

EVALUATION OF POLYETHYLENE STRIP
FOR FORMING CENTERLINE JOINT
Final Report: Work Plan No. 9

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MICHIGAN DEPARTMENT OF STATE HIGHWAYS

EVALUATION OF POLYETHYLENE STRIP
FOR FORMING CENTERLINE JOINT
Final Report: Work Plan No. 9

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Research Laboratory Section
Testing and Research Division
Research Project 68 NM-221
Research Report No. R-788

Michigan State Highway Commission
Charles H. Hewitt, Chairman; Louis A. Fisher, Vice-Chairman
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Lansing, October 1971

EVALUATION OF POLYETHYLENE STRIP FOR FORMING CENTERLINE JOINT

The purpose of this study was to evaluate the performance of longitudinal centerline joints formed by installing a polyethylene strip as compared with sawed centerline joints. Although sawed joints have performed satisfactorily they are claimed to be more costly than joints formed by inserting a plastic strip in the fresh concrete.

Background

The polyethylene strip method for forming longitudinal joints was presented for discussion to the Department's New Materials Committee at its December 15, 1968 meeting. The Committee directed the Research Laboratory to contact several states where the plastic strip had been used, and also to inspect installations in neighboring states. The states solicited for information on the plastic strip were: California, Illinois, Minnesota, Ohio, and Virginia. Installations in Ohio and Illinois were inspected by Department personnel. The results of this preliminary work were presented to the Committee at its August 26, 1969 meeting, and are summarized below.

Four of the states allowed optional use of the plastic strip forming method in place of sawing. The fifth, Virginia, approved its use on a project-to-project basis. All states reported satisfactory performance provided the material was properly installed. However, installation difficulties were encountered at headers and at joints in the plastic strip. Problems were also experienced in obtaining correct elevation of the strip; in some cases improper elevation was believed to have caused random longitudinal cracking. No actual amount of savings realized was obtained but estimated savings ranged from 5 to 10 cents per lineal foot.

The Committee agreed that a trial installation should be made before accepting the plastic strip forming method as an alternate to sawing the centerline joints.

As a result of the Committee's decision, Work Plan No. 9 was prepared in accordance with PPM 20-6.3 and submitted to the FHWA office for approval on July 13, 1970. The Work Plan was accepted as a Category 2 experimental project on July 21, 1970.

Material

The polyethylene strip is manufactured by the New England Plastics Corporation, Woburn, Mass. The strip specified for the experimental installation was 2-1/2 in. wide by 0.012 in. thick. Six rolls, each containing 1,000 ft, were supplied by the manufacturer without cost to the Department.

Installation

Federal Project I 69-2(1)38, Michigan Project I 13074-001 in Calhoun County was selected for the experimental installation. Two 1/2-mile long test sections with the centerline joint formed by use of the plastic strip and two standard control sections of equal lengths were planned. The contractor agreed to install the plastic strip at no extra cost. An attempt to install the plastic strip was made on August 3, 1970. However, the installation device did not function properly and the strip was pulled out of the fresh concrete as the paver moved forward. Adjustment of the equipment failed to correct the problem and installation on this project was cancelled.

Further attempts to install the plastic strip were made on May 24 and 26, 1971 on Federal Project I 96-4(104)217, Michigan Project I 82122-01238A in Wayne County. As in the previous case the strip was not embedded properly but was pulled out and dragged along with the finishing machine. Changes in the friction applied to the strip as it passed through the installation device failed to correct the problem in dispensing the strip properly and the procedure was discontinued. The installation device is shown in Figures 1 and 2.

Conclusions and Recommendations

On the basis of observations of the installation attempts, it appears that it would be difficult to consistently install the strip and maintain proper elevation and, therefore, it is recommended that this project be terminated. We have learned that most states using this method of forming centerline joints have had problems in obtaining satisfactory installations, and at least three states have discontinued its use.

