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September 3, 1999

RESEARCH UPDATE

U 1999-5

PAVEPREP CRACK REDUCTION INTERLAYER

REFERENCES:

Report WP 94-R-19, U94-11, U95-7, U96-14, U97-15

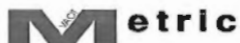
INTRODUCTION:

In 1994, Paveprep Crack Reduction Interlayer was applied on three separate projects, Lowell-Westfield F029-2(11), Highgate STP 9214 and on US Route 5 in Hartford. The Lowell-Westfield (VT 100) site consisted of several courses of bituminous pavement. The Highgate (US 7) site consisted of a bituminous pavement over a portland cement concrete base. The US Route 5 site in Hartford was placed on a milled surface with a bituminous concrete overlay.

PROJECT HISTORY:

Installation on the Lowell-Westfield and Highgate projects posed little or no problems during the application, or when the pavement was placed. On the Hartford project, the interlayer detached itself from the road surface the day following its placement. The loss of bond was probably due to the rough textured pavement surface and the condition was furthered aggravated by rain showers that followed the installation.

The following week a new 24 foot (7.3m) strip was placed near where the previous strip had been. Emulsified asphalt was applied on the milled surface just before the PavePrep installation. One lane was paved within five to ten minutes of application. The fabric was picked up by the shoes on the paver's automatic grading and slope equipment. This problem was corrected by lifting up each pad as it passed over the PavePrep.



All units in metric. Exceptions: mile markers/mileage reference for project location and supplier's costs.

PRODUCT DESCRIPTION:

PavePrep is a high density asphaltic membrane laminated between a nonwoven polyester geotextile and a woven polyester geotextile. The material is available in 102 foot (31m) roll lengths for widths of 12 inches (30cm) and 20 inches (51cm), and 48 foot (14.6m) roll lengths for 36 inches (91cm) and 40 inches (102cm) widths. At the time of these projects the material cost of 20 inch (51cm) wide PavePrep was \$1.00 to \$1.20 a linear foot.

PERFORMANCE:

The product was applied over shoulder to shoulder transverse cracks at all four sites and over a longitudinal crack along the centerline in Highgate.

PROJECT	SITE LOCATION	INITIAL WIDTH OF CRACK (mm)	CURRENT WIDTH OF CRACK (mm)
Lowell-Westfield VT Route 100	MM 3.26	13 (06/1994)	0 (07/1999)
	MM 6.13	13 (06/1994)	3 (07/1999)
Highgate US Route 7	MM 3.60	32 (07/1994)	0 (07/1999)
	MM 3.60 (@ CL)	32 (07/1994)	0 (07/1999)
Hartford US Route 5	MM 3.13	19 (09/1994)	19 (07/1999)

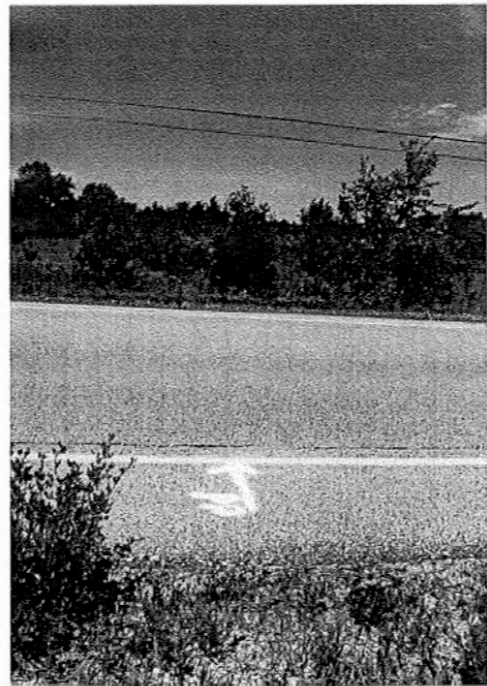
In 1996 it was initially reported that the test site in Lowell at MM 3.26 had developed three small reflective cracks totaling ten feet in length. In 1997 it was reported as having increased to a total of 14 feet. During a 1999 inspection it was concluded that this crack was not entirely along the alignment of the PavePrep interlayer. A portion of it, nine feet in length beginning at the eastbound shoulder going toward the centerline was along the line of the interlayer, and, from that point on, the crack diverges toward the south, away from the interlayer. Several other cracks are present on both sides of the test site. No cracking was evident at MM 6.13 test site in Lowell.

Since the last inspection in Hartford in 1997, two independent transverse cracks had developed along the alignment in which the PavePrep was installed. One crack measured nine feet in length, beginning at the shoulder edge going toward centerline, while the other was 23 feet in length, beginning at the median and going toward centerline. Overall the crack is across the entire lane with the two cracks overlapping slightly at the center. The crack has recently been filled with a crack sealant.

The Highgate test site shows no signs of reflective cracking along the previous, transverse shoulder-to-shoulder crack, or the centerline.



Lowell-Westfield VT Route 100
@ MM 3.26



Highgate US Route 7
@ MM 3.60



Hartford US Route 5 @ MM 3.13

SUMMARY:

After five years of service, two of the five test sites developed reflective cracks, and at one of these sites, it failed along its entire length. Although the results are inconclusive at this time, the Hartford failure may be attributed to a high traffic volume and the milled surface on which the material was placed. In Lowell, one site continues to perform as it was designed to, while the other is beginning to show signs of failure. Although both these sites were part of the same resurfacing project, the site at MM 6.13 has less traffic volume than at MM 3.26, possibly contributing to the performance difference. The Highgate site has a concrete road base and low traffic volume, factors that may be associated with its good performance.

Transverse cracking is typically associated with moisture or environmental factors. Therefore, the product's performance may be affected by the subbase on which all these roads are constructed.

FOLLOW-UP:

Performance monitoring will continue for the life of these projects, with emphasis on reflective cracking identification.