

OFFICE MEMORANDUM



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STATE HIGHWAY DEPARTMENT
JOHN C. MACKIE, COMMISSIONER

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June 13, 1963
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To: E. A. Finney, Director
Research Laboratory Division

From: O. L. Lindy

Subject: Terminal Report on Performance of Experimental Concrete Pavement
Containing HP 7 Admixture: US 23A in Rogers City (Project F 71-24,
C1). Research Project R-42 B-15(1). Research Report No. R-425.

At your request, the Field Tests and Surveys Unit condition surveyed and photographed existing conditions on the 20-year-old experimental concrete pavement project in Rogers City. The pavement contained HP 7, the powdered chemical compound manufactured by the Master Builders Co. of Cleveland, as an admixture to prevent bleeding and subsequent scaling. Construction took place in 1942 and was reported in an undated memorandum by R. S. Fulton printed as part of Research Report No. 212 (1954). A 10-year report was prepared by W. C. Broughton, and published as Research Report No. 193 (dated 8-20-53).

Original project layout is shown in Fig. 1, which indicates partial resurfacing of a portion constructed without HP 7, in 1958, under Contract 71091, C3U. In 1962, after the Laboratory's survey, the entire project was resurfaced under Contract 71091, C5U. Fig. 1 also indicates surface deterioration as recorded immediately before this complete resurfacing, which was done under the second Departmental five-year program for modernization of the state trunkline system. The original experimental unreinforced pavement was 8.5-in. uniform in thickness. Transverse plane of weakness joints were placed every 20 ft, and every sixth one was a 1-in. wide expansion joint.

Changes in surface condition between the 10-year survey and final resurfacing may be summarized as follows:

- 21 transverse cracks
 - 1 spall at intersection of a transverse crack and the centerline joint
 - 5 spalls at centerline joint
 - 14 spalls at transverse joints
 - 19 spalls at intersection of transverse joints and the centerline joint
 - 1 spall along outer edge.

Figs. 2 through 6 show conditions just prior to resurfacing. No scaling developed in the project's second 10 years of service. Surface deterioration resembling scaling

(Fig. 5) resulted from the abrasive action of gravel tracked from intersecting roads. Reflection cracking in the 1958 resurfacing is shown in Fig. 7.

In view of the complete resurfacing of the pavement, this report should be considered as terminating the research project.

