

GUIDELINES — PROJECTS REQUIRING SILT FENCES, SILT BARRIERS OR FILTER BARRIERS.

SS24504-1215

September 25, 2015

VIRGINIA DEPARTMENT OF TRANSPORTATION
2007 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS**SUPPLEMENTAL SECTION 245—GEOSYNTHETICS AND LOW PERMEABILITY LINERS****SECTION 245—GEOSYNTHETICS** of the Specifications is completely replaced with the following:**SECTION 245—GEOSYNTHETICS AND LOW PERMEABILITY LINERS****245.01—Description**

These specifications cover artificial fiber textile products to be used in transportation construction work, and low permeability liners for stormwater management facilities.

245.02—Shipping, Handling, and Storage Requirements

Geosynthetic shall be permanently marked with a clearly legible print showing manufacturing plant or plant Identification Code number, located on the roll edge at least every 16 feet. Rolls shall be labeled at both ends of the outside of the roll outer wrapping and both ends of the inside of the geotextile roll core, and labels shall list the roll number, production date, AASHTO M288 class(es) the product meets, and the product name; if the permanent marking contains this information, the labels may be omitted.

Each geosynthetic roll shall be wrapped or otherwise packaged in a manner that will protect the geosynthetic, including the ends of the roll, from damage due to shipment, water, sunlight, and contaminants. The protective wrapping shall be maintained during periods of shipment and storage.

During storage, geosynthetics rolls shall be elevated off the ground and adequately covered to protect them from the following: site construction damage; precipitation; extended ultraviolet radiation including sunlight; strong acids or strong bases; flames including welding sparks; temperatures in excess of 160 degrees F; and other environmental conditions that may damage the physical property values of the geosynthetic. Geosynthetics that are not properly protected may be subject to rejection.

245.03—Testing and Documentation

Each geosynthetic material provided to the project shall have a manufacture date within its current NTPEP product 3-year evaluation cycle. The manufacturer and any subsequent private labeler facility shall be listed as compliant by NTPEP within the current calendar year, or immediate past calendar year with an application for audit for the current calendar year.

VDOT may sample product from a facility or project at any time for verification sampling and testing. Failure may result in the product being rejected or removed from the Approved List.

Property values in these specifications represent minimum average roll values (MARV) in the weakest principal direction unless direction is otherwise specified; permittivity values specified are minimum; AOS and panel vertical strain values are maximum; or mass per unit area, UV degradation, and asphalt retention values are typical.

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Product acceptance is determined by comparing the manufacturer test data against these specifications and using independent assurance testing, verification sampling and testing, and facility audits.

- (a) **Geotextile Fabric for Use in Silt Fences:** Geotextile shall be a woven fabric and function as a vertical, permeable interceptor designed to remove suspended soil from overland water flow. Fabric shall filter and retain soil particles from sediment-laden water to prevent eroding soil from being transported off the construction site by water runoff.

Physical Property	Test Method	Requirements
Filtering efficiency	ASTM D5141-11 and NTPEP Erosion Control Products Committee Work Plan	Min. 75%
Flow rate	ASTM D5141-11 and NTPEP Erosion Control Products Committee Work Plan	Min. 0.2 gal/ft ² /min

In addition to these requirements, the geotextile shall comply with the requirements of AASHTO M288 for temporary silt fence property requirements, Table 7, Temporary Silt Fence Property Requirements, for grab strength and ultraviolet stability.

- (b) **Geotextile for Use as Riprap Bedding Material:** Geotextile shall comply with the requirements of AASHTO M288 for separation geotextile properties, Table 3, for apparent opening size and ultraviolet stability and geotextile strength property requirements, Table 1, Class 2, for grab strength and puncture strength.
- (c) **Geotextile Fabric for Use in Drainage Systems (Drainage Fabric):** Drainage fabric shall be nonwoven and clog resistant, suitable for subsurface application, and thermally and biologically stable.

Polypropylene material is acceptable in environments with pH values between 3 and 12 inclusive; polyester material between 3 and 9 inclusive.

Physical Property	Test Method	Requirements
Permittivity	ASTM D4491	Min. 0.5 sec ⁻¹
Apparent opening size	ASTM D4751	Max. No. 50 sieve

In addition to these requirements, the geotextile shall comply with the requirements of AASHTO M288 for strength requirements, Table 1, Class 3, for grab strength.

- (d) **Geotextile for Use in Stabilization:** These are geotextiles used in saturated and/or unstable conditions to provide the functions of separation and reinforcement.

1. **Subgrade Stabilization Fabric:**

Physical Property	Test Method	Requirements
Apparent opening size	ASTM D 4751	Max. No. 20 sieve

In addition to this requirement, the geotextile shall comply with the requirements of AASHTO M 288 for strength property requirements, Table 1, Class 3, for grab strength, tear strength, and puncture strength.

2. **Embankment Stabilization Fabric Up to 6 Feet High:**

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Physical Property	Test Method	Requirements
Apparent opening size	ASTM D 4751	Max. No. 20 sieve
Seam strength	ASTM D 4632	90% specified grab strength

In addition to this requirement, the geotextile shall comply with the requirements of AASHTO M288 for strength property requirements, Table 1, Class 1 for grab strength, tear strength, and puncture strength.

