

January 7, 1972

H. 2. 2

Memo to: J. H. Havens, Director  
Division of Research

From: A. S. Rahal *ASR*  
Research Engineer

Subject: Experimental Overlay of Glazon over Two Bridge Decks;  
RP 106-286-HG3 in Shelby County and  
HM 99-1324A-MB3 in Powell County

In accordance with a Personal Service Agreement entered into with the Glazon Industries, Inc., on July 2, 1971, the two subject decks were patched and overlaid with Glazon. On July 27, 1971, work started on RP 106-286-HG3, KY 395 bridge over I 64 in Shelby County. Work consisted of routing old concrete and sandblasting the surface (Figures 1 and 2). State personnel and equipment were used for all cleaning operations. The same procedures were followed to clean HM 99-1324A-MB3 in Powell County near Clay City.

On July 28, 1971, Glazon personnel and equipment arrived at the work site in Shelby County. Glazon representatives judged the cleaning adequate and proceeded with patching the southbound lane (Figure 3). No accurate information is available as to the exact formulation of the Glazon used or proportions in the mix. Glazon Industries declined disclosure of such information since their material was not patented. Before patching, the holes were thoroughly dried. Shrinkage and cracking were noticed in the patches shortly after drying (Figure 4). Later, on other lanes, patch holes were primed with a Glazon liquid before patching (Figures 5 and 6).

After a short drying period, the deck was sprayed with a Glazon mix similar to that for patching but more fluid (Figures 7 and 8). Some problems were encountered due to weak air supply, but were shortly overcome. The sprayed deck looked satisfactory to Glazon personnel who did most of the work in patching and overlaying the deck. The operation was moved to the Clay City bridge and the same procedures were followed in working the northbound lane.

Two wingwalls on the Shelby County bridge were sprayed with a Glazon mix made with white cement.

On August 3, 1971, both bridges were completed though work was interrupted by rain several times. On August 5, 1971, both bridges were reopened to two-lane traffic.

This Division closely observed these operations from the beginning. It was later learned from the Division of Maintenance that the northbound lane of the Shelby County deck, which was badly deteriorating, had been repaired on September 15, 1971.

#### SUMMARY OF OBSERVATIONS:

1. Application of Glazon material is relatively simple.
2. Shrinkage and cracking were noticed on all patches (Figures 9 and 10).
3. Except for some color variation, the overall appearance of the finished decks was satisfactory (Figure 11).
4. The appearance of the wingwalls, after white Glazon was sprayed on, was quite an improvement over the original condition (Figure 12).
5. Inspection on August 5, 1971, revealed extensive deterioration in the northbound lane of the Shelby County bridge and some distressed places on the Clay City bridge (Figures 13, 14, and 15).
6. Periodic inspection of both sites indicated the following:
  - a. Extensive deterioration and loss of adhesion, primarily on the Clay City bridge (Figures 16, 17, and 18).

- b. Extensive cracking in both deck overlays.
  - c. The coating on the wingwalls continues to look good (Figure 19).
  - d. The Clay City deck has a scaly appearance (Figure 20).
  - e. Color variations remains significant on the Shelby County overlay (Figure 21).
  - f. Patched areas are detectable due to surface depressions (Figure 22).
7. Nothing could be said at this time about the wearing strength of the material because both bridges are not heavily traveled and more time is needed to observe performance under traffic.

