ASHE Old Dominion

FIBERMAT

The Ultimate Stress Absorbing Membrane

Meshing Strength with Flexibility for a longer Pavement Life

BRANSCOME INCORPORATED

1/22/2016

Pavement Preservation Concepts

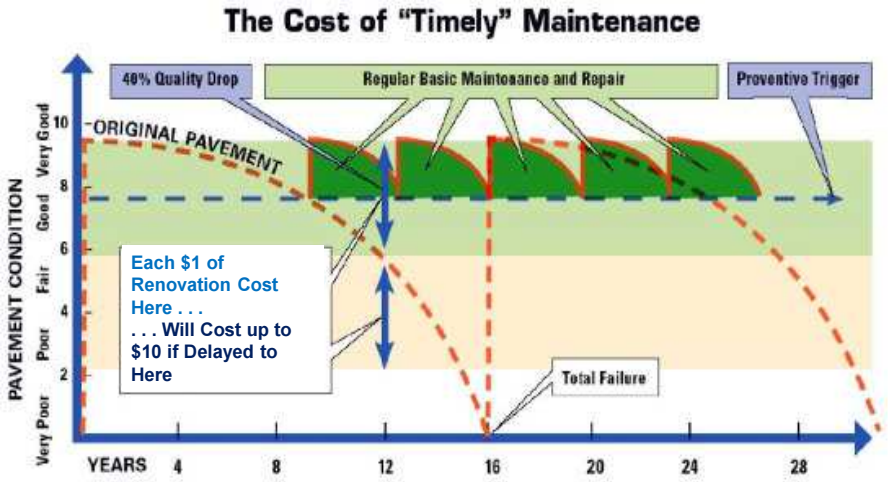
Pavement Preservation . . .

". . . a program employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety, and meet motorist expectations."

Source: FHWA Pavement Preservation Expert Task Group

1/22/2016

Pavement Preservation Treatments



1/22/2016

Pavement Preservation Treatments

- Crack treatment
  - crack filling
  - crack sealing
  - FiberMat Type B (SAMI)
  - Crack Inhibiting Treatments
- Surface seals
  - fog seals
  - sand seals
  - scrub seals
- Slurry surfacing systems
  - slurry seals
  - micro-surfacing
  - cape seals
- Thin and ultra-thin overlays
  - UltraWear
  - Superpave 4.75 and 9.5 mm
- Milling
  - profile milling
  - micro-milling
  - diamond grinding
- Recycling
  - cold in-place recycling
  - hot in-place recycling
- Chip Seals
  - Single chip seals
  - double chip seals
  - racked in chip seals
  - cape or slurry seals

1/22/2016

FIBERMAT

The Ultimate Crack Inhibiting Membrane

The Right treatment, to the Right road at the Right time.

1/22/2016

Branscome FiberMat Process video 10-9-15.mp4

FIBERMAT

Fiberglass placed between two layers of Emulsion

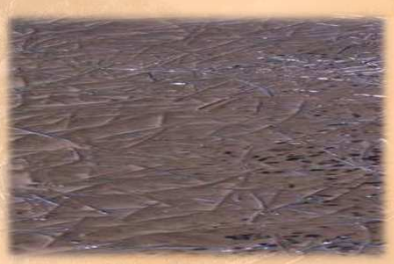
=

Asphalt Emulsion:

the waterproof membrane

Glass Fiber Strands:

the ability to withstand stress and give enhanced tensile properties (bridge the cracks)



Emulsion

- FiberMat® Emulsion (modified CRS-1p or CRS-2p)
- Must be Polymer modified
- Branscome uses an emulsion that has tighter specs than ASTM requires (best practices)

Aggregate

- Various aggregate sizes used (¼″ to ½″ most common)
- Local specifications for chip seals
- Use aggregates with a low percentage of fines passing the #200 sieve

1/22/2016

FiberMat® was designed to . . .

- enhance tensile strength and reduce reflective cracking.
- be quickly applied and easily shaped.
- have great wearing as well as tensile properties.
- be used at various levels in the pavement structure.

1/22/2016

When should FiberMat® be used?

- **When existing surface is showing signs of distress such as . . .**
  - Alligator, fatigue and reflective cracking

- **FiberMat is used…**
  - As a stress Absorbing Membrane
  - As a Stress Absorbing Membrane Interlayer - (SAMI) with a Wearing Course
  - As a replacement for the textile and grid markets (paving fabrics)

1/22/2016

How does FiberMat® add value to your new pavement?

