

MICHIGAN
STATE HIGHWAY DEPARTMENT
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State Highway Commissioner

SPALLING OF JOINTS ON PROJECT 14-33, C1

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Research Project 48 F-18

Research Laboratory
Testing and Research Division
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On October 20, 1948 an inspection was made of spalled joints on Project 14-33, C1, located on M-60 west of Vandalia. The inspection was made by the writer accompanied by L. D. Childs and A. M. Burke of the Research Laboratory and T. C. Banhagel and E. H. Dahlman of the District Office in Kalamazoo.

Certain joints on this project were reported by Harry Fleming to Scott A. Baker in July, 1948 as being under stress to the point that spalling had occurred. The matter was referred to Mr. W. W. McLaughlin who, upon visiting the project, authorized the Research Laboratory to make an investigation to determine the cause of spalling.

The study revealed that the joints under stress were confined entirely to that part of the project located between Cassopolis and Vandalia. Expansion joints in this location were spaced at 400 foot intervals. No expansion joints were used in the balance of the project because of time of construction.

Upon examination of several of the spalled joints after cutting away the adjacent concrete, it was discovered that the top of the expansion joint filler material was 2 to 3 inches below the surface of the pavement. See Figures 1 and 2. The placement of the filler in such a position permitted the fresh concrete in the top portion of the pavement to form a solid connection over the filler. In those cases where the workmen were negligent in not removing this material during final finishing of the joint, spalling has resulted because this narrow bridge of concrete was not capable of withstanding the horizontal thrust of the slabs upon expanding. See Figure 3. Measurements of the joint filler

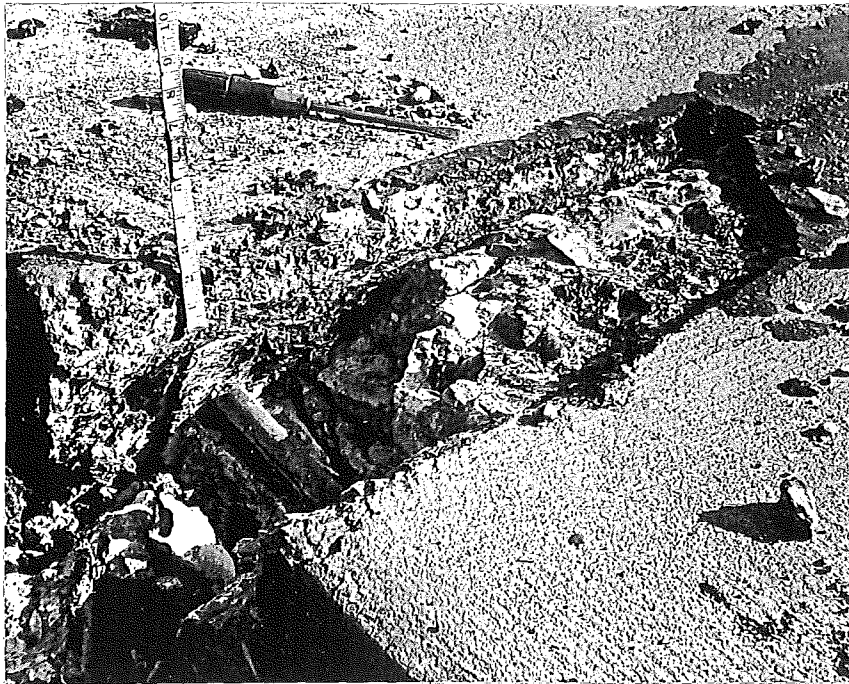


Figure 1. Position of Expansion Joint Filler at Sta. 48 + 10.