Attachments

ASR:dw



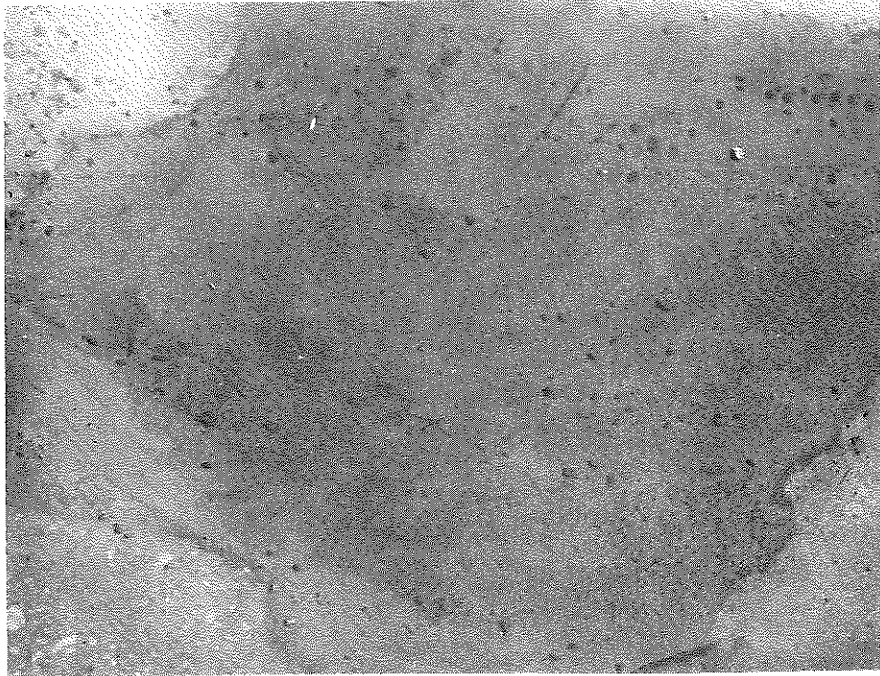
**Figure 1. Routing Old Concrete**



Figure 2. Sandblasting the Surface



Figure 3. Patching the Deck



**Figure 4. Shrinkage Cracking in the Patches**



**Figure 5. Priming the Patch Holes before Patching**





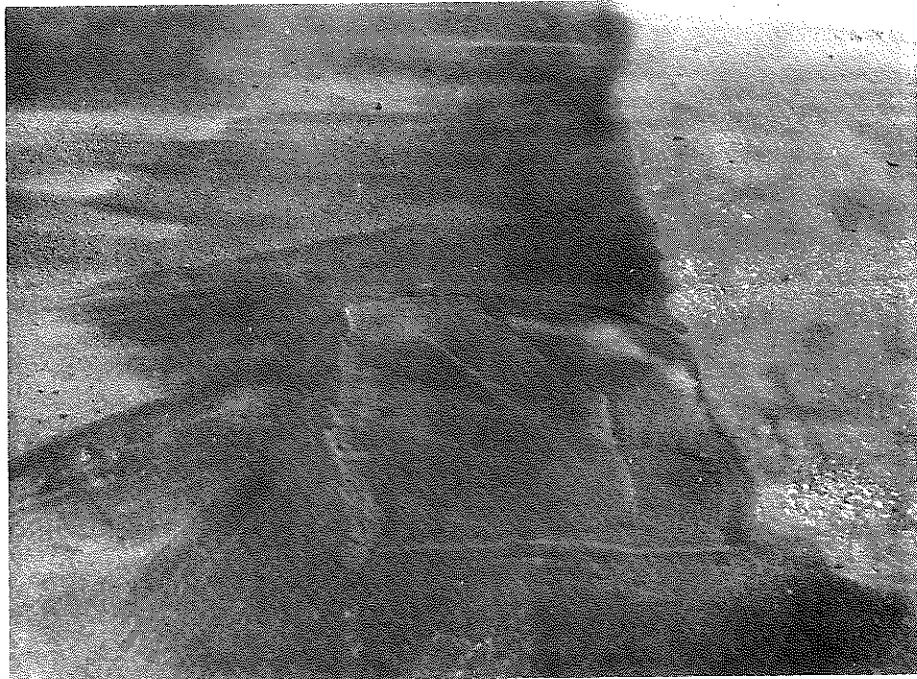
**Figure 6.** A Primed Patch Hole



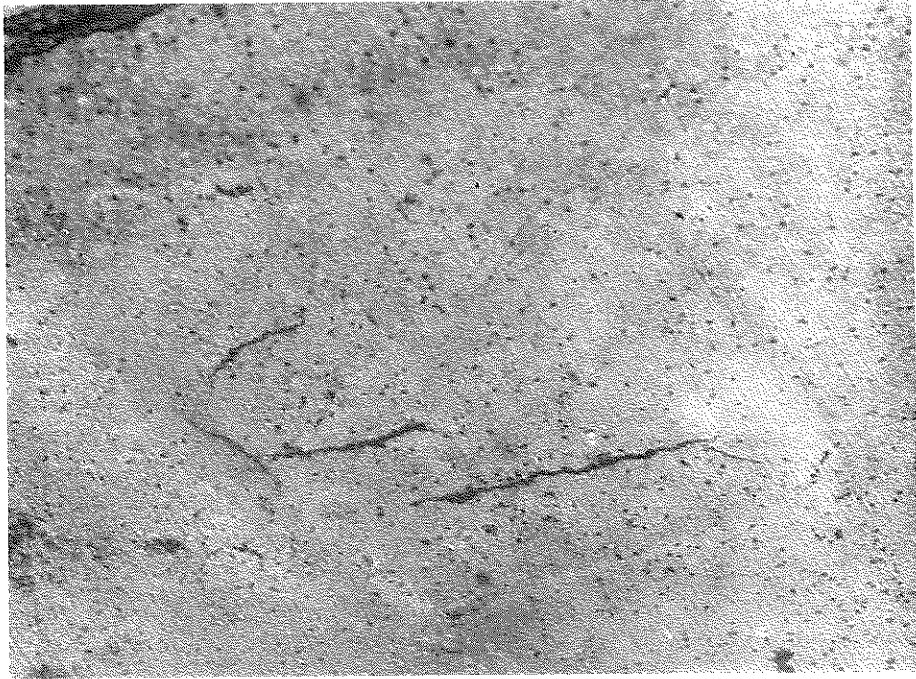
**Figure 7.** Spraying of the Clay City Deck



