

R-218

MICHIGAN  
STATE HIGHWAY DEPARTMENT  
Charles M. Ziegler  
State Highway Commissioner

EXPERIMENTAL RESEALING OF JOINTS ON M-83  
Saginaw County, Projects 73-25, 63 and 4

L. A. Fickes

Cooperative Research Project Between the Maintenance Division  
and the Testing and Research Division

Highway Research Project 53 C-9  
Progress Report No. 1

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Research Laboratory  
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EXPERIMENTAL RESEALING OF JOINTS ON M-83  
Saginaw County, Projects 73-25, C3 and 4

During August, September and October of 1954, the joints and cracks of a 5.57 mile stretch of M-83 in Saginaw County were resealed with SOA, three experimental non-rubber hot-poured sealing materials and one rubber type hot-poured sealing material. The joint and cracks were cleaned and resealed by Sixth District maintenance personnel from Saginaw County under supervision of the Research Laboratory. This experiment is part of an attempt to find a maintenance resealing material that will maintain an effective seal longer than does SOA in order to eliminate the present necessity of resealing annually, and at the same time involve no special technique or equipment for application other than that required for SOA.

The identification and station location of each sealer are listed in Table I and indicated on the map in Figure 1. Project 73-25, C3 is a 20-ft concrete pavement containing expansion joints 100-ft apart. The pavement was built in 1934 and has an average of about two transverse cracks per 100-ft slab. Project 73-25, C4 is a 20-ft concrete pavement built in 1938. It contains 120-ft expansion joints, 60-ft contraction joints and 30-ft dummy joints. There is an average of a one-lane transverse crack per 30-ft slab. Both projects are in good condition and are located in State Trunkline Control Section 73131. All joints and cracks were in need of sealing.

Sealing materials used in the project were as follows:

A. A proprietary brand of rubber-asphalt material developed especially for maintenance resealing of joints and cracks in concrete pavements. This material had a needle penetration of 81 at 77 F, 100 g, 5 sec and a recommended pouring temperature of 360-395 F. Its cost is approximately \$0.10 per lb.

B. An SOA asphalt, 85-100 penetration, conforming to department specifications, pouring temperature approximately 400 F, cost approximately \$0.02 per lb.

C. A non-rubber petroleum resin, manufacturer's code No. 40095d, also developed especially for maintenance resealing, with a needle penetration of 87, and a recommended pouring temperature of about 400 F, cost approximately \$0.055 per lb.

D. Catalytic asphalt, manufacturer's code No. 5858, conforming to Texas Highway Department specifications for maintenance sealer, having a penetration of 49, and a pouring temperature of about 450 F, cost approximately \$0.025 per lb.

E. Catalytic asphalt, manufacturer's code No. 5454. Pouring temperature 410-425 F, cost approximately \$0.018 per lb.

Prior to sealing the joints and cracks in the pavement, they were raked out with a hand tool and then blown out with about 90 lb of compressed air to remove all loose joint seal and foreign material, Figure 2. The sealing materials were melted in a directly heated melter and poured by means of hand pour pots as shown in Figures 3 and 4. A typical crack and expansion joint after resealing are shown in Figures 5 and 6 respectively.

Materials A and C were the only materials that did not show a tendency to track on the pavement from passing traffic. They also were identified by the operators as being the most satisfactory to handle, i. e., melting, pouring, etc.

This project will be examined in the spring of 1955 and again in the autumn to evaluate the experimental hot-pour bituminous sealers and compare their performance with that of the SOA in the control section.

