

MICHIGAN  
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PERFORMANCE OF HOT-POUR RUBBER-ASPHALT JOINT SEALING  
COMPOUNDS IN 50-FT. SPACED JOINTS

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PERFORMANCE OF HOT-POUR RUBBER-ASPHALT JOINT SEALING  
COMPOUNDS IN 50-FT. SPACED JOINTS

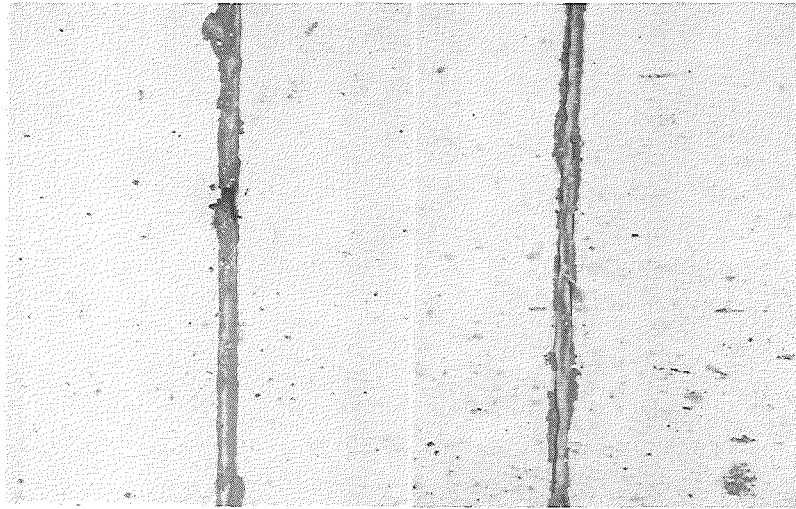
Hot-pour rubber-asphalt joint seals have shown consistent failures in Michigan highways where contraction joints are spaced at 99-ft. intervals (MSHD Research Report No. 220, Jan. 10, 1955). Although many failures were of the cohesion type where the sealing material itself had deteriorated, most failures were of the adhesion type where the sealer was no longer adhered to the joint faces. Since half-inch joints spaced at 99-ft. intervals will open considerably in cold weather, many adhesion failures are probably caused by high stresses produced in the sealing material when undergoing such extension. It seems that an obvious solution to this problem would be in the construction of pavements in which the joints would open to a lesser degree.

If half-inch joints were spaced 50 feet apart, one would expect about half the joint movement that is obtained in joints spaced 99 feet apart. As a result, the joint seal in such joints might be expected to be subject to less stress and therefore less apt to fail. In order to check this hypothesis, a survey was made of the few postwar pavements in Michigan with half-inch contraction joints spaced 50 feet apart and containing hot-pour rubber-asphalt joint seal. Five such projects, which had not been resealed but still contained the original joint seal, were located and examined in detail. These projects and their locations are listed below:

<u>Project No.</u>	<u>Location</u>
73-46, C4	M-47 South of St. Charles
44-34, C1	M-24 North of Lapeer
50-22, C1	M-97 South of M-59
50-53, C1	Metropolitan Pkwy. South of Mt. Clemens
38-48, C2	US-12 East of Jackson

The joint seal had failed in all five of the projects that were surveyed, (Figures 1 through 6). The failures were typical of those found in joints spaced 99 feet apart. In every case the joint seal was no longer adhered to the joint faces and sand or other foreign material was usually found in the joint groove. In one project a large number of joints contained sealer which showed both adhesion and cohesion failure, (Figure 5-B).

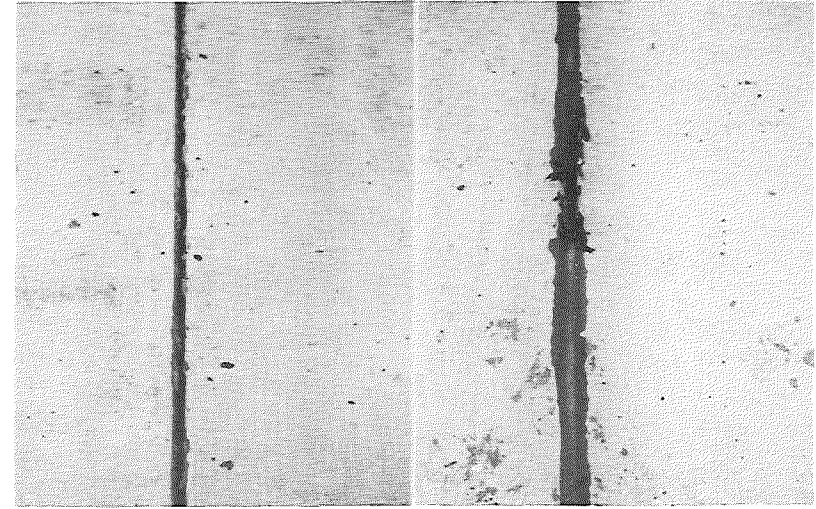
The results of this survey indicate that the problem of joint seal failure would not be helped by the spacing of contraction joints at 50-foot intervals instead of 99-foot intervals.



