

MICHIGAN
STATE HIGHWAY DEPARTMENT
Charles M. Ziegler
State Highway Commissioner

CONCRETE PAVEMENT JOINT SAW-CUTTING
AND SEALING EXPERIMENT US-27

Construction Project F19-41, 06 F-68(9)

Joint research project between Construction
Division and Testing and Research Division

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Highway Research Project 51 F-21

Research Laboratory
Testing and Research Division
Report No. 175
April 9, 1952

CONCRETE PAVEMENT JOINT SAW CUTTING
AND SEALING EXPERIMENT, US-27

In accordance with plans made in cooperation with the Road Division, an experimental application of sawed center joint was made during the 1951 construction season on the US-27 concrete paving project south of St. Johns, Construction Project F 19-41, C6. Research Project 51 R-21 was set up to embrace execution and study of this installation, including cutting and sealing.

The accompanying map, Figure 1, shows details of location and description of the sawed center joint, of 4 transverse saw-cut joints, and of adjacent areas included for reference. Section A of Figure 1 includes an area of standard preparation and sealing of joints not under laboratory supervision. Section B includes an area under partial laboratory supervision, with wire brushing of transverse joints. Section C includes the experimental sawed joint installation. A complete description is given in the legend of Figure 1.

All sawed joints were cut on August 14th to 17th, inclusive, using a Clipper Model C-130 concrete cutting saw furnished by the Clipper Manufacturing Company, 2800 Warwick, Kansas City 8, Missouri. Sawing was done by personnel from the Clipper Company, supervised by Mr. E. W. Perkins. Total length of center cut was 3,760 lineal feet, average depth 2 inches, average width $5/32$ inch. Average cutting speed was 48.6 inches per minute. A total of 4 saw blades were used but one of these was a replacement blade and is not included in figuring costs. Slurry from the cutting operation was flushed out with air.

Sealing of the longitudinal saw-cut center joint followed the cutting operation as soon as possible. Sealing was done with a solvent type cold-applied joint sealer No. 77, supplied by the Presstite Engineering Company, St. Louis, Missouri. This material was pumped directly into the joint by means of a special nozzle connected to a long, high-pressure hose. The hose was connected to a pump which was attached to a 55-gallon drum containing the material. Pump and accessories were furnished by Pyles Industries, Inc., 8926 Second Avenue, Detroit 2, Michigan. Sealing was done by personnel from the Presstite Company under the supervision of Mr. R. B. Shofstall, and included the dates August 16th to 18th. The center cut was blown out with air immediately prior to sealing.

Inspection at an age of 5 months showed that the center joint was in excellent condition. There was no evidence of cracking, of loss of material by seepage, of extrusion, or of spalling of the concrete adjacent to the joint. This project will be kept under continuous observation by Research Laboratory personnel, and its condition will be recorded at suitable intervals.

Cost for cutting the joints figures $10\frac{1}{2}$ cents and for sealing, $5\frac{1}{2}$ cents or a total cost of 24 cents per linear foot for cutting and sealing. This includes material, labor and all equipment rental with the single exception of a purchase price of \$398.15 for the pump and accessories from Pyles Industries, Inc. It compares with an estimate of 6 cents per linear foot furnished by Mr. E. Oryderman of the Construction Division for material and labor, exclusive of equipment, used in standard practice for center joint. A more complete analysis of cost is included in the Appendix.

It is expected that the cost of cutting and sealing saw-cut center joint would be materially reduced to the contractor, perhaps to a figure approximating 16 cents per lineal foot as a result of availability to the contractor of equipment and labor included in the above estimate.

The accompanying photographs, Figures 2 through 10, show the equipment used and the condition of the joint at various ages.

FIGURE 3. OPERATION OF CUTTING LONGITUDINAL CENTER JOINT. NOTE WATER & AIR SUPPLY LINES.



FIGURE 2. CLIPPER SAW, MODEL C-130, USED FOR CUTTING LONGITUDINAL CENTER JOINT.

FIGURE 4. SHOWS DEPTH OF SAWCUT IN CENTER JOINT.

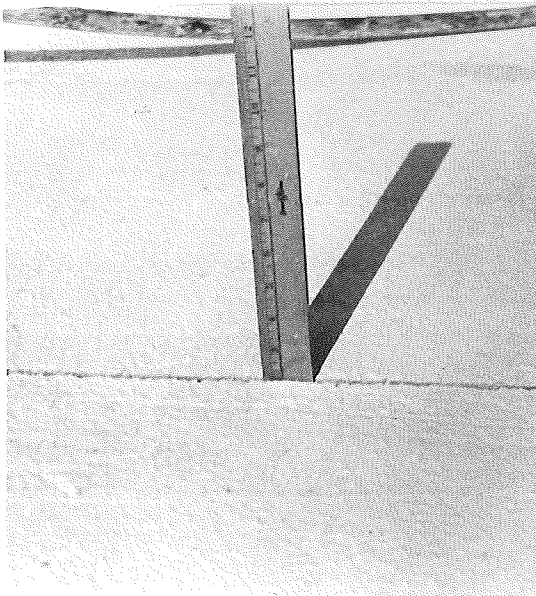


FIGURE 5. SHOWS LONGITUDINAL CENTER JOINT AFTER CUT HAS BEEN MADE, BUT PRIOR TO SEALING.

