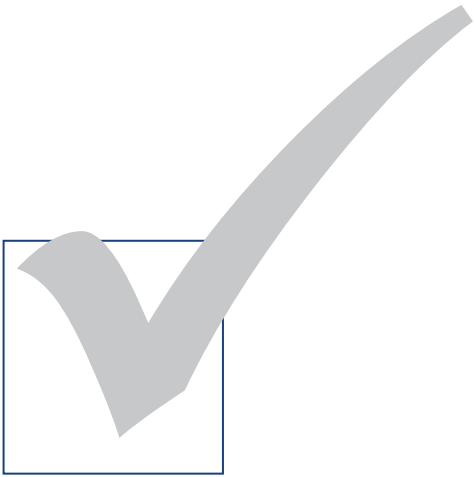
Pavement Preservation
Checklist Series

9

Paving Fabric Interlayer



U.S. Department of Transportation
Federal Highway Administration

Paving Fabric Interlayer Checklist

This checklist is one in a series created to guide State and local highway preservation/maintenance and inspection staff on the use of innovative pavement preservation techniques.

FHWA uses its partnerships with different pavement preservation organizations including American Association of State Highway and Transportation Officials, and State and local transportation agencies to promote pavement preservation.

To obtain other checklists or to find out more about pavement preservation, contact your local FHWA division office or check the following FHWA Web page:

www.fhwa.dot.gov/pavement/preservation/resources.cfm

Other valuable resources on pavement preservation:

- www.roadresource.org
- www.fp2.org
- www.tsp2pavement.pavementpreservation.org

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Purpose

Paving fabric interlayers help mitigate reflective cracking and provide a moisture barrier to water intrusion. The fabric interlayer is placed immediately prior to a chip seal or hot mix asphalt overlay.

Preliminary Responsibilities

Document Review

- ☐ Project specifications
- ☐ Construction manual
- ☐ Traffic control plan
- ☐ Agency requirements
- ☐ Fabric manufacturer's instructions
- ☐ Safety data sheets
- ☐ Applicable Occupational Safety and Health Administration (OSHA) safety requirements
- ☐ Contractor quality control (QC) plan

Project Review

- ☐ Confirm that the project is a good candidate for a paving fabric interlayer. Care must be exercised when considering the use of paving fabrics in areas such as traffic roundabouts, cul-de-sacs, on vertical grades over 10%, curves with a radius of 200 ft or less, and within 100 ft of intersections where the stopping or turning of heavy vehicles is expected. (Note: If the fabric will be covered by a chip seal and the three-month ambient average low temperature is less than 15°F, it is not a good fabric candidate.)
- ☐ Determine the existing pavement section.
- ☐ Verify data for the average daily traffic (ADT) and equivalent single wheel axle loads (ESAL).
- ☐ Assess how much rutting is present and whether the rutting is due to asphalt mix instability or base failure. Interlayers may not be appropriate if structural deficiencies are present.
- ☐ Investigate whether the pavement is structurally sound. Paving fabrics are appropriate for a structurally sound pavement that is aged or oxidized.
- ☐ Determine how much and what type of cracking exists. Paving fabric is appropriate for low severity alligator (fatigue) and block cracking conditions.

- ☐ Check for surface irregularities, and if so, determine whether the pavement needs a leveling course.
- ☐ Investigate the extent and severity level of other pavement distresses, such as raveling, polished aggregate, flushing, or bleeding. Evaluate whether a paving fabric is appropriate to alleviate the distresses. Typically, applying a paving fabric over structural distresses may not be the appropriate solution.
- ☐ Visually examine the current drainage conditions and confirm they are sufficient to prevent surface deterioration.
- ☐ Verify that a paving fabric interlayer is a cost-effective solution.

Material Checks

Asphalt Binder

- ☐ Asphalt binder is specified for paving fabric; asphalt emulsion is not recommended.
- ☐ Verify the asphalt binder grade conforms to grade specified on the paving fabric delivery ticket.

Paving Fabric

- ☐ Confirm that the paving fabric label complies with agency specifications. This is typically a nonwoven, needle-punched paving fabric.
- ☐ Ensure the width of the paving fabric matches the project requirement. The fabric rolls are manufactured in various widths.
- ☐ Verify the paving fabric is from an approved source.
- ☐ Ensure the paving fabric meets American Association of State Highway and Transportation Officials (AASHTO) designation M 288-06 (2011).