A. STA. 359+75

B. STA. 363+25

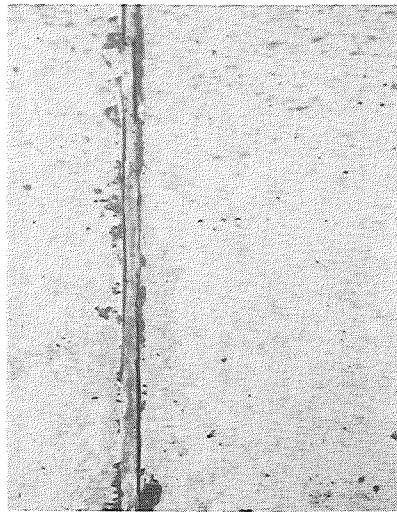
FIGURE 1. PROJECT 73-46 C 4: ADHESION LOSSES OF JOINT SEAL IN 50 FOOT SPACED JOINTS, M-47 SOUTH OF SAINT CHARLES.



A. STA. 368+50 EXPANSION JOINT NEAR BRIDGE

B. STA. 391+97 APPEARS SEALED AT SURFACE BUT LACKS ADHESION

FIGURE 2. PROJECT 73-46, C 4: JOINT SEAL FAILURES IN 50 FOOT SPACED JOINTS, M-47 SOUTH OF SAINT CHARLES



