

# OFFICE MEMORANDUM

415



MICHIGAN  
STATE HIGHWAY DEPARTMENT

JOHN C. MACKIE, COMMISSIONER

November 6, 1962

To: E. A. Finney, Director  
Research Laboratory Division

From: R. H. Merrill

Subject: Curb and Median Joint Sealing to Correct Deck Leakage: Houghton-Hancock Lift Bridge (B01 of 31012). Research Project R-62 B-66. Report No. R-402.

Details of the curb and deck joint sealing performed to date on the Houghton-Hancock bridge are covered in the attached summary. The work was done in accordance with item 1A of Specifications for Application of Sealant Coatings and Repair of Concrete, B01 of 31012 (Houghton-Hancock Bridge) dated August 17, 1962. Other items of repair covered by these specifications have been postponed until next year, in accordance with H. J. Rathfoot's letter to W. W. McLaughlin dated September 12, 1962. The joint sealing was on the upper bridge deck of the lift span and was accomplished by a highway maintenance crew with the cooperation of J. Badaluco, L. Heitsman, D. Numinen, R. F. Rosatti, and the writer. W. L. Minarik representing the H. B. Fuller Co. was present to give technical assistance on handling and application procedures used with his products (Guardkote 140 FR primer and Resiweld Adhesive No. 633 sealer).

The joint sealing operations covering 1040 ft of curb and median joint on the lift span required three days (October 2, 3, and 4, 1962). The sealing operation proceeded satisfactorily. A maintenance crew had completed welding of the outer curb channel to the steel grid of the deck before the joint seal operation was begun. Traffic control was accomplished by either containing operations to one of the two lanes in either direction, or by raising the span so that traffic could use the lower level.

An inspection of the joint sealing is contemplated for the spring of 1963 to assess its performance after a winter of service exposure.

OFFICE OF TESTING AND RESEARCH

R. H. Merrill, Civil Engineer  
Research Laboratory Division

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SUMMARY OF JOINT SEALING OPERATIONS  
Houghton-Hancock Bridge, Span 6

General Procedure

A general view of operations on the bridge deck is shown in Fig. 1. The treatment began with sandblasting the curb to a height of 1.5 to 2 in., and the deck for the same distance from the curb (Fig. 2). When sandblasting had progressed far enough to prevent interference with priming operations, Guardkote 140 FR was hand-mixed in 1-pint quantities using a 1:1 mixture of the resin and hardener. This was hand-brushed on the curb face to the height of the sandblasted area and out onto the deck about 2.5 in. (Fig. 1). Care was taken to leave an excess in the opening between the deck and curb. As the prime coat was being applied, two men mixed the Resiweld 633 in 2-gal batches using an air-operated drill equipped with a paddle. Mixing time was about 5 min, or until no streaks were noticeable (components A and B were different colors and were mixed 1:1 by volume). The Resiweld 633 was extremely flow-resistant, so two 2.5-quart caulking guns with 1-in. nozzles were used to lay a fillet at the junction of the curb and deck (Fig. 3). The guns were filled by sucking up the mixed epoxy through the open end and then replacing the nozzle for use. Holding the gun at about a 45° angle to both the curb and deck, a 1-in. fillet was obtained. This fillet was then smoothed using a piece of polyethylene plastic. This procedure gave a concave fillet that was feathered on the curb and deck surfaces (Fig. 4). Blast sand was sprinkled on the fillet to give a rough surface for bonding of later sealant coatings.

First Day: October 2

Deck temperature: 55 to 73 F

Area coated: 360 lin ft (west curb and north 100 ft of median curb, southbound lanes)

Materials used: 9 gal Resiweld 633 (40 lin ft per gal)

1.25 gal Guardkote 140 FR (290 lin ft per gal)

Sandblasting began at 7:00 a.m. on the north end of the west curb. Since the air was still quite damp, there was some difficulty in getting the sandblaster to operate without plugging. Due to a breakdown of the sandblaster, work stopped about 4:00 p.m.