Paving Fabric Rolls

- ☐ Confirm that fabric rolls are stored on a dry surface to prevent exposure to water.
- ☐ Verify that protective plastic covers remain on fabric rolls to prevent exposure to the sun.
- ☐ Require the manufacturer to supply material certification for the material lot used on the project.
- ☐ Pull identifying tags on plastic covers for agency records (tags identify lot numbers, size, and specified style number).

Sand

- ☐ Verify the material is clean, free of deleterious material, and a uniform gradation (⅜ in. nominal maximum).

Pre-Construction Inspection Responsibilities

Surface Preparation

- ☐ All moderate- and high-severity structural distresses have been properly repaired.
- ☐ Grass and weeds have been removed or destroyed by chemical herbicide. If an herbicide was used, approximately one to two weeks has been given to kill the vegetation before applying the treatment.
- ☐ Ensure cracks wider than ¼ in. are filled with sealant to control reflective cracking. Caution is advised as high asphalt binder temperatures may cause the sealant to expand under the fabric.
- ☐ Verify that the pavement surface is clean and dry.
- ☐ Ensure that all utility access covers, castings, and concrete surfaces are protected with temporary covers.
- ☐ Verify that all road delineators, pavement markers including ceramic, plastic, tape, and thermoplastic striping, are removed prior to fabric installation.
- ☐ Confirm measures have been taken to prevent the asphalt binder from entering into drainage systems.

Equipment Inspections

Distributor Truck

- ☐ All nozzles are uniformly angled 15° to 30° from the spray bar.
- ☐ The spray bar is at the proper height.
- ☐ The spray pattern has been checked for uniformity and proper triple overlap.
- ☐ All nozzles are free of clogs.
- ☐ The spray bar has been checked for constant pressure along the entire length.
- ☐ The distributor's application calibration has been checked.
- ☐ Nozzles deviating more than 10% from the average flow rate should be replaced or corrected.
- ☐ The thermometer for measuring temperatures of the asphalt binder in the tank has been checked for accuracy.

Paving Fabric Installation Equipment

- ☐ Equipment must be specially designed to hold the fabric roll without sagging.
- ☐ Placement equipment must be rigged with the following attachments:
  - Roll brake that prevents uncontrolled rolling and keeps the paving fabric taut.
  - Adjustable tension bar to limit fabric wrinkling.
  - Brooms across the full width of the roll to smooth out the paving fabric as it is placed. The brooms can be adjusted vertically to apply proper pressure on the fabric.

Pneumatic-Tired Rollers

- ☐ Pneumatic-tired rollers used to embed the paving fabric into the asphalt binder.
- ☐ The roller tire size, rating, and pressure comply with the manufacturer's recommendations.
- ☐ The tire pressure is the same on all tires.
- ☐ All tires have a smooth surface.
- ☐ A sufficient number of rollers are available that when placed in echelon can provide full paving fabric coverage in one pass.
- ☐ Rollers equipped with a spray system that includes control valves and nozzles that apply a release agent to the tires.

Sand Applicator

- ☐ A mechanical spreader capable of distributing sand uniformly over the paving fabric.
- ☐ Verify the spreader has an adjustable spread rate control. (Note: The sand serves as a bond breaker and prevents contact between tires and the fabric binder. This can happen due to fabric binder bleeding to the fabric surface in hot ambient air temperatures.)

Sweepers

- ☐ Sweepers shall meet applicable U.S. Environmental Protection Agency standards.
- ☐ Pickup sweepers should be used to remove dust, dirt, or other debris from the pavement surface.

Air Compressor

- ☐ Verify the air compressor has sufficient pressure and volume to blow excess sand off the surface of the applied fabric. (Note: An air compressor is not needed if sand is not applied to the fabric.)

Weather Requirements

- ☐ Follow the range of dates (seasonal limitations) established by the agency for constructing a chip seal or hot mix asphalt overlay.
- ☐ Ensure the paving fabric is placed at the same air and surface temperatures required by the agency for subsequent placement of a chip seal or hot mix asphalt overlay. Typically the air and surface temperatures are 50°F and rising, except if pavement temperatures exceed 140°F, suspend the operation. (Note: The length of time the asphalt binder is in liquid state is impacted by cool pavement temperatures. When applied to a cool pavement, it can stiffen in seconds and lose its tackiness, and not hold the paving fabric in place.)
- ☐ Air and surface temperatures have been checked at the coolest location on the project.
- ☐ Confirm that the paving fabric application does not begin if rain is likely during the construction of the hot mix asphalt overlay, or does not begin if rain is forecast within 24 hours after chip sealing.
- ☐ Work should be avoided when wind speeds exceed 20 mph. (Note: High winds can create problems with asphalt binder application.)

