

# OFFICE MEMORANDUM



MICHIGAN  
DEPARTMENT OF STATE HIGHWAYS

August 4, 1967

To: L. T. Oehler, Director  
Research Laboratory Division

From: M. G. Brown

LAST COPY  
DO NOT REMOVE FROM LIBRARY

**Subject:** Inspection Report of Field Applications of "Speed Crete" Patching Mixtures. Research Project 65 NM-140. Research Report No. R-646.

The following is a brief pictorial report of inspections made by H. L. Patterson and M. G. Brown in June 1967, of several field applications of "Speed Crete" mixtures placed during the summer of 1966. For details of the initial application of these patches refer to Research Report No. R-618, dated December 9, 1966. To facilitate reference to this first Report, the patched areas will be discussed in the same chronological order.

Pavement Patch, US 23 BR, Ann Arbor.

This full-depth patch was placed in mid-April 1966, and inspected on June 6, 1967. Figure 1 shows the general appearance of the patch with numerous large cracks in the surrounding concrete. The patch appeared fairly sound but some hollow areas around the perimeter, and some fine surface crazing or shrinkage cracks, were present. The hollow regions indicate that it may be losing bond with the old concrete.

Sidewalk Patch, N. Washington Ave., Lansing.

This area was patched in front of the Gladmer Theater on April 29, 1966. Two views of the patched sidewalk are shown in Figure 2. The original patch of April 29, was inspected on June 13, 1967, and found to contain a number of fine cracks and sounded very hollow when checked with a hammer. It appears to have lost bond with the older underlying concrete although the patch remains in place. Newer patched areas, placed about September, 1966 by the Lansing DPW adjacent to the original, can be seen in the general view of Figure 2. These areas also contained many hollow or loose portions.

Northbound US 127 over NYCRR, North of Jackson

This northbound structure, X01 of 38131, constitutes the primary field test of "Speed Crete" which was arranged, and followed jointly, by the Offices of Testing and Research and Maintenance. All of the patches placed May 17, 1966, were sounded out and photographed on June 6, 1967. Four of the most prominent patches are shown in Figure 3. All of the patches appeared to be solid

upon cursory examination, but closer inspection disclosed a number of small hollow areas within the larger patches. A fine crazing or random cracking was also noted on the surface of many of these patches. The large patch at the north end of span three (Fig. 3) contained about three hollow spots as outlined in the photograph. The deeper patch, toward the east curb in span three, that contained added pea gravel in the patching mix appeared quite sound. This patch ordinarily is not subjected to traffic.

#### South Pennsylvania over NYCRR in Lansing

One large, and one smaller patch, were placed July 27, 1966, near the north end of this structure close to the east curb. These were inspected June 6, 1967, and the largest patch is shown in Figure 4. This larger patch had a small hollow area toward the west end, and the smaller patch had a hollow region on the south perimeter. Otherwise, the patches appeared in good condition and didn't exhibit the fine surface cracking observed in many of those on the US 127 structure at Jackson.

#### Paterson St. Bridge over Kalamazoo River, Kalamazoo.

Since the first Report (No. R-618) was published, details of deck patching placed July 26, 1966, by the City of Kalamazoo were obtained. These patches were inspected June 21, 1967, with C. H. Voss, District Engineer, and are shown in Figure 5. The areas patched are on the westbound side of the east end span, near pier three. These patches differ from all the ones previously mentioned, in that the boundary of the patches was saw-cut about one-inch deep before chipping out the spalled concrete. These patches were about 3 by 3 ft, 2-1/2 by 2-1/2 ft, and 1-1/2 by 2 ft in size, and were a maximum of about 1-1/2 to 2-in. deep. About 4-1/2 bags of "Speed Crete" were hand-mixed in a wheelbarrow and sprayed with a clear curing compound after finishing. The patches were opened to traffic in about one hour. All three patches were sound, with no hollow areas and didn't contain shrinkage cracks.

In summary, all of the patches in the five locations placed last year, and recently examined after one winter's exposure, still remain in place. However, many of them contain fine surface cracking and small hollow areas indicating partial loss of bond. The Paterson St. Bridge patches are the best observed thus far. This may be partly due to the fact that they had saw cut boundaries. At this point, it appears that "Speed Crete" patching mixtures are performing with a qualified degree of success. A second winter's exposure may produce more observable effects on some of the patches with hollow and cracked areas.

August 4, 1967

Paul Klieger of the Portland Cement Association Research Laboratories in Skokie, Illinois, was recently contacted concerning their experience with "Speed Crete" and similar fast-setting hydraulic cement mixtures. His comments were not overly optimistic but predicted a service life of this type of material of possibly three to five years or more, depending on the conditions of placement and exposure. He indicated that most of these materials contain Type II portland cement, plaster of Paris, and up to 40 percent fine sand and clay.

Detailed laboratory data on "Speed Crete" will be supplemented by tests on two very similar materials being obtained, and issued in a separate report. One of these, "Express Repair," may be identical since it is being made by a former member of the manufacturers of "Speed Crete": Cement Materials Corporation, now of Elgin, Illinois. The other product being obtained is "CCC-Crete" made by the Chemical Cement Co. of Belleville, New Jersey.

