FIBERMAT

The Ultimate Stress Absorbing Membrane
FIBERMAT® TEAM

• Nelson Wesenberg – Manager New Product Development & Marketing, Midland Asphalt

• Dave Fittante – National Sales Engineer, Midland Asphalt

• Quint Davis – Pavement Preservation Manager, Simon Contractors
Today's DOT Professionals have an enormous responsibility to maintain 3.95 million miles of public roads valued at $1.75 trillion.
It is clear that they are making Business decisions when it comes to **Investing** Public Funds

**ASSET MANAGEMENT**

*What is it and why should you care?*
*Or “Experiences from the Highway Side”*

Asset Management for Ports - Workshop
January 21, 2007

Sue McNeil
Professor, University of Delaware
Chair, TRB Asset Management Committee
New and innovative thinking is required to stretch the limited dollars available.

**The Old Approach**
- Limited Preservation
- Underestimated Traffic, Loads, Costs
- Use Locally Available Materials
- Repaired Worst First
- Design for Lowest Initial Cost
- Limited Design Life
- Limited Economic Analysis
- Insufficient Funds

**Asset Management**
**The New Approach**
- Transportation Networks Viewed as Utilities
- Investments in Assets Rather than the Traditional Public Idea of Mere Expenditures of Funds
Pavement preservation is a cost-effective set of practices that extend pavement life and improve safety and motorist satisfaction while saving public tax dollars. Smart business decision!
FiberMat® was designed to:

- Enhance tensile strength and reduce reflective cracking.
- Quickly applied and more easily shaped.
- Has great wearing as well as tensile properties.
- Used at various levels in the pavement structure.
FiberMat HISTORY

- Developed and used in the UK for over 20 years
- Used as a SAMI and Wearing Course
- Used in traditional chip seal, decorative finishes, bridge decks, textile and grid markets
WHAT IS FIBERMAT®
FIBER GLASS

Asphalt emulsions are applied through a split spray bar - *the waterproof membrane*. Fiber glass strands are introduced between the spraybars - *the ability to withstand stresses and give enhanced tensile properties*.
EMULSION

A uniform, consistent binder layer is produced.

A *special* emulsion is applied @ typically 0.4 -0.5 Gal/SY. (*Split 50:50*)

Fiber glass is cut in-situ between the layers at 2-4oz/SY
AGGREGATES

- VARIOUS STONE SIZES USED
- ¼ TO ½ INCH MOST COMMON
- LOCAL SPECIFICATIONS FOR CHIP SEALS
- CARE WITH P200
THE FIBERMAT® PROCESS

Rolling and sweeping completes the treatment. The surface can normally be opened to traffic within 15 minutes.

The finish produced is a skid-resistant wearing surface - SAM. (Type A)

Or can be used as a SAMI (Type B), overlaid with a different wearing course such as Hot Mix Asphalt or NovaChip.
### FiberMat® Type A & B

<table>
<thead>
<tr>
<th>FiberMat® Type A</th>
<th>FiberMat® Type B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Polymer Modified Asphalt Emulsion</strong></td>
<td><strong>Polymer Modified Asphalt Emulsion</strong></td>
</tr>
<tr>
<td>- 0.4 – 0.8 gal/sy</td>
<td>- 0.35 – 0.45 gal/sy</td>
</tr>
<tr>
<td><strong>Fiberglass</strong></td>
<td><strong>Fiberglass</strong></td>
</tr>
<tr>
<td>- 2 - 3 oz/sy</td>
<td>- 3 - 4 oz/sy</td>
</tr>
<tr>
<td><strong>Aggregate</strong></td>
<td><strong>Aggregate</strong></td>
</tr>
<tr>
<td>- 17 – 25 lbs/sy</td>
<td>- 10 – 15 lbs/sy</td>
</tr>
<tr>
<td>- 1/2”, 3/8” or 1/4” and combination there of</td>
<td>- 1/4” blinding aggregate</td>
</tr>
</tbody>
</table>

![Diagram showing the structure of FiberMat® Type A and B](image)

- **Chopped glass fibre Binder**
- **Aggregated Binder**
- **Wearing course**
- **Aggregate**
- **Asphalt**
- **Cracked surface**
They developed a truck mounted 8 foot wide unit Mini-Machine 4 foot wide unit used in the UK.