Determining Application Rates

- ☐ Agency project specifications are followed. In the absence of agency requirements, refer to manufacturer's recommended application rates, which typically range between 0.22 gal/yd² and 0.35 gal/yd² depending on the weight of the fabric. Overlay projects are generally 0.22 to 0.28 gal/yd², and chip seal projects are generally 0.28 to 0.35 gal/yd².
- ☐ The condition of the existing pavement surface is one of the determining factors for the proper binder application rate.
- ☐ Milled surfaces may require an increased asphalt binder application rate.
- ☐ Contact the paving fabric manufacturer for the application rate that is appropriate for the specific paving fabric and pavement condition.

Checking Application Rates

Asphalt Binder—Method A
(RECOMMENDED FOR CALIBRATION)

- ☐ Record the weight of a 1 yd² pan or the paving fabric material.
- ☐ Place the pan or paving fabric on the road surface.
- ☐ Have the distributor apply asphalt binder over the pan or paving fabric.
- ☐ Record the weight of the pan and asphalt or the paving fabric and asphalt.

- ☐ Subtract the two weights to obtain the weight of the applied asphalt binder.
- ☐ Divide the net weight in pounds by the weight per gallon to determine gallons per square yard.
- ☐ To check application across the bar, repeat above procedure.

Asphalt Binder—Method B
(RECOMMENDED FOR RANDOM CHECKS)

- ☐ Park the distributor on level ground, measure the asphalt binder using a measuring stick, and recover the number of gallons of asphalt binder. The measuring stick should touch the top of the binder and read the amount of material in the tank at the top edge of the manhole ring. (Note: Always wear insulated gloves.)
- ☐ Measure off a known area for a test section.
- ☐ Have the distributor apply asphalt to the test section.
- ☐ Park the distributor on level ground and remeasure and record the gallons of asphalt.
- ☐ Subtract the two numbers to obtain the gallons of asphalt applied.
- ☐ Divide the gallons applied by the area covered by asphalt. The result equals the application rate in gal/yd^2. (If using feet, there are 9 ft^2 per yd^2.)

Traffic Control

- ☐ Verify that traffic control conforms to plans and specifications and complies with the *Manual on Uniform Traffic Control Devices (*MUTCD).
- ☐ Verify that traffic control personnel are trained and qualified in accordance with contract documents and agency requirements.
- ☐ Any unsafe conditions are reported to a supervisor.
- ☐ Ensure that flaggers do not hold traffic for too long. Long work zones need two-way communication between flaggers.
- ☐ Ensure a pilot car leads traffic slowly, 25 mph or less, through the work zone.
- ☐ Due to safety concerns and potential damage to the paving fabric, traffic is not recommended on fabric. If traffic must cross the fabric, including construction traffic, sand or hot mix asphalt is broadcast on the paving fabric to prevent tires coming in contact with the underlying asphalt binder.
- ☐ Signs are removed or covered when they are no longer needed.

Project Inspection Responsibilities

Note: The paving fabric interlayer should be placed on the same day as the hot mix asphalt overlay or chip seal, unless the installed paving fabric is maintained overnight to prevent damage.

Sweeping

- ☐ Verify the pavement is swept to provide a clean surface for the asphalt binder to bond to the pavement. Ensure that milled surfaces are thoroughly cleaned and swept for proper bonding.

Asphalt Binder Application

- ☐ Check that the asphalt binder is within the temperature range recommended by the paving fabric manufacturer.
- ☐ Ensure the application looks uniform and free of streaking that leaves ridges or gaps.
- ☐ Check for plugged or dripping nozzles.
- ☐ Randomly check the application rate.
- ☐ If any problems are observed, stop the distributor truck.
- ☐ Verify that the asphalt binder will be applied 2 to 4 in. beyond all edges of the paving fabric.
- ☐ Ensure that longitudinal joints are placed on lane delineation.

