

AMERICAN Paving Fabrics, Inc.

VIRGINIA PAVEMENT RESEARCH
AND INNOVATION SYMPOSIUM



VIRGINIA ASPHALT ASSOCIATION

An Introduction to Pavement Interlayers Installation Means & Methods



Geosynthetic Pavement Interlayers

WHY?...Interlayers Extend Pavement Life

- ✓ Preserves Base Structural Value by minimizing water intrusion into existing substrate.
- ✓ Delays Reflective Crack Return in new overlays (up to 200% longer)
- ✓ Adds Flexural Strength to HMA
- ✓ Significantly Increases Bonding b/w layers through use of PG Liquid Asphalts.

Interlayer Product Types

Typical Interlayer Product Types Available :

- ⬇ Peel and Stick Products
- ⬇ Glass grids (may be coated with elastomeric polymer or bitumen)
- ⬇ Composites (combining polymer or glass grids and non woven textiles)
- ⬇ Paving Mats or Hybrid textiles
- ⬇ Non-woven textiles (polypropylenes)

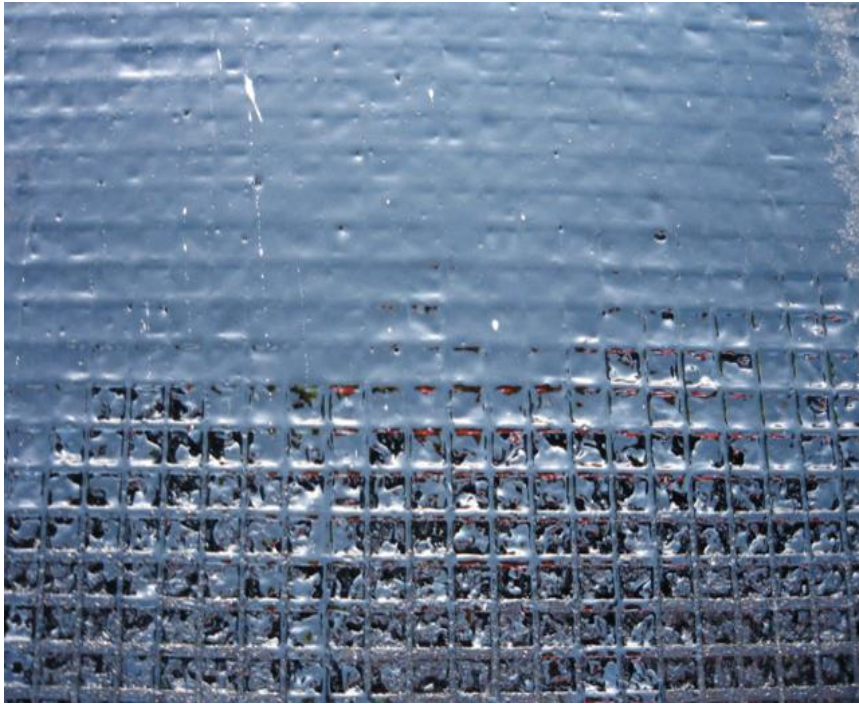
Peel and Stick Interlayers

May be a combination of a woven or nonwoven paving fabric or paving grid on a thick layer of bitumen for direct application on localized cracks & joints....



Polymer & Glass Grids (typically open aperture)