**Figure 8.** Spraying of the Shelby County Deck



**Figure 9.** Shrinkage in the Patch after Drying



**Figure 10. Cracking**



**Figure 11. Finished Lane**



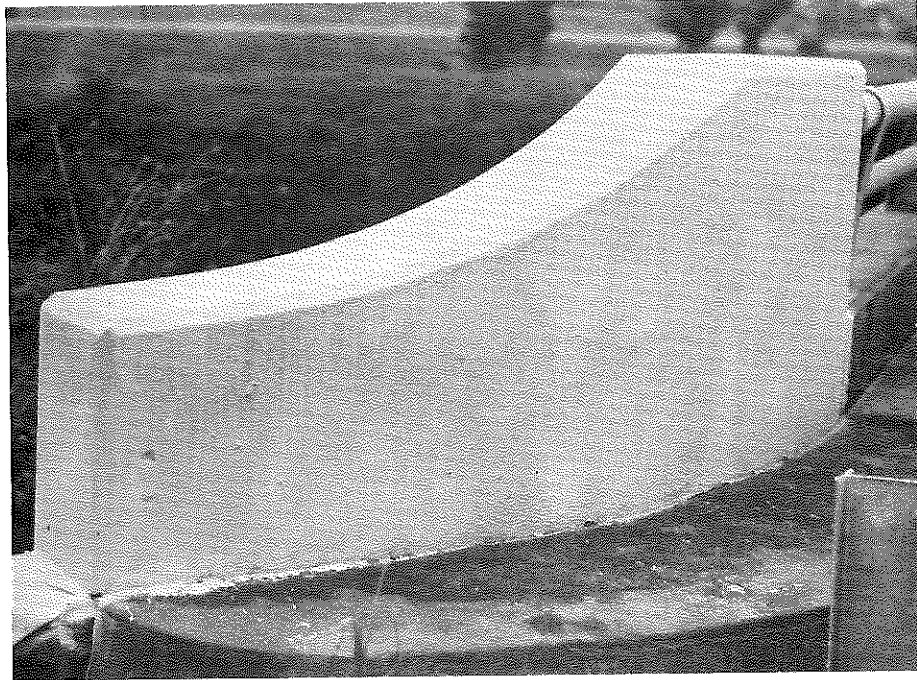


Figure 12. Sprayed Wingwall



