



SKAPS INDUSTRIES

DROP-IN SPECIFICATIONS GEOTEXTILE OVERLAY

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1. GENERAL

1.1 SECTION INCLUDES

- A. This specification is applicable to the use of a paving fabric saturated with asphalt cement between pavement layers.
- B. The function of the paving fabric is to act as a waterproofing and stress relieving membrane within the pavement structure.
- C. The specification is not intended to describe fabric membrane systems specifically designed for pavement joints and localized (spot) repairs.

1.2 UNIT PRICES

- A. Method of Measurement: By the square meter (or square yard as indicated in contract documents) including seams, overlaps, and wastage.
- B. Basis of Payment: By the square meter (or square yard - as indicated in contract documents) installed.

1.3 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO) "Standard Specification for Geotextile Specification for Highway Applications" Designation M 288-06.
- B. Texas Department of Transportation, Manual of Testing Procedures: TEX-616-J: Asphalt Retention and Potential Change of Area.
- C. American Society for Testing and Materials (ASTM):
 - 1. D 123 – Standard Terminology Relating to Geotextiles
 - 2. D 276 – Standard Test Method for Identification of Fibers in Textiles
 - 3. D 4354 - Practice for Sampling of Geosynthetics for Testing.
 - 4. D 4355 - Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).
 - 5. D 4439 - Terminology for Geotextiles.
 - 6. D 4491 - Test Methods for Water Permeability of Geotextiles by Permittivity.
 - 7. D 4533 - Test Method for Index Trapezoid Tearing Strength of Geotextiles.



8. D 4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles.
9. D 4759 - Practice for Determining the Specification Conformance of Geosynthetics.
10. D 4751 - Test Method for Determining Apparent Opening Size of a Geotextile.
11. D 4873 - Guide for Identification, Storage, and Handling of Geotextiles.

1.4 DEFINITIONS

- A. *Maximum Average Roll Value (MaxARV)*: Property value calculated as typical plus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will be below the value reported.
- B. *Minimum Average Roll Value (MARV)*: Property value calculated as typical minus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed value reported.
- C. *Typical Roll Value*: Property value calculated from average or mean obtained from test data.

1.5 SUBMITTALS

- A. CERTIFICATION:
 1. Prior to material delivery to project site, the contractor shall provide the engineer with a written certification or manufacturers quality control data which displays that the geotextile meets or exceeds minimum average roll values (MARV) specified herein.
 2. The contractor shall submit, if required by the engineer, manufacturer's quality control manual for the geotextile to be delivered to the site.
 3. The Manufacturer shall demonstrate transparency of their manufacturing process by showing traceability of the product from origin of raw material through finished good.
 4. The Manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the specification. Documentation describing the quality control program shall be made available upon request.



5. The manufacturer's certificate shall state that the furnished geotextile meets MARV requirements of the specification as evaluated under the manufacturer's quality control program. The certificate shall be attested to by a person having legal authority to bind the Manufacturer.
6. Manufacturing Quality Control (MQC) test results shall be provided upon request.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Geotextile labeling, shipment and storage shall follow ASTM D 4873.
- B. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.
- C. Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer's certificate.
- D. Each geotextile roll shall be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants.
- E. The protective wrapping shall be maintained during periods of shipment and storage. If the wrapping is damaged prior to installation, the outer wrap of geotextile material must be discarded before installation.
- F. During storage, geotextile rolls shall be elevated off the ground and adequately covered to protect them from the following: Site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, chemicals that are strong acids or strong bases, flames, sparks, temperatures in excess of 71°C (160°F) and any other environmental condition that might damage the geotextile.

2. PRODUCTS

2.1 MANUFACTURERS

- A. All rolls of the geotextile shall be identified with permanent marking on the roll or packaging, with the manufacturers name, product identification, roll number and roll dimensions.