- Slows reflective cracking
- Improved Chip Retention
- Extended Life of the chip seal
- Extended Life of the HMA Surface
- Prevents water intrusion into sub-base

1/22/2016

Benefits of FiberMat®

- **Reduction in the time cracks re-appear**
  - As a result, reduction of water into the base layers of the pavement
  - Reduced maintenance costs for pothole maintenance, crackfilling
  - Reduction in the rate of overall pavement deterioration
- The surface can normally be opened to traffic in as little as 20 minutes

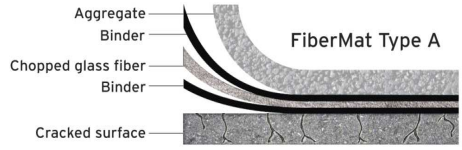
(depending on weather conditions)

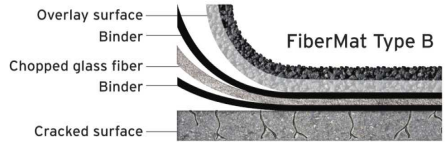
1/22/2016

FiberMat® Type A or B

Type A
- Polymer Modified FiberMat ® Asphalt Emulsion
  - ***0.4 – 0.6 gal/sy***
- Fiberglass
  - ***2 - 3 oz/sy***
- Aggregate
  - ***17 – 25 lbs/sy***
  - *½", 3/8" or ¼"* ***and combination***

Type B
- Polymer Modified FiberMat® Asphalt Emulsion
  - ***0.35 – 0.45 gal/sy***
- Fiberglass
  - ***3 - 4 oz./sy***
- Aggregate
  - ***10 – 15 lbs/sy***
  - ***¼" blinding aggregate***





1/22/2016

FiberMat® Process History

HISTORY

- Developed in the UK
- Used as a SAMI and Wearing Course
- Used in traditional chip seal, decorative finishes, bridge decks, textile and grid markets

FiberMat® Process History

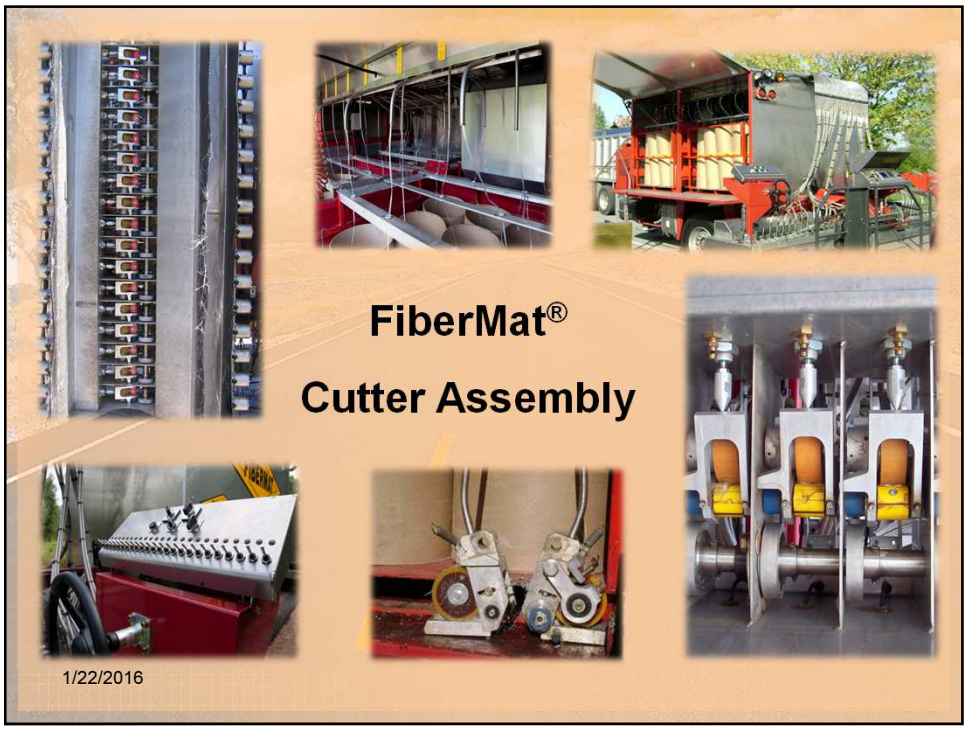
Mini-Machine 4 foot wide unit used in the UK

Truck mounted 8 foot wide unit

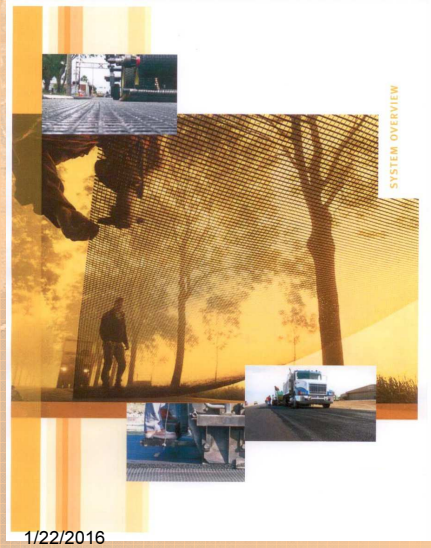
Current FiberMat® trailer

13' wide unit with computer controls


The FiberMat® Trailer
Preserving your roads through a world of innovation
FIBERMAT
14
branscome.com
1/22/2016


FiberMat®
Cutter Assembly
1/22/2016

How does FiberMat® compare to Fabric?



TECHNICAL NOTE

PROPER INSTALLATION OF PAVING FABRIC INTERLAYERS WHEN PLACED PRIOR TO CHIP SEALING

www.tencate.com

Revised: May 18, 2010

1

1/22/2016

FiberMat® vs Paving Fabrics

FiberMat® wins head-to-head comparison with Paving Fabric

COLAS

FiberMat Update
September 2013

Solutions™
We're all in this together™

FiberMat® wins head-to-head comparison with Paving Fabric on Michigan Interstate 75

FiberMat® was recently placed in the State of Michigan on seven miles of interstate 75 and it all came about because FiberMat® out-performed paving fabric in a head-to-head comparison conducted by the Michigan Department of Transportation (MDOT).