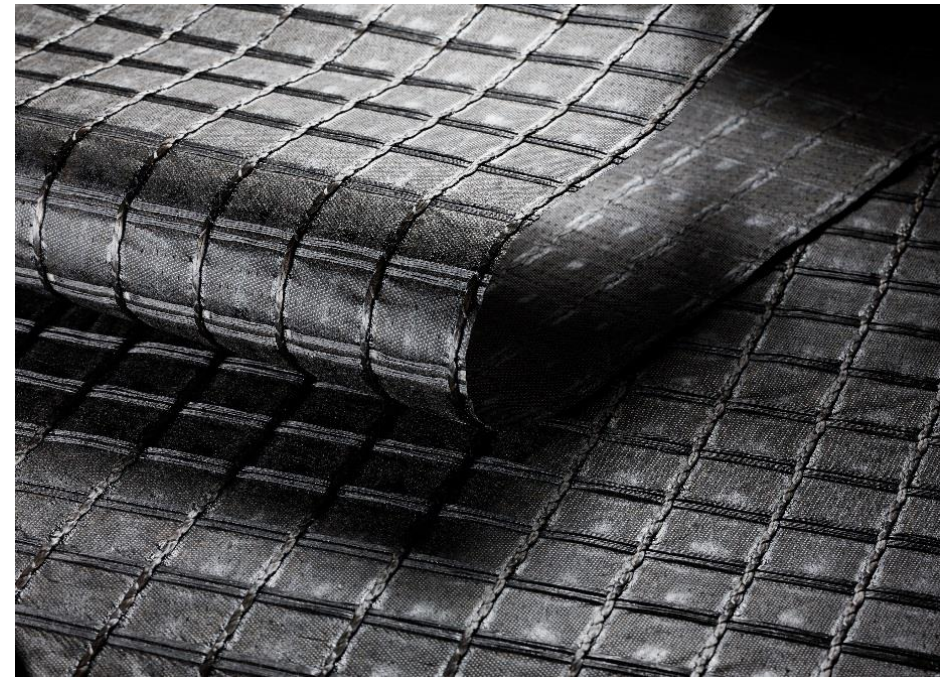
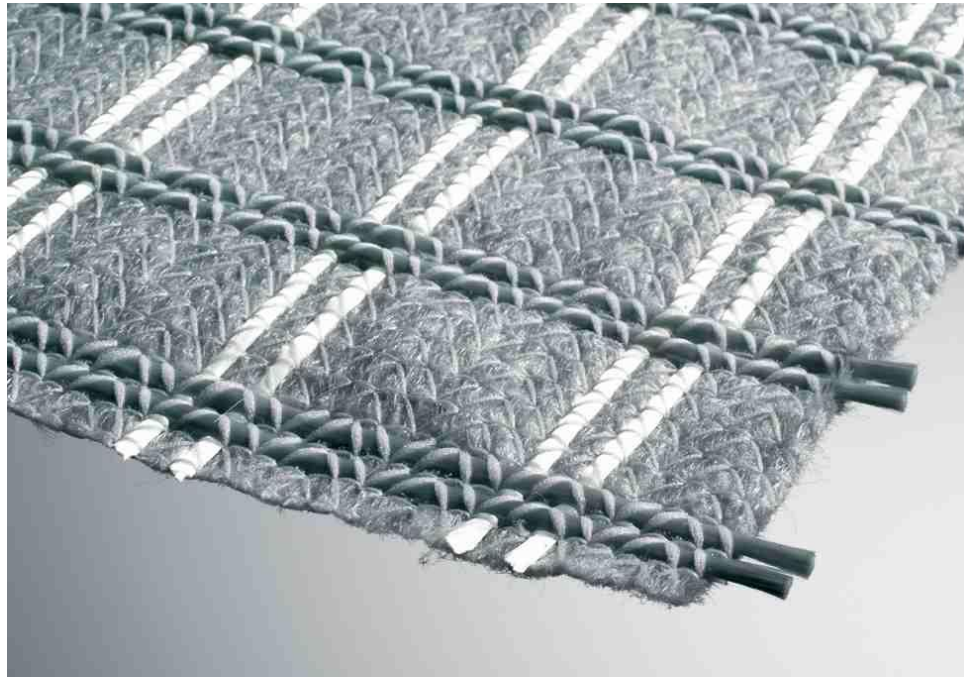
Glass grids ...may be coated with polymer or bitumen or a combination. Some of these materials have self adhesive backing.



Polymer grids typically punched and stretched polypropylene or knitted/woven polyesters.

Composite Grids

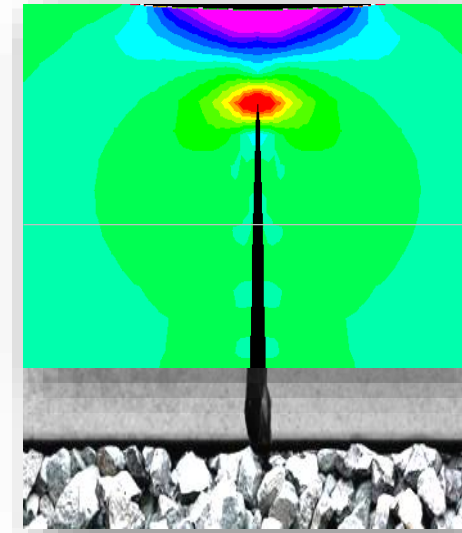
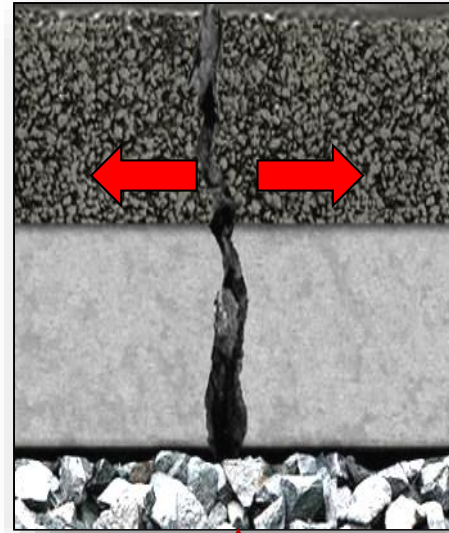
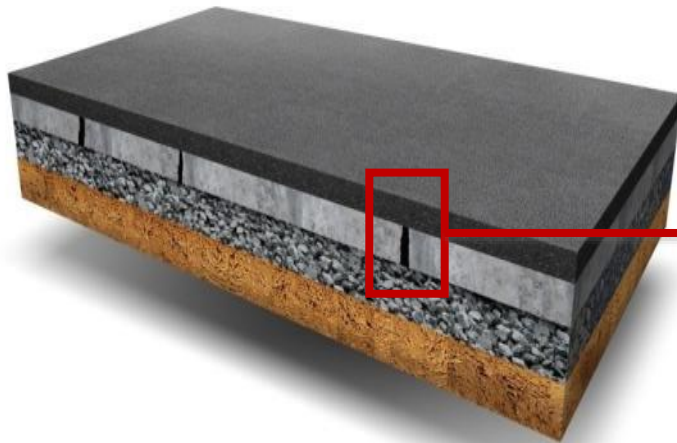
Composites are typically a combination of continuous filament polymer or glass with non-woven geotextiles...mechanically combined by lamination or stitching.