FIGURE 7. APPLICATION OF PRESSTITE NO. 77 TO CENTER JOINT.



FIGURE 6. PUMPING EQUIPMENT FOR APPLICATION OF PRESSTITE NO. 77.

FIGURE 8. PRESSTITE ENAMELITE MACHINE FOR APPLICATION OF PRESSTITE NO. 88 TO CONTRACTION JOINTS.

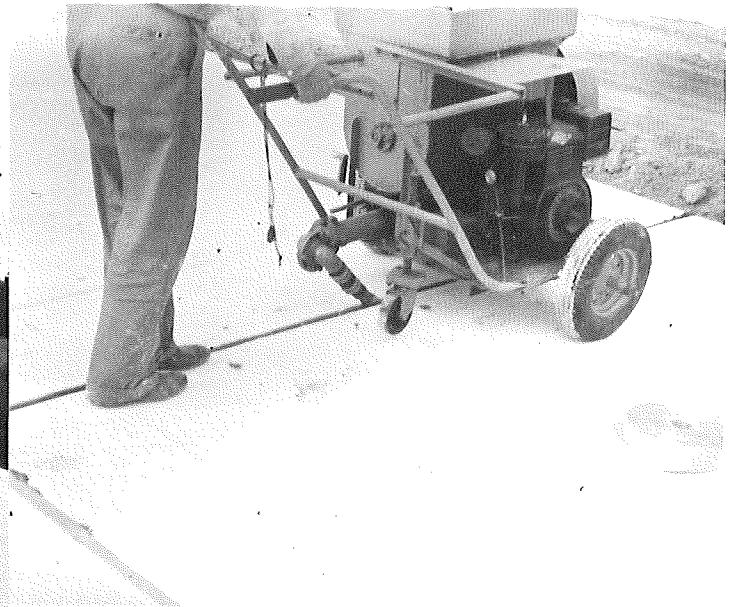
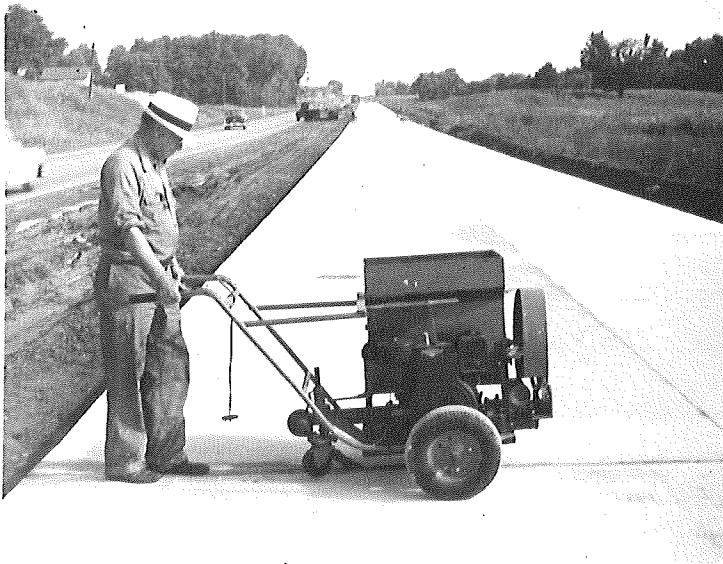


FIGURE 9. PRESSTITE ENAMELITE MACHINE FOR APPLICATION OF PRESSTITE NO. 88 TO CONTRACTION JOINTS.



Figure 10. Condition typical of sawed center joint after five months.

APPENDIX

Cost of cutting and sealing the longitudinal saw-cut joint is estimated at 24 cents per lineal foot over and above the estimate of \$398.15 for equipment furnished by Pyles Industries, Inc. Basis for the above estimate is as follows:

Cutting

Saw blades at approximately \$155. per blade	\$0.123 per foot
Labor, 2 men, 4 days, 8 hours, at \$1.75 per hour	0.030
Rental on Ford duplex and air compressor	0.010
Labor on above	0.009
Rental on saw at \$12.50 per day, 4 days	<u>0.013</u> \$0.185 per foot

Sealing

Material (Prestitite No. 77) including tape at 10 cents per pound	0.021 per foot
Truck freight on above	0.003
Labor, 2 men, 13.5 hours at \$1.75 per hour	0.013
Rental on Ford duplex and air compressor	0.010
Labor on above	<u>0.009</u> \$0.056 per foot

Total.....\$0.24 per foot