Figure 13. Peeling and Deterioration of Overlay on the Shelby County Bridge

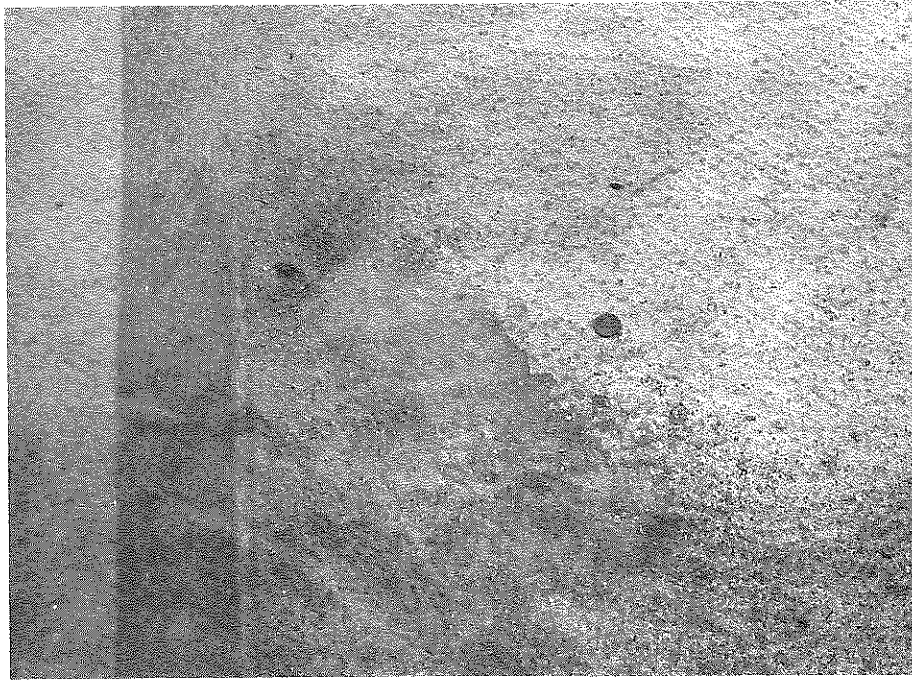


Figure 14. Deterioration of Overlay on the Clay County Bridge