Second Day: October 3

Deck temperature: 55 to 61 F

Area coated: 375 lin ft (median curb and 115 ft of east curb starting from the south end, northbound lanes)

Materials used: 10 gal Resiweld 633 (37.5 lin ft per gal)

Sandblasting started at 7:00 a.m. with a new hose and nozzle, so that by the time the temperature reached 60 F (10:00 a.m.), 200 ft had been finished. Application procedure for the epoxies was the same as the preceding day. A check of fillet laid the first day showed a good cure; it could just be dented with a key. Work stopped at 3:00 p.m. due to rain.

Third Day: October 4

Deck temperature: 55 to 64 F

Area coated: 305 lin ft (remainder of east curb, northbound lanes, and remainder of median curb, southbound lanes)

Materials used: 9 gal Resiweld 633 (34 lin ft per gal)  
1 gal Guardkote 140 FR (300 lin ft per gal)

The deck was wet from the night's rain, and was blown free of standing water and dried with a propane torch. Joint seal applied the preceding day had cured satisfactorily.



Figure 1. Sandblasting, priming, and mixing operations during joint sealing on the east curb, northbound lanes.

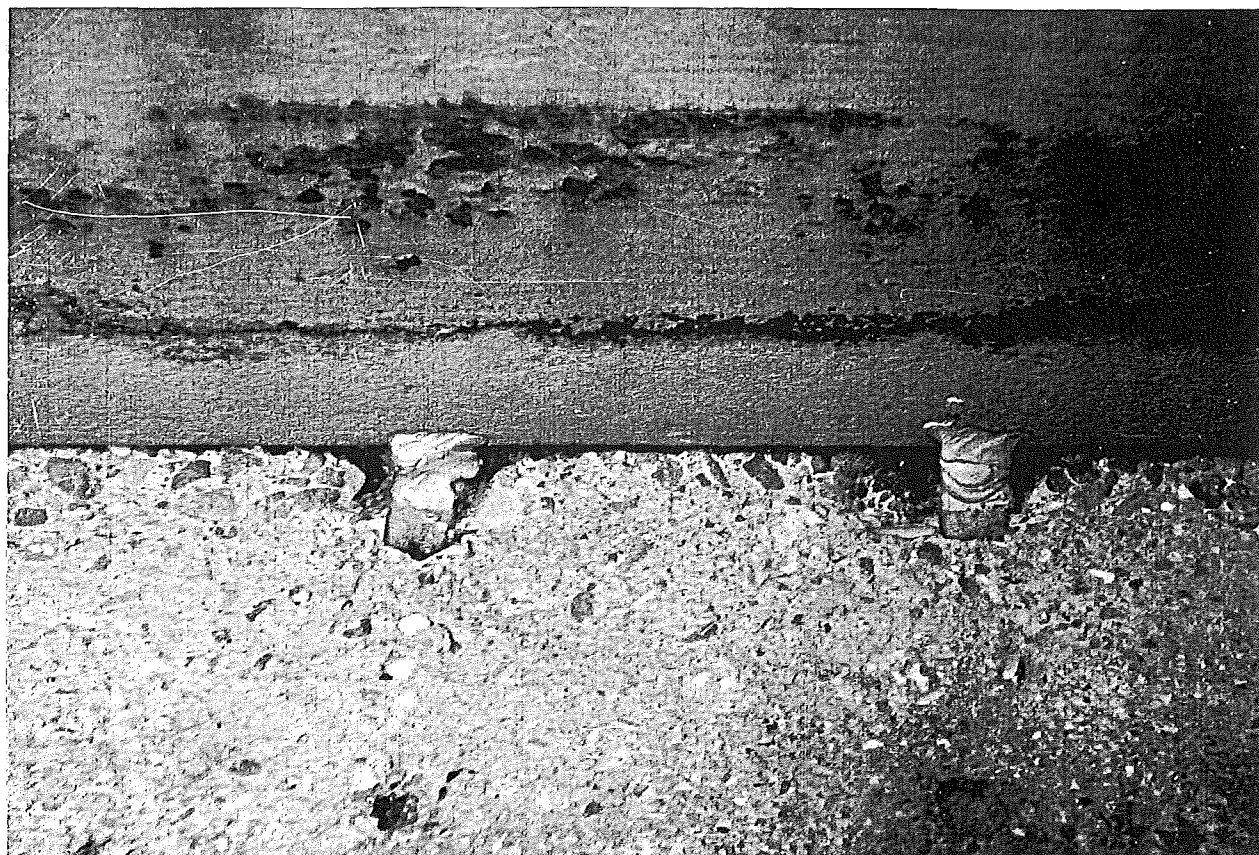


Figure 2. East curb joint after sandblasting, showing transverse steel welds made previously by maintenance crew.