In 2012 MDOT compared FiberMat® Type B to a paving fabric on a 1 mile section of an HMA overlay project on interstate 75 in Chippewa Co. The paving fabric was placed on the north- bound passing lane and the FiberMat® was placed by Brewer Construction and Terry Materials on the south-bound passing lane, just north of the M-28 Interchange. According to MDOT personnel, FiberMat® far out -performed the paving fabric in ease of installation and they found that the use of FiberMat® had resulted in little to none of the reflective cracks coming back through the resulting HMA overlay. Due to these results, MDOT let a new project in 2013 for seven miles of FiberMat® Type B on I-75 just north of St. Ignace, MI.

Brewer Construction placing FiberMat® on I-75 in Michigan's Upper Peninsula

FiberMat® visible at center joint was exposed in 4th of July holiday weekend traffic with no reported issues

Reports indicate that during the 2012 job the competition experienced many of the typical installation issues associated with paving fabrics: crack fill material bleeding through prior to the placement of the HMA and fabric edges lifting when driven on by paving equipment (resulting in the fabric wrapping itself around the tires). Delamination was witnessed between the fabric and existing pavement resulting in movement of the HMA mat during the rolling process, which produced a very irregular centerline. FiberMat® on the other hand did not experience any of these problems and was installed and performed as promised.

MDOT's results confirm that FiberMat® is a cost-effective, easily-installed crack inhibiting membrane which will greatly delay the propagation of reflective cracks. Once again FiberMat® beats the competition from head to toe.

For more information contact Nelson Wesenberg at nwesenberg@colasolutions.com

Colas Solutions, Inc. 7334 Main Street • Cincinnati, Ohio 45244
T: 888.369.2363 • 513.272.5648 • F: 513.561.2876 • www.colassolutions.com

Issue 4-2013
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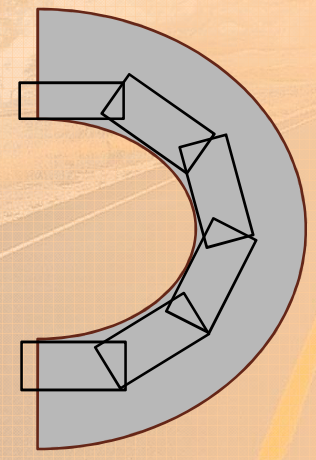
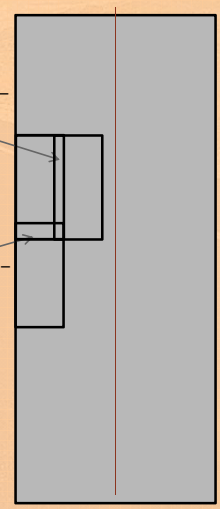
1/22/2016

Typical installation of Geotextiles

Cutting and overlapping of the fiberglass mat in restricted areas



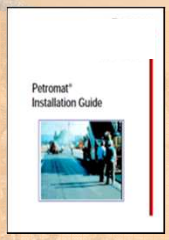
Overlapping of the fiberglass mat across transverse and/or longitudinal joints

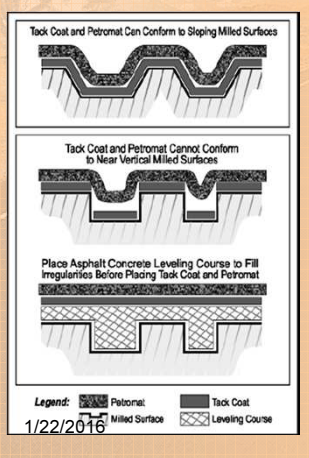


1/22/2016

Note: This drawing and following information was taken directly from the geotextile literature

Paving Fabrics





- **There are some areas that should be avoided to prevent paving fabric slippage such as:**
  - **Intersection radius,**
  - **Traffic circles**
  - **Horizontal curves with a radius of 200 feet or less,**
  - **Bubble portion of a cul-de-sac**
  - **Areas of hard starting, stopping or turning and include intersections where high wheel loads are expected,**
  - **Sharp curves,**
  - **Subgrade water penetration from high water tables.**

1/22/2016

Recyclability

FiberMat® has been proven to be 100% Recyclable


FiberMat Update

COLAS Solutions

We're all in this together

FiberMat®- Recycled After 7 Years of Outstanding Performance

Norjohn Contracting and Paving placed a FiberMat® Type A wearing surface at the entrance to one of their many aggregate locations in 2007. The FiberMat® which utilized 2 oz./sy of fiberglass was than subjected to daily heavy truck traffic in and out of the facility. Finally, after seven years of exceptional performance Norjohn decided it was time to replace the pavement.

A standard milling machine removed the FiberMat® and 4 inches of HMA in one pass, the milled material was than placed in a RAP pile located at their hot mix asphalt facility. Later the recycled FiberMat® and RAP material was processed with conventional crushing and screening equipment to be reused in another quality HMA pavement produced and placed by Norjohn Contracting and Paving.