OFFICE OF TESTING AND RESEARCH



M. G. Brown, Supervisor  
Concrete and Surface Treatments Unit  
Research Laboratory Division

MGB:sjt

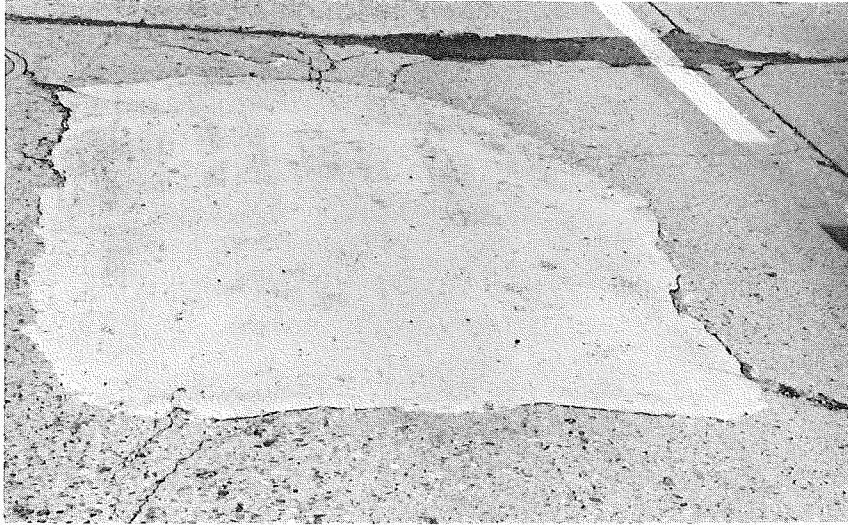


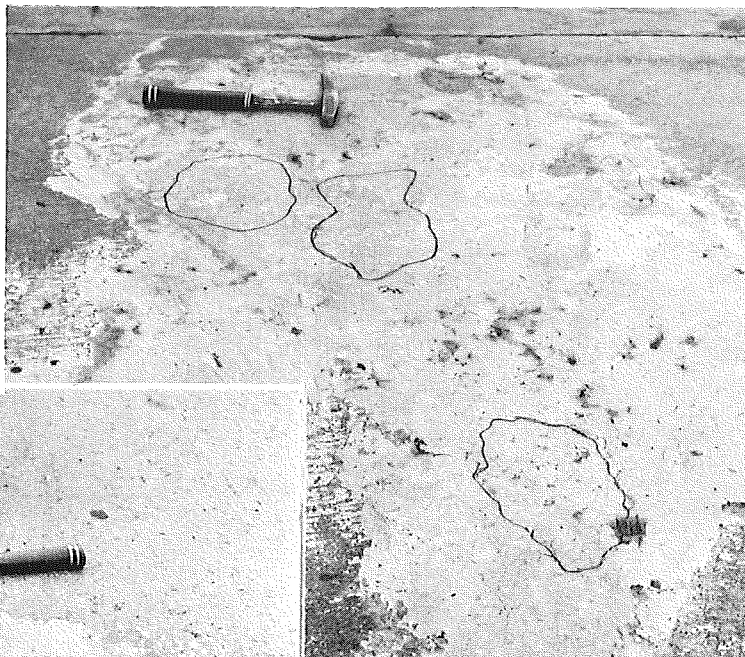
Figure 1. Full-depth pavement patch in northbound US 23 BR, (view looking south), placed in mid-April, 1966.

Figure 2. Close-up of patch placed 4-29-66 in front of Gladmer Theater showing shrinkage cracks near corner. Second view shows original patch and additional ones placed in September, 1966, by Lansing DPW.



Large patch at north end of span 3 with hollow areas outlined in black.

Patch area at center longitudinal joint in span 1 showing fine shrinkage cracks in surface. Patch variable to 1-1/2 inches deep over lapped re-bars.



Deep patch (upto 2-1/2 inches) in gutter area near east curb, span 3.

Patches along steel dam at pier 2 with hollow area outlined in black.

Figure 3. Views of patches in northbound deck of US 127 over NYCRR placed 5-17-66.



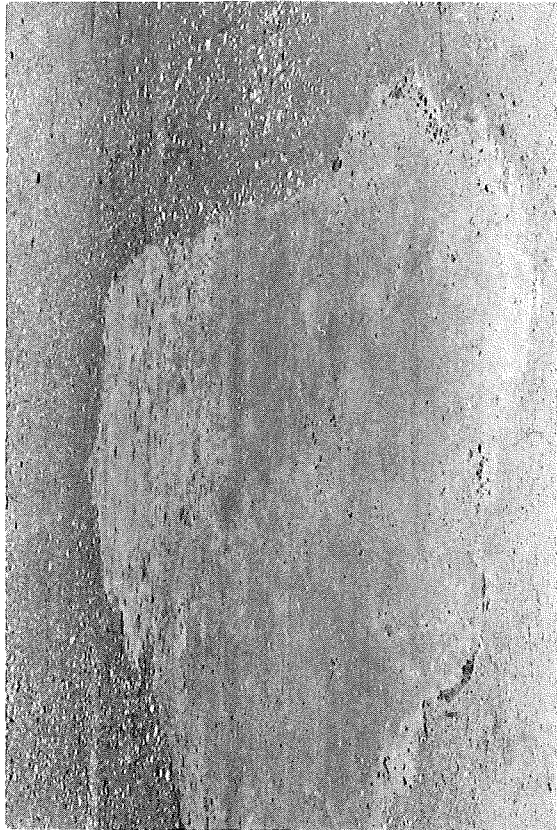


Figure 4. Large patch near east curb of northbound half of deck; placed 7-27-66. Pennsylvania Ave. over NYCRR.



Figure 5. Patches placed 7-26-66 in Paterson St. bridge over Kalamazoo River in Kalamazoo. Over-all view shows three patches in north half of east end span near pier three. Close-up shows largest patch, about three-feet square, and sawed perimeter.