Figure 3. Sealing median curb joint with 2.5-quart caulking gun.



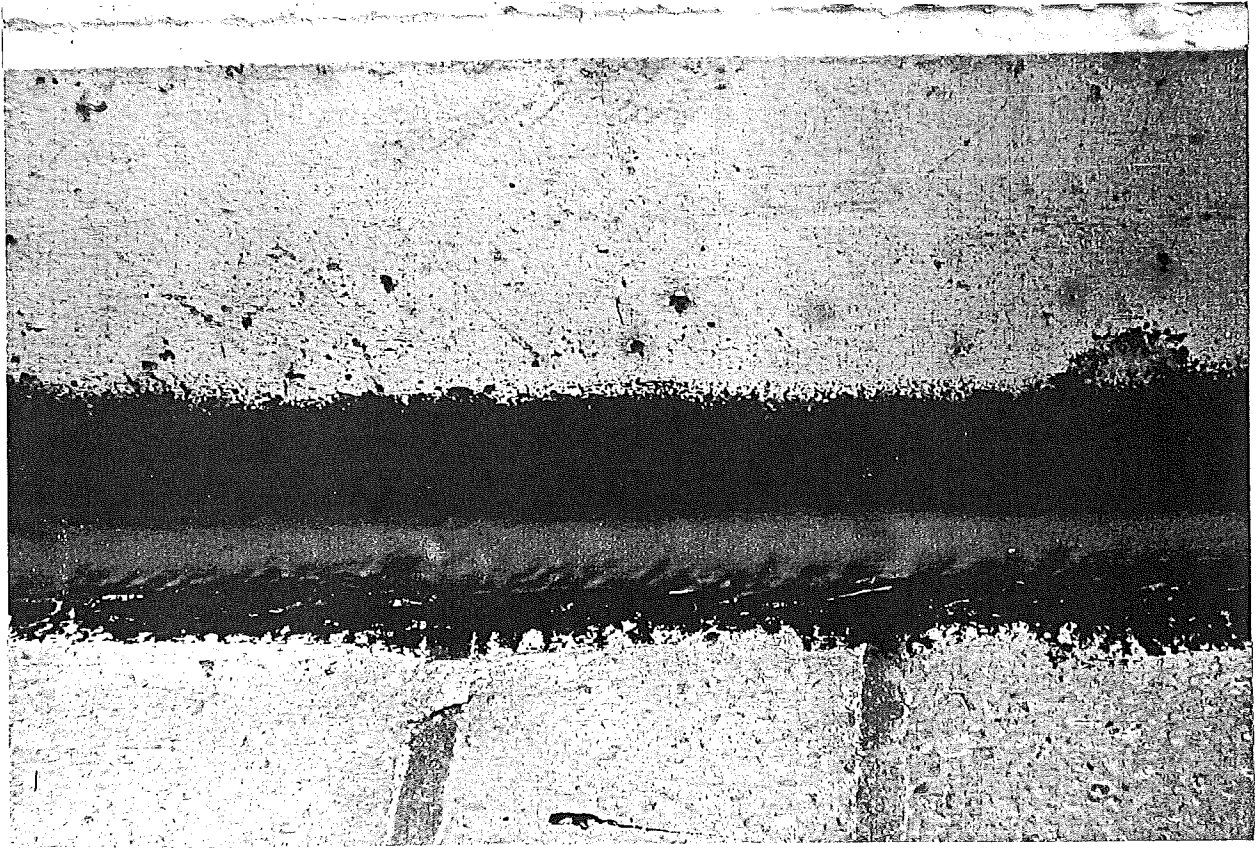


Figure 4. Finished curb joint after priming and sealing.