2.2 GENERAL REQUIREMENTS

- A. The paving fabric shall be needle punched nonwoven and heat treated on one side and shall conform to AASHTO M288, Mild Climate Region specification for paving fabrics.
- B. The geotextile should meet the following Minimum Average Roll Values (MARV) for nonwoven geotextile:

Property	Test Method ASTM	Units	Survivability condition	
			High	Low
			(GC140)	(GC130)
Grab Tensile Strength	D 4632	lbs (kN)	102 (0.453)	90 (0.400)
Elongation	D 4632	%	50	50
Trapezoid Tear	D 4533	lbs (kN)	45 (0.200)	35 (0.155)
CBR Puncture	D 6241	lbs (kN)	300 (1.334)	275 (1.223)
UV Resistance	D 4355	%/hrs	70/500	70/500
Asphalt retention	-	gal/yd ²	0.2	0.2
Melting point	-	°F (C°)	300 (149)	300 (149)

2.3 GEOTEXTILE QUALITY ASSURANCE

A. Product Marking

1. Labels should be affixed to the exterior of the packaged roll to include:
 - a) Name of source manufacturing facility
 - b) Geotextile product name as listed with AASHTO/NTPEP
 - c) AASHTO M288 class (es) that product meets
 - d) Date of manufacture



B. Quality Control Testing

1. All supplied geotextiles shall be tested for quality control in in-house testing facilities as per required standard.
2. All supplied geotextiles shall include certificates of analysis for all specified properties.
3. Geotextile properties, other than Ultraviolet Stability shall be tested by NTPEP to verify conformance with this specification.
4. Testing laboratories shall be compliant and certified to the ISO 9001:2008 quality system standard.

C. Asphalt Sealant: The Engineer shall approve asphalt cement. A grade asphalt of the same type used in the manufacture of the hot mix asphalt for the overlay should be acceptable.

D. Manufacturing Facilities

1. The source manufacturing facility for supplied geotextiles shall maintain audited compliance through AASHTO representative auditors for Quality Management System Processes for:
 - a) Organization and Organizational Policies
 - b) Product Marking and Labeling
 - c) Manufacturing Process and Documentation Control
 - d) Quality Control of Raw Materials
 - e) Quality Control Inspection, Measurement, and Testing for Geotextile Products.
 - f) Quality Control Personnel – Training and Competency Evaluation
 - g) Statistical Analysis of Test Results
 - h) Resolution of Non-Conforming Product of Test Results
 - i) Retention of Test Results and Product Traceability
 - j) Quality Control Testing Facilities
 - k) Marking, Storage, Shipping, and Handling of Finished Geotextile
 - l) Internal Quality Audits of Each Plant Producing Product
2. Source manufacturing facilities shall be compliant and certified to the ISO 9001:2008 quality system standard.



E. Equipment:

1. The asphalt distributor shall be capable of spraying the asphalt sealant at the prescribed uniform application rate. No streaking, skipping, or dripping will be permitted. The distributor shall also be equipped with a hand spray having a single nozzle and positive shut-off valve.
2. Mechanical or manual lay down equipment shall be capable of laying the geotextile smoothly.
3. The following miscellaneous equipment shall be provided: stiff bristle brooms or squeegees to smooth the geotextile; scissors or blades to cut the geotextile; brushes for applying asphalt sealant to geotextile overlaps.
4. Pneumatic rolling equipment to smooth the geotextile into the sealant, and sanding equipment may be required for certain jobs. Rolling is especially required on jobs where thin lifts or chip seals are being placed. Rolling helps ensure the geotextile bond to the adjoining pavement layers in the absence of heat and weight associated with thicker lifts of asphaltic pavement.

3. EXECUTION

3.1 PREPARATION

- A. Washed concrete sand may be spread over an asphalt-saturated geotextile to facilitate movement of equipment during construction or to prevent tearing or delamination of the geotextile. Hot-mix broadcast in front of construction vehicle tires may also serve this purpose. If sand is applied, excess quantities shall be removed from the geotextile prior to placing the surface course.
- B. Sand is not usually required. However, ambient temperatures are occasionally sufficiently high to cause bleed-through of the asphalt sealant resulting in undesirable geotextile adhesion to construction vehicle tires.



