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MINIMIZATION OF REFLECTION CRACKS INSTALLATION REPORT — 1973

by

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INTRODUCTION

For the past three years the Bituminous Section of the Virginia Highway Research Council has been working toward minimizing reflection cracking of both rigid and flexible pavements. For the last two years, the section's efforts have been focused on flexible pavements and the Pavement Section has concentrated on rigid pavements and transverse cracks resulting from cement treated bases.

The materials used in the experimental work done so far — polypropylene fabric, glass fabric, nylon, and latex -- all offer tremendous potential of extending the life of asphalt overlays for several years. However, the results of these experimental applications are still inconclusive because of the relatively short time they have been down.*

This year two new materials were added to those used in the past and new techniques in applications were also tried.

INSTALLATION

Four materials were placed at two locations this year. On June 26 a latex material, Pliopave from Goodyear, was applied to a section of Route 301 north of Stoney Creek, see Figure 1 attached. The Pliopave is added to the mix in the mixing box, whereas the latex previously used, Petroset, was sprayed on the pavement after the mix was placed and rolled. The Pliopave was added in amounts of 3% and 5% by weight of the asphalt (design AC=5.0%). It was originally intended that this material would be pumped out of 55 gallon drums, resting on the ground, into the asphalt plant pug mill; but after three batches of plant mix were produced the pump clogged and would no longer work. The drums then were lifted to the platform beside the pug mill and the Pliopave added to the mix by buckets.

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* Installations described in references 1-3.

Because of the problem encountered in adding the latex to the mix, the desired location had to be abandoned and another section chosen. As Figure 1 shows, the mix (165 psy of I-2) with the Pliopave was applied in the N.B.T.L. Although not as badly cracked as the original section, the area of placement did have some rather severely cracked areas.

During the installation penetrations and viscosities were obtained from the unmixed asphalt, the asphalt after mixing and from both Pliopave mixtures. The results are shown in Table 1.

TABLE 1

PENETRATION AND VISCOSITY RESULTS, RTE. 301 TEST SECTION

Asphalt	Average Penetration	Viscosity	
		140°F	275°F
AC-20	75	1989	380
I-2	62	2574	418
3% Pliopave	140	3673	1197
5% Pliopave	78	—	—

Because of the great increase in viscosity of the recovered asphalt from the 5% Pliopave mix, the viscosities were beyond the range of the normal viscometer. The results from the 3% Pliopave asphalt are unusual in that the penetration and viscosity both increased appreciably. Both of these results indicate that the addition of the latex causes changes in the properties of the asphalt.

Three different materials were placed on August 7 and 8 on Route 29 north of Charlottesville in the S. B. T. L. as shown in Figure 2. The overlay was 125 psy of S-5.

The first material placed was Petromat. Although this material had been used in the two previous years, a new method of installation was tried this year. Prior to placement of the Petromat, CAE-2 at a rate of .25 gsy was applied and allowed to cure. Two 300' rolls of 12' wide Petromat were then applied using the small rollers shown in Figure 3. This procedure allows the roll to be pulled rather than carried and simplifies the application greatly. A 300' uncracked section was left between the Petromat and the Burlington glass fabric that was placed next. A 300' section of fabric was placed in 52" widths, which allowed three strips with about a 12" longitudinal overlap. The manufacturers brought a small tractor (Figure 4) that applied the fabric very easily. Prior to placement of the Burlington material .15 gsy of CAE-2 was applied and allowed to cure.

The glass fabric tended to wrinkle on the inside wheel path just in front of the paver, but this did not appear to affect the overlay. Other than this wrinkling, there was nothing unusual about the overlay placement.

The Petroset was applied on August 8 by a small asphalt distributor (Figure 5). One hundred ten gallons of Petroset were cut with 220 gallons of water and the diluted mixture was sprayed at the rate of .15 gsy. This mixture was absorbed into the pavement in about 45 minutes.

REVIEW OF PREVIOUS SECTIONS

All experimental applications over flexible pavements during the last two years were recently inspected and no recognizable cracking was noted in either the test sections or the adjacent control sections.

REFERENCES

(1) McGhee, K. H., and C. S. Hughes, "Installation Report, The Use of Fabric Reinforced Overlays to Control Reflection Cracking of Composite Pavements", Feb. 1973, VHRC 72-R27.