Paving Fabric Applications

- ☐ Check the manufacturer's instructions to orient the paving fabric with the correct side down. (Typically, the fabric is unrolled with the fuzzy side down.)
- ☐ Ensure the paving fabric is applied when the asphalt binder is in its liquid state and before the binder loses its tackiness. (Note: Normal application places the paving fabric immediately behind the asphalt distributor.)
- ☐ Check that the asphalt binder extends 2 in. to 4 in. beyond all fabric edges.
- ☐ Verify optimum saturation of the asphalt binder is across the paving fabric, including the longitudinal and traverse edges. (Note: The correct application rate of the asphalt binder can be checked by observing binder in the wheel tracks of the fabric applicator vehicle or from the pneumatic-tired rollers. In addition, all material overlaps must be tacked with binder to ensure no slippage.)
- ☐ Confirm the fabric is not over saturated on warm or hot days. (Note: Over saturation can cause fabric slippage.) If premature saturation of the paving fabric is observed, the binder application rate may need to be reduced.
- ☐ Check that fabric is taut across the width of the fabric roll. (Note: Avoid over tensioning the fabric roll, or shrinking across the fabric width may occur.)

- ☐ Verify the paving fabric is broomed immediately after placement.
- ☐ Inspect the beginning and ending of the paving fabric roll for bonding. If not bonded, the area must be removed.
- ☐ Ensure the broomed paving fabric is free of wrinkles. (Note: If longitudinal wrinkles appear, check the fabric roll's brake setting.)
- ☐ The following steps must be followed before applying the surface treatment if fabric wrinkles are present:
  - Hot mix asphalt overlay—cut fabric wrinkles that are 1 in. or more in height, and lap in the direction of the paver.
  - Chip seal—remove fabric wrinkles greater than ¼ in. in height.
- ☐ Verify that longitudinal fabric joints overlap approximately 2 in. to 4 in.
- ☐ Verify that transverse fabric joints are not overlapped and finished as a proper butt joint.
- ☐ Inspect for unacceptable fabric folds in horizontal curves.

Sand Application

- ☐ Confirm that if the hot mix asphalt overlay or chip seal is not placed the same day as the paving fabric, the fabric is sanded to prevent tires coming in contact with the asphalt binder. (Note: Sand coverage should be maintained until the overlay or chip seal is placed.)
- ☐ Ensure the following steps are taken on chip seal projects:
  - Verify that sand is applied to prevent contact between tires and fabric binder. Do not reduce application of asphalt binder because it prevents saturation of the paving fabric.
  - After removal of excess wrinkles, dry sand is applied immediately behind fabric placement and prior to rolling operations.
  - Sand is applied at a uniform rate of 2 to 6 lb/yd^2.
- ☐ Ensure that after correcting excess wrinkles on hot mix asphalt overlay projects, dry sand is applied to prevent the asphalt binder from coming in contact with the following:
  - Pneumatic-tired rollers while seating the paving fabric.
  - Tires from vehicular traffic.

Rolling

- ☐ Verify that pneumatic-tired rollers begin rolling immediately after fabric placement, wrinkle repair, and sand application. (Note: If rollers are equipped with a spray system that applies a release agent to the tires, sanding may not be necessary.)
- ☐ Ensure rollers run in echelon to provide immediate coverage over the full width of fabric.
- ☐ Confirm there are a minimum of three passes on the paving fabric to ensure the paving fabric is completely saturated by the asphalt binder.
- ☐ Verify the roller speeds are 5 mph or less.
- ☐ Ensure the rollers make gradual starts, stops, and turns to avoid damaging the fabric.

Driving on Paving Fabric

Due to safety concerns and potential damage to the paving fabric, traffic should not be allowed on fabric before the application of the hot mix asphalt overlay or chip seal. If absolutely necessary to open to light traffic, the following precautions must be taken:

- ☐ Verify that all traffic speeds are 25 mph or less.
- ☐ Confirm a pilot car is used to control traffic speeds on the paving fabric.

- ☐ Ensure the following step is taken on chip seal projects:
  - Broadcast sand on chip seal projects to prevent tires from coming in contact with fabric and underlying asphalt binder. All excess sand must be removed prior to the application of the chip seal binder.
- ☐ Ensure the following step is taken on hot mix asphalt overlay projects:
  - Broadcast hot mix asphalt on overlay projects to prevent tires from coming in contact with fabric and underlying asphalt binder.