The “Reflective Crack Mechanism”

Crack growth

- # Stresses into the new asphalt layer
- # Due to high tension at crack tip

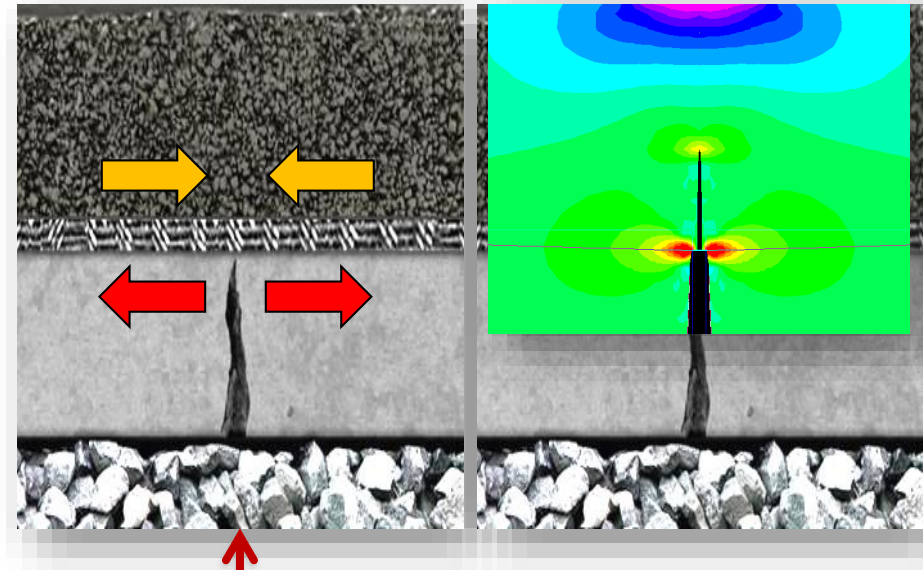
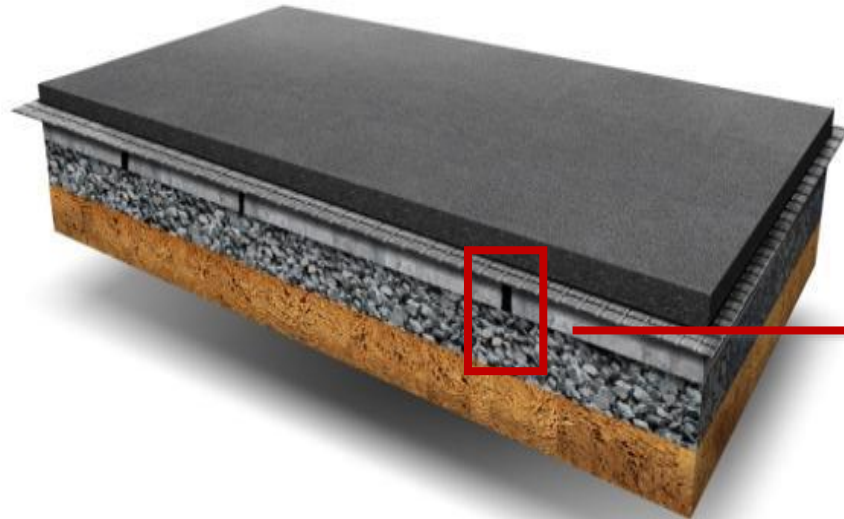


“0” Tensile Strength in
HOT MIX ASPHALT

Source 1: Montestruque G. E., 2002, *Contribuição para a Elaboração de Método de Projeto de Restauração de Pavimentos Asfálticos Utilizando Geossintéticos em Sistemas Anti-Reflexão de Trincas* (Contribution to the preparation of a method of a project for rehabilitation of asphaltic pavements using geosynthetics on anti-reflective crack systems). Doctor's Thesis, Technological Institute of Aeronautics, São José dos Campos, Brazil.

Functional Aspect of Reinforcement Grids

The reduction of reflective cracks, as the reinforcement grid absorbs and distributes the strain across the grid matrix...



“Intercept Crack Energy”

Source 1: Montestruque G. E., 2002, *Contribuição para a Elaboração de Método de Projeto de Restauração de Pavimentos Asfálticos Utilizando Geossintéticos em Sistemas Anti-Reflexão de Trincas* (Contribution to the preparation of a method of a project for rehabilitation of asphaltic pavements using geosynthetics on anti-reflective crack systems). Doctor's Thesis, Technological Institute of Aeronautics, São José dos Campos, Brazil.

What influences cracking?

The type of damage mechanism causing the cracks to appear at the pavement surface depends on:

- the properties and nature of the pavement structure (e.g. thickness, stiffness, subgrade etc.)
- the traffic characteristics - % Trucks
- the climatic conditions
- whether it is new construction or maintenance

Crack Prevention



Interlayer Selection Process

- Pavement Conditions
- Pavement Conditions
- Pavement Conditions
- Cost \$\$



Recognizing Pavement Distresses- Determinant for Product Application Selection



Caution! Not all conditions appropriate!

