.8	12.5	9.4	7.5	6.3	5.4	4.7	4.2	3.8	2.5	1.9	1.3	0.9	0.8
Bioretention Soil									Gravel Layer		1.0"				
30.0									Standard Test						
25.0									dt₁, test time		Test		Output		
									min / sec		#		Infiltration Rate		
									7 30		1		5.0 in/hr		