Figure 15. Appearance of the Shelby County Deck on August 5, 1971



Figure 16. Deterioration on the Clay City Deck, December 29, 1971

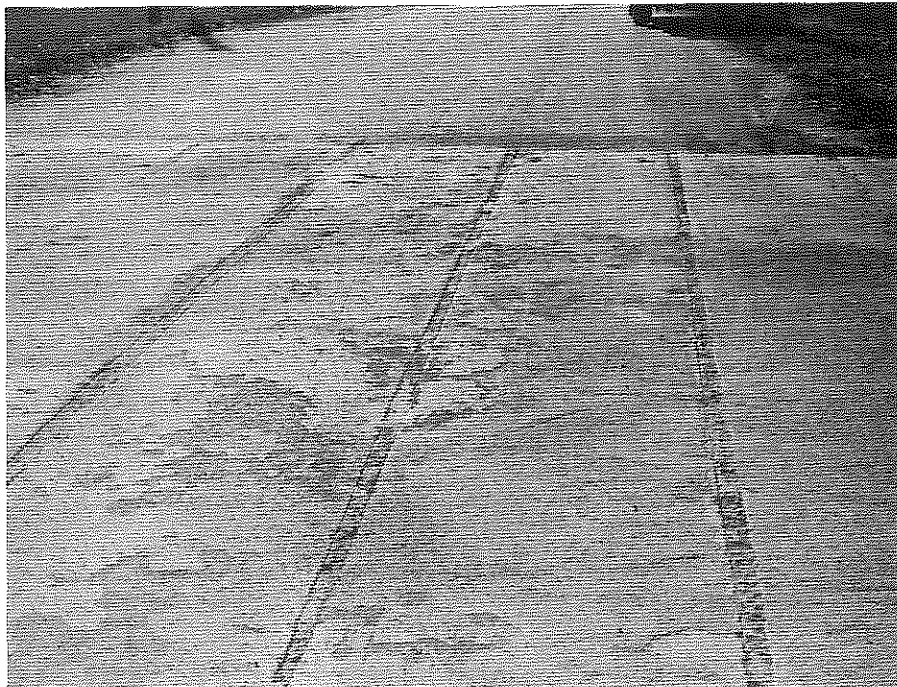
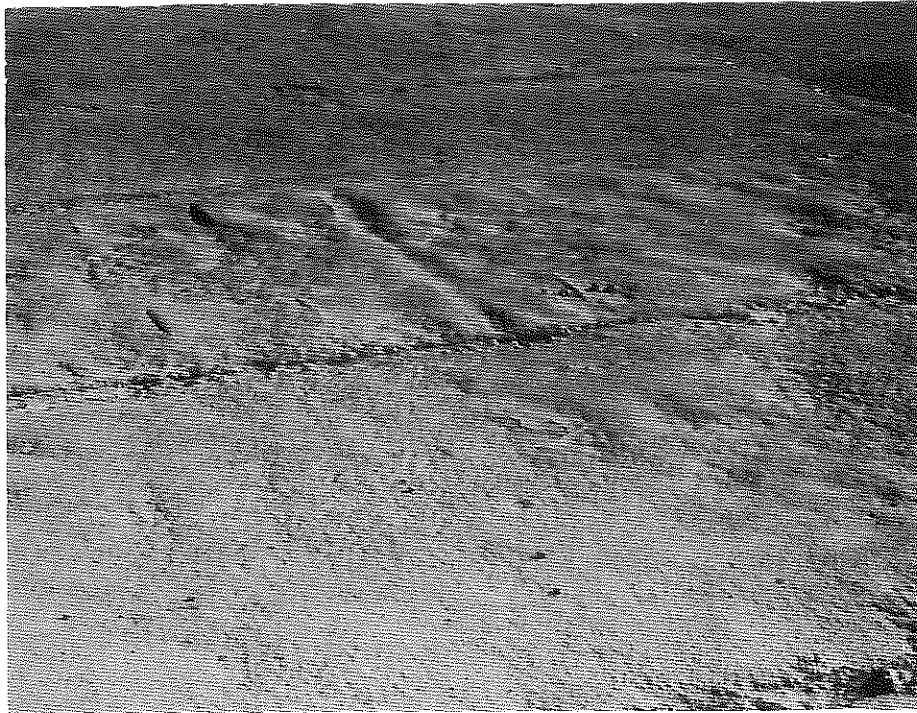
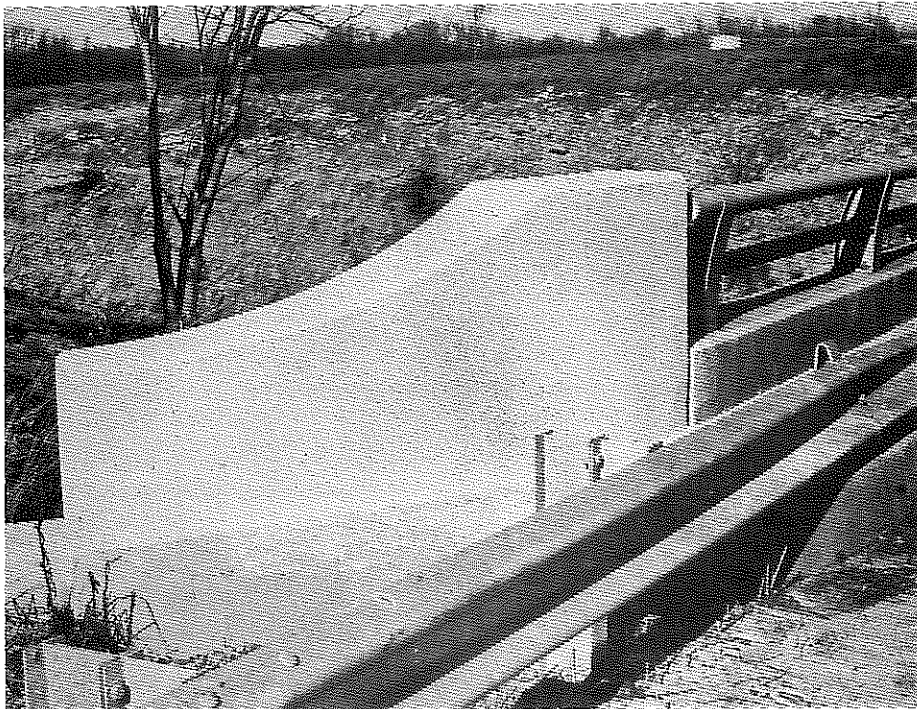