OFFICE OF TESTING AND RESEARCH

O. L. Lindy, Supervisor
Field Tests and Surveys Unit
Research Laboratory Division

OLL:js

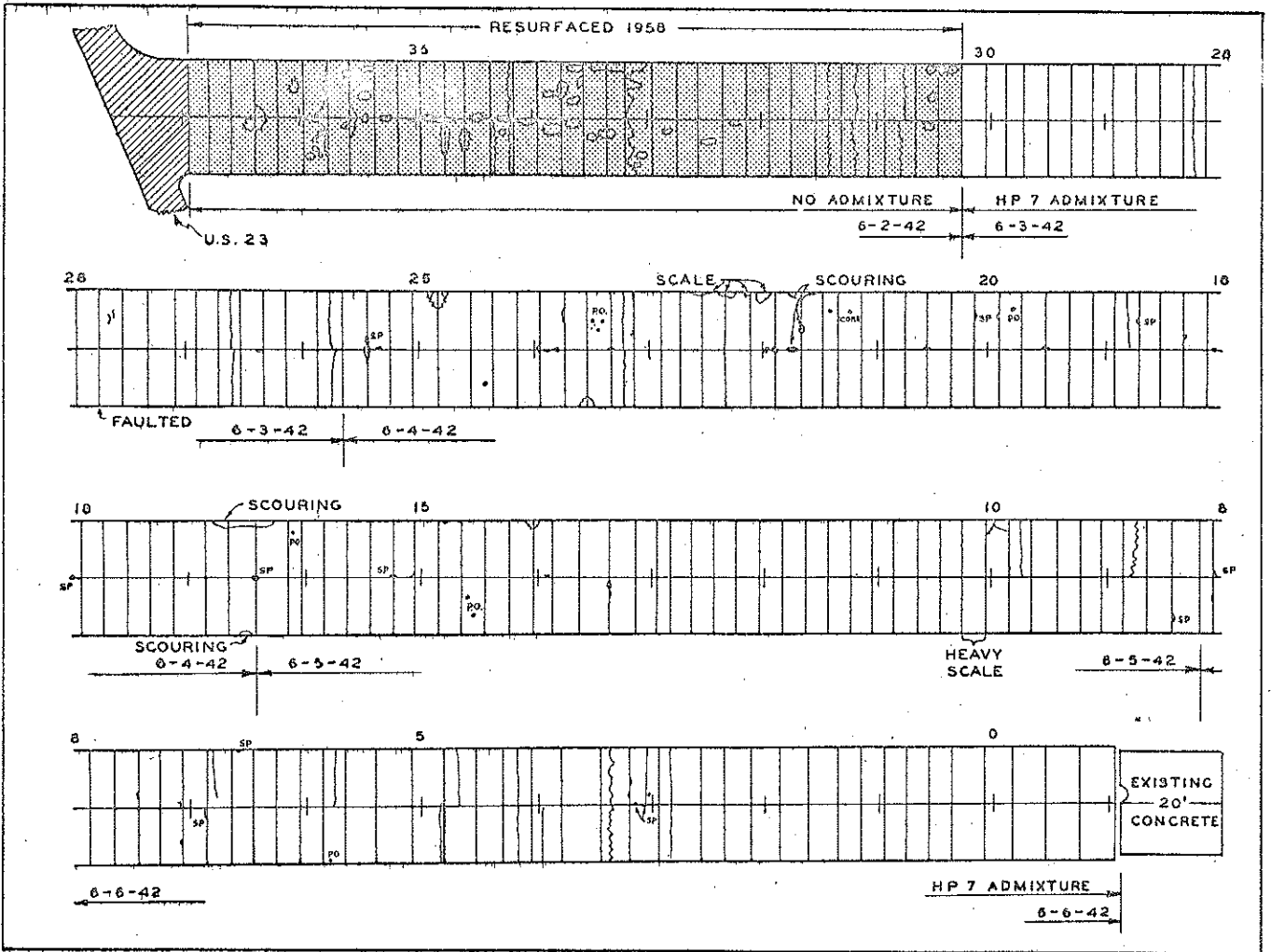
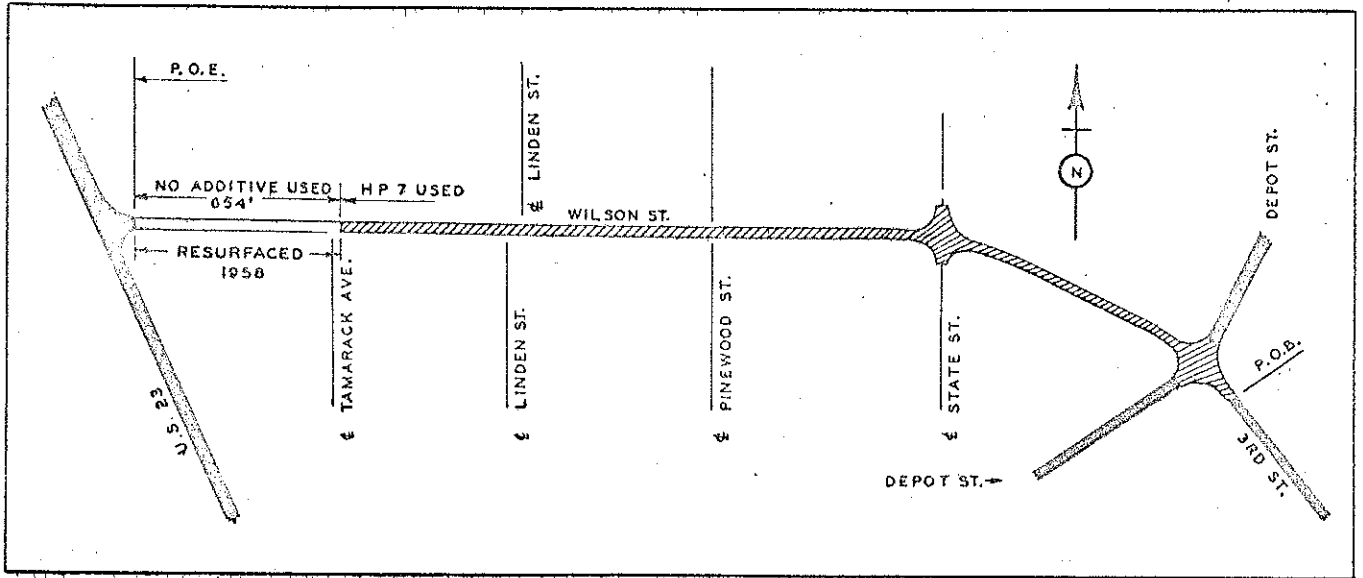


