

GEOTEXTILE BOND BREAKER INTERLAYER FOR CONCRETE OVERLAY

1. DESCRIPTION. Install a geotextile fabric bond breaker interlayer on an existing concrete pavement in accordance with the standard specifications, the plans, and as described below:
2. MATERIAL REQUIREMENTS. The geotextile interlayer material shall comply with the requirements of Table 1 shown below:

**Table 1.
Specifications for Geotextile Interlayer Material for Concrete Overlay**

Property	Requirements	Test Procedure
Geotextile type	Nonwoven, needle-punched geotextile, no thermal treatment (calendaring or IR)	EN 13249 Annex F
Color	Uniform/nominally same-color (black or white)	Visual Inspection
Mass per unit area	≥ 14.7 oz/yd ² ≤ 16.2 oz/yd ²	ASTM D 5261
Thickness under load (pressure)	a. At 0.29 psi [2 kPa]: ≥ 120 mil b. At 2.9 psi [20 kPa]: ≥ 100 mil c. At 29 psi [200 kPa]: ≥ 40 mil	ASTM D 5199
Wide-width tensile strength	≥ 685 lb/ft	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 ⁻⁴ ft/s	ASTM D 5493
In-plane water permeability (transmissivity) under load (pressure)	a. At 2.9 psi [20 kPa]: ≥ 1.6x10 ⁻³ ft/s b. At 29 psi [200 kPa]: ≥ 6.6x10 ⁻⁴ ft/s	ASTM D 6574
Weather resistance	Retained strength ≥ 70%	ASTM D 4355 @ 500 hrs. exposure
Alkali resistance	≥ 97% polyolefin	EN 13249 Annex B
Peel Strength Geotextile to Concrete	≥ 4.2 lbs/linear inch	ASTM D 903
Peel Strength Geotextile to Geotextile	≥ 4.2 lbs/linear inch	ASTM D 903

3. Quality Control

- 3.1. Manufacturing Quality Control (MQC): Testing shall be performed at a laboratory accredited by GAI-LAP for tests required for the geotextile, at frequency in accordance with ASTM D 8102.
- 3.2. All supplied geotextiles shall include certificates of analysis for all specified properties.

4. SUBMITTALS

4.1. Product Certification

- 4.1.1. The Contractor shall provide the Engineer a certificate stating the name of the geotextile manufacturer, product name, style, chemical compositions of filaments or yarns and other pertinent information to fully describe the geotextile.

4.1.2. The Manufacturer shall demonstrate transparency of their manufacturing process by showing traceability of the product from origin of raw material through finished good.

4.1.3. 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.

4.1.4. The Manufacturer's certificate shall be supplied before product shipment. The certificate shall state that the furnished geotextile meets all requirements of specification as evaluated under the manufacturer's quality control program. A person having legal authority to bind the Manufacturer shall attest to the certificate.

5. DELIVERY, STORAGE, AND HANDLING

5.1. Ensure geotextile labeling, shipment and storage follows ASTM D 4873.

5.2. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.

5.3. Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer's certificate.

5.4. Wrap each geotextile roll with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants.

5.5. Maintain the protective wrapping during periods of shipment and storage. If the wrapping is damaged prior to installation, discard the outer wrap of geotextile material before installation.

5.6. Store geotextile rolls elevated off the ground and with adequately cover to protect them from the following: site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, surface water, chemicals that are strong acids or strong bases, flames, sparks, temperatures in excess of 160 deg F (71 deg C) and any other environmental condition that might damage the geotextile.

6. INSTALLATION

6.1. Installation of the geotextile fabric can be performed by using an adhesive, or nails with washers to ensure the geotextile remains in place and does not come loose, fold, or bulge.

6.2. Site Preparation

6.2.1. For new pavements on stabilized substructures and unbonded overlays, sweep the surface clean before placing geotextile interlayer and/or adhesive. Excessive debris may damage geotextile during installation and service.

6.2.2. For unbonded overlays:

6.2.2.1. Replace isolated areas of pavement where subgrade/subbase show evidence of active movement in the existing pavement. Repair the subgrade/subbase as

necessary.

6.2.2.2. Fill any substantial voids greater than 2 in (5 cm) deep on the pavement surface with an approved material.

6.2.2.3. Joint deterioration with little or no faulting can be bridged with the overlay.

6.2.2.4. Use full-depth repairs at isolated spots where structural integrity needs restoring.

6.3. Installation Using Adhesive

6.3.1. Geotextile Interlayer Adhesive Application

6.3.1.1. Apply the adhesive to the existing pavement surface or milled surface before the placement of the geotextile.

6.3.1.2. Apply the adhesive continuously to the pavement around the perimeter of each geotextile roll/panel with a desired spray width of approximately 6 in (15 cm), or as specified.