Figure 17. Deterioration and Scaling on the Clay City Deck, December 29, 1971





**Figure 18.** Deterioration on the Clay City Deck, December 29, 1971



**Figure 19.** Appearance of Wingwall on the Shelby County Bridge, December 29, 1971

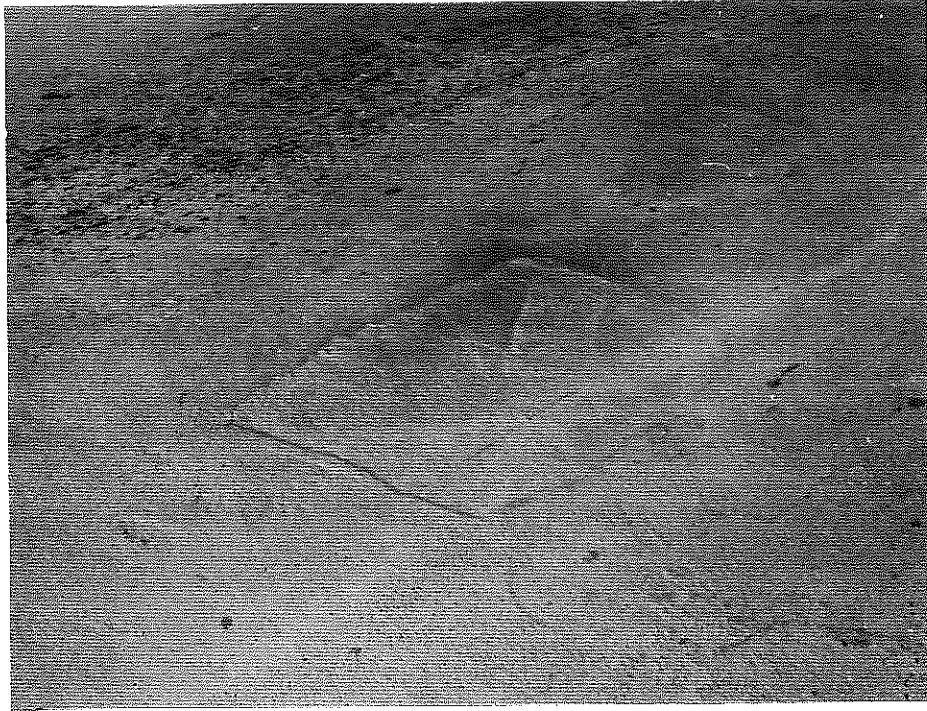


**Figure 20.** General Appearance of the Clay City Bridge Deck,  
December 29, 1971



**Figure 21.** General Appearance of the Shelby County Bridge Deck,  
December 29, 1971





**Figure 22.** Depression in a Patch on the Shelby County Deck,  
December 29, 1971

MEMO TO: Jim Havens

FROM: A. B. Blankenship  
Asst. Director of Maintenance,  
Bridges

DATE: Aug. 18, 1971

SUBJECT: Shelby and Powell Counties  
RP 106-286-HG3 and HM 99-1324A-MB3  
Experimental Overlay  
Glazon Industries, Inc.