A. STA. 113+50 CLOSEUP

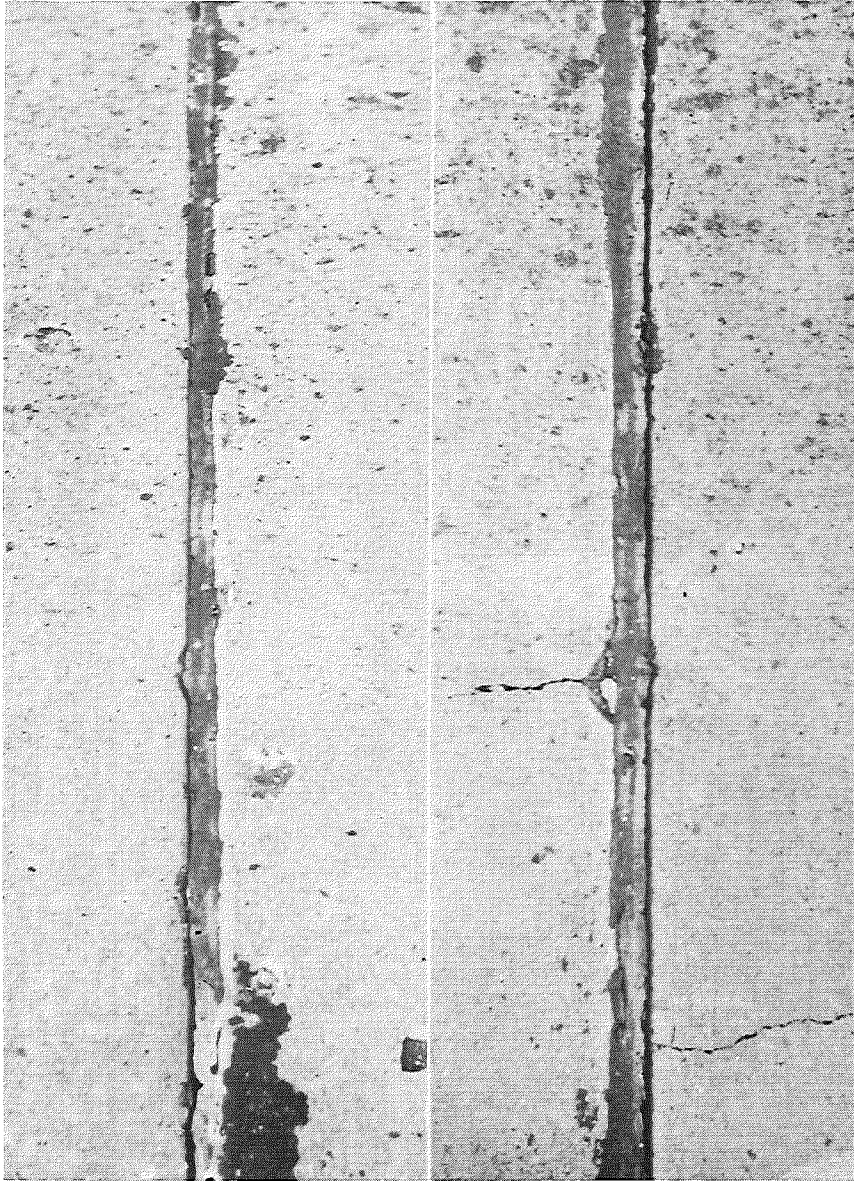


B. STA. 113+50 OVERALL



C. STA. 96+15

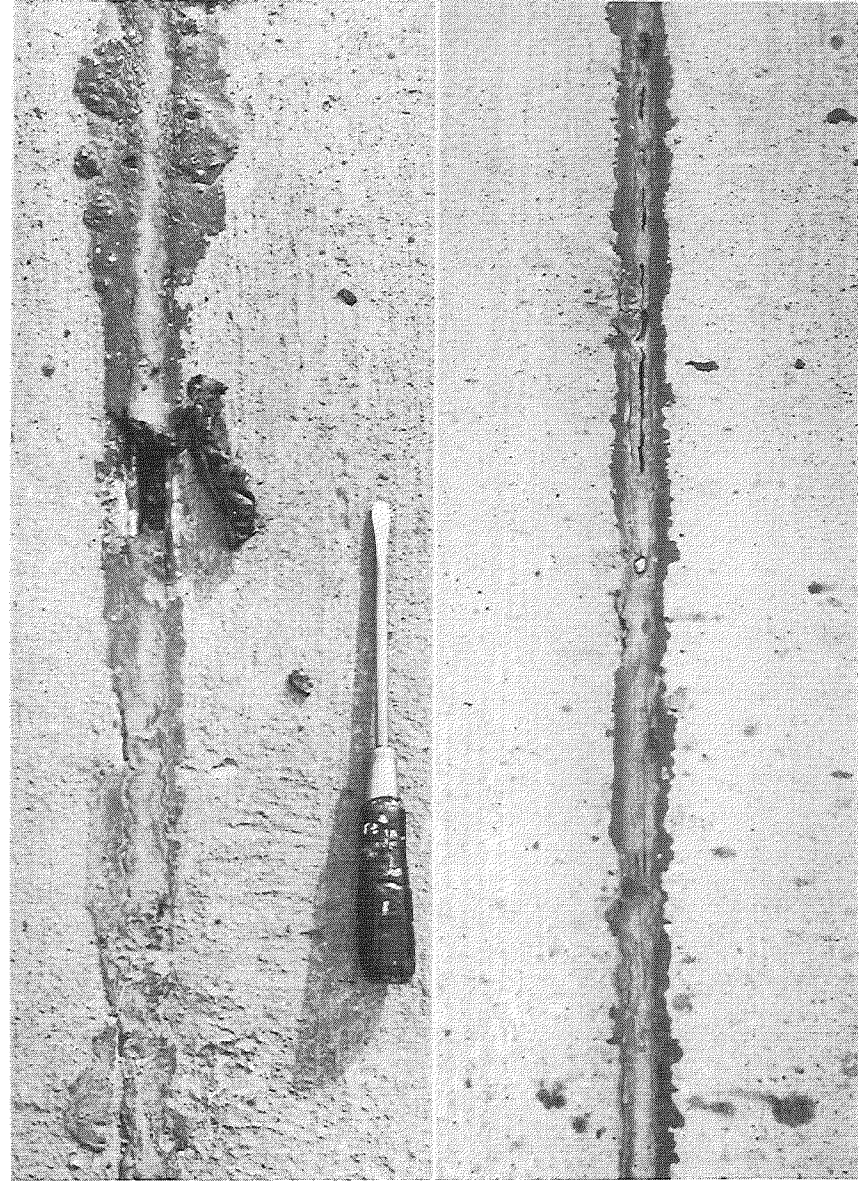
FIGURE 3. PROJECT 44-34 C1: VARIOUS DEGREES OF ADHESION FAILURE IN 50 FOOT SPACED M-24 NORTH OF LAPEER.



A. STATION 712+50 TYPICAL FAILURE

B. STATION 710+05 EXTREME FAILURE

FIGURE 4. PROJECT 50-22, CI: ADHESION FAILURE IN 50 FOOT SPACED JOINTS, M-97 SOUTH OF M-59.

