

STABILIZED MULCH MATRIX (SMM)

SCDOT Designation: SC-M-815-6 (11/08)

1.0 Stabilized Mulch Matrix (SMM)**1.1 Description**

Use Stabilized Mulch Matrix (SMM) as an allowable mulch for erosion control and vegetation establishment as outlined in *Supplemental Specification for Seeding SCDOT (SC-M-810)*. Do not use SMM as a channel liner or for areas receiving concentrated flow. Install SMM in the following situations:

- For enhancement of permanent and temporary cover operations.
- On slopes up to 3H:1V, for permanent and temporary cover applications on slopes less than 50 feet.
- On slopes up to 2H:1V for temporary cover by mulch and temporary cover by seeding applications on slopes less than 25 feet.
- When the minimum required functional longevity of soil protection is three (3) months.
- When the soil is dry and rain is not expected within 48 hours after application.
- When there is a high degree of certainty that heavy rains will not follow application.

Do not use a SMM as Type A Temporary Erosion Control Blankets, channel liners, or in areas receiving concentrated flow. Do not use SMM as a Bonded Fiber Matrix (BFM) or Fiber Reinforced Matrix (FRM).

1.2 Materials

Provide a Stabilized Mulch Matrix (SMM) composed of defibrated organic fibers with, at a minimum, one of the following additives: soil flocculants, cross-linked hydro-colloidal polymers, or cross-linked tackifiers that upon drying become insoluble and non-dispersible to eliminate direct raindrop impact on soil. Do not use materials composed of paper, cellulose fiber, or a mixture of paper, cellulose, and other materials. Provide an SMM composed of:

- Long strand, non-toxic fibers.
- Thermally processed fibers heated to an appropriate temperature for sterilization purposes.

Use a SMM that does not form a water-insensitive crust that can inhibit plant growth. Provide a SMM that completely photo-degrades or biodegrades. Do not use materials listed for use as a Hydraulic Mulch (HM). Seed, lime, and fertilizer may be added to the SMM mixture according to the current requirements of **Section 810, Seeding Specifications**.

Furnish SMM components pre-packaged by the manufacturer to assure material performance and compliance with the minimum requirements of Table 1 when applied at a rate of 3,500 pounds per acre. Under no circumstances will field mixing of additives or components be accepted.

Provide SMM from a manufacturer listed on the most recent edition of the *SCDOT Qualified Product List 71* and provide documentation of testing at an approved independent laboratory demonstrating performance based on reduced water runoff, reduced soil loss, and enhanced plant germination.

Table 1: Minimum SMM Requirements

SMM Property		Required Value
Thermally Processed Fiber by Weight		80% ± 10%
Bonding Agent / Crosslinked Hydro-Colloidal Tackifiers by weight		5% ± 2%
Moisture Content by weight		12% ± 3%
Organic Matter		90% minimum
Color		Colored to contrast application area, shall not stain concrete or painted surfaces.
SMM Property	Test Method	Required Value
Physical		
Mass Per Unit Area	ASTM D6566*	9.0 oz/yd ²
Thickness	ASTM D6525*	0.08 inch minimum
Ground Cover	ASTM D6567*	97% minimum
Water Holding Capacity	ASTM D7367	900% minimum
Endurance		
Functional Longevity	Observed	Minimum of 3 months
Performance		
Cover Factor	SCDOT Approved Large Scale Testing	0.10 maximum
% Effectiveness	SCDOT Approved Large Scale Testing	90% minimum
Cure time	Observed	24 - 48 hours
Vegetation Establishment	ASTM D7322*	300% minimum

* ASTM test methods developed for Rolled Erosion Control Products (RECPs) that have been modified to accommodate Hydraulic Erosion Control Products (HECPs).

1.2.1 Quality Assurance

Before installation of SMM, provide the following information from the manufacturer:

- Written quality control program conforming to the requirements of subsection 1.2.2 *Quality Control*.
- Documentation of field and/or laboratory testing that quantifies the performance of the product conforming to the requirements of subsection 1.2.2 *Quality Control*.

Ensure that each package of SMM bears complete identification including, but not limited to, the following:

- Manufacturer’s name and location,
- Manufacturer’s telephone number and fax number,
- Manufacturer’s e-mail address and web address,
- SMM name, model, and/or serial number, and
- SMM physical composition.

