

PETROMAT INSTALLATION REPORT

by

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INTRODUCTION

Reflection cracking of both rigid and flexible pavements has been a problem for many years and with the recent increase in the use of bituminous overlays on jointed concrete pavement (e.g. Rt. 460 from Suffolk to Petersburg) such cracking has received a great deal of attention. Several attempts have been made to minimize the effect of the cracking by the use of a sand bond-breaking layer and with sulphur. The results have varied widely, with most being negative. The one successful attempt has been with the sand method on Route 13 in Northampton County, where after eight years some of the joints still have not reflected through the overlay.

Recently an unwoven polypropylene fabric with the trade name "Petromat" has become available for use in minimizing reflection cracks. This material has high tensile properties and supposedly prevents horizontal overstressing of the overlay. It costs approximately \$.45/sy, before installation.

INSTALLATION

Four overlay projects were chosen for the experimental use of this material; three (Rtes. 33, 29, and 81) were bituminous pavements, and one (Rte. 460) was a previously overlaid concrete pavement.

Route 33 E. of Harrisonburg and W. of Intersection with Route 276

The first Petromat section was placed on June 30, 1971 in the EBTL of Route 33 as shown in Figure 1. (All figures are appended.) The existing surface had extensive cracking in the wheel paths and the centerline was also cracked. One large transverse crack was noted approximately 42 feet from the end of the section. Prior to placing the fabric, .3 gsy of CAE2 was shot onto the pavement. The Petromat was immediately placed on the tack coat and broomed smooth before the CAE2 had an opportunity to cure. After approximately three hours, the haul trucks and paver reached the Petromat section and wrinkled the fabric (Figure 2) and caused transverse tears in the overlay, which was 120 psy of MS-5. These tears were generally ironed out with the breakdown rollers, but did result in some surface irregularities.

Route 29 Chatham Bypass S. of Route 832 Structure

The next section was placed on July 1, 1971 in the NBTL of Route 29 as shown in Figure 3. The existing surface had some cracking in both wheel paths throughout the section, but was extensively cracked in the last (northernmost) 75 feet. Prior to placing the Petromat, a CAE2 tack coat was shot at .25 gsy and allowed to cure approximately two hours. The temperature was about 80°F and the skies were overcast. However, the tack coat cured very well. The Petromat was rolled out and broomed smooth very quickly. Sand was then spread over the fabric and traffic allowed on the section. Before the paver reached this section a rain shower started and paving operations were suspended until the next day. The fabric held up under the traffic for approximately 24 hours with no trouble before the overlay was placed on it. The overlay consisted of 125 psy of MS-5.

