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July 9, 1999

RESEARCH UPDATE

U 1999-1

**PERFORMANCE OF COLD RECYCLED BITUMINOUS PAVEMENT
TROY-NEWPORT, VT ROUTE 105**

REFERENCES:

Report WP 92-R-8, Research Report 94-3, U96-3, U96-18

INTRODUCTION:

This report describes the performance of cold recycled bituminous pavement (CRBP) which was placed on VT Route 105 in the towns of Troy and Newport. The project was one of the earlier pavement rehabilitation efforts using CRBP with special equipment for in-place recycling. An analysis of pavement performance based on collected data is presented herein.

PROJECT DESCRIPTION:

Troy-Newport project F 034-2(10) began at MM 5.730 in Troy and continued easterly for 5.274 km to MM 5.682 in the town of Newport. Constructed in 1992, the project included 100mm of cold in-place recycling, a 45mm Type II (~~prime coat and seal coat of bituminous material with pea stone and stone grits~~) bituminous binder course, and a 30mm Type III (~~prime coat of bituminous material with sand cover~~) bituminous wearing course. Also placed was a 75 mm standard overlay in two lifts, Type II and Type III, which provides a control section for comparison with the CRBP.

Six test sites were established on the project, four in areas of CRBP and two in areas of standard overlay. Each year these sites are examined and measured for cracking, rutting and roughness.



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

PROJECT HISTORY:

The project was completed in the summer of 1992. After one year of service, the pavement developed longitudinal cracking, typically offset 1.0 m or 2.5 m from the centerline. Project participants hypothesized that the cracking was caused during construction by the screed and was further exacerbated by the use of a “stiffer” 75 blow Marshall mix design. Since cracking attributable to these causes is not relevant to the effectiveness of the CRBP process, the offset centerline cracking has been excluded from the tabulated crack count.

PERFORMANCE:

The following table compares seven years of performance evaluation between CRBP and standard overlay.

TROY-NEWPORT PERFORMANCE COMPARISON			
		CRBP TEST SITES	STANDARD OVERLAY SITES
1993	CRACKING	25	0
	RUTTING	0.6	0
	ROUGHNESS	1.2	1.2
1994	CRACKING	34	45
	RUTTING	0.5	0.3
	ROUGHNESS	1.2	1.5
1995	CRACKING	62	79
	RUTTING	1.9	2.4
	ROUGHNESS	1.5	1.6
1996	CRACKING	79	126
	RUTTING	0.8	1.6
	ROUGHNESS	1.6	1.3
1997	CRACKING	185	245
	RUTTING	2.9	3.1
	ROUGHNESS	1.5	1.1
1998	CRACKING	238	308
	RUTTING	2.7	3.4
	ROUGHNESS	1.4	1.4
1999	CRACKING	246	308
	RUTTING	2.0	1.9
	ROUGHNESS	N/A	N/A

Units: Cracking m/100m
 Rutting mm
 Roughness (IRI) ... m/km

SUMMARY:

After seven years of service, the CRBP is continuing to perform slightly better than the standard overlay in cracking, rutting and roughness. At the time of this report, it was not possible to obtain current measurements for roughness due to unavailability of equipment. Another effort to obtain this information will be made later in the year.

Although performance is nearly equivalent, the cost difference between CRBP and standard overlay is not. The CRBP was placed at a cost of \$10.20/m² and the standard overlay was placed at a cost of \$6.53/m². Based on the unit costs, there would need to be a 36% increase in the service life of the CRBP pavement in order to be equal in value to the standard overlay. The CRBP placed on the Troy-Newport project has yet to show such superior performance when compared to the standard overlay.

FOLLOW UP:

Pavement surveys will continue on an annual basis until firm conclusions can be drawn as to the anticipated service life of the CRBP and its relative cost effectiveness.