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December 16, 1999

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RESEARCH UPDATE

U 1999-8

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**GLASPHALT PAVEMENT PERFORMANCE  
HARTLAND, VT ROUTE 12**

**REFERENCES:**

Report WP 92-R-20, U92-4, U93-8, U97-1

**INTRODUCTION:**

This report describes the performance of waste crushed glass utilized as a portion of the coarse aggregate in a bituminous concrete pavement surface course placed on VT Route 12 in Hartland. This project is one of two state highways constructed using this process. In 1972, the City of South Burlington constructed a 0.68 km section on VT Route 116, but due to the placement of a bituminous surface course shortly thereafter, little data was obtained regarding its performance.

**PROJECT DESCRIPTION:**

Hartland project STP 9328(1)S began at the intersection of VT Route 12 and VT Route 5 in Hartland at mile marker 0.000 and continued northerly, 0.97 km to mile marker 0.600. Constructed in 1992, the overlay design specified a 363 metric ton per mile leveling course of VT Type IV (9.5 mm maximum) bituminous concrete pavement and a 44mm VT Type III (12.5 mm maximum) bituminous concrete pavement surface course. As a test of its performance, a 0.77 km section of VT Route 12 (mile marker 0.120 through mile marker 0.600) was paved with a glasphalt wearing course in the southbound lane, the northbound lane was constructed with a standard bituminous pavement. Details on the production and placement of the experimental and control mixes are available in Research Update U92-4.

Two test sites, each 30 m in length, were established on the project. Each year these sites are examined and measured for cracking, rutting and ride roughness.



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

**PROJECT HISTORY:**

In the Spring of 1993, the project was inspected and revealed some loss of glass aggregate as evidenced by the existence of glass particles on the surface of the adjacent gravel shoulder. All glass particles noted were free of any asphalt coating. Surface pitting was apparent only under close observation. The surface texture of the pavement was quite open between the wheel paths on both the glasphalt and standard pavement.

Locked wheel friction tests taken 50 days after paving indicated little or no difference in skid resistance between the standard mix and glasphalt, since the skid value for both treatments was 48.

**PERFORMANCE:**

The following table presents seven years of performance evaluations of glasphalt pavement.

<b>GLASPHALT PAVEMENT</b>			
	<b>Cracking (m/100m)</b>	<b>Rutting (mm)</b>	<b>IRI (m/km)</b>
<b>1992 (Pre-Construction)</b>	292	9.5	3.90
<b>1992 (Post-Construction)</b>	0	0	3.37
<b>1993</b>	0	0	1.27
<b>1994</b>	25	0	1.71
<b>1995</b>	31	0	1.45
<b>1996</b>	32	0	1.67
<b>1997</b>	46	0	2.00
<b>1998</b>	60	0	1.70
<b>1999</b>	(67)	(3)	N/A

( ) ..... based on data from one test site

In 1999, the exact location of test site one was undetectable. Therefore, performance data for cracking and rutting were based on test site two only. Roughness (IRI) measurements were not obtained due to the unavailability of equipment.

**SUMMARY:**

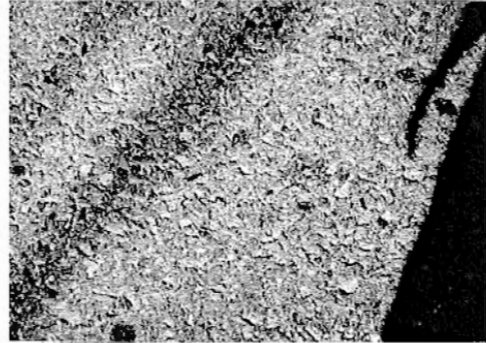
An examination of the table indicates, at the test sites, the glasphalt is performing well. In comparison to the measurements taken prior to construction, it can be noted that after seven years, minimal cracking and rutting have occurred.

In 1999, an inspection revealed some pitting in the southbound lane where aggregate was lost but the distress was not severe. The presence of glass is still very noticeable, particularly in the shoulder area where less wear has occurred.

The overall performance of the material appears to be equivalent to the standard bituminous pavement adjacent to it. The addition of glass as an aggregate increases the tendency for asphalt stripping. However, with the addition of an anti-stripping agent, as was the case here, the problem seems to be minimal.



**Glasphalt Pavement (front) /  
Standard Mix (back)**



**Rough texture in Glasphalt area**

**FOLLOW UP:**

Performance monitoring will continue with the emphasis on loss of aggregate, cracking, rutting and ride roughness.