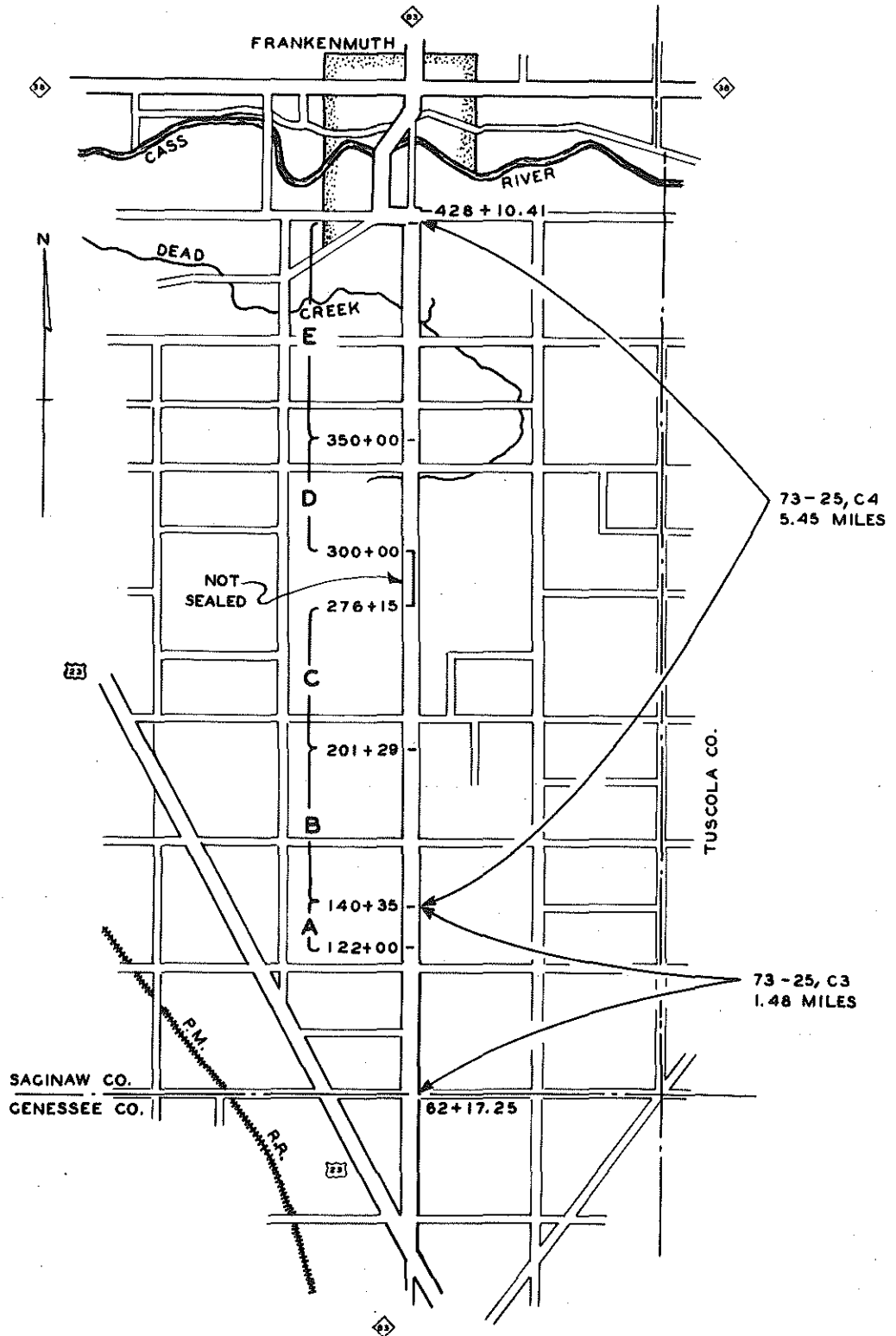


FIGURE I

LOCATION OF EXPERIMENTAL MAINTENANCE RESEALING OF JOINTS AND CRACKS WITH VARIOUS TYPES OF HOT Poured BITUMINOUS MATERIALS

TABLE I

LOCATION OF EXPERIMENTAL MAINTENANCE RESEALING OF JOINTS AND CRACKS  
WITH VARIOUS TYPES OF HOT-POURED BITUMINOUS MATERIALS

Material	Station Location	Miles of Two- Lane Pavement	Date Sealed	Pavement Temp. °F	
				Max.	Min.
A	122+00 to 139+00	0.32	October 6, 1954	64	58
B	139+00 to 201+29	1.18	August 9, 1954	73	55
C	201+29 to 276+15	1.42	August 16 & 17, 1954	101	76
D	276+15 to 350+00 except 276+15 to 300+00 in West Lane	1.17	August 17 & 18, 1954	94	65
E	350+00 to 428+00	1.48	September 9, 1954	84	70

