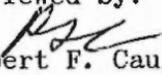


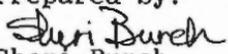
MATERIALS & RESEARCH DIVISION

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RESEARCH UPDATE

Number U94-17

RECLAIMED BASE STABILIZATION WITH CALCIUM CHLORIDE RICHFORD, VT ROUTE 105

Purpose:

The Agency of Transportation is evaluating various rehabilitation techniques from the perspective of life-cycle cost effectiveness. This report covers the first project using calcium chloride (CaCl_2) as a base stabilizer, and is part of the on-going Pavement Performance and Annualized Cost Study.

Project Description:

The project, Richford STP 9272(1)S, on VT. 105, began at MM 4.246 and extended easterly 4.984 miles to MM 9.230 (the Richford/Jay town line). The existing pavement structure consisted of three or four bituminous courses with the last treatment consisting of a 3/4" bituminous layer placed in 1983. The average daily traffic was just over 700 vehicles in 1991.

Construction:

Construction was completed in 1992 by Pike Industries of Tilton, N.H. The reclaimed base stabilization item and the addition of calcium chloride was subcontracted to Gorman Brothers, Inc., of Albany, N.Y. and the project was divided into three experimental areas.

From MM 4.246 to MM 5.00 (Sect. A), the roadway was reclaimed to a depth of 9 inches. A 30% concentration of CaCl_2 was mixed into the top 6" of reclaimed material in two separate applications, each totaling 0.4 gallons per square yard. The area was then graded, compacted and sealed with a final application of 0.2 gallons of CaCl_2 per square yard. Overlays of 1.75" of Type II and 1.5" of Type III bituminous concrete completed the treatment. Test sites 4.4, 4.6 and 4.7 were established in the experimental CaCl_2 test area.

From MM 5.00 to MM 5.4 (Sect. B), a leveling course and standard overlay of 1.5" Type III bituminous concrete was applied over the existing pavement. Test sites 5.0 and 5.2 were established in this area.

From MM 5.4 to MM 9.230 (Sect. C), the roadway was reclaimed to a depth of 4". An overlay of 1.75" Type II and 1.5" Type III bituminous concrete was applied. Test sites 6.2, 6.6, 7.8 and 8.6 were established in this area.

Evaluation:

Results of the pavement survey are shown on the following charts. 1992 readings are preconstruction.

SECTION A:

CaCl ₂ STABILIZATION	1992	1993	1994
ROUGHNESS IN/MI	167	72	80
CRACKING LF/100LF	1913	7	43
RUTTING 1/16"	2.5/16	0	< 1/16

SECTION B

STANDARD OVERLAY

ROUGHNESS IN/MI	141	77	104
CRACKING LF/100 LF	2176	5	48
RUTTING 1/16"	2/16	0	1/16

SECTION C

RECLAIM ONLY

ROUGHNESS IN/MI	197	85	108
CRACKING LF/100 LF	1078	6.5	33
RUTTING 1/16"	5/16	1/16	2/16

* Centerline paving joint and screed induced longitudinal cracking is not included in the totals.

Cost Information:

The costs for three treatments were as follows:

Section A CaCl ₂ Stabilization	Reclaimed Base	\$1.33/sy
	Liquid CaCl ₂	\$1.20/sy
	Pavement	\$5.42/sy
	Total	\$7.95/sy
Section B Standard Overlay	Pavement	\$3.65/sy
	Total	\$3.65/sy
Section C Reclaim Only	Reclaimed Base	\$1.33/sy
	Pavement	\$5.42/sy
	Total	\$6.75/sy

The difference of the cost of pavements between section A and C and Section B are due to different thicknesses of Bituminous Concrete. Both Sections A and C had 3.5 inches of pavement, while Section B had only 1.5 inches.

Summary:

To date the CaCl₂ Stabilized base area has maintained a smoother ride while cracking and rutting values reveal no early trends.

Follow-up:

Field observation and testing will continue on this project until the life-cycle cost of each treatment can be determined.