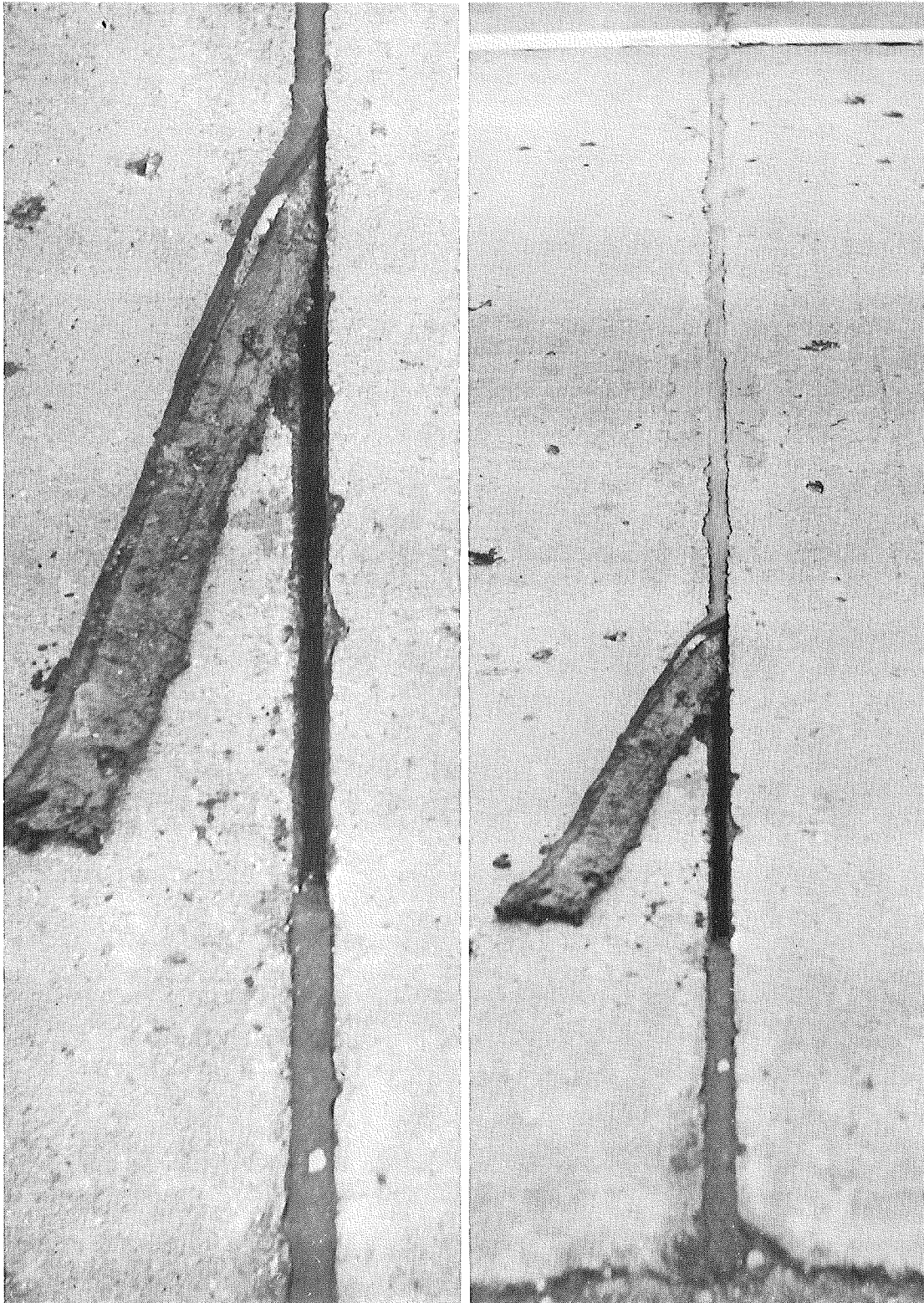


A. STATION 337+60 APPEARANCE FAIR AT SURFACE BUT SEALER LACKS ABHESION AND JOINT CONTAINS SAND AND DIRT.

B. STATION 408+60 ADHESION AND COHESION FAILURES NEAR WEST END OF PROJECT.

FIGURE 5. PROJECT 50-53 CI: JOINT SEAL FAILURES IN 50 FOOT SPACED JOINTS METROPOLITAN PARKWAY SOUTH OF MOUNT CLEMENS.





A. CLOSEUP

B. OVERALL VIEW

**FIGURE 6. PROJECT 38-48, C2, STATION 913+47: COMPLETE JOINT SEAL ADHESION FAILURE IN 50 FOOT SPACED JOINTS US-12 EAST OF JACKSON.**