Figure 1. Location and condition survey data.



Figure 2. Typical transverse crack (above).

Figure 3. Typical transverse
plane of weakness joint (right).





Sta. 14 + 00



Sta. 23 + 50



Sta. 24 + 96

Figure 4. Slab corner cracking at joints.

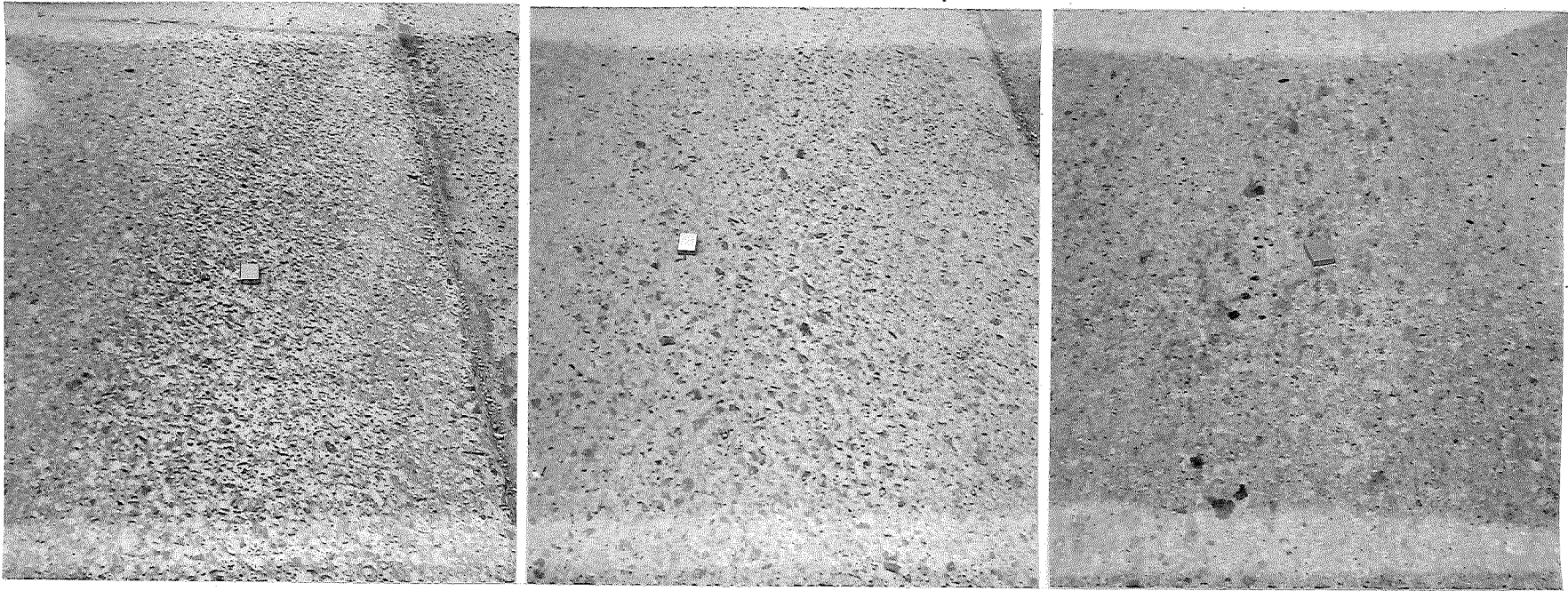


Figure 5. Condition resembling scale, caused by tracking from intersecting, gravel-surfaced Pinewood St. (left) and Linden St. (center). For comparison, note "scale"-free surface between these intersections (right), where abrasive action has not occurred.