Attached for your information is this office's report on the recently completed experimental project placing a glazon overlay. This material was supplied by Glazon Industries, Inc. and the placement of the material was supervised by their representatives.

ABB/dgp

CC: J. W. Spurrier  
A. R. Romine  
J. H. Sturgill

Attachments

**REPORT ON  
GLAZON EXPERIMENTAL MATERIAL**

On July 2, 1971, a Personal Service Agreement was entered into with the Kentucky Department of Highways and Glazon Industries, Incorporated, for a single source, experimental material to overlay and patch two bridges, one being in District # 5, RP 106-286-HG3, KY 395 over I-64, north bridge; and the other, HM 99-1324A-MB3, a county bridge in Powell County near Clay City.

Work started on RP 106-286-HG3 on July 27, 1971, and consisted of routing out deteriorated concrete and sandblasting the surface to a like-new concrete appearance using the Department's equipment and personnel. Mr. Pete Stigall was supervising the cleaning operations. After cleaning RP 106-286-HG3, the cleaning operation was moved to HM 99-1324A-MB3 where identical procedure was followed.

On July 28, 1971, Glazon representatives moved in on RP 106-286-HG3 and inspected the cleaning operation, pronounced it adequate and proceeded to patch the routed areas. This operation proceeded very smoothly under the direction of Glazon representatives with them doing most of the work. The patches looked very good until they started cracking and peeling. This occurrence is recorded in the attached photographs.

At approximately 12:00 noon on July 28, 1971, Glazon overlay equipment was set up on the bridge and steps to place the overlay were taken. It was soon discovered that the power supply furnished by the Department was not adequate. However, this was overcome by the use of a small air compressor and the Glazon overlay was placed under their supervision. On July 29, 1971, this operation was moved to Clay City and the cleaning operation to KY 395.

This experimental project continued in this manner, except for interruption due to rain. On August 3, 1971, both bridges were completed and on August 5th, both bridges were re-opened to two-lane traffic.

The following is the mix used. This information is very brief since Glazon does not desire to provide information concerning materials used on this project:

Patching:	6 - Gallons sand
	3 - Gallons high-early cement
	3 - Ounces Glazon additive
	4 - Ounces unknown product
Overlay:	2-1/2 - Gallons Glazon additive
	10 - Ounces lamp black
	4 - Ounces unknown product
	6 - Gallons sand
	3 - Gallons high-early cement

Mix was varied to suit the Glazon representative.