SMM is listed on the most recent edition of *SCDOT Qualified Product List 71* prior to being accepted for use. Prior to inclusion on *SCDOT Qualified Products List 71*, SMM must meet the physical and performance criteria outlined in this specification.

1.2.2 Quality Control

Before installation of SMM, provide the following information from the manufacturer:

- Written description of the manufacturer’s quality control program of field and/or laboratory testing that quantifies the performance of the product. Performance testing must take place at a laboratory accredited to perform tests required for the product tested.
- Instructions on the proper installation and maintenance of the SMM.
- Certification of the testing requirements upon request.

Provide verification of conformance with manufacturer’s published specifications (i.e. the certification) which at a minimum identify the following:

- Independent qualified test facility name and location,
- Manufacturer,
- Product ID,
- Test ID, and
- Test date.

1.3 Construction Requirements

1.3.1 Installation

Use SMM with components pre-packaged by the manufacturer to assure material performance. Do not field mix materials, additives, or components.

Examine substrates and conditions before applying materials. Do not proceed with installation until unsatisfactory conditions are corrected. Apply SMM to geotechnically stable slopes that are constructed to divert runoff water away from the face of the slope, eliminating damage to the slope face caused by the surface flow from above the slope.

Use personnel or subcontractors certified and trained by the manufacturer in the proper procedures for mixing and application of SMM. Strictly comply with the manufacturer’s mixing recommendations and application instructions. Use approved hydraulic seeding/mulching machines with appropriate nozzles for SMM applications. Apply SMM from opposing directions to the soil surface in successive layers, reducing the “shadow effect” to achieve maximum coverage of all exposed soil. Do not apply the SMM immediately before, during, or after rainfall. Allow SMM a minimum of 24 hours to dry after installation. Install SMM materials at the general application rates of Table 2.

Table 2: SMM Installation Requirements

Condition	Max Continuous Slope Length (ft)	Temporary Cover by Mulch (no seed) Application Rate (lbs/acre)	Temporary Cover by Seeding Application Rate (lbs/acre)	Permanent Cover Application Rate (lbs/acre)
5:1 Slope	70	1,800	1,200	1,800
4:1 Slope	60	2,000	1,500	2,000
3:1 Slope	50	2,500	1,800	2,500
2:1 Slope	25	3,000	2,000	Not Applicable

1.3.2 Delivery Storage and Handling

Use SMM with components pre-packaged by the manufacturer to assure material performance. Have materials and products delivered in UV and weather resistant factory labeled packages. Store and handle SMM in strict compliance with the manufacturer’s instructions and recommendations. Protect SMM from damage from weather, excessive temperatures, and construction operations. Clean all spills promptly.

1.3.3 Inspection and Maintenance

Prepare a SMM maintenance plan that includes the following:

- Reapplication of SMM as directed by RCE to disturbed areas that require continued erosion control.
- Maintenance of equipment to provide uniform application rates.
- Rinsing all SMM mixing and application equipment thoroughly with water to avoid formation of residues and appropriate discharge of rinse water.

Degradation of SMM can be expected to occur as a result of mechanical degradation, chemical degradation, biological hydrolysis, sunlight, salt, and temperature. Where necessary, reapply SMM in accordance with the manufacturer's instructions. Reapplication is not required unless SMM treated soils are disturbed or turbidity or water quality shows the need for an additional application. If SMM treated soils are left undisturbed, the necessity of reapplication will be determined by the RCE. The Department will not pay for the reapplication of SMM within three (3) months of the initial application unless the reapplication is approved by the RCE.

1.3.4 Acceptance

Obtain RCE acceptance and approval of SMM installations. When requested by the RCE, ensure that a manufacturer's representative is on-site to oversee and approve the initial SMM installation. Obtain a letter from the manufacturer approving the installation when requested by the RCE.

1.3 Measurement

The quantity for the pay item Stabilized Mulch Matrix (SMM) is the surface area covered by the SMM applied at the recommended rate and is measured by the one-acre (acre) unit of SMM in-place, complete and accepted. The installation of SMM may require written acceptance by the manufacturer's representative before acceptance for payment.

1.4 Payment

Payment for Stabilized Mulch Matrix (SMM) is full compensation for installing SMM as specified or directed by the RCE and includes furnishing, applying, and maintaining the SMM including testing and documentation of Quality Control and Quality Assurance programs and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.

Table 3: Bid Item Number

Bid Item Number	Description	Units
8101120	Stabilized Mulch Matrix (SMM)	ACRE