

**S-1**                    **(2105) GEOTEXTILE FABRIC BOND BREAKER INTERLAYER FOR CONCRETE OVERLAY**

*Use this provision when constructing a concrete overlay of an existing concrete pavement.*

NEW WRITE-UP 07/24/15

SP2014-84.1

Install a geotextile fabric bond breaker interlayer on an existing concrete pavement in accordance with the provisions of Mn/DOT 2105, 2301, the plans and as modified below:

**S-1.1**                    **MATERIAL REQUIREMENTS**

The geotextile interlayer material shall comply with the requirements of Table 1 shown below:

| <b>Table 1.<br/>Specifications for Non-woven Geotextile Interlayer Material for Concrete Overlay</b> |  |  |
|--|--|--|
| <b>Property</b>  | <b>Requirements<sup>1</sup></b>  | <b>Test Procedure</b>                  |
| Geotextile type  | Nonwoven, needle-punched geotextile, no thermal treatment (calendaring or IR)  | Manufacturer Certificate of Compliance |
| Color  | Uniform/nominally same-color fibers  | Visual Inspection                      |
| Mass per unit area   | ≥ 14.7 oz/yd <sup>2</sup> [500 g/m <sup>2</sup> ]  | ASTM D 5261                            |
| Thickness under load (pressure)  | [a] At 0.29 psi [2 kPa]: ≥ 0.12 in [3.0 mm]<br>[b] At 2.9 psi [20 kPa]: ≥ 0.10 in [2.5 mm]<br>[c] At 29 psi [200 kPa]: ≥ 0.04 in [1.0 mm]                      | ASTM D 5199                            |
| Wide-width tensile strength  | ≥ 685 lb/ft [10 kN/m]  | ASTM D 4595                            |
| Wide-width maximum elongation  | ≤ 130%   | ASTM D 4595                            |
| Water permeability in normal direction under load (pressure)   | At 2.9 psi [20 kPa]: ≥ 3.3x10 <sup>-4</sup> ft/s [1x10 <sup>-4</sup> m/s]  | Mod. ASTM D 5493 or ASTM D 4491        |
| In-plane water permeability (transmissivity) under load (pressure)                                   | [a] At 2.9 psi [20 kPa]: ≥ 1.6x10 <sup>-3</sup> ft/s [5x10 <sup>-4</sup> m/s]<br>[b] At 29 psi [200 kPa]: ≥ 6.6x10 <sup>-4</sup> ft/s [2x10 <sup>-4</sup> m/s] | Mod. ASTM D 6574 or ASTM D 4716        |
| Weather resistance   | Retained strength ≥ 60%  | ASTM D 4355 @ 500 hrs. exposure        |
| Alkali resistance  | ≥ 96% polypropylene/polyethylene   | Manufacturer certification of polymer  |

**S-1.2**                    **CERTIFICATION, SAMPLING AND TESTING REQUIREMENTS**

(A)                    **Certificates of Compliance**

Ensure the supplier submits to the Engineer a Certificate of Compliance and a document stating the manufacturer's MARV with each shipment of geotextile. The minimum average roll value (MARV) requirements shall conform to AASHTO M288, which require a 97.7 percent degree of confidence. Provide a copy of the Certificate of Compliance and MARV with each geotextile sample sent to the Materials Laboratory for testing.

(B)                    **Sampling and Testing Requirements**

The Department's inspection and test results will determine acceptance of the geotextile, in accordance with MnDOT 1603.4, "Acceptance." In the presence of the Engineer, randomly select samples in the

field at the rates and sample sizes shown in the Schedule of Materials Control. Cut samples across the full width of the roll. Do not sample the first full turn (outside layer) or the last full turn (inside layer) of the roll.

S-1.3 CONSTRUCTION REQUIREMENTS

(A) Handling and Placement Requirements

- (1) Prior to the placement of the fabric layer, remove loose or deteriorated surfacing, clean the surface by power sweeping, and air blasting. Removal of deteriorated areas from joints, cracks, bituminous-patched areas, etc. may require air blasting, the use of a small milling machine, or handwork as directed by the Engineer. Perform air blasting with high-pressure 100 psi [690kPa] equipment. Patch spalls and other surface defects with an approved patching material. The patching material for use shall consist of a bituminous material, cementitious material, or other equivalent material meeting the approval of the Engineer. The patch shall provide a flat, tight surface before placement of the interlayer or concrete overlay.
- (2) Roll fabric out on underlying layer. Fabric should be tight without excess wrinkles and folds. Place the fabric within 7 days of concrete paving.
- (3) Adhere the fabric to the underlying layer using one of the following methods:
  - (a) Pin the fabric to the underlying layer with bolts/nails punched through 2 in – 2.75 in [50 – 70 mm] galvanized washers/discs every 6 feet [1.8 m]. Use additional fasteners as needed to ensure fabric does not shift or fold prior to concrete placement.
  - (b) Approved cylinder spray adhesive for geotextiles and recommended by the manufacturer for use to attach the fabric to the underlying concrete. Apply a minimum of 12 inch wide adhesive bond to attach any edge of geotextile fabric edge to the underlying pavement or to another piece of geotextile fabric. Apply pressure to the fabric to set the adhesive prior to placing the concrete.
- (5) Fabric should overlap by 8 in +/- 2 in [200 mm +/- 50 mm].
- (6) In no location should more than 3 layers of fabric overlap.
- (7) Fabric should extend beyond the edge of the new concrete and into a location that facilitates drainage by 4 in +/- 2 in [10 mm +/- 5 mm].
- (8) Fabric must terminate in or next to a drainable pavement layer, or exposed in such a way that free drainage of water within the fabric is not impaired.
- (9) Place the fabric bond breaker layer to a grade and tolerance such that the overlying PCC pavement thickness will meet minimum design requirements.
- (10) Slightly dampen, but not saturate, the fabric, prior to concrete placement.

(B) Maintenance

Maintain the geotextile fabric bond breaker layer during and after placement throughout its entire length until placement of the concrete overlay. During this maintenance period, correct any deficiencies to the satisfaction of the Engineer. The bond breaker layer shall properly drain at all times. Do not place fabric on areas subject to excess traffic until immediately before concrete placement.

During construction, keep the bond breaker and associated drain trenches free of fine soils or other contaminants. If contamination of the bond breaker layer occurs, remove and replace or clean the surface to the satisfaction of the Engineer to assure drainage capacity as designed at no cost to the Department.

If a rain event occurs after placement of the geotextile fabric bond breaker, the Engineer will allow the use of rollers to remove excess water from the fabric, or any method acceptable to the Engineer, prior to concrete paving.

(C) Permeable Aggregate Base Drain Installation

When specified, install drains after the pavement is constructed and before placing any shoulder aggregate/base aggregate. (See Section S-\_\_\_ (SUBSURFACE DRAINS, PERMEABLE AGGREGATE BASE

TYPE) of these Special Provisions). Do not operate trucks or other equipment longitudinally directly over the edge drain system.

S-1.4            MEASUREMENT AND PAYMENT

The Engineer will measure the number of square yards [**square meters**] of satisfactorily installed geotextile. The Engineer will base payment made under Item 2105.604 (Geotextile Fabric Special) at the Contract bid price per square yard [**square meter**], including, but not limited to, geotextile, overlap, placement, anchoring, and any needed repairs.