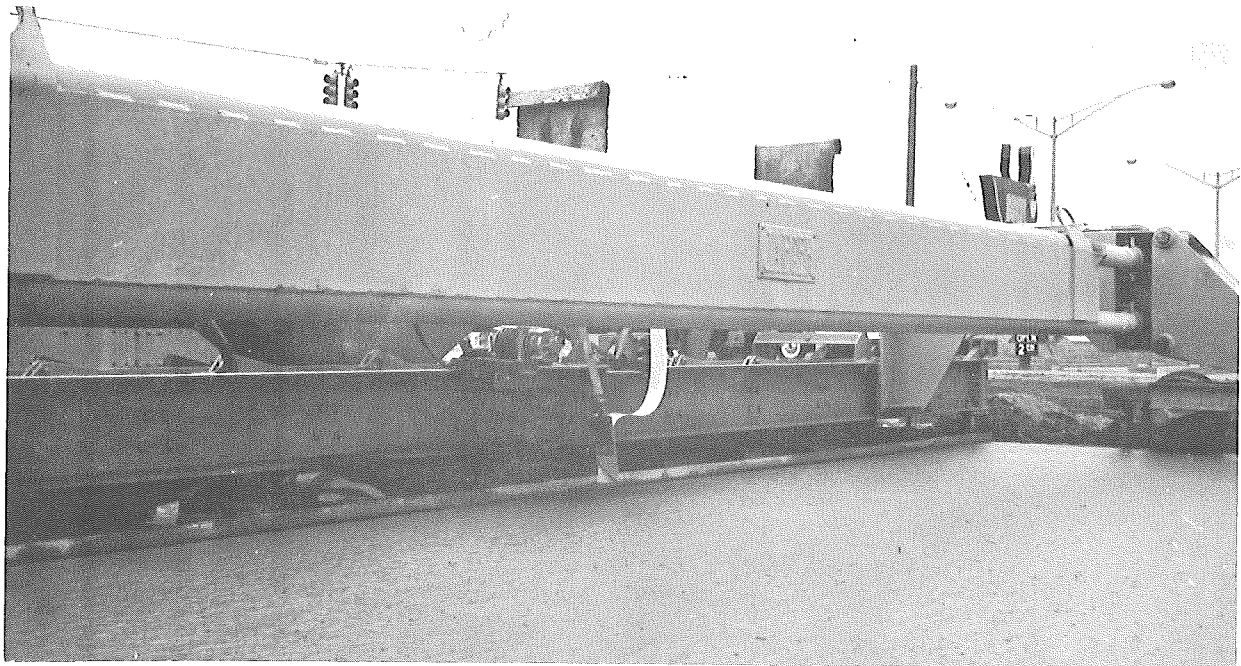


Figure 1. Location of polyethylene center strip installation device on rear of finishing machine.

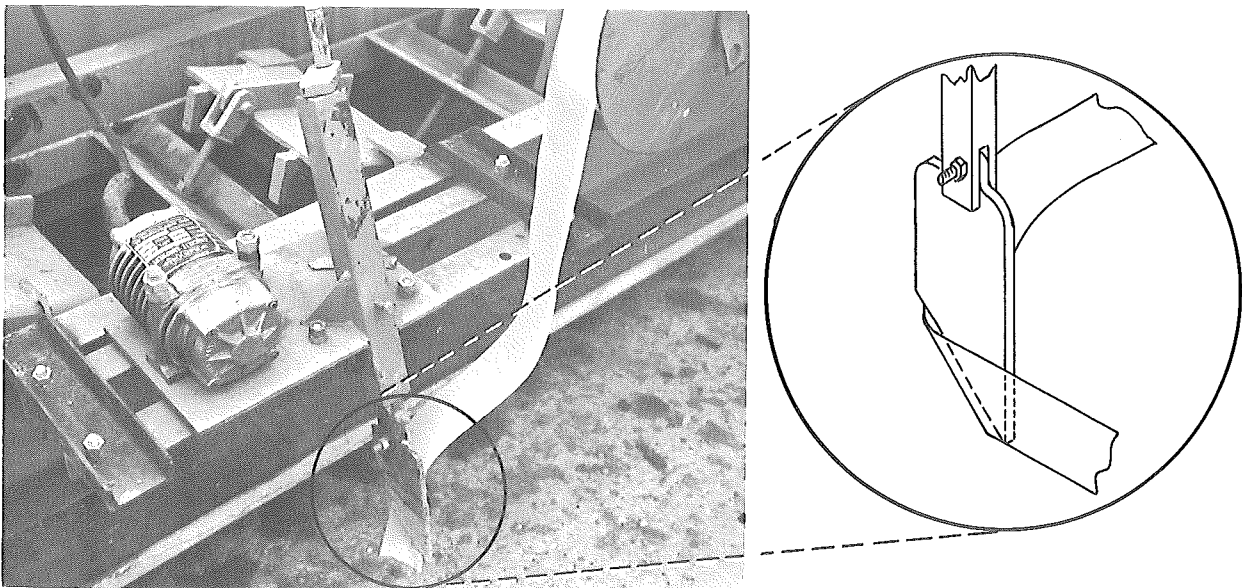


Figure 2. Polyethylene center strip installation device. A 1,000-ft roll of the plastic strip is placed on the reel (upper right) and fed through the hollow guide of the installation tool (center). The drawing shows how the strip is bent at a 90-degree angle in order to trail vertically behind the machine. The friction between the concrete and the strip holds it in position and it is embedded as the finisher moves forward. The concrete is consolidated by the vibrator mounted on the base plate of the device as shown at left in the photograph.