

# OFFICE MEMORANDUM



MICHIGAN  
DEPARTMENT OF STATE HIGHWAYS

June 21, 1972

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To: M. L. O'Toole  
Assistant Engineer of Maintenance Operations

From: L. T. Oehler

Subject: Demonstration of Vermeer Saw (I 75, Genesee County).  
Research Report No. R-822, Research Project 68 F-102.

Per your conversation with J. E. Simonsen on June 5, 1972 the demonstration of the subject saw was observed on June 8, 1972. The following is a summary of our findings.

The area selected for the sawing experiment was at Sta. 1190, southbound I 75 north of Coldwater Rd in Genesee County. This 1957 pavement consists of two 12-ft lanes of reinforced concrete 10 in. thick. The area to be repaired was 6-ft 3-in. long and 24 ft wide. Two pre-cast slabs, each 6 ft long by 12 ft wide were placed in the cleaned out area and bituminous filler material installed in the joints.

The Vermeer T-600 saw was equipped with a 7-ft diameter wheel having 130 carbide-tipped cutting teeth. The saw makes a cut 4 in. wide. Prior to sawing, the limits of the area to be repaired were marked on the slab and a string line installed a certain distance away from, and parallel to, the end limits. This line served as a guide for the operator.

Sawcuts were made by lowering the cutting wheel to the bottom of the slab at the centerline of the pavement and then moving across the slab out onto the shoulder. The average time for each of the four lane cuts was eight minutes. The cuts appeared straight, but the cuts in the traffic lane were out of parallel by as much as 1 in. and those in the passing lane were out about 1/2 in. The cut itself varied in width from 3-1/2 to 4 in.

The surface edges of the cut were ragged, and the corners at the shoulder edge spalled as the wheel cut through (Fig. 1). The spalls along the surface edge were shallow, in most cases, but a few were as much as 2 in. deep. The spall width varied from 1/2 to 3 in. Undercutting of the slab occurred, especially in the area where the cutting wheel was lowered through the slab. The most severe spall of this type was about 3 in. deep (Fig. 2). The typical condition of the top and bottom surface edges can be seen in Figure 3. Ledges or "stepping" were present in the vertical edge of the cut at the pavement centerline (Fig. 4). The condition of the completed joints in the traffic lane is shown in Figure 5.

On the basis of the above information, it is evident that the quality of the Vermeer sawcut does not measure up to that of a diamond blade cut. It appears that the unevenness of the cut and undercutting of the slab may eventually result in high localized compression forces across the slab face which could lead to formation of corner breaks and spalls. This problem could probably be reduced by installing more expansion space at each repair than presently used. The ragged surface edge will more than likely result in noisy joints, but if further spalling does not occur the smoothness of the joints should get better as they close.

To off-set the disadvantages of the Vermeer saw, its use should result in reduced repair cost. At the present time we have not been able to obtain information on this item. We have, however, through the Vermeer Company area representative, learned that on the I 75-US 23 job, teeth wear amounted to \$1.50 per lineal ft of cut. Diamond blade cost per lineal ft ranges from \$1.00 to \$1.50.

We do not believe that the demonstration furnished sufficient evidence to either reject or accept the use of the Vermeer saw. In order to learn more about the cost, quality of the cut, and roughness of the joints, we suggest the machine be authorized for cutting a substantial number of joint repair cuts on an existing contract, or be allowed on some contract let in the near future.

If you wish, we will assist in evaluating the machine as well as the final repairs should you decide to allow the Vermeer saw to be used on a limited basis. As previously mentioned, it may be possible to redesign the joints to better accommodate the sort of sawcut produced by this type of saw.

TESTING AND RESEARCH DIVISION

*Le Roy T. Ochler*  
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Engineer of Research

LTO:bf

cc: P. J. Marek  
J. F. Oravec  
M. N. Clyde



Figure 1. Vermeer sawcut on south side of repair in passing lane. Corner spall can be seen to the right of cut.