- (e) **Prefabricated Geocomposite Pavement Underdrain:** Prefabricated geocomposite pavement underdrain shall consist of a polymeric drainage core encased in a nonwoven filter fabric envelope having sufficient flexibility to withstand bending and handling without damage. Prefabricated geocomposite pavement underdrain shall conform to the following:

1. **Core:** The drainage core shall be made from an inert, polymeric material resistant to commonly encountered chemicals and substances in the pavement environment and shall have a thickness of not less than 3/4 inch. Outer surfaces shall be smooth to prevent excessive wear of bonded filter fabric.

Physical Properties	Test Method	Requirements
Compressive strength panel vertical strain and core area change	ASTM D1621/D2412	Min. 40 psi at 20% deflection after 24 hrs at 0 deg F and at 125 deg F
Panel vertical strain and core area change at 22.7 psi	ASTM D6244	Max. 10% for core area and panel height
Water flow rate (after 100 hr at 10 psi normal confining pressure gradient of no more than 1.0)	ASTM D4716	Min. 15 gal/min/ft width for 12-in specimen length

2. **Filter Fabric:** Geotextile shall be bonded to and tightly stretched over the core. Geotextile shall not sag or block the flow channels, shall have a life equivalent to that of the core material, and shall conform to the requirements of (c) herein.

- (f) **Geocomposite Wall Drains:** Prefabricated geocomposite wall drain shall consist of a polymeric drainage core encased in a nonwoven filter fabric envelope having sufficient flexibility to withstand bending and handling without damage. Geocomposite wall drains shall conform to the following:

1. **Core:** The drainage core shall be made from an inert, polymeric material resistant to commonly encountered chemicals and substances in the roadway. Outer surfaces shall be smooth to prevent excessive wear of bonded filter fabric.

Physical Property	Test Method	Requirements
Compressive strength at 20% deflection	ASTM D1621/D2412	Min. 40 psi after 24 hrs at 0 degree F and at 125 degree F
Water flow rate (after 100 hr at 10 psi normal confining pressure and gradient of no more than 0.1)	ASTM D4716	Min. 15 gal/min/ft width (for 12-in specimen length)

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2. **Filter Fabric:** Geotextile shall be bonded to and tightly stretched over both sides of the core. Geotextile shall not sag or block the flow channels, shall have a life equivalent to that of the core material, and shall conform to the requirements of (c) herein, except that grab strength requirement shall meet AASHTO M288 Table 1, Class 2.

- (g) **Geomembrane Moisture Barrier:** Geomembrane moisture barrier shall be resistant to biological attack. geomembrane shall be constructed of PVC and shall conform to the requirements of the PVC geomembrane Institute 1104 material specification for PVC geomembrane (Revision #1 effective April 15, 2008) and shall meet the following additional or more stringent requirements:

Physical Property	Test Method	Requirements
Thickness	ASTM D5199	Min. 30 mils
Tensile (1-in strip)	ASTM D882	Min. 0.80 kip/ft (ultimate)
Tear Strength (Die C)	ASTM D1004	Min. 8 lbf
Seam Seal Strength	ASTM D1004	Min. 0.18kip/ft

- (h) **Dewatering Bag:** A nonwoven geotextile sewn together to form a bag that can be used in lieu of a de-watering basin for the purpose of filtering out suspended soil particles. The bag shall be capable of accommodating the water flow from the pump without leaking at the spout and seams.

Physical Property	Test Method	Requirements
Grab strength @ Elongation >50%(CRE/Dry)	ASTM D4632	Min. 250 lb (min)
Seam strength	ASTM D4632	90% Specified grab strength
Puncture	ASTM D4833	Min. 150 lb
Flow rate	ASTM D4491	Min. 0.189 ft ³ /sec/ft ² (min)
Permittivity	ASTM D4491	Min. 1.2 sec ⁻¹
UV resistance	ASTM D4355	Min. 70% at 500 hr
AOS	ASTM D4751	Max. 100 sieve

- (i) **Pavement Interlayer:** Paving geosynthetics shall be used as an interlayer between pavement layers. Specific application of these paving interlayers shall be determined by the Engineer.

1. **Paving Fabric:** The geotextile shall conform to the requirements of AASHTO M288 Paving Fabric Property Requirements, Section 10.

2. **Paving Mat:** The paving mat shall meet the requirements of ASTM D7239 Geosynthetic Paving Mat, Type 1.

- (j) **Low Permeability Liners for Stormwater Management Facilities:** SWM liner soil shall be classified as CL, CH or MH in accordance with ASTM D2487 and shall have a maximum coefficient of permeability of 1×10^{-6} cm/sec in accordance with ASTM D5084, after compaction. The maximum particle size shall be three inches in its largest dimension. Natural soils, which do not meet these specifications, may be blended with bentonite to provide the specified permeability characteristics.

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Geosynthetic Clay Liner shall have a maximum coefficient of permeability of 1×10^{-8} cm/sec in accordance with ASTM D5887.

This specification is not intended for dam embankment material or clay core cut-off trench material.

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