- C. Neither the asphalt sealant nor the geotextile shall be placed when weather conditions, in the opinion of the Engineer, are not suitable. Air and pavement temperatures shall be sufficient to allow the asphalt sealant to hold the geotextile in place. For asphalt cements, air temperature shall be 10^oC and rising. For asphalt emulsions, air temperature shall be 15^oC (60^oF) and rising.
- D. The surface on which the geotextile is to be placed shall be reasonably free of dirt, water, vegetation, or other debris. Cracks exceeding 3 mm (1/8 in) in width shall be filled with suitable crack filler. Potholes shall be properly repaired as directed by the Engineer. Fillers shall be allowed to cure prior to geotextile placement.

3.2 INSTALLATION OF TACK COAT

- A. The specified rate of asphalt sealant application must be sufficient to satisfy the asphalt retention properties of the geotextile and bond the geotextile and overlay to the old pavement.
- B. When emulsions are used, the application rate must be increased to offset water content of the emulsion.
- C. Application of the sealant shall be by distributor spray bar, with hand spraying kept to a minimum. Temperature of the asphalt sealant shall be sufficiently high to permit uniform spray pattern. For asphalt cements the minimum temperature shall be 150oC (300oF). To avoid damage to the geotextile, however, the distributor tank temperatures shall not exceed 160oC (320oF).
- D. A spray pattern for asphalt emulsion is improved by heating. Temperatures in the 55oC (130oF) to 70oC (160oF) range are desirable. A temperature of 70oC (160oF) shall not be exceeded since higher temperatures may break emulsion.
- E. The target width of asphalt sealant application shall be the geotextile width plus 150 mm (6 in). The asphalt sealant shall not be applied any farther in advance of geotextile placement than the distance the Contractor can maintain free of traffic.
- F. Asphalt spills shall be cleaned from the road surface to avoid flushing and geotextile movement.
- G. When asphalt emulsions are used, the emulsion shall be cured prior to placing the geotextile and final wearing surface. This means essentially no moisture remaining.



3.3 INSTALLATION OF THE GEOSYNTHETIC (PAVING FABRIC)

- A. The geotextile shall be placed onto the asphalt sealant (calendared or smooth side up) with minimum wrinkling prior to the time the asphalt has cooled and lost tackiness. As directed by the Engineer, wrinkles or folds in excess of 25 mm (1 in) shall be slit and laid flat.
- B. Blooming and/or pneumatic rolling will be required to maximize geotextile contact with the pavement surface.
- C. Overlap of geotextile joints shall be sufficient to ensure full closure of the joint, but should not exceed 150 mm. Transverse joints shall be lapped in the direction of paving to prevent edge pickup by the paver. A second application of asphalt sealant to the geotextile overlaps will be required if in the judgement of the Engineer additional asphalt sealant is needed to ensure proper bonding of the double geotextile layer.
- D. Removal and replacement of geotextile that is damaged will be the responsibility of the Contractor.

3.4 PROTECTION

- A. Trafficking the geotextile will be permitted for emergency and construction vehicles only.
- B. Placement of the hot-mix overlay should closely follow geotextile laydown. The temperature of the mix shall not exceed 160°C (320°F). In the event asphalt bleeds through the geotextile causing construction problems before the overlay is placed, the affected areas shall be blotted by spreading sand. To avoid movement of, or damage to the seal-coat saturated geotextile, turning of the paver and other vehicles shall be gradual and kept to a minimum.
- C. Prior to placing a seal coat (or thin overlay such as an open-graded friction course), lightly sand the geotextile at a spread rate of 0.65 to 1.0 kg per m² (0.15 to 0.20 lb/ft²), and pneumatically roll the geotextile tightly into the sealant.

END OF SECTION