Minnesota Department of Transportation

Memo

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TO: File: Research on Longitudinal Joint Deterioration

FROM: Mark Watson
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DATE: 10 September, 2009

SUBJECT: Joint Stabilization (JointBond®) Test Sections

Introduction:
This memo describes the joint stabilization (JointBond®) treatment and documents the application and early performance of two short test sections.

Joint Stabilization (JointBond®) Treatment:
Joint Stabilization (Joint Bond®) is a polymerized maltene emulsion designed to penetrate into the longitudinal joint. This treatment can be applied 1.0 to 1.5' on either side of the longitudinal construction joint of Hot Mixed Asphalt (HMA) pavements and doesn't remove the pavement striping. This treatment, according to the manufacturer, works best when applied right after paving, or within 12 months, and has the purported benefits of 'fortifying' the longitudinal joint and making the pavement impervious to water and salt brine.

T.H. 95 Test Section:
On September 8, 2008 at T.H. 95 (5.75 miles east of TH 169 (Princeton))
Application:

- Started at Reference Point (RP) 28.0 and applied three closely spaced 100 ft long test sections at varying application rates
- Figure 1 shows the application of JointBond over the longitudinal joint, and Figure 2 shows the completed test section (Note the relatively short length). Note how the product penetrated the pavement leaving a dark black color.

Figure 1. T.H. 95, September 8, 2008 – JB Application

Figure 2. T.H. 95, September 8, 2008 – Immediately After JB Application

Performance Evaluation:

- A field visit was made by Patti-Wallin Johnson of D3 on 11-6-2008 (2 months after application) after maintenance reports of color change from clear to brown as shown in Figure 3. Note that the photos were taken after a rain, as shown by the retained water in the centerline rumble strips.
- A field visit was made in 2009 by Mark Watson and John Pantelis of CO MRR (nearly 1 year after construction). This visit did not find evidence of discoloration in the application area as shown in Figure 4. Note that the photos were also taken after a rain, however there was no retained water in rumble strips in the JointBond section, but there was retained water in the chip seal section as shown in Figure 5.
- Although the brown color has faded, an evaluation of pavement marking reflectivity **has not** been performed.
- The 2009 field visit did not observe a difference in field performance between the treated and untreated sections

Figure 3. T.H. 95, November 11, 2008 – 2 Months After JB Application

Figure 4. T.H. 95 JB, August, 2009 – 1 Year After JB Application

Figure 5. T.H. 95 Chip Seal, August, 2009

Conclusions:

- After one year, there is no discernable difference in pavement performance between the JointBond Section and the control based on visual observation alone.

Recommendations:

- Continue monitoring the field performance of the test section
- Perform reflectivity measurements
- Perform permeability measurements

Minnesota Road Research Project (MnROAD) Test Section:

On September 10, 2008 at MnROAD Low Volume Road

Application:

- Applied in the transition zone between cells 34-35 (Sta 7445 – 7495 dist. of 50')
- Figure 6 shows the application of JointBond over the longitudinal joint at MnROAD during the Midwestern Pavement Preservation Partnership (MPPP) Meeting.
- Figure 7 shows photos of the completed test section taken in August 2009, after a rain event (Note the relatively short length). Note how the product penetrated the pavement).

Figure 6. MnROAD, September 10, 2008 – JB Application

Figure 7. MnROAD JB, August, 2009 – 1 Year After JB Application

Conclusions:

- After one year, there is no discernable difference in pavement performance between the JointBond Section and the control based on visual observation alone.

Recommendations:

- Continue monitoring the field performance of the test section
- Perform reflectivity measurements
- Perform permeability, friction and texture measurements (MnROAD location will facilitate testing and evaluation due to the controlled traffic environment which can be challenging on a higher volume 2-lane rural highway)

Summary:

In Summary the Joint Stabilization (Joint Bond®) Treatment is marketed as a rejuvenater designed to prevent the deterioration of the longitudinal joint without damaging pavement markings. This product is also designed to make the pavement impervious to water and salt brine.

The Joint Stabilization (Joint Bond®) treatment was applied on two test sections in 2008. Upon construction the product penetrated into the pavement surface. On TH 95 there were reports that the pavement surface had turned brown, this was not permanent.

Field visits in 2009, after rain events, did not reveal any noticeable performance difference between the treated and untreated sections. A laboratory study will be conducted in the Maplewood Materials Lab to further evaluate the product.