Typical Pavement and Base Failures



Have the Pavement Management Team
Quantify the severity and extent of
distresses....



Effects of Water on Pavements

Interlayer Functionality

Loss of Base Load Bearing Capacity

- Water intrusion through pavement into base:

33-67%

Federal Highway Admin. (FHWA) RD 73-14, states; “between 33 and 67% of storm water infiltrates through the pavement”

- Asphalt from 33% - 50%
- Concrete from 50% - 67%

- **Pavement cracks increase base degradation:**

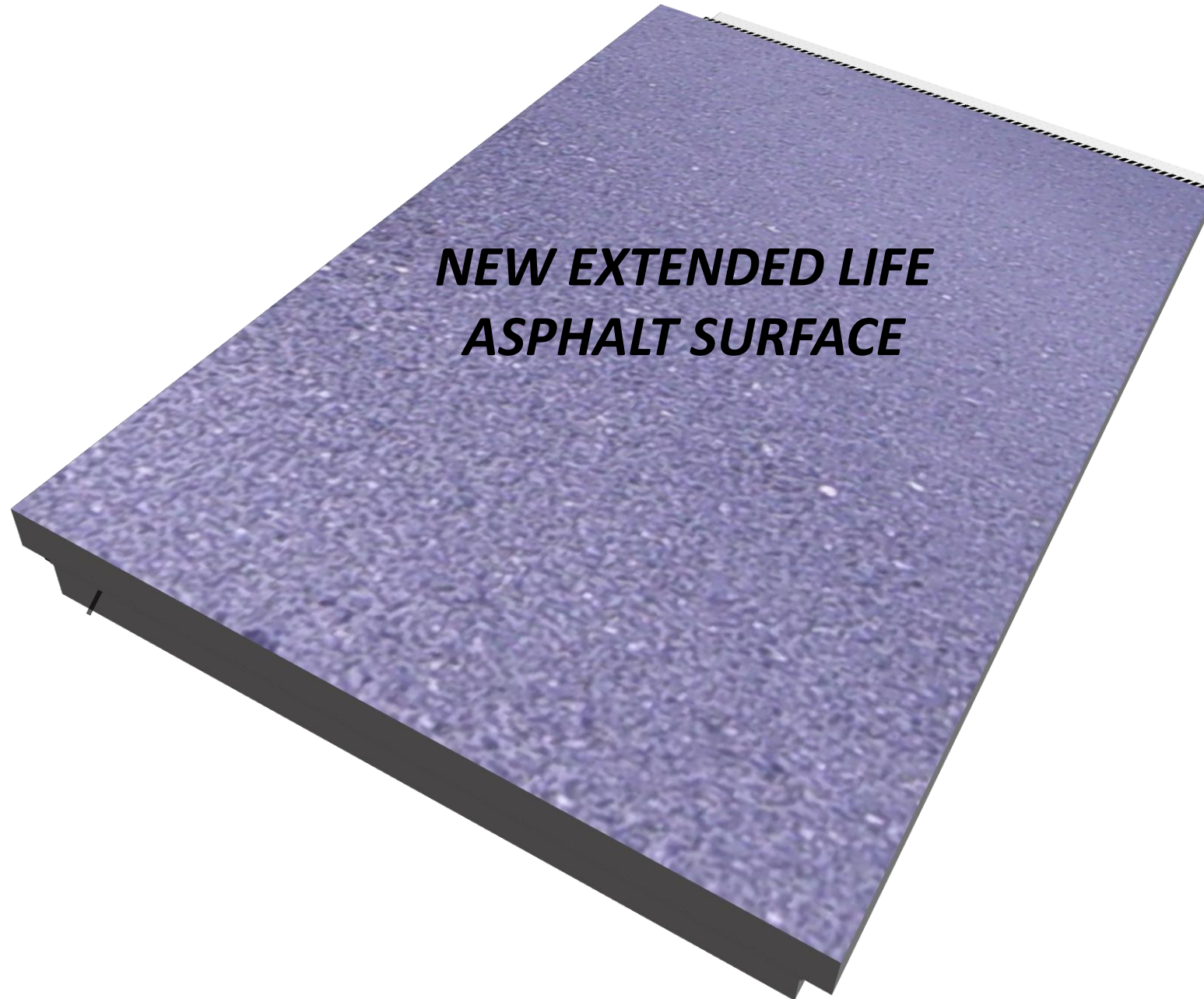
Cracks significantly increase water penetration and base degradation, leading to loss of load bearing capacity.