(2) Hughes, C. S., "Petromat Installation Report", March 1972, VHRC 71-R21.

(3) ______________ "Minimization of Reflection Cracks — Installation Report — Rte 29 north, Charlottesville", Dec. 1972, VHRC 72-R17.

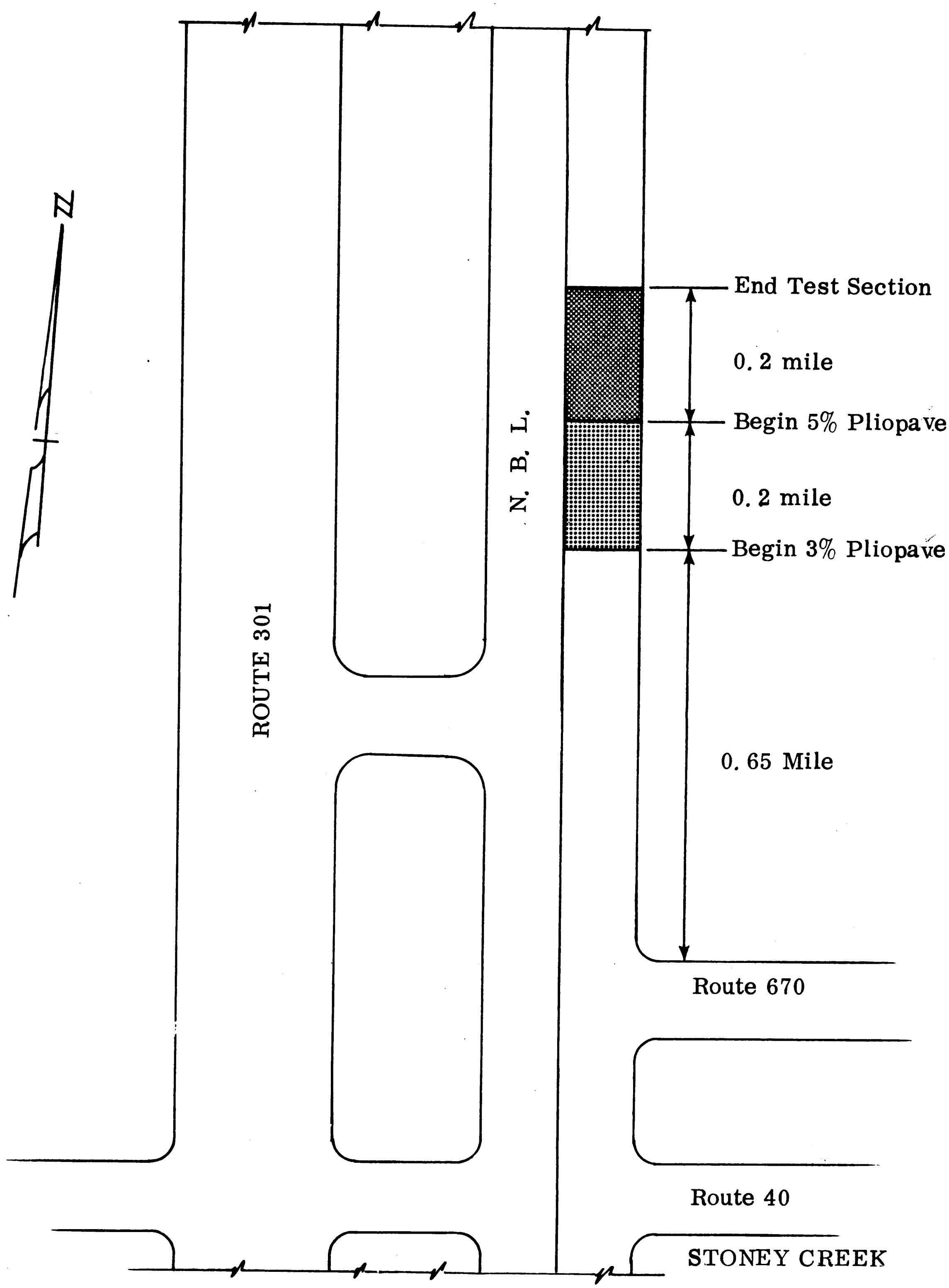

Figure 1. Pliopave test section