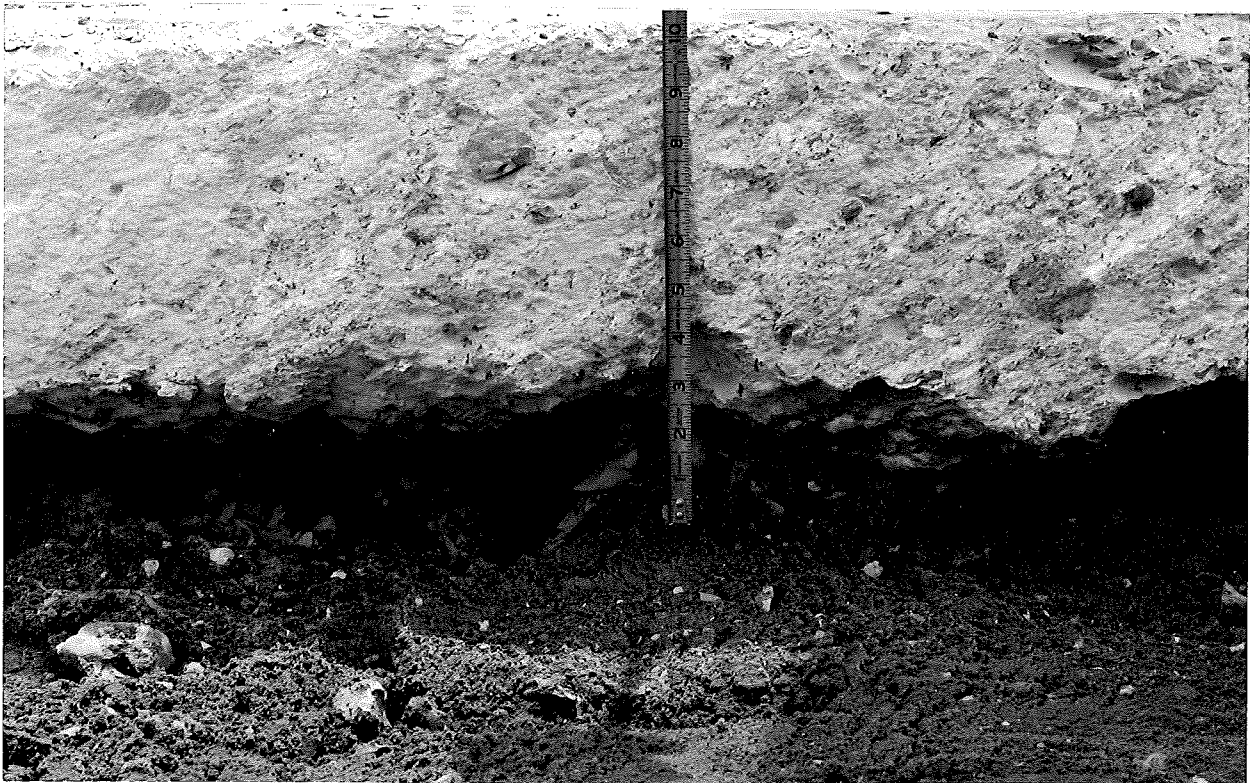


Figure 2. Undercutting of slab bottom. The most severe breaks occurred where the cutting wheel was lowered through the slab.



Figure 3. Typical condition of Vermeer sawcut.



Figure 4. Ledges or "stepping" in vertical edge near centerline of the pavement.



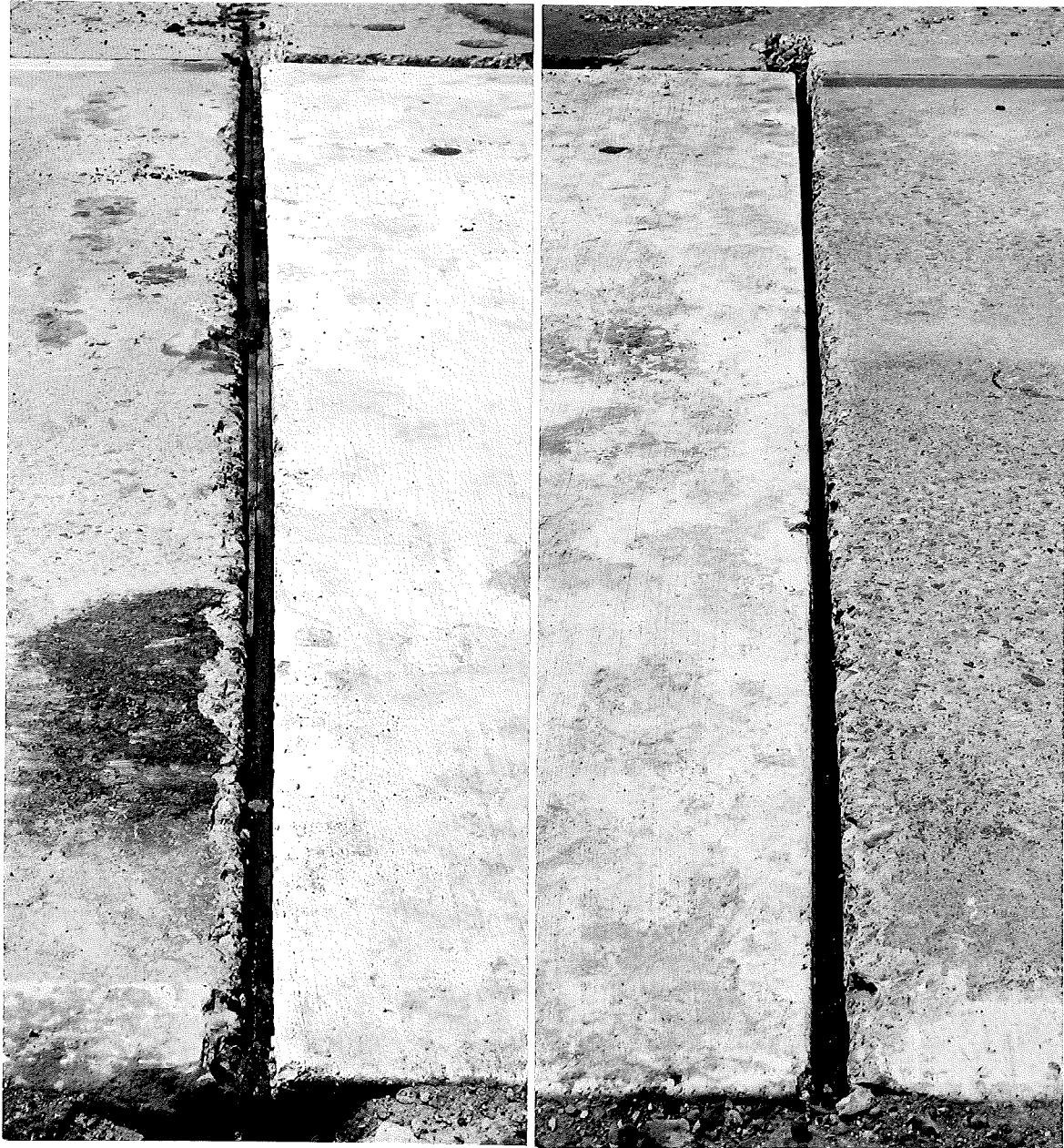


Figure 5. Condition of completed joints; south joint is shown to the left and north joint to the right.