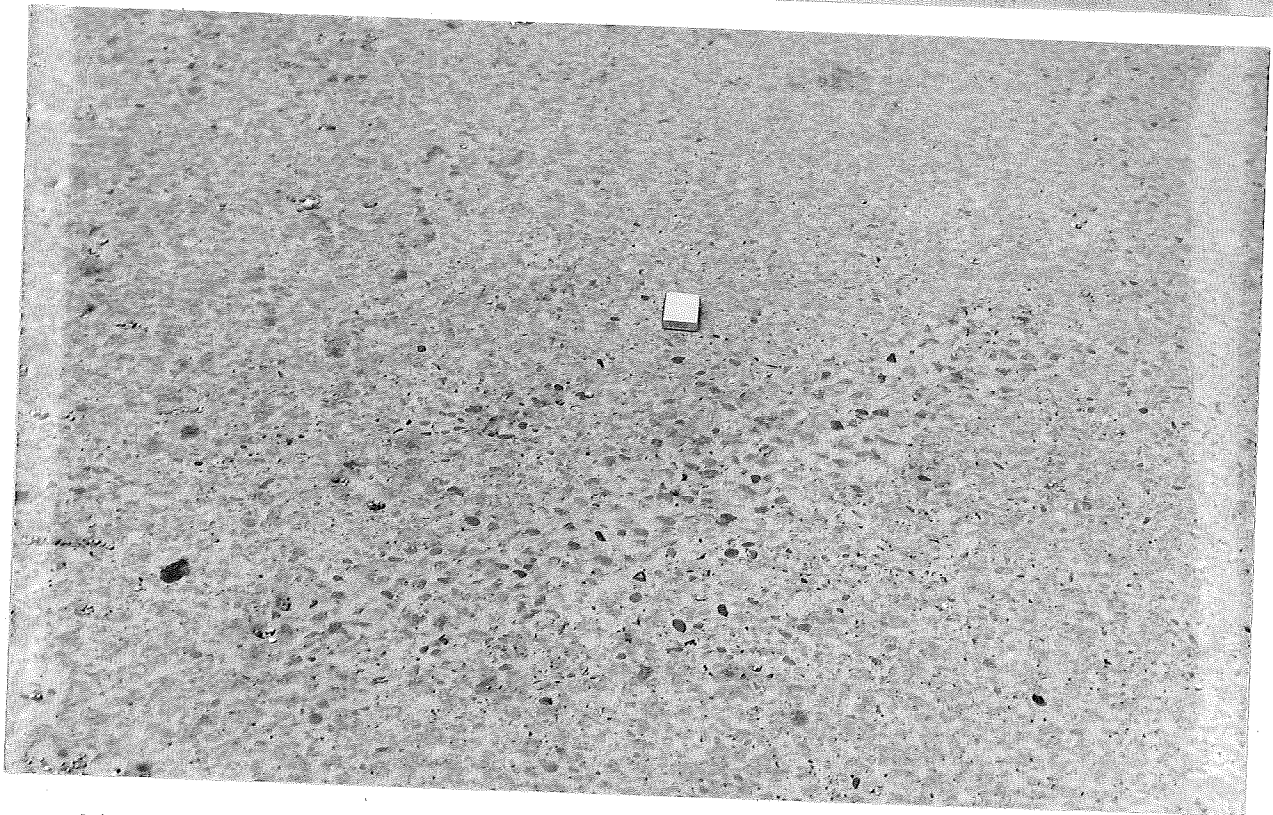


Figure 6. New 20-ft slab at State Street (top). Although no record of this construction appears in Departmental records, it appears to be the result of sewer construction, rather than failure of the experimental concrete. Note light scale of surface on this slab (bottom).



Figure 7. West end of resurfaced project, over section originally constructed as control, without HP-7. Note reflection cracking over longitudinal and transverse joints (bottom).