



MATERIAL SALES COMPANY

HEDRICK INDUSTRIES

CRUSHED STONE

SAND

GRAVEL

Green River Quarry
3675 Spartanburg Hwy, Flat Rock, NC 28731

Bioretention Media 2022
Blending & Testing Methods

Material Sales Company’s Bioretention Media is blended at Green River Quarry, located in Flat Rock, NC. We determine the ratio of the blend based on a recommendation from Summit Laboratories located in Charlotte, NC. Manufactured sand, silt/clay fines, & aged mulch are bucket blended w/ a loader until the product is well blended and uniform. The mulch is sent to Clemson University to verify that the Phosphorus levels are sufficient and within the tolerance.

All Bioretention orders must be preapproved and accepted by the project before any material is blended and shipped to a jobsite. Attached is a lab report from Summit Laboratories with additional information regarding the gradation, the phosphorus index, and the Double Ring Test that reports the Infiltration Rate.

(By Volume)	NCDENR Bioretention Media Specs (2020)	Green River Quarry’s WNC Blend Bioretention Media (2022)
Sand	75 – 85%	80%
Fines	8 – 15%	12%
Organics	5 – 15%	8%
P Index	Less than 30	27
Infiltration Rate	At least 1”/hour	3.12”/hour

* The Green River Quarry WNC Blend does not meet the washed sand spec due to the lack of clean natural sand in WNC. However, the blend does meet the overall ratio of sand/fines/organics.

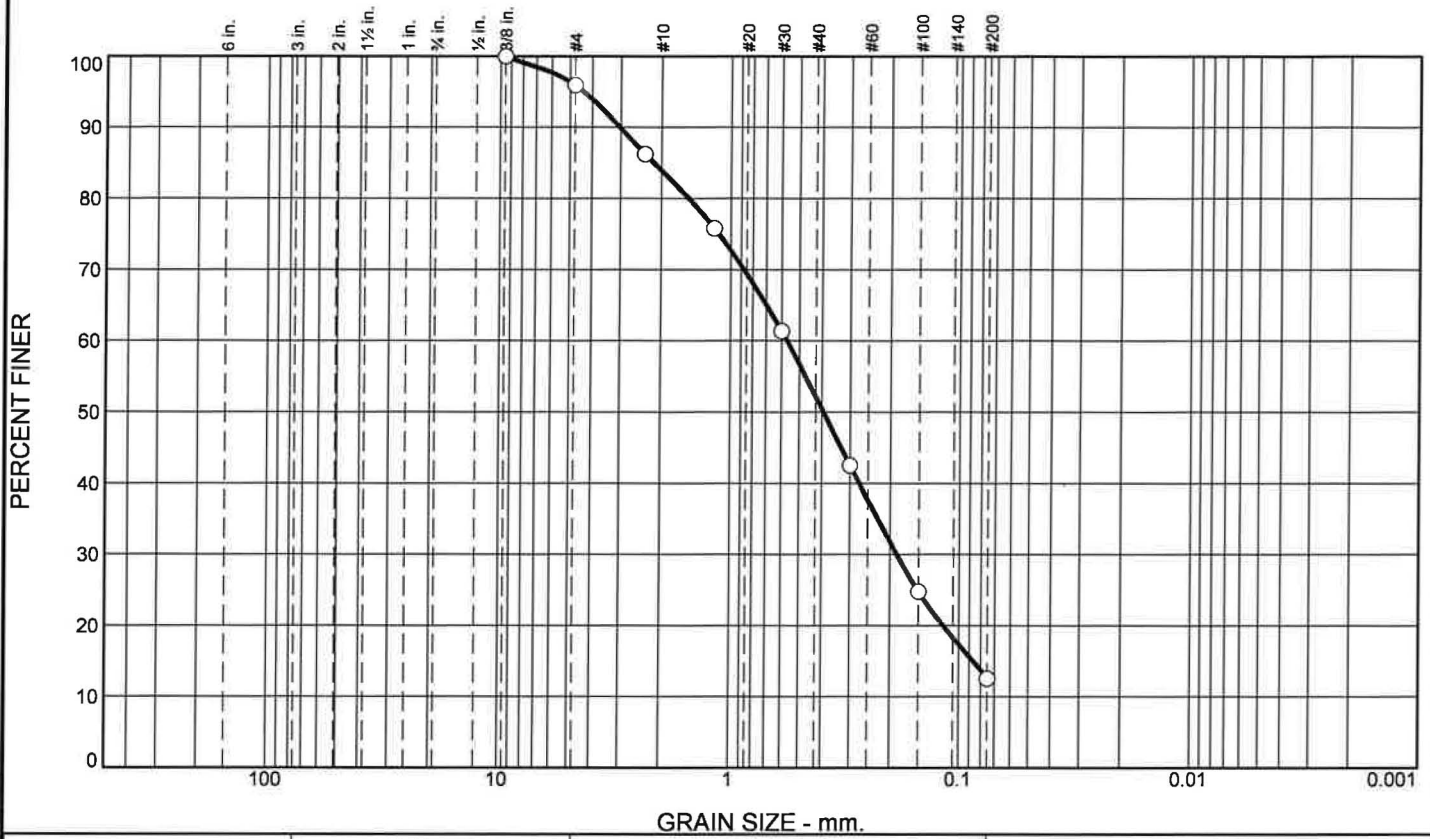
Bioretention Media should not be mechanically compacted or driven on as this may affect infiltration rates. Bioretention Media should only be installed if the construction site is stabilized from on-site silt/clay.