The Pavement Interlayer Solution



“GOOD-BETTER- BEST Proposition”
Family of Paving Interlayers

Fabric Installation: How it Works



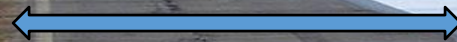
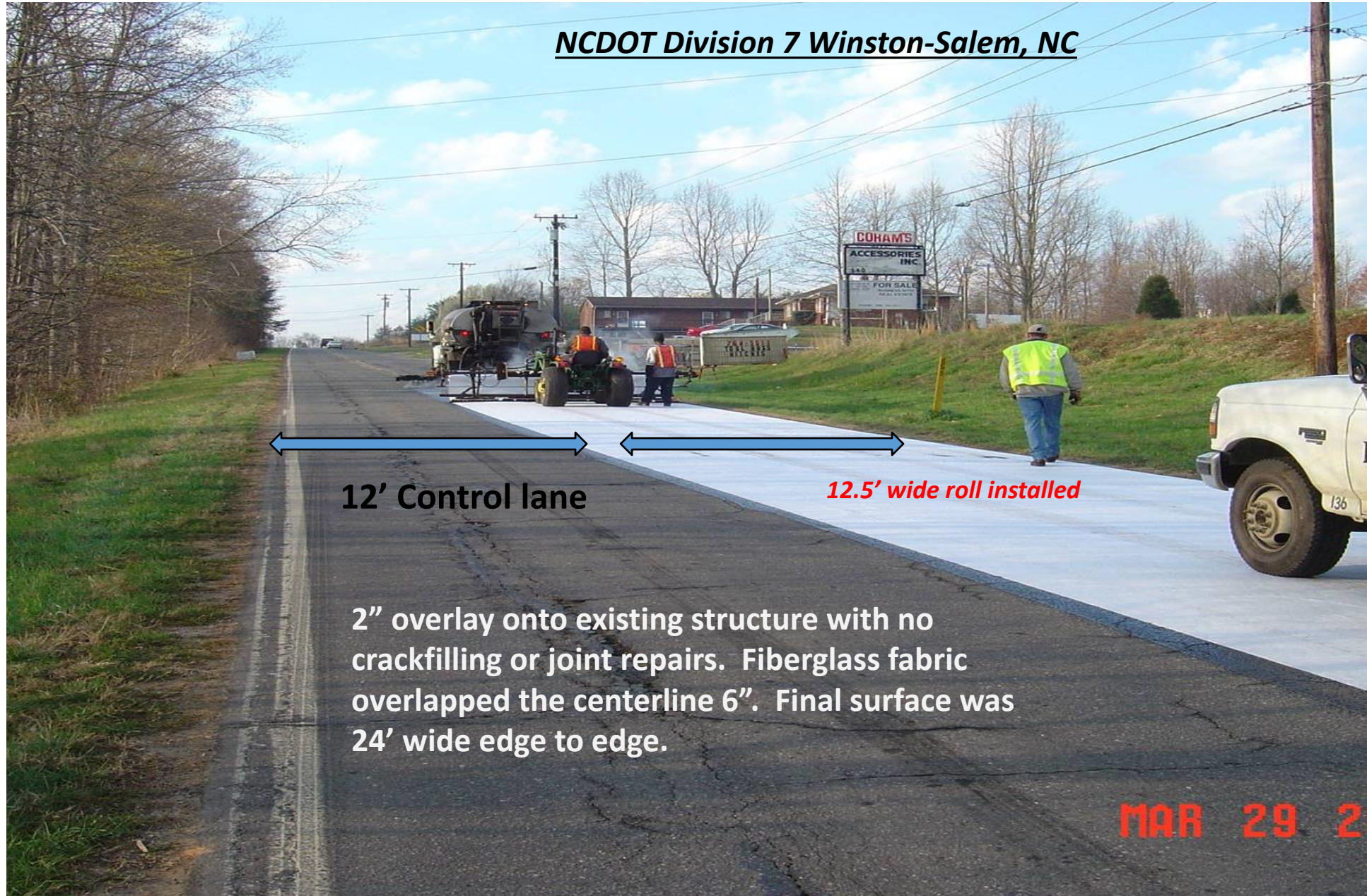