Route 81 S. of the Fancy Hill Interchange

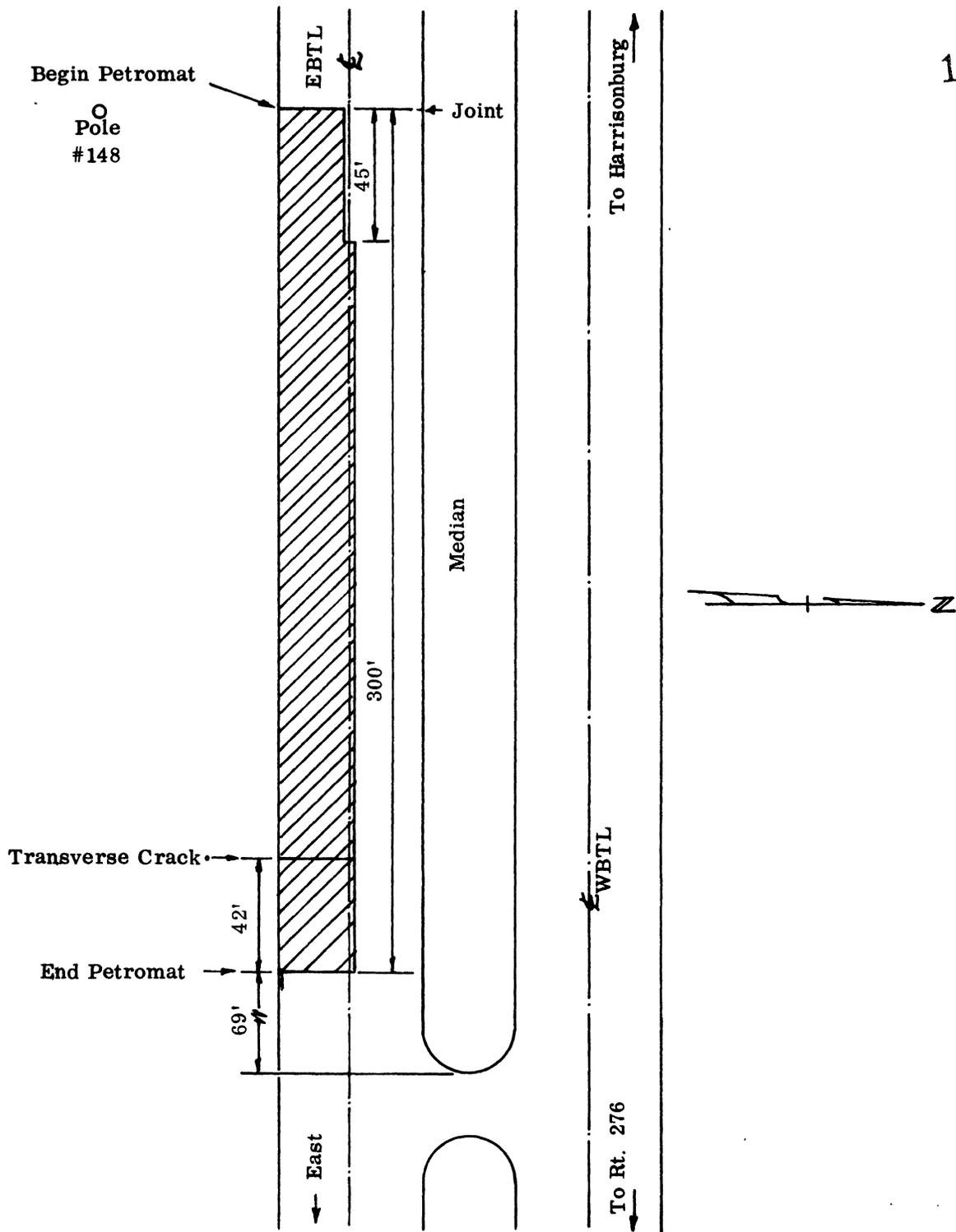
The last section on a bituminous pavement was placed on October 18, 1971 in the SBTL of Route 81 as shown in Figure 4. The existing surface was cracked and had a slurry seal application on all but the southernmost 50 feet of the section. This 50-foot section was badly cracked. The installation followed that of Route 29 with the exception that a tack coat of only .2 gsy of CAE2 was used, and the installation proceeded very smoothly. The maintenance schedule called for 200 psy of MI-2 and 130 psy of MS-5. On the Petromat section the MI-2 was not placed; only the 130 psy of MS-5 was applied.

Route 460 W. of Intersection with Route 602 in Sussex County

The only section over concrete pavement was placed on August 23, 1971 as shown in Figure 5. This section had been overlaid about 3 years previously. Approximately 25 of the 99 cracks over which the 3-foot wide Petromat strips were applied were hardly visible. The remaining 74 joints were very evident and often had two cracks from 6 inches to one foot apart. The installation proceeded very smoothly; however, because each joint was essentially a separate 3-foot test section, the installation took longer than it did on a single 300-foot section. Traffic was on the fabric approximately 12 hours before the overlay was placed and caused no detrimental effects. Although sand was placed on the fabric before traffic was allowed on it, the sand was whipped off within an hour. The overlay was 125 psy of MS-5.

PERFORMANCE

Only two sections have been inspected recently. The Route 33 project is showing no cracking, either in the Petromat area or the so-called controlled area, where no fabric was used. However, the section on Route 460 is showing extensive transverse joint reflective cracking on both the Petromat area and areas where Petromat was not used. These cracks became evident within three months of construction. It is possible that vertical joint movement is the cause of this very early failure and, hopefully, joint transfer tests can be made to help determine the extent of the movement taking place.