Preparing the Paving Fabric Surface for Treatment

- ☐ Verify that excess sand is blown from the fabric surface with compressed air prior to placing the hot mix asphalt overlay or chip seal.
- ☐ Confirm that any damage to the fabric is repaired prior to placing the treatment.

Cleanup Responsibilities

- ☐ Check that all paving fabric cores and remnants from the project site are removed and properly disposed of.

Common Problems and Solutions

(Problem: Solution)

Wrinkles in the Paving Fabric:

- ☐ Insert metal bar inside fabric core to prevent fabric rolls from sagging.
- ☐ Adjust roll brakes to maintain proper tension on fabric roll.
- ☐ Cut and overlap fabric on horizontal curves to prevent wrinkles.
- ☐ Do not use rolls that were rolled improperly at the factory.
- ☐ Make sure fabric applicator is parallel to the traffic lane; veering to the left or right can cause wrinkles. Regular measurement checks of the applicator should be done to ensure that the roll is in proper alignment.

Excessive Asphalt Binder Spattering:

- ☐ Check the spray bar pressure.

Non-Uniform Application of Asphalt Binder:

- ☐ Check temperature of asphalt binder.
- ☐ Check viscosity of asphalt binder.
- ☐ Check nozzle size is appropriate for application rate.
- ☐ Ensure nozzles are aligned properly.

- ☐ Check height of spray bar.
- ☐ Check spray bar pressure.
- ☐ Determine if any nozzles are plugged.
- ☐ Clean or replace nozzle tips.
- ☐ Back flush distributor bar.

Asphalt Binder Bleeding Through Paving Fabric:

- ☐ Check application rate of asphalt binder.
- ☐ Broadcast hot mix on paving fabric (overlay projects).
- ☐ Broadcast sand on paving fabric (overlay or chip seal projects).
- ☐ Reduce application rate of asphalt binder as long as the minimum specified amount of asphalt binder is maintained to achieve asphalt saturation creating a moisture barrier.
- ☐ Check down pressure of brooms on paving fabric applicator.
- ☐ Check paving fabric weight.
- ☐ Check viscosity of asphalt binder.
- ☐ Ambient and/or pavement temperatures may be too high; broadcast hot mix or sand on paving fabric. (See second and third boxes above.)

Insufficient Paving Fabric Saturation:

- ☐ Reapply asphalt binder to the paving fabric surface to complete fabric saturation. (Note: This technique is not recommended in hot mix overlay applications.)
- ☐ During the chip sealing process, increase the chip seal asphalt emulsion rate to complete fabric saturation and enough to provide retention for the chip seal aggregate.
- ☐ Note: To determine the amount of emulsion to saturate the paving fabric, construct a test strip. Apply chip seal emulsion over the fabric for approximately 8 ft to 10 ft in length, and full width of the fabric roll. Observe for 5 minutes to see if emulsion remains on the fabric surface or is absorbed by the fabric. If fabric absorbs the emulsion and an adequate amount remains on the fabric surface, then increase the emulsion application rate to allow for fabric absorption and to provide enough emulsion to retain chips.

Fabric Not Bonding at Longitudinal or Transverse Joints:

- ☐ Fabric binder not applied 2 in. to 4 in. beyond fabric edges.
- ☐ Reapply asphalt binder to the paving fabric surface to complete fabric saturation.
- ☐ Check broom pressure on the paving fabric applicator to ensure pressure is uniform across the full width of the fabric roll.

Sources

Information in this checklist is based on or refers to the following sources:

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Construction Management Team, HICP-30
Office of Preconstruction, Construction, and Pavements
Federal Highway Administration
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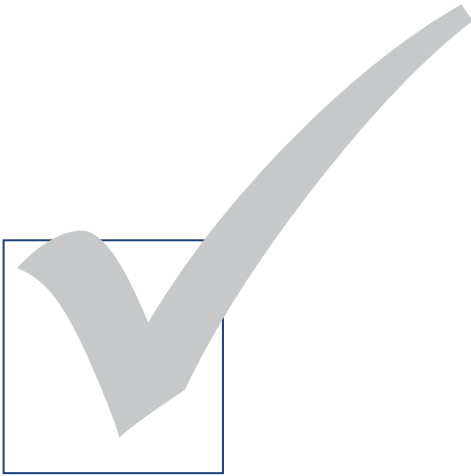

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