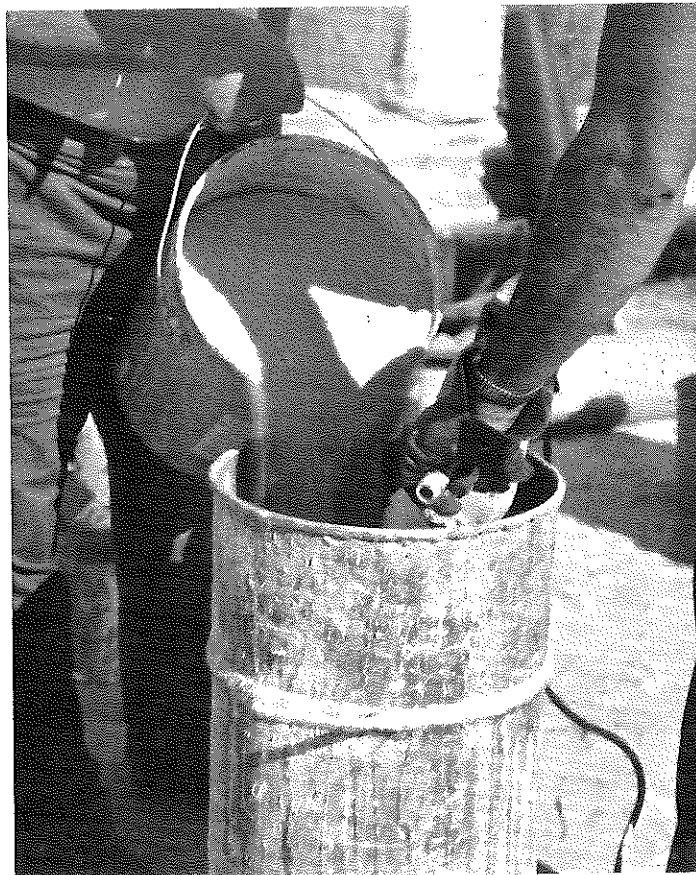
This mixture was blended in a drum and then delivered to a hopper from which it was pumped and sprayed onto the bridge deck. Once all of the bugs were ironed out of this operation, it moved very fast and efficiently. Some overlay placements were made on wet deck as well as dry ones; however, all placements were made under the direct supervision of Glazon representatives. During the process of curing which took approximately 18 to 24 hours, a fine spray of water was applied.

On August 6, 1971, the Division of Research reported to this office that the Glazon material had disappeared from one-half of the bridge deck on KY 395. Mr. Don Miller from this office was dispatched immediately to inspect both the KY 395 bridge and the Clay City bridge. He reported that approximately fifty percent

of the material had failed on the KY 395 bridge and that there was apparent failure starting on the Clay City project. The reason for this failure is unknown to this office since preparation and application was either approved, as is the case with preparation; or, in the case of application, it was directly supervised with Glazon representatives.



**All Blacktop, Loose Sand and Other Foreign Material is Removed in Preparation for Glazon.**

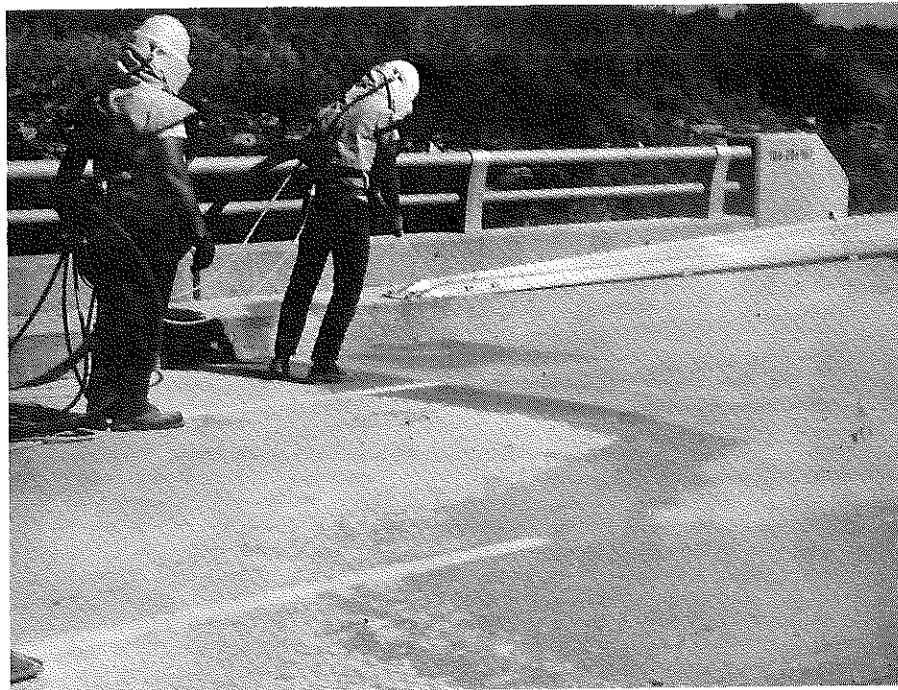


**Glazon is Mixed as Outlined in the Report.**





