

SECTION 329120 – Expanded Slate ASTM C-330 Sand for MDC Bioretention Media

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections apply to work of this section.

1.2 SUMMARY

- A. Section Includes:
 - 1. 2.1 Alternative MDC Bioretention Media using Expanded Slate ASTM C-330 sand
 - 2. 2.2 Components
 - a. Lightweight ASTM C-330 Sand Gradation for MDC Bioretention Media
 - b. fines fraction
 - c. organic component
- B. Related Sections:
 - 1. Section 312000
 - 2. Section 319100
 - 3. Section 329300
 - 4. Section 334600

1.3 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Manufactured Media: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce bioretention media.
- C. Expanded Slate ASTM C-330 Sand: A manufactured sand graded from the screenings of crushed expanded slate.

D. Expanded Slate Fines: For the purposes of this specification, expanded slate passing a #200 screen.

E. Aged Pine Bark Fines: pine bark fines passing a ½" screen aged after screening volume measured after compressing.

E. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.

F. Subsoil: Usually all soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

G. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1. Bioretention Media: Include product label and manufacturer's installation instructions specific to this Project.

Carolina Stalite Company 800-898-3772 www.permatill.com

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

1. Material Test Reports: For bioretention media

B. Submit manufacturer's technical product data and certified laboratory test results for the following:

1. ASTM C330 Expanded Slate Lightweight sand gradation

C. Sample: Provide one (1) quart of Bioretention Media in heavy duty clear re-sealable plastic storage bags labeled, "Bioretention Media", and the type and the project name.

1.6 QUALITY ASSURANCE

A. Provide the bioretention media prepared by a blender approved in the production of the specified items.

B. Pre-installation Conference: Conduct at the Project site.

1.7 DELIVERY, STORAGE AND HANDLING:

- A. When stockpiling finished bioretention media blend, place on a paved or protected base to prevent contamination.
- B. Do not deliver or place soil in frozen, wet, or muddy conditions.

PART 2 – PRODUCTS

2.1 GENERAL PRODUCT REQUIREMENTS:

- A. Provide a mixture to meet 15A NCAC 02H .1052 MDC FOR BIORETENTION CELLS
 - 1. MEDIA MIX. The media shall be a homogeneous engineered media blend with approximate volumes of: (a) 75 to 85 percent medium to coarse washed expanded slate ASTM C330 sand; (b) 8 to 10 percent expanded slate fines passing a #200 screen; and (c) 5 to 10 percent organic matter by compressed volume (such as pine bark fines compressed volume).
 - 2. MEDIA P-INDEX. The phosphorus index (P-index) for the media shall not exceed 30 in Nutrient Sensitive Waters (NSW) as defined in 15A NCAC 02B .0202 and shall not exceed 50 elsewhere.
 - 3. Compaction: The media shall not be mechanically compacted after being placed by conveyance equipment. To avoid future settlement, where natural compaction has not yet occurred it is recommended to either water in place or use foot pressure until firm to meet final elevation.
 - 4. When calculating the volume necessary for the project, add approximately 22% to the calculated volume to allow for compaction necessary to meet infiltration rate and specified depth. One cubic yard of the Bioretention Media weighs approx. 0.78 tons dry loose.

2.2 BIORETENTION MEDIA COMPONENTS:

A. Expanded Slate Lightweight sand gradation

- 1. Unit Dry Weight loose: 53 lb./c.f. to 58 lb./c.f. (ASTM C29)

2. ASTM 330 Gradation: MS16 Expanded Slate

Sieve Size	% Retained	% Passing
9.5 mm (3/8")	0 %	100%
4.75 mm (#4)	0-5 %	95-100 %
2.36 mm (#8)	0-20 %	80-100 %
1.18 mm (#16)	50-15 %	50-85 %
0.589 mm (#30)	40-75 %	25-60 %
0.295 mm (#50)	70-95 %	5-30 %
150 µm (#100)	90-100%	0-10 %
75 µm (#200)	95-100%	0-5 %

B. Fine Fraction

Sieve Size	% Retained	% Passing
75 µm (#200)	0%	100 %
0.05 mm	25-35%	65 -75%
0.002 mm	98-100%	0-2%

C. Organic Component

1. Aged pine bark fines screened to minus 1/2"
2. Compost shall not contain any manure products or municipal biosolids
3. Compost shall be screened to minus 1/2"
4. Organic component shall have total N of ≤ 2% of dry weight.
5. Organic component shall have P (P2O5) of ≤ 1% of dry weight.
6. Organic component salt content shall be < 10 millimho/cm at 25 ° C (ECe <10) on a saturated paste extract.
7. Organic component metals and contaminants must fall within US EPA Standard 40

2.3 BIORETENTION MEDIA PERFORMANCE STANDARDS

A. Laboratory Testing:

1. Phosphorus Index (PI) of the blended media shall fall between 10 and 30 (NCDA)
2. Permeability and Nutrient Removal test reports available upon request.

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PART 3 - INSTALLATION GUIDELINES

3.1 INSTALLATION

A. Erosion Control

1. Always follow local water quality guidelines to prevent sediment accumulation in or around the bioretention installation. Proper erosion control devices and groundcover must be in place before finalizing the installation of the rain garden. :

B. Placing Bioretention Media:

1. Contain and protect the Bioretention Media to prevent contamination or segregation of components if stock piling on site before placement.
2. Refer to project drawings and specifications for Minimum depth of Bioretention Media in accordance with 15A NCAC 02H .1052 MDC
3. Place the Bioretention Media in horizontal lifts not exceeding 12 inches depth.
4. The media shall not be mechanically compacted after being placed by conveyance equipment. To avoid future settlement, where natural compaction has not yet occurred it is recommended to either water in place or use foot pressure until firm to meet final elevation.

3.2 PLANTING

- A. Plant per drawings and specifications
 - 1. When tree, shrub and perennial planting is specified, add a 1 to 3 inch layer of triple shredded aged hardwood mulch to reduce substrate surface temperature, retain moisture, slow down infiltration, and capture heavy metals.
 - 2. Sod installation requires a sand base sod. Place sod directly on the bioretention media and irrigate until established.

3.3 MAINTENANCE

- A. Follow state guidelines for maintenance practices, including but not limited to pest management, watering newly planted plant materials, pruning, erosion and sediment control, raking and replacing mulch, debris clean up, weeding and periodic soil testing. Even the most porous soils can clog from accumulated debris and sediment.
- B. Broom clean paved areas and cover stockpiled material after each day's operation.

END OF SECTION 329120