Case Study- North Carolina Rt. 52

Installation Date- March 29, 2004; Fiberglass Paving Mat

NCDOT Division 7 Winston-Salem, NC



12' Control lane



12.5' wide roll installed

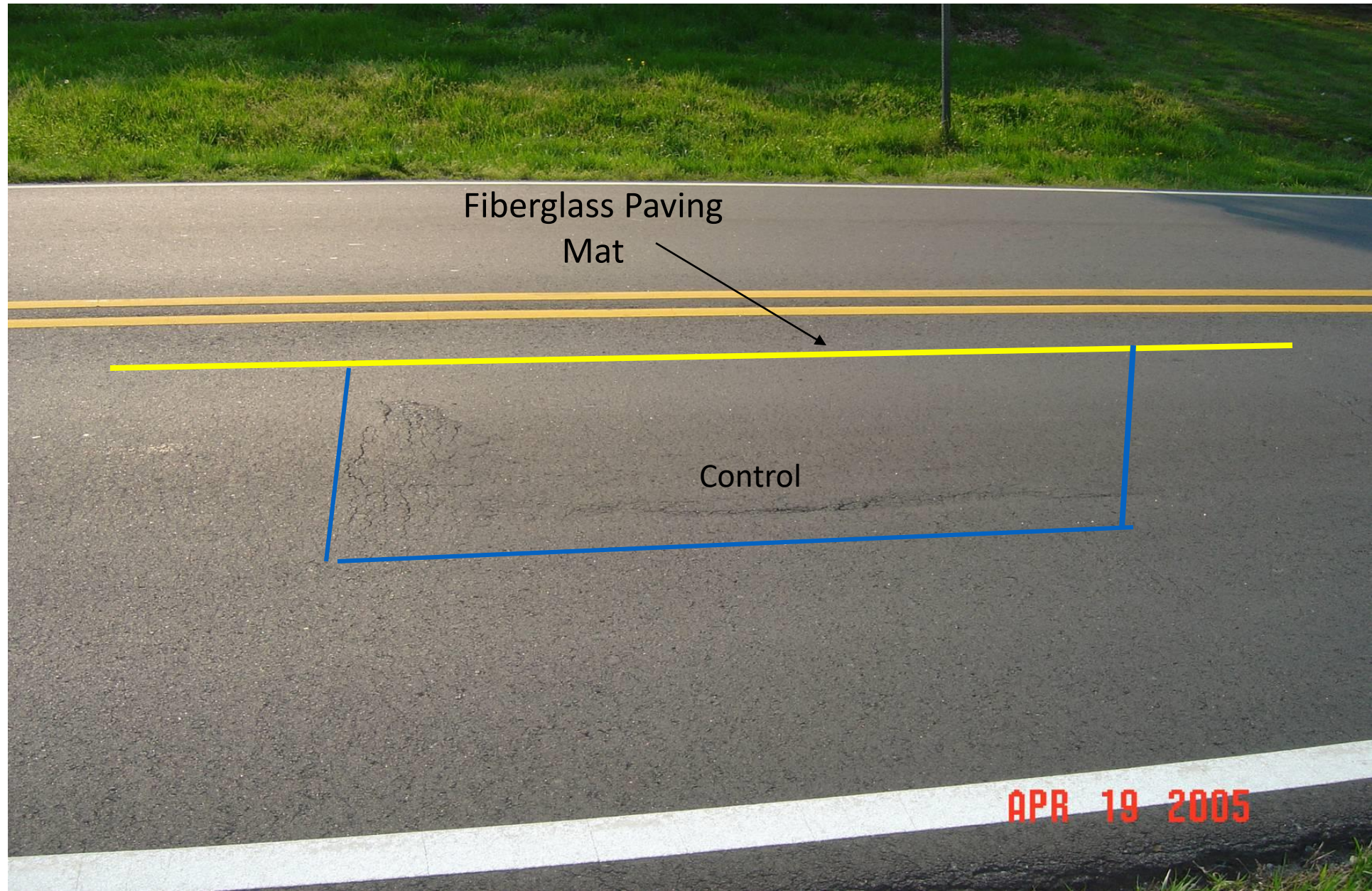
2" overlay onto existing structure with no crackfilling or joint repairs. Fiberglass fabric overlapped the centerline 6". Final surface was 24' wide edge to edge.

MAR 29 2004

NC Rt. 52 April 19, 2005 (13 months)