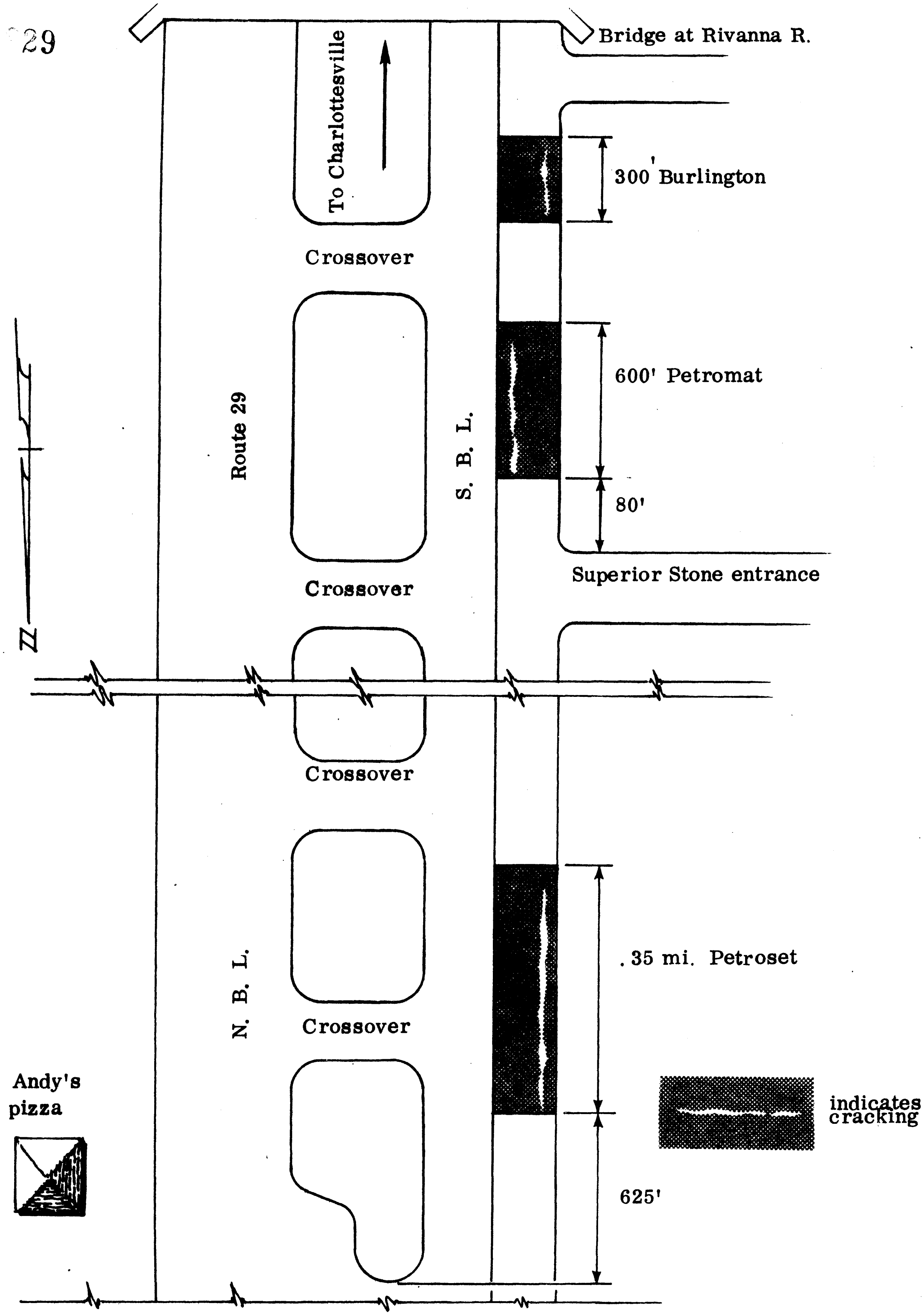

Fig. 2. Test Sections on Route 29 North of Charlottesville

Figure 3. Hand manipulated rollers facilitate application of Petromat.

Figure 4. Small tractor applies Burlington glass fabric quickly.

Figure 5. Distributor applies Petroset uniformly.