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Figure 1. Location of Petromat Section East of Harrisonburg

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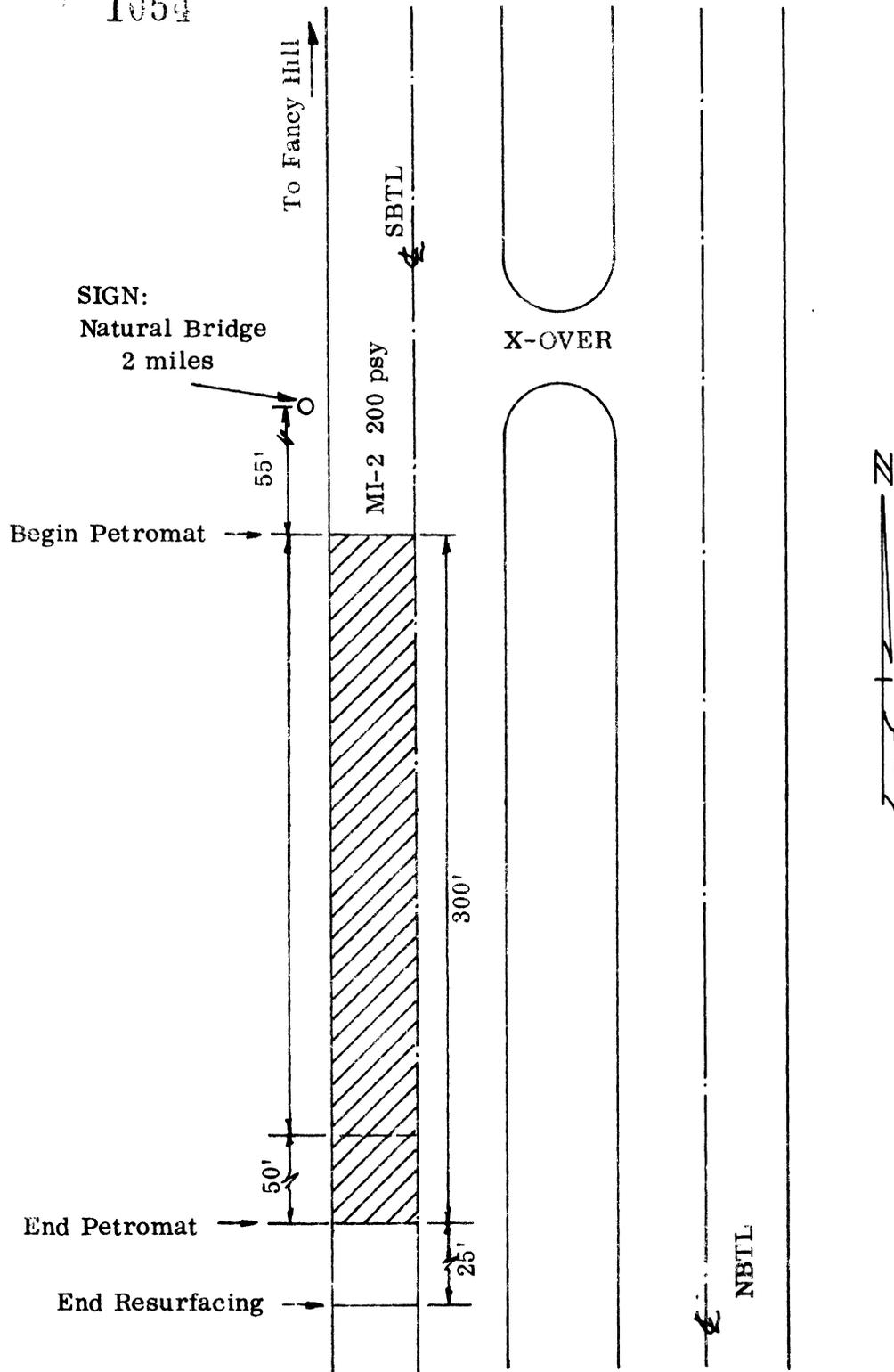