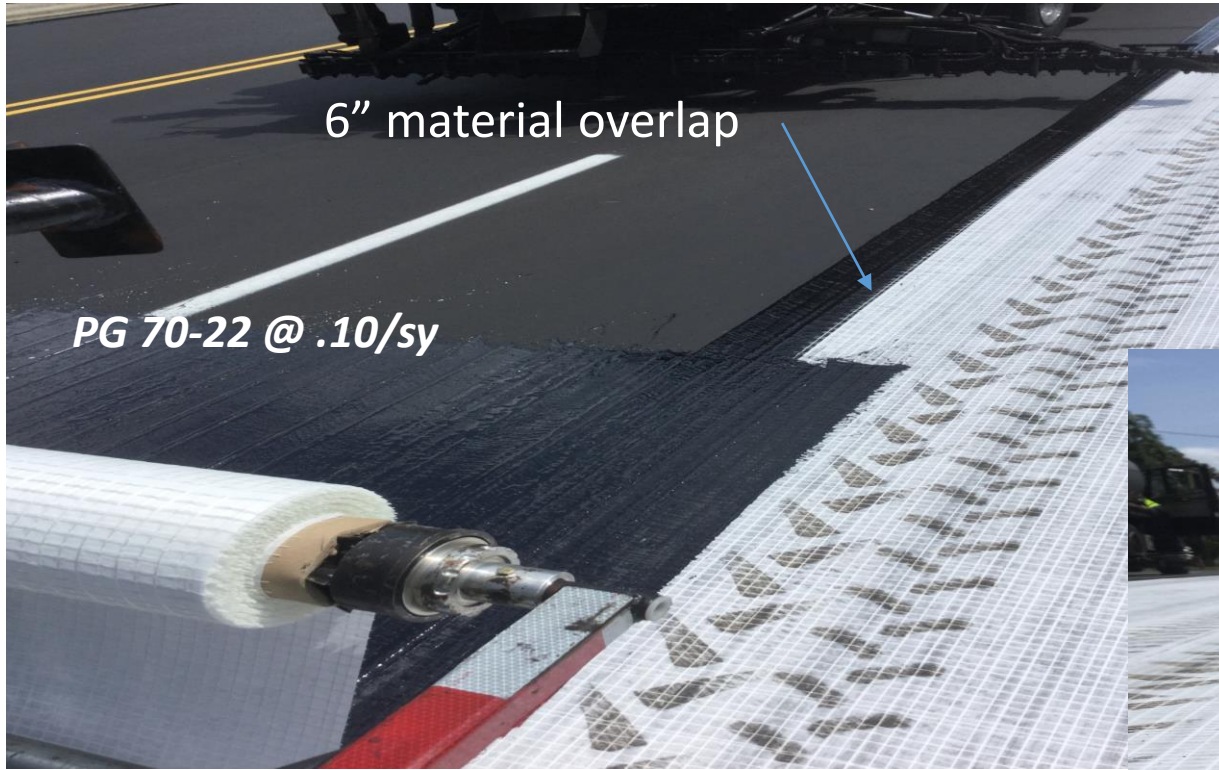


NC Rt. 52 April 19, 2005



30 kN Composite Installation August 2015

Warsaw, NC



Adequate tack coat on concrete gutter pan. (PG 70-22)






Newly milled
Surface!

Existing asphalt parking lot showing signs of
fatigue and alligator/thermal cracking. Asphalt
is approximately 10 years old!

S.L. Nusbaum Realty



S.L. Nusbaum Realty



Almost 3 years later and still no cracks!

2/16/18

S.L. Nusbaum Realty



Notice that the original cracks just stop in their tracks!! Fabric mitigated the energy of original crack from propagating into new overly. 2/16/18

S.L. Nusbaum Realty



Newly milled asphalt in preparation for fabric and new asphalt overlay!

Existing 12 year old asphalt showing signs of major fatigue and thermal cracking! Looks like a job for fabric!

S.L. Nusbaum Realty



Existing ½" crack in asphalt after milling was complete. Without the use of a fabric here, this crack would reappear in the new asphalt in less than 2 years! The fabric shown delays that crack return for an additional 4-5 years!



**Still no cracks in surface
across driveline!**

**Fabric is continuing to mitigate reflective cracking
Almost 3 years after installation!**

S.L. Nusbaum Realty

Surface & Preparation

Surface Preparation

Ensure surface is clean, dry, and free of any loose material.
Fill all surface cracks larger than 1/8" inch with a sealant.

Tack Coat

Follow manufacturer's guidelines or VADOT specifications
application rates and material types

Installation

Materials should be installed with a laydown machine with a pipe inserted through the core. Care should be taken to prevent creases or folds in the grid.



Best Practice-Seal Joints



Clean and Remove Organics.....



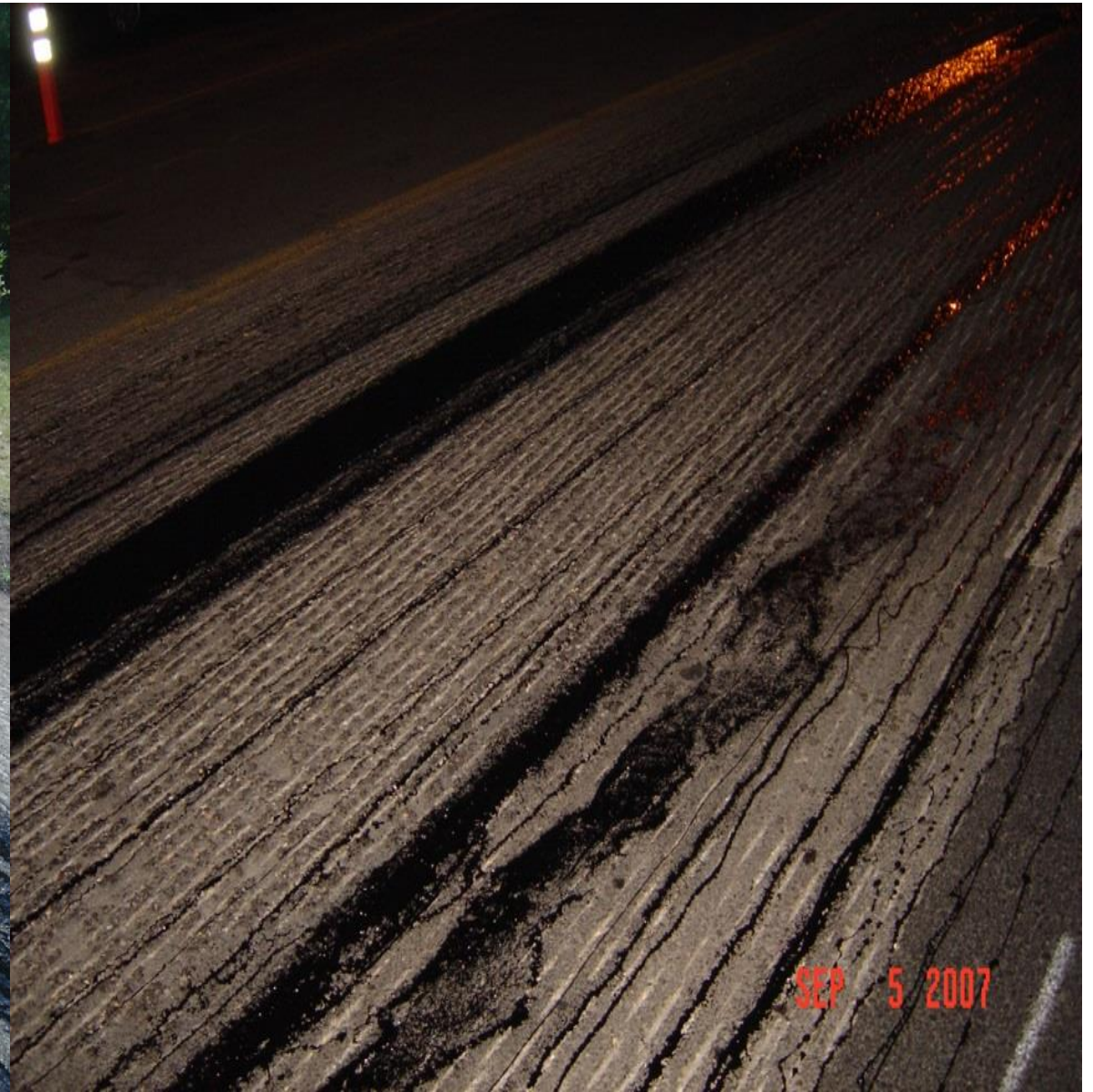
....Be Prudent...Be Smart!