6.3.1.3. Apply the adhesive to the edge of previously laid geotextile for all roll end and panel overlaps with a desired spray width of 6-8 in, or as specified.

6.3.1.4. Spray a test pattern to determine the best distance from the surface required to achieve the desired spray width. Adjust/open the applicator spray flare fitting until the spray pattern is wide enough to achieve the desired width.

6.3.1.5. Apply a single, continuous coat of the adhesive in front of the installation of geotextile at a pace necessary to achieve the desired spray width.

6.3.1.6. When ambient temperatures are above 68 degrees Fahrenheit, allow adhesive to dry properly before bonding to geotextile. Dry time can vary depending on temperature, humidity and coat weight. Typical dry time is 1 to 5 minutes. To check for dryness, use the back of your fingernail to press into the adhesive and lift up. Any adhesive transfer or viscous stretching of the adhesive indicates that the adhesive requires more time to dry. If the adhesive feels tacky, but there is no transfer or stretching, the adhesive is ready for bonding geotextile. The adhesive should be covered and rolled with geotextile within one hour of application. Position geotextile carefully as a strong bond is made instantly upon contact.

6.3.1.7. When ambient temperatures are below 68 degrees Fahrenheit, geotextile can generally be immediately placed onto adhesive. Adhesive can be used under the same temperature conditions as allowed for pouring of concrete, typically above 40 degrees Fahrenheit. When placing geotextile in this condition, geotextile needs to properly bond to adhesive before construction or vehicle trafficking begins. Position geotextile carefully and let it set until a strong bond is formed.

6.3.2. Geotextile Interlayer Placement

6.3.2.1. Begin placement at the starting end of the project making sure to apply adhesive as described above.

6.3.2.2. Install the geotextile taught over the adhesive without wrinkles. Placement of

geotextile can be achieved by unrolling down the length of roadway by hand or machine. Carefully position geotextile as a strong bond is made instantly upon contact with adhesive.

- 6.3.2.3. Roll geotextile within one hour of adhesive application, with uniform pressure over the entire bonded area. The minimum recommended pressure is 25 psi. On large projects, a small drum roller is a preferred method for applying uniform pressure.
- 6.3.2.4. Additional geotextile panels may be required to cover the width of the pavement. For overlapping, spray adhesive onto the previously installed geotextile panel edge, install new panel and roll the overlap as specified above. Overlapping should not exceed three layers thick; therefore offset every other initial geotextile panel by 6-8 ft. (until entire width of pavement is covered. This will ensure proper shingling of the geotextile panels while preventing excessive layers at the corners. When overlaps are needed, the adjacent roll edge/end overlap shall be 6 inch minimum. End-of-roll overlaps shall be shingled in the direction of paving progression.
- 6.3.2.5. Extend geotextile beyond both edges of the new concrete pavement at least 6 inches. Geotextile is designed to flow water laterally through the geotextile. The six-inch tail on the outside of the pavement allows for overlap bonding and may be connected to a drainage system to flow water away from the pavement.
- 6.3.2.6. If vehicle traffic is present on the road or slow paving is expected, place geotextile no more than 650 ft. before the paving process.
- 6.3.2.7. If construction traffic is expected to travel on geotextile, avoid tight turns, sudden braking and acceleration, as this could damage or disturb the placed geotextile. Any public traffic should be controlled by flaggers or pilot cars and kept to a minimum.
- 6.3.2.8. If geotextile is being placed through an intersection or other area of higher traffic volume, place geotextile immediately before the paving process. This eliminates damage due to the heavy traffic directly on geotextile. Repair any traffic damage to the geotextile using a new piece of geotextile.
- 6.3.2.9. Once geotextile has bonded to the adhesive, it can be covered immediately with the concrete pavement/overlay.
- 6.3.2.10. Ensure geotextile surface temperature is below 90 degrees Fahrenheit at time of concrete placement to avoid heat stress and differential curing. Water misting can be used to reduce temperature.
- 6.3.2.11. Place concrete pavement/overlay directly on top of the placed geotextile. If geotextile becomes wet, it may be paved over provided there is no ponded water. Care should be taken not to displace geotextile while trucks drive on it, dump concrete into the paving apparatus, or onto the geotextile. Trucks should release the emergency parking break when dumping into an advancing paver to prevent damage to geotextile. Trucks should avoid sharp turns, hard braking, and quick acceleration at all times. The concrete overlay should be placed according to the project plans.
- 6.3.2.12. Place geotextile no more than five days before the paving process. Prolonged exposure to the elements may cause damage to geotextile. Do not allow construction equipment to track soil onto the geotextile. Clean off any excess

sediment as it can affect drainage. Ensure water does not pond or deposit sediment on geotextile before concrete placement. Geotextile may be damp, but not soaked, during concrete placement.