For further information contact Nelson Wesenberg – nwesenberg@colassolutions.com

Conventional Milling — FiberMat® still in place after 7 years

FiberMat® - The Ultimate Crack Inhibiting Membrane

Easy to Install - Easy to Recycle

Case Studies


M. Thompson October 2007 — Page 1 of 14

Evaluation of FiberMats Type B as a Stress Absorbing Membrane Interlayer to Minimize Reflective Cracking in Asphalt Pavements

FIBERMAT

by

Arif Chowdhury, P.E.
Assistant Research Engineer
Texas Transportation Institute

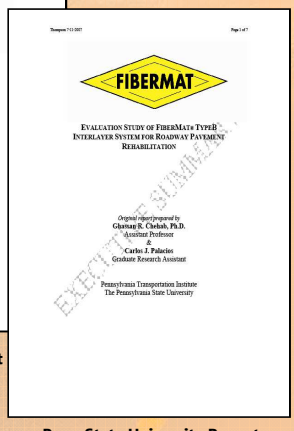
And

Joe W. Bartoli P.E.
Senior Research Fellow
Texas Transportation Institute

Texas Transportation Institute
Texas A&M University
College Station, Texas
September 2007

EXECUTIVE SUMMARY

Texas A & M Report


Thompson 7-13-2007 — Page 1 of 7

FIBERMAT

EVALUATION STUDY OF FIBERMATS TYPE B INTERLAYER SYSTEM FOR ROADWAY PAVEMENT REHABILITATION

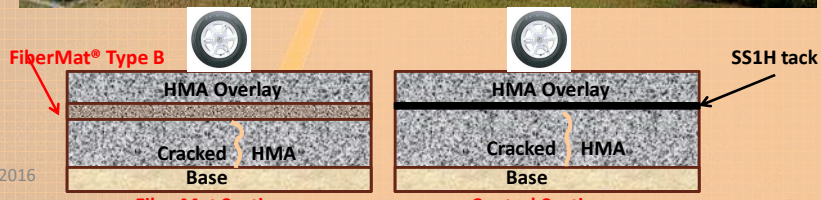
Original report prepared by
Ghassan R. Chehab, Ph.D.
Assistant Professor
&
Carlos J. Palacios
Graduate Research Assistant

Pennsylvania Transportation Institute
The Pennsylvania State University

EXECUTIVE SUMMARY

Penn State University Report

Pennsylvania Transportation Institute & Penn State University Findings



1/22/2016

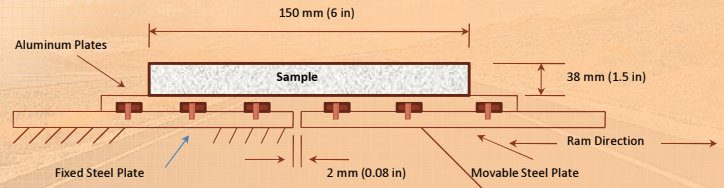
Penn State Study Field Cores

FiberMat Interlayer

No Treatment

1/22/2016

Texas Transportation Institute & Texas A & M University Findings



Control

FiberMat

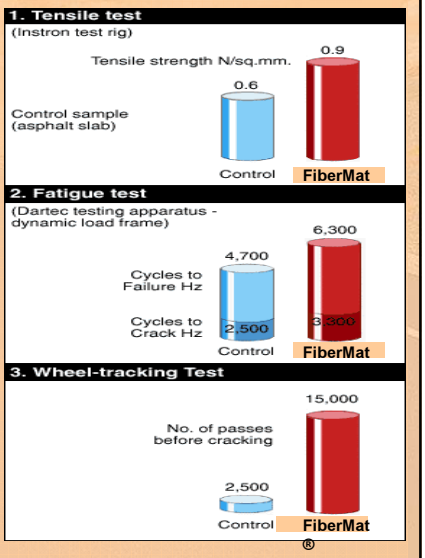
1/22/2016

Laboratory Evaluation

FiberMat® has shown to enhance the performance of an overlay by 30%

(due to it's improved fatigue and tensile stress characteristics)