Than they developed a truck mounted 8 foot wide unit
Trailer mounted 13 foot wide unit
Computer Controls

Steerable trailer
HOW IS IT APPLIED?
FIBER STORAGE
FIBERMAT® MACHINE

Easy to work on with folding bars

2nd Spray bar

1st Spray bar

Cutting Units

Underside of application unit
FIBERMAT® MACHINE

- Chopping Unit Close Up
TECHNICAL REPORTS

- Nottingham university, UK
- Ulster university, Ireland
- Lcpc, Autun, France
- New South Wales road transportation authority, Australia
- Rilem - 1996
- World congress on emulsions October 2006
- Penn State – PTI report on Fibermat type b March 2007
- Ctaa – Niagara Falls, on November 2007
- Rilem Chicago, IL June 2008
EXECUTIVE SUMMARY

United States

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

by

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

Joe W. Bunion, P.E.
Senior Research Fellow
Texas Transportation Institute

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

FIBERMAT

Original report prepared by
Ghassan R. Chehab, Ph.D.
Assistant Professor
&
Carlos J. Palacios
Graduate Research Assistant
Pennsylvania Transportation Institute
The Pennsylvania State University

FIBERMAT

Texas A & M Report

Pennsylvania State Report
PENNSYLVANIA TRANS. INST.
TEST SECTIONS
PENN STATE

FiberMat® Type B

PCC Sections

HMA Sections

FiberMat® Type A

A

HMA Overlay

Cracked HMA

Base

B

Cracked HMA

Base

C

PCC

Strong Base

PCC

Weak Base
EXECUTIVE SUMMARY

FiberMat®
Type B
Interlayer
(crack stops)

Control
Core Sample
(Crack continues)
• Horizontal crack propagation along the FiberMat® interface rather than by cracking vertically above as in control samples.

• Generally, specimens containing FiberMat® improved cracking resistance in the small overlay testers 3 to 4 times more than control samples. The large overlay FiberMat® samples survived 14 times more compared to the control.
FIBERMAT® TYPE A – FIELD TEST

Groth Road in Murray, New York

March 2004
LONGITUDINAL CRACKS REAPPEARED AFTER 6 MONTHS

January 2005
SNOW PLOW DAMAGE AFTER 2ND WINTER
FIBERMAT® TYPE A – FIELD TEST
Groth Road in Murray, New York

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
PROJECTS NEAR YOU

New York
Pennsylvania
Ohio
Michigan
Wisconsin
N & S Carolina
Massachusetts
Alberta
Ontario
Public Safety

**Speed and efficiency of application**
Initial construction speed minimizes disruption to the public
Open to traffic quickly minimizing disruption to the public

**Improved surface friction characteristics**
Safer driving conditions in good and bad weather

**Waterproofs surface preventing damage to sub base**
Maintains ride quality longer
Maintains safe driving surface (slow pothole development)

**Improves Customer relations**
Reduces public complaints due to poor road conditions
BENEFIT TO THE CUSTOMER

Cost Effectiveness

Speed and efficiency of application
- Lower labor costs vs. competitive products
- Speed of process reduces crew & equipment costs on road
- Reduces exposure to potential liability

Waterproof surface preventing damage to sub base
- Extends pavement life
- Maintains ride quality longer
- Maintains safe driving surface (slow pothole development)

Slows propagation of reflective cracks
- Extends pavement life
- Extends life of overlay surface treatment
- Maintains waterproofing characteristics for longer life
Increased tensile strength. (+30%)
Good fatigue performance. (+30%).
Site monitoring has provided practical evidence of pavement longevity.
The system can be used throughout the construction layers.
FiberMat® is manufactured on-site and to size.
FiberMat® can be opened to traffic quickly.
The binder layer provides waterproofing properties.
FiberMat® provides a good surface on which to apply other asphalt layers.
CONCLUSION

» Quantifiable & validated benefits in terms of a reduction in reflective and sealing alligator cracking.
» A variation on a known system.
» Used as a SAMI or a Wearing Course - new tool for the Pavement Engineer to Preserve the Pavement.
The Ultimate Stress Absorbing Membrane

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