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RESEARCH UPDATE

U96-11

TERMINAL BLEND ASPHALT RUBBER HOT MIX LOWELL-WESTFIELD VT 100

REFERENCES:

Work Plan 94-R-3, Report 94-9

INTRODUCTION:

The Lowell-Westfield project, F 029-2(11), was Vermont's initial trial of terminal blend asphalt rubber hot mix (ARHM). The 14.27 km project was constructed during the 1994 construction season, and an evaluation was initiated to determine the cost effectiveness of the ARHM material. Terminal blend is one of several methods of utilizing scrap (used tires) rubber in asphalt mixes. It is a wet blend approach, i.e, the rubber is blended with the asphalt cement (AC) binder prior to being combined with the aggregate. The process is distinct in that blending takes place at an asphalt terminal and the rubber blended asphalt binder is stored in tanks and transported as needed. Terminal blend asphalt rubber utilizes a finer gradation and results in more complete dissolution of the rubber in the binder, as compared with other ARHM products.

PROJECT DESCRIPTION:

The project was located on VT 100, beginning at MM 2.864 in Lowell and ending at MM 4.700 in Westfield. It included a 3.293 km control section beginning at MM 2.864, and ending at MM 4.91, all within the town of Lowell. This control section was a simple 38 mm overlay of Type III bituminous concrete. The remainder of the project, from MM 4.91 in Lowell to MM 4.70 in Westfield (a distance of 10.98 km), was paved with a 38 mm ARHM overlay.

Eleven test sites were established, four within the control section and seven within the ARHM section, and have been surveyed annually. The performance of these sites, after two winter maintenance seasons, is summarized in the table below .

TWO YEAR PERFORMANCE OF ARHM VS STANDARD OVERLAY							
	OVERLAY (mm)	# TEST SECTIONS	RUTS (mm)	MAYS m/km	CRACKS m/100 m	% REFLECTIVE CRACKING	AVE. PRECONSTR. CRACKING
CONTROL	38	4	0	39	153	51%	598 m/100 m
EXPERIMENTAL	38	7	0	76	140	51%	754 m/ 100 m

All units in metric: Exceptions: mile markers/mileage references for project location; supplier's costs (presented in dual English/Metric units.)

Metric

It should be noted that the crack maps compiled during the pavement surveys indicate that in the experimental test sections, as well as in the control sections, much of the cracking is reflection cracking. It is also evident that preconstruction cracking was significantly greater in the experimental test sections and these sections would therefore be more predisposed to reflective cracking. Based on this observation, it would seem that the ARHM is outperforming the standard overlay to a greater extent than is immediately apparent.

COST:

The cost of the experimental pavement was \$5.86/m^2 (\$4.90/SY). This included a cost of \$3.78/m^2 (\$3.16/SY) for the 38 mm overlay of ARHM and \$2.08/m^2 (\$1.74/SY) for the 383 t/km leveling course.

The cost of the control section was \$5.37/m^2 (\$4.49/SY), consisting of the 38 mm overlay cost of \$3.29 m^2 (\$2.75/SY) and \$2.08/m^2 (\$1.74/SY) for the 383 t/km leveling course.

SUMMARY:

Based upon observations to this point, the ARHM pavement is performing slightly better than the standard overlay in the area of crack development. However, ride measurement is significantly better within the control sections. The marginally superior performance observed in the area of cracking may suggest an extended service life of the ARHM pavement, and may possibly justify its additional cost (about 9%). The project will be surveyed annually and the evaluation will continue until firm conclusions can be drawn.