FiberMat® has shown to reduce wheel-track cracking by a rate of 300%



1/22/2016

Four-year Performance Review

FiberMat® Type A – Field Test
Groth Road in Murray, New York

FIBERMAT® TYPE A (Left Side of Roadway **CRS-2p (Right Side of Roadway)**

March 2004
FIBERMAT® TYPE A
LONGITUDINAL CRACKS REAPPEARED AFTER 6 MONTHS

January 2005
FIBERMAT® TYPE A
CRS-2p
SNOW PLOW DAMAGE AFTER 2ND WINTER

1/22/2016

Four-year Performance Review

FiberMat® Type A – Field Test
Groth Road in Murray, New York

FIBERMAT® TYPE A (Left Side of Roadway **CRS-2p (Right Side of Roadway)**

January 2006
FURTHER SNOW PLOW DAMAGE & WATER PUMPING AFTER 3RD WINTER

January 2007
DAMAGE CONTINUED NOW WATER IS PUMPING FROM SUBBASE

June 2008
REPAIRS NEEDED IN ORDER TO MAINTAIN PUBLIC SAFETY

1/22/2016

Four-year Performance Review

FiberMat® Type A – Field Test
Groth Road in Murray, New York

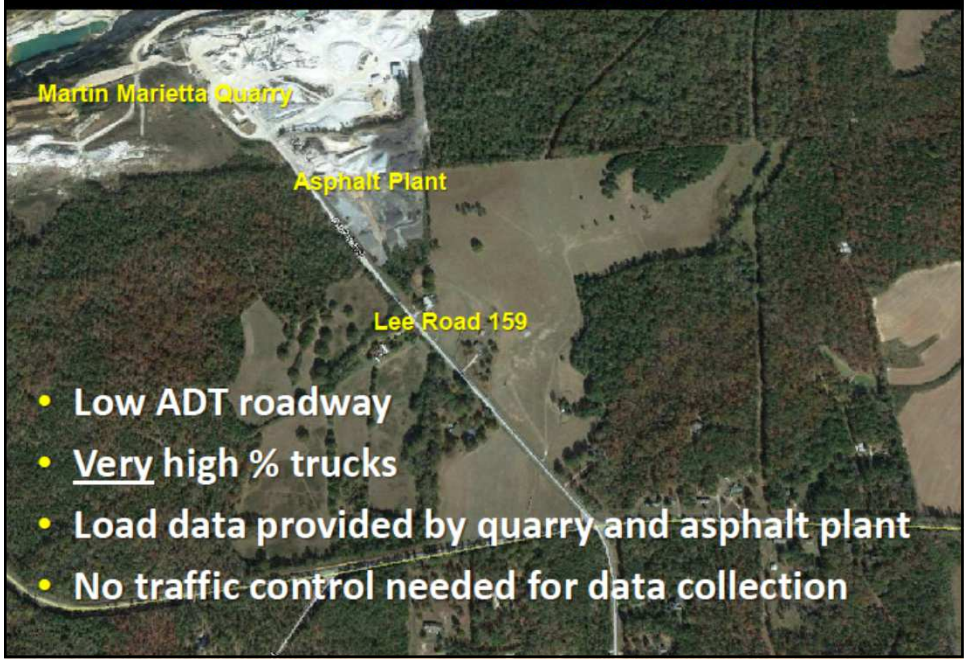
FIBERMAT® TYPE A (Left Side of Roadway CRS-2p (Right Side of Roadway)