IDENTIFICATION OF SEALING MATERIALS

Experimental Resealing, M-83, Saginaw County

- A. Keystone Roadway Paving Joint Asphalt, Keystone Asphalt Products Co.
- B. SOA, P. O. 18535, Standard Oil Company, Whiting, Indiana
- C. Kendex 40095d, Kendall Refining Co.
- D. Catalytic Asphalt No. 5858, Allied Materials Corporation
- E. Catalytic Asphalt No. 5454, Allied Materials Corporation

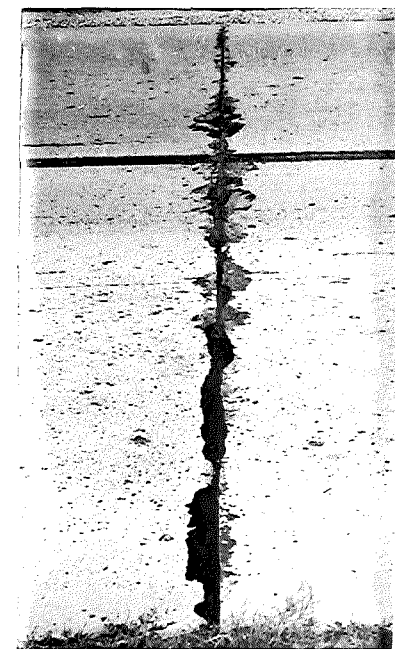
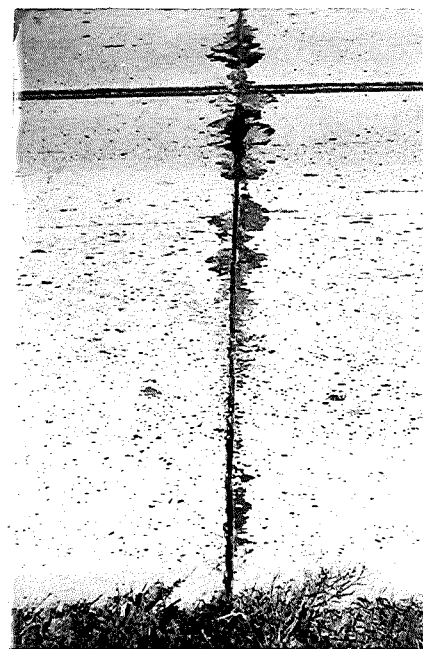
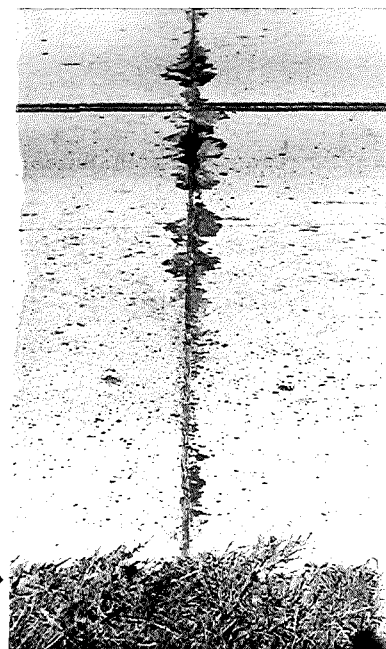


▲ FIGURE 2. RAKING AND AIR BLOWING OPERATION TO CLEAN JOINT FOR RESEALING.

FIGURE 5. TYPICAL CRACK AFTER RESEALING. STATION 267 + 60.



▼ FIGURE 6. TYPICAL EXPANSION JOINT BEFORE CLEANING, AFTER CLEANING AND AFTER RESEALING. STATION 142 + 15.



▲ FIGURE 3. DIRECTLY HEATED KETTLE FOR MELTING SEALING MATERIALS.



▲ FIGURE 4. RESEALING JOINT WITH HAND-POUR POT.