Please let me know if you need any additional information. Thank you,

Jon Neumann
Vice President
Material Sales Company

Particle Size Distribution Report

ASTM D6913



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0	0	4	12	32	39	13

Test Results (ASTM D6913)				
Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
0.375	100			
#4	96			
#8	86			
#16	76			
#30	61			
#50	43			
#100	25			
#200	13			

* (no specification provided)

Material Description
WNC Blend

Atterberg Limits
 PL= _____ LL= _____ PI= _____

Coefficients
 D₉₀= 3.0348 D₈₅= 2.1651 D₆₀= 0.5677
 D₅₀= 0.3935 D₃₀= 0.1874 D₁₅= 0.0866
 D₁₀= _____ C_u= _____ C_c= _____

Classification
 USCS= _____ AASHTO= _____

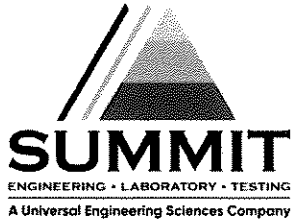
Test Remarks
 12% Fines, 80% Sand, 8% Organics (Composition by Volume)
 P Index: 27

Sample Date: 04-25-22

Summit Engineering Ft. Mill, South Carolina	Client: Materials Sales Company Project: Bio Retention Soil Mixes
	Project No: 6510.L0852 Figure

Tested By: FG

Checked By: MH



May 11, 2022

Jon Neumann
Material Sales Company
Phone Number: 828-230-2774
Email: jneumann@hedrickind.com

**Subject: Report of Infiltration Rate Testing
Green River Quarry Bio Mix
3675 Spartanburg Highway
Flat Rock, North Carolina
SUMMIT Project Number: 9705.G0001**

Dear Mr. Neumann:

As requested, Summit Engineering, Laboratory & Testing, Inc. (SUMMIT) has performed infiltration testing for Green River Quarry Biomix off Spartanburg Highway in Flat Rock, North Carolina. A more detailed description of the site location and our test results can be found on the attached figures. The following paragraphs provide a brief summary of our observations and test results.

Observations and Testing

SUMMIT visited the project site and performed a double-ring infiltrometer test on the proposed bio-mix material. The test was performed at approximately 6 inches below the created bio mix mound. It should be noted that no testing depth was specified.

After preparing the ground and positioning the double-ring apparatus, water was added to a sufficient level to allow for a clear view and water level measurements. SUMMIT recorded the initial water level and then recorded water level measurement every 15 minutes for the following 210 minutes (3.5 hours) until the rate of infiltration stabilized.

Infiltrometer Testing Results

The material was loosely placed as an 8' x 8' test pad approximately 3 feet above grade. The test pad material consisted of a Material Sales Company proprietary biomix designated as WNC Blend. During the second hour of testing, the infiltration rate began to stabilize, which may indicate saturation of the subgrade soils. The measured infiltration rates then remained constant throughout the remaining duration of the test.

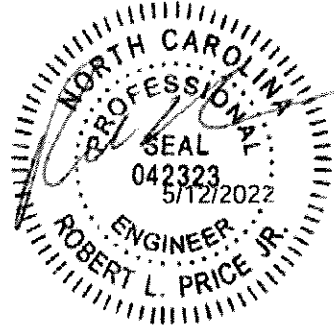
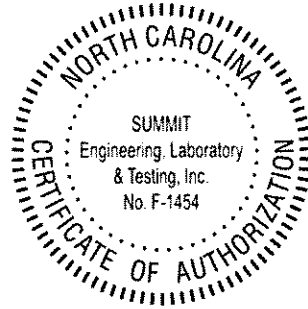
The double-ring infiltrometer test was performed in general accordance with ASTM D 3385. Results of the double-ring infiltrometer test indicates an average infiltration rate of 3.628 inches per hour and a stabilized infiltration rate of 3.115 inches per hour. Please see Figure 2 for a graphical presentation of our test results.

SUMMIT appreciates the opportunity to provide our professional services to you on this project. If you have any questions concerning the information in this report, or if we can be of further service, please contact us.

Sincerely,
SUMMIT



Adam M. Jordan
Assistant Project Manager



Robert L. Price, P.E.
Chief Engineer

Attachments: Figure 1 - Test Location
Figure 2 - Double-Ring Infiltrometer Test Result