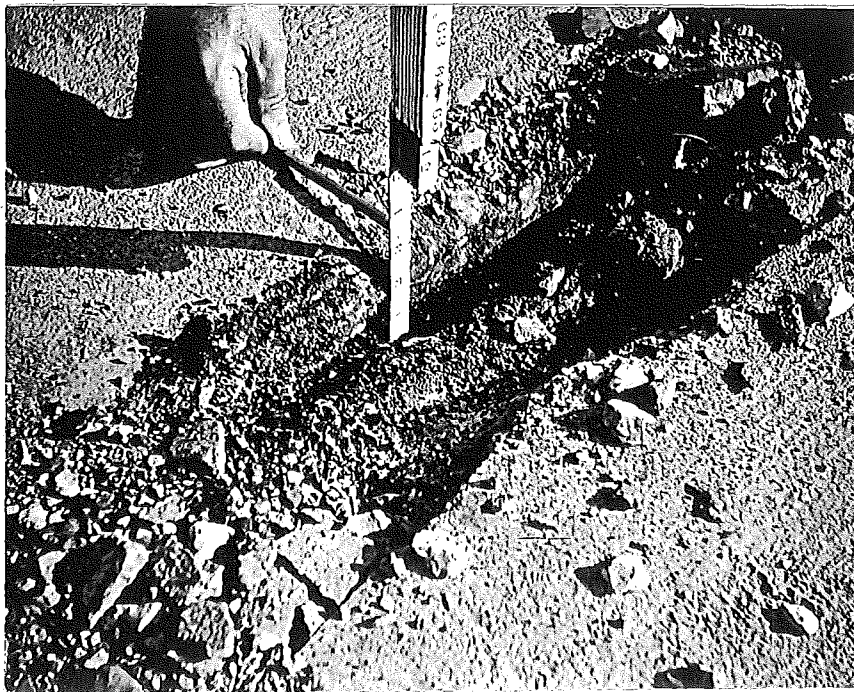


Figure 2. Position of Expansion Joint Filler at Sta. 36 + 18.

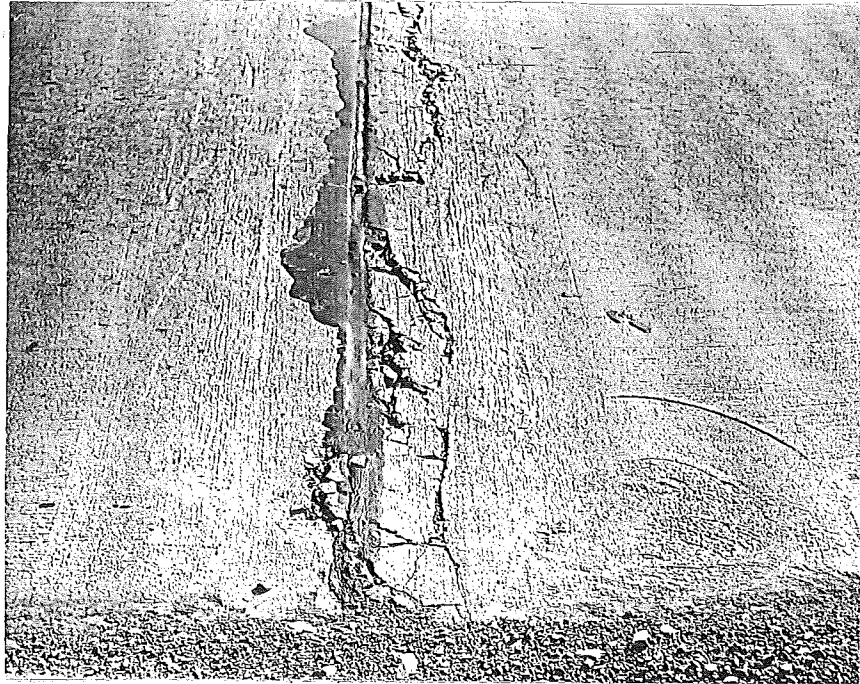


Figure 3. Typical Spalling of Concrete Due to Joint Condition.