6.4. Installation Using Nails with Washers

6.4.1. Geotextile Placement

- 6.4.1.1. Proceed with placement only after the surface is properly prepared and cleaned.
- 6.4.1.2. Roll the geotextile material onto the base or existing pavement surface, keeping the roll tight and minimizing wrinkles, kinks, and folds.
- 6.4.1.3. Overlap the edges of the geotextile by 8 inches +/- 2 inches. No more than three layers should overlap at any point.
- 6.4.1.4. Extend geotextile past both edges of the pavement a minimum of 6 inches, and may be tied into a longitudinal underdrain system to provide positive drainage.
- 6.4.1.5. Roll the geotextile out in a sequence that facilitates good overlapping, prevents folding or tearing by construction traffic, and minimizes the potential that the material will be disturbed by the paver.
- 6.4.1.6. Utilize temporary gaps in geotextile where trucks are crossing and making sharp turns.

6.4.2. Geotextile Fastening

- 6.4.2.1. Secure the geotextile to the underlying layer with nails placed through 2 to 2.75 inch galvanized washers or disks.
- 6.4.2.2. Secure initial geotextile roll end with nails with washers at 3 foot spacing.
- 6.4.2.3. Secure geotextile at 6-foot centers or less in both transverse and longitudinal directions. Longitudinal edges may require 3 foot spacing for extra security, especially in windy conditions.
- 6.4.2.4. Secure geotextile roll end overlaps with nails with washers at 3-foot spacings.
- 6.4.2.5. Verify all nail lengths for the type of existing pavement before installation begins. Normally, 0.75 inch nails for existing concrete pavements and 1.5 inch nails for asphalt or Cement Treated Base (CTB) substructures.
- 6.4.2.6. Test fastening guns and nails on the existing pavement prior to fabric installation to ensure the nails can be driven to their full depth.
- 6.4.2.7. After evaluation, choose the fastener device that provides enough power to drive the selected nail into the existing pavement on a consistent basis.
- 6.4.2.8. If a nail does not fully penetrate the existing pavement, drive another nail

and washer next to it. Remove loose nails to avoid truck tire punctures.

- 6.4.2.9. Use additional nails with washers as needed to ensure that the geotextile does not shift or fold before or during paving.
- 6.4.2.10. If vehicle traffic is present on the road or slow paving is expected, place geotextile no more than 650 ft. (200 m) before the paving process.
- 6.4.2.11. If construction traffic is expected to travel on geotextile, avoid tight turns, sudden braking and acceleration, as this could damage or disturb the placed geotextile. Any public traffic should be controlled by flaggers or pilot cars and kept to a minimum.
- 6.4.2.12. If geotextile is being placed through an intersection or other area of higher traffic volume, place geotextile immediately before the paving process. This eliminates damage due to the heavy traffic directly on geotextile. Repair any traffic damage to the geotextile using a new piece of geotextile.
- 6.4.2.13. If damage due to wind uplift or haul trucks occurs, cut out and replace the geotextile with adequate nails with washers.
- 6.4.2.14. Ensure the geotextile surface temperature is below 90 degrees Fahrenheit (32 degrees Celsius) at time of concrete placement to avoid heat stress and differential curing. Water misting can be used to reduce temperature.
- 6.4.2.15. Place concrete pavement/overlay directly on top of the placed geotextile. If geotextile becomes wet, it may be paved over provided there is no ponded water. Care should be taken not to displace geotextile while trucks drive on it, dump concrete into the paving apparatus, or onto the geotextile. Trucks should release the emergency parking brake when dumping into an advancing paver to prevent damage to geotextile. Trucks should avoid sharp turns, hard braking, and quick acceleration at all times. The concrete overlay should be placed according to the project plans.
- 6.4.2.16. Place geotextile no more than five days before the paving process. Prolonged exposure to the elements may cause damage to geotextile. Do not allow construction equipment to track soil onto the geotextile. Clean off any excess sediment as it can affect drainage. Ensure water does not pond or deposit sediment on geotextile before concrete placement. Geotextile may be damp, but not soaked, during concrete placement.

7. Measurement and Payment

- 7.1. Method of Measurement: The amount of pavement, shoulder, and/or base/subbase surface area covered in accordance with the specifications in square yards.
- 7.2. Basis of Payment: By square yard covered, including all overlaps. Adhesive or nails with washers for fastening to the existing pavement, wastage, and all furnishing labor and equipment shall be considered incidental to the bid price for:

<u>ITEM NUMBER</u>	<u>ITEM DESCRIPTION</u>	<u>UNITS</u>
25050ED	GEOTEXTILE BOND BREAKER INTERLAYER	SQ YD