Installation Continued-Tack



Using Equipment that is not calibrated and maintained will end up in premature failure in your asphalt.



Proper Application



Sealed Pavement-Proper Tack Application-Bond Ensured:

100% coverage and Rate Control ensures that your pavement will recognize maximum service life with a superior bond between layers of existing asphalt and new overlay. (FHWA Statistics)...LESS TACK=LESS LIFE!

Typical Installation Guidance

1 Bends/Curves

Folds- slit and overlapped. Alternatively use short lengths and overlap in direction of paving

2 Joints/Overlaps

Typically 2-6” longitudinal and transverse overlaps...more importantly make sure all materials are tacked together

3 Trafficking the Grid

Asphalt delivery vehicles should avoid sharp turns and hard braking.

Constructability-Durable



Reinforcement should be durable allowing construction equipment to line up to the asphalt paving machine without “pick-up” under construction truck tires... or paver ...minimizing field construction issues.

Hot Weather Constructability



Best Practice- Tack- Lapping Installation



Care ...Trafficking the Grid



VIRGINIA DEPARTMENT OF TRANSPORTATION
2016 ROAD AND BRIDGE SUPPLEMENTAL SPECIFICATIONS
SECTION 318 – PAVEMENT INTERLAYERS

SECTION 318 – PAVEMENT INTERLAYERS of the Specifications is inserted as follows:

318.01 – Description

This work shall consist of providing all labor, materials, and equipment; performing all operations required for Contractor project quality control; furnishing, overlapping, and placing of pavement interlayer and tack coat, if required, in the designated locations as detailed in the Contract and specified herein; and maintaining the interlayer until placement is completed and accepted.

318.02 – Materials

Pavement interlayer shall conform to Section 245.

318.03 – Procedures

(a) Delivery and Storage

For both on-site and off-site storage, the Contractor shall take all necessary precautions to maintain the integrity of the interlayer in a state equal to what existed at the time of testing and certification. This includes but is not limited to ultraviolet protection, protection against rodents, contaminant chemical abrasion, and any other harmful elements. Interlayer shall be stored in accordance with manufacturer's recommendations, and shall remain in supplier packaging until ready for use. It shall not be removed from packaging more than 7 days before the next layer of pavement structure is installed over it.

The Contractor's Quality Control Representative shall examine all interlayer for damage and defects prior to installation. Any interlayer found to be damaged or defective shall be repaired per the manufacturer's recommendations or as directed by the Engineer, or removed from the jobsite and replaced by the Contractor at no additional cost to the Department. Mechanical equipment other than that used for installation and the paving equipment shall not be permitted directly on the interlayer surface unless authorized by the Engineer.

(a) Surface Preparation and Interlayer Placement

Manufacturer's instructions shall be followed, including the following:

1. A pre-pave meeting shall be held no less than 14 days prior to paving or milling operations beginning. The pre-pave meeting may be held as part of the pre-construction meeting.
2. The layer to be covered by the interlayer shall be clean and free of debris, stable, and prepared according to the manufacturer's recommendations. Tack coat shall be applied per manufacturer's recommendations, based on asphalt retention rate and additional rate for anticipated surface condition of pavement. Tack coat shall be a PG binder from VDOT Approved List No. 50. Cracks shall be remediated as required by the Contract.
3. When the interlayer is pulled into place, the strong direction (if any) shall be placed as shown on the Plans, or according to the manufacturer's recommendations if not shown on the Plans. It shall be unrolled as smoothly as possible without dragging in accordance with the Manufacturer's recommendations.

The Contractor shall use a manufacturer-certified installer for the specific products being installed, or a manufacturer's representative shall be on site during installation. The

Demand for Value-Added Performance

- What Are You Paying For?

Hot Mix Asphalt

Pavement Interlayers

+

-Structure
-Ride



-Reinforcement &
-Reflective Crack Mitigation
-Water Barrier
- Increased Adhesive Bonding
-Ease of Recyclability
-EXTENDED SERVICE LIFE!

Thank You...





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Southern Division

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