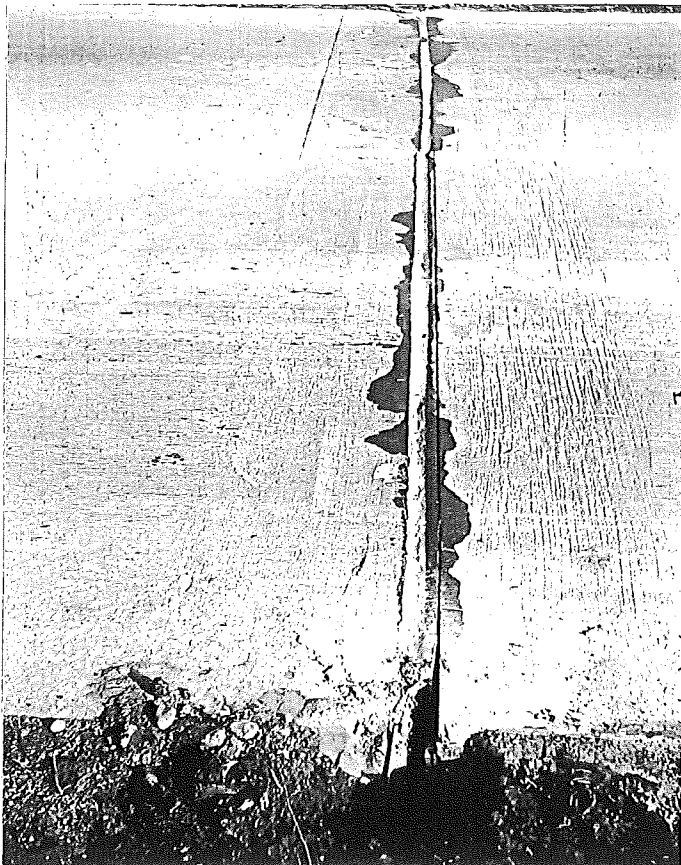


Figure 4. Saw Cut to Repair joint.

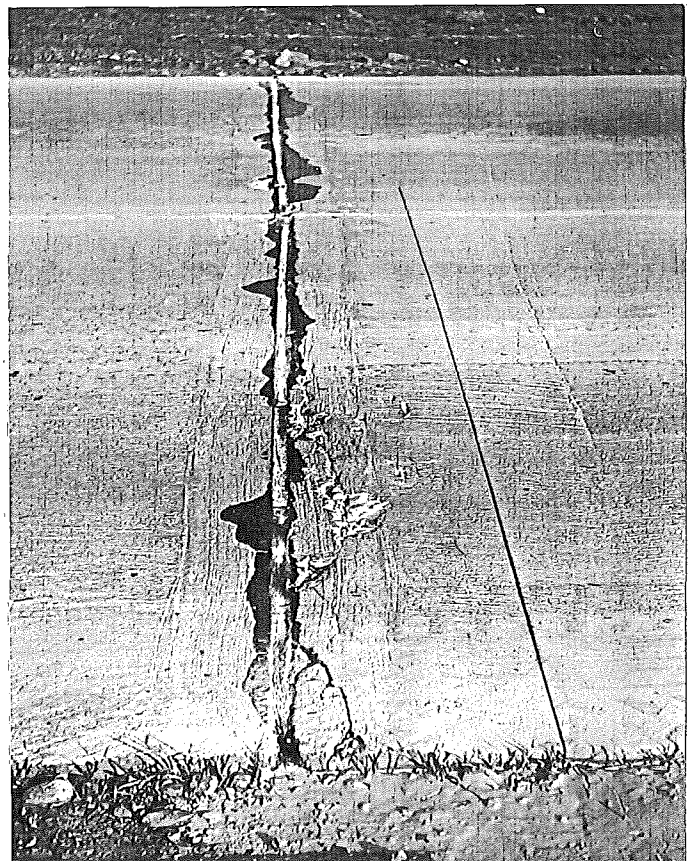


Figure 5. Saw Cut to repair spalled area.