October 2009

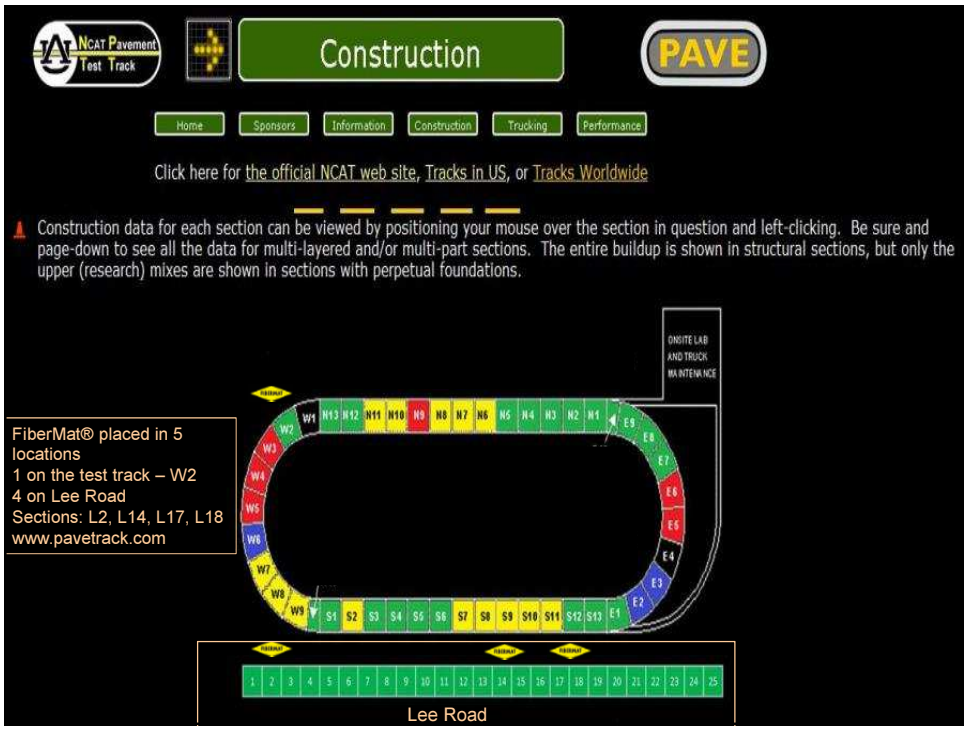
1/22/2016

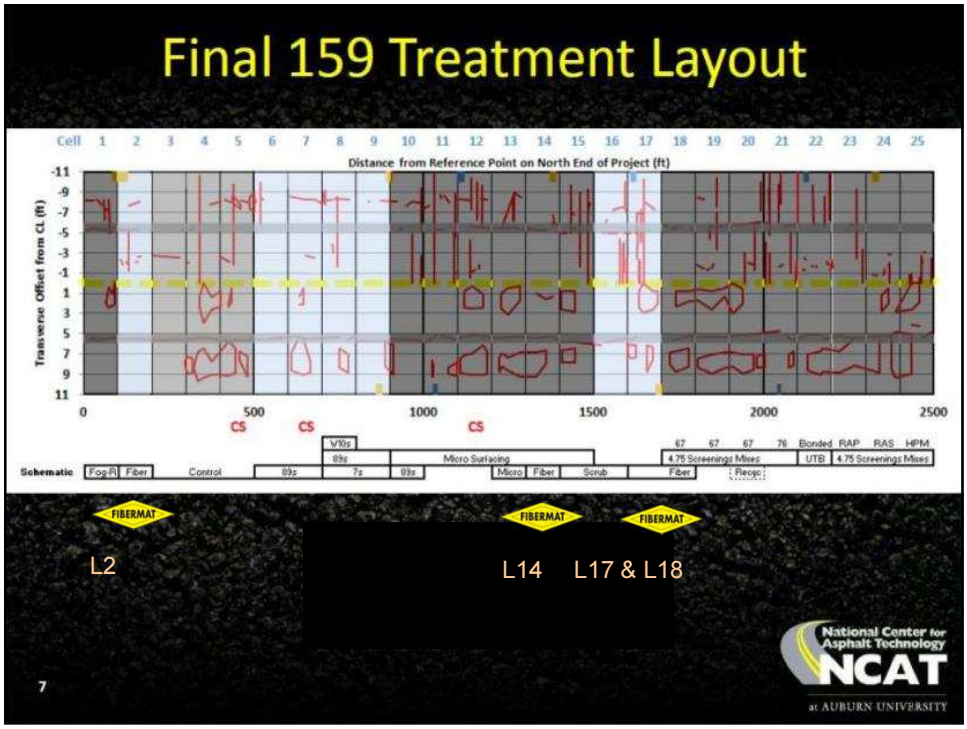
FiberMat® on the NCAT Test Track

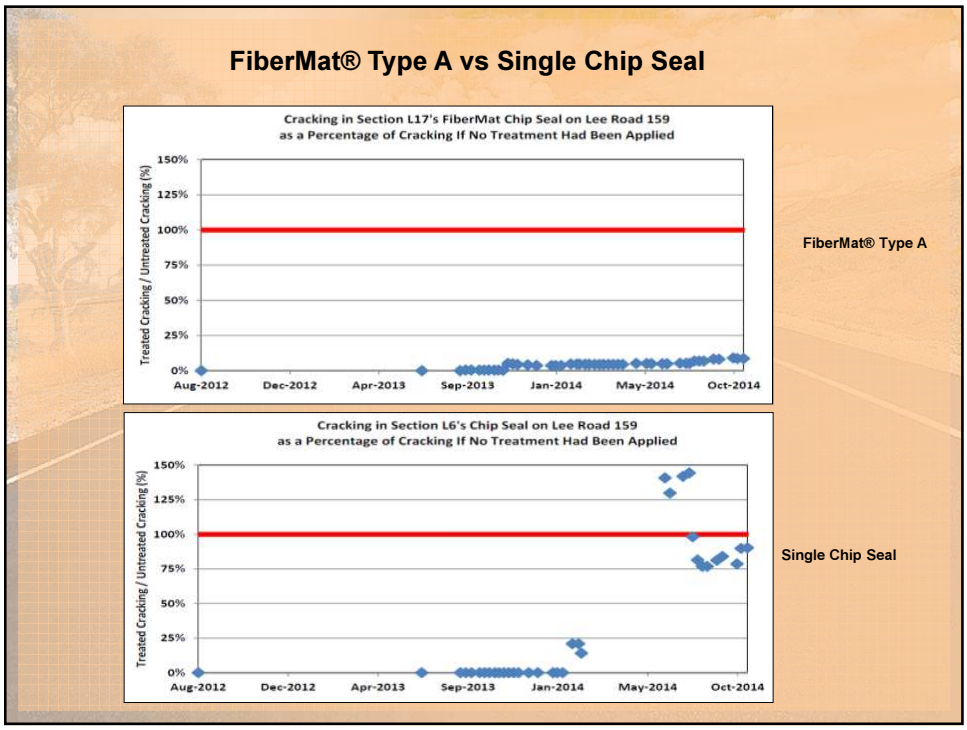
PG Sections on Lee Road 159



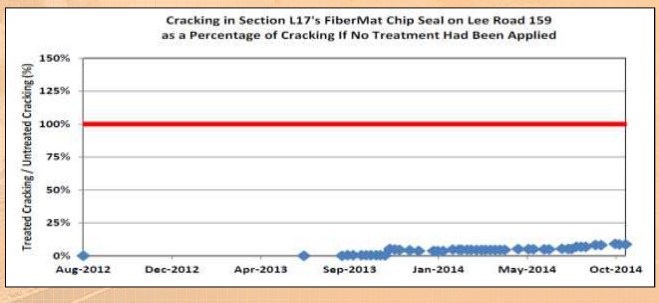
- Low ADT roadway
- Very high % trucks
- Load data provided by quarry and asphalt plant
- No traffic control needed for data collection