Figure 4. Location of Petromat Section
Route 81 South of Fancy Hill

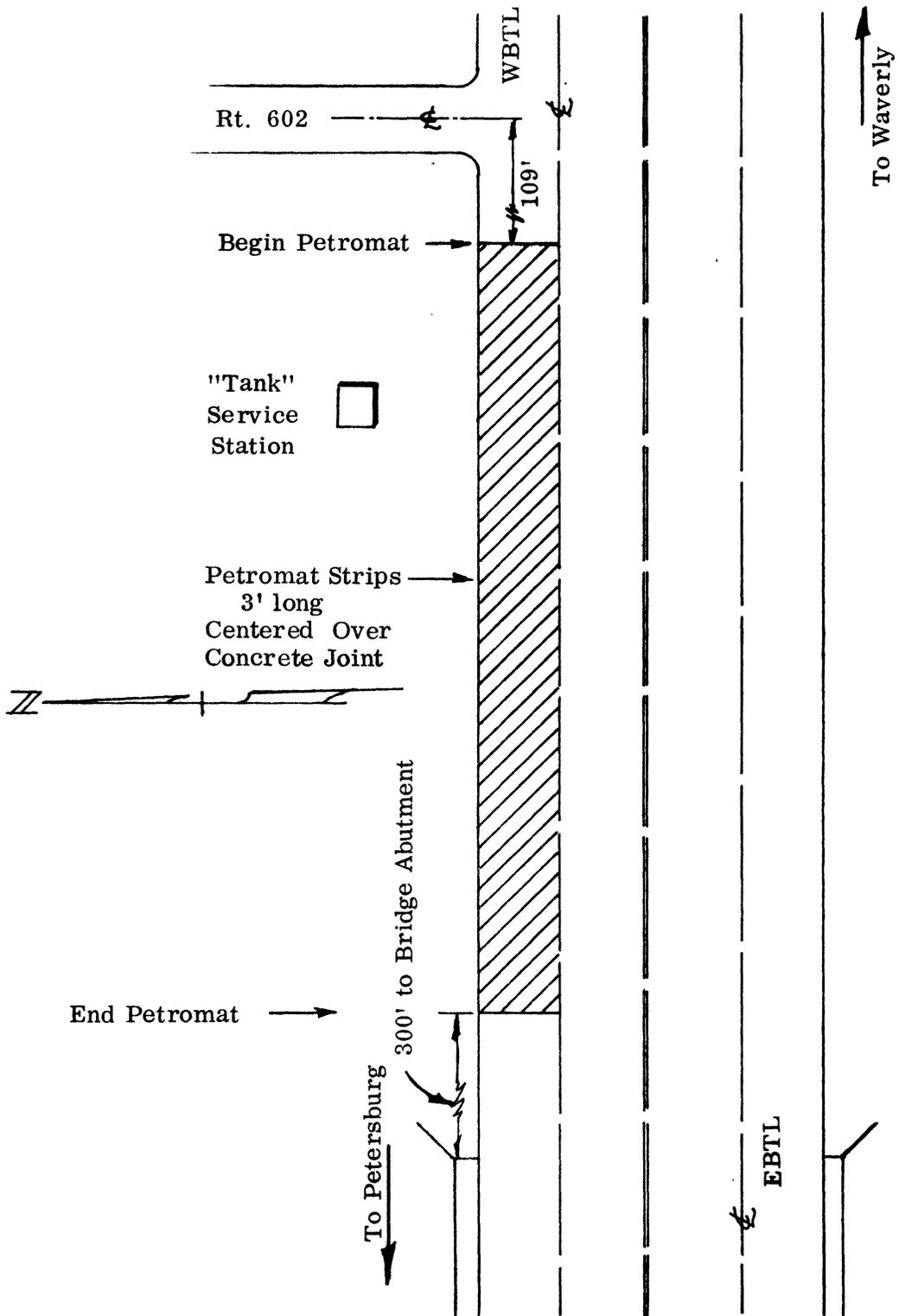


Figure 5. Location of Petromat Section Lanes West of Waverly