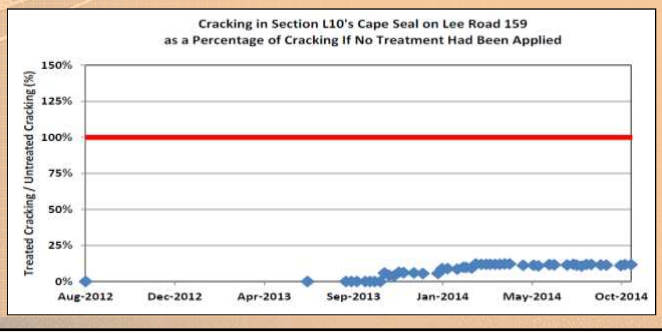

Final 159 Treatment Layout
Cell 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Distance from Reference Point on North End of Project (ft)
Transverse Offset from CL (ft)
-11 -9 -7 -5 -3 -1 1 3 5 7 9 11
0 500 1000 1500 2000 2500
CS CS CS
Schematic
Fog-R Fiber Control 89s V10s 89s 7s 93s Micro Surfacing Micro Fiber Scrub Fiber Recyc 67 67 67 76 4.75 Screenings Mixes Bonded UTB RAP RAS HPM 4.75 Screenings Mixes
FIBERMAT
FIBERMAT
FIBERMAT
L2
L14
L17 & L18
National Center for Asphalt Technology
NCAT
at AUBURN UNIVERSITY
7


FiberMat® Type A vs Single Chip Seal
Cracking in Section L17's FiberMat Chip Seal on Lee Road 159
as a Percentage of Cracking If No Treatment Had Been Applied
Treated Cracking / Untreated Cracking (%)
150% 125% 100% 75% 50% 25% 0%
Aug-2012 Dec-2012 Apr-2013 Sep-2013 Jan-2014 May-2014 Oct-2014
FiberMat® Type A
Cracking in Section L6's Chip Seal on Lee Road 159
as a Percentage of Cracking If No Treatment Had Been Applied
Treated Cracking / Untreated Cracking (%)
150% 125% 100% 75% 50% 25% 0%
Aug-2012 Dec-2012 Apr-2013 Sep-2013 Jan-2014 May-2014 Oct-2014
Single Chip Seal

FiberMat® Type A vs Cape Seal (Chip seal with Micro)



FiberMat® Type A



Cape Seal
(Chip seal with Micro)

Virginia Beach Boulevard – Virginia Beach, VA

36

Defense Supply Center – Richmond, VA - 2011

1/22/2016

Defense Supply Center – Richmond, VA - 2011

1/22/2016

Project - Route 609 Hopewell, VA

Prior to FiberMat®

1/22/2016

Project - Route 609 Hopewell, VA

During the FiberMat® Process

1/22/2016

VDOT Special Provision for Fiber-Reinforced Bituminous Membrane

VIRGINIA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION FOR
FIBER-REINFORCED BITUMINOUS MEMBRANE

I. DESCRIPTION

This work shall consist of installing a waterproof membrane consisting of a combination of quick setting polymer modified asphalt emulsion, chopped fiberglass strands and cover coat material on the roadway in accordance with these specifications; and the lines and typical sections as shown on the plans, or as directed.

Type A shall be applied as a surface coating. Type B shall be applied on the on the existing pavement then overlaid with a variety of surface treatments.

II. MATERIALS

Polymerized Emulsion.

1. CRS-1P or CRS-2P. Shall be a rapid setting cationic emulsified asphalt when tested in accordance with AASHTO T59 Testing Emulsified Asphalt.

2. Polymer Modifier. The minimum amount and type of polymer modifier shall be determined by the laboratory reforming the designs. The minimum, polymer modifier content shall be 3% polymer solids, based on bitumen weight. The polymer material shall be milled or blended into the asphalt or blended into the emulsifier solution prior to the emulsification process.

3. Coarse Aggregate. Shall conform to Section 203 and 202 of the Specifications. Coarse aggregate shall be a minimum Grade B or higher, size No. 8 and/or No.67. Crushed stone shall only be used on roads of Traffic Groups VI and above unless the surface treatment consists of modified single seal treatment or modified double seal treatment. Aggregates shall not be used within 24 hours of washing. Aggregate from more than one source shall not be furnished for a specified route or a group of sub-division routes unless permitted by the engineer. The following modified the aggregate material as defined in Section 203 of the Specifications:

Designation Modification

N Non-polishing

material only

L Lightweight
G Washed gravel

only

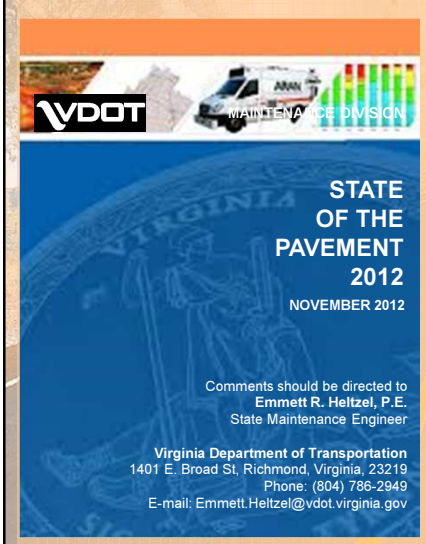
Notes: Where 8N is specified, it shall meet the gradation requirements of 8P. Where 8L is specified it shall meet the following gradation:

Sieve Size	% Passing
1/2	100
3/8	75 - 100
No. 4	10 - 40
No. 8	Max 5

Where 8G is specified, it shall meet the gradation requirements of No. 8P

1/22/2016

VDOT State of The Pavement 2012



1/22/2016

VDOT State of The Pavement 2012

Maintenance Division *State of The Pavement - 2012*

Table C3. Pavement Condition by District and County for Secondary System (Samples) - 2012

District	County No.	County Name	Lane Miles Rated, Secondary (Samples)	Deficient Lane Miles	% Deficient
Ric hm ond (4)	12	Brunswick	82.82	27.00	32.60%
	20	Chesterfield	138.32	56.64	40.95%
	26	Dinwiddie	118.32	33.70	28.49%
	37	Goochland	111.66	2.12	1.90%
	42	Hanover	164.78	51.81	31.44%
	43	Henrico	376.14	90.36	24.02%
	58	Mecklenburg	78.08	32.02	41.01%
	63	New Kent	80.28	5.02	6.25%
	74	Prince George	130.67	63.38	48.50%
	District 4 Total		**1281.07**	**362.05**	**28.26%**

1/22/2016

FiberMat® VDOT Richmond District 2015

County	Route Number	Lane Miles / Square Yards
Charles City	106	0.39 / 9,575
Goochland	6	2.55 / 35,904
Hanover	33	1.15 / 16,867
Hanover	54	2.15 / 30,272
Hanover	54	0.66 / 9,293
Henrico	156	0.91 / 12,813
Henrico	156	1.82 / 25,626
New Kent	273	6.63 / 85,571
Nottoway	46	2.25 / 29,040
Nottoway	46	1.30 / 18,304
Nottoway	49	6.86 / 88,540
	Total:	**26.67 / 361804**

1/22/2016

Other FiberMat® throughout the State of Virginia

Location / Year	Route Number / Name	Lane Miles / Square Yards
Fords Colony Annually	John Pott, Edinburg & Blackheath	To date/ 18,829
Prince George Co. 2011	609	1.75 / 21,567
Hopewell, VA 2012	Route 36	0.94 / 13,787
Suffolk	Route 58	2.15 / 30,272
Camp Peary, VA	On base	1264
Ben Moreel 2012	Lincoln Military Housing	1.00 / 12,333
Army Supply Depot 2011	Richmond	25,626
Net Center 2013	Newport News	137,355
	Total:	**261,033 sy**

1/22/2016

Cost per square yard FiberMat® only

FiberMat® Average Price/SY				
Year Placed	Location	County	Square Yards	Ave Price/sy
2015	U. S. Coast Guard Station	Yorktown	1,203	$4.14
2015	U. S. Coast Guard Station	Yorktown	2,205	
2012	Defense Supply Center (Road)	Richmond	3,054	
2016	Route 931	Chesterfield County	6,072	
2015	Route 54	Hanover County	9,293	
2015	Route 106	Charles City County	9,575	
2016	Route 828	Chesterfield County	10,505	$2.72
2016	Route 651	Chesterfield County	11,487	
2015	Route 156	Henrico County	12,813	
2016	Route 667	Chesterfield County	15,359	$2.44
2015	Route 33	Hanover County	16,867	
2015	Route 46	Nottoway County	18,304	
2012	Defense Supply Center (Lots)	Richmond	19,514	
2016	Route 651	Chesterfield County	22,927	
2016	Route 604	Chesterfield County	24,996	
2015	Route 156	Henrico County	25,626	$2.26
2015	Route 46	Nottoway County	29,040	
2015	Route 54	Hanover County	30,272	
2016	Route 641	Chesterfield County	32,602	
2015	Route 6	Goochland County	35,904	
2011	Route 609	Prince George County	36,600	
2016	Route 642	Chesterfield County	41,253	
2016	Route 626	Chesterfield County	44,786	
2014	Route 15	Nottoway County	46,323	
2016	Route 653	Chesterfield County	47,058	
2016	Route 631	Chesterfield County	53,391	$2.16
2015	Route 273	New Kent County	85,571	
2015	Route 49	Nottoway County	88,540	
		Total Square Yards to Date	**781,140**	

1/22/2016

Cost per square yard FiberMat® & Chip

FiberMat® & Chip Average Price/SY				
Year Placed	Location	County	Square Yards	Ave Price/sy
2012	Camp Peary	Williamsburg	250	$7.94
2012	Edinburgh Drive	Ford's Colony	5,718	
2012	Black Heath Drive	Ford's Colony	7,112	
2012	Route 58	Suffolk	10,677	$3.41
2012	Ben Moreell	Norfolk	12,333	
2013	John Potts Drive	Ford's Colony	12,906	
2012	Newport News Shipyard	Newport News	13,300	
2013	Route 36, Oaklawn Boulevard	Hopewell	13,787	
2013	Edinburgh Drive	Ford's Colony	14,843	
2014	Ford's Colony Drive	Ford's Colony	14,869	
2013	Net Center Office Mall	Newport News	25,810	$2.76
2015	Felker Air Field	Fort Eustis, Virginia	40,013	
2012	Net Center Office Mall	Newport News	88,305	$2.79
		Total Square Yards to Date	**259,923**	

1/22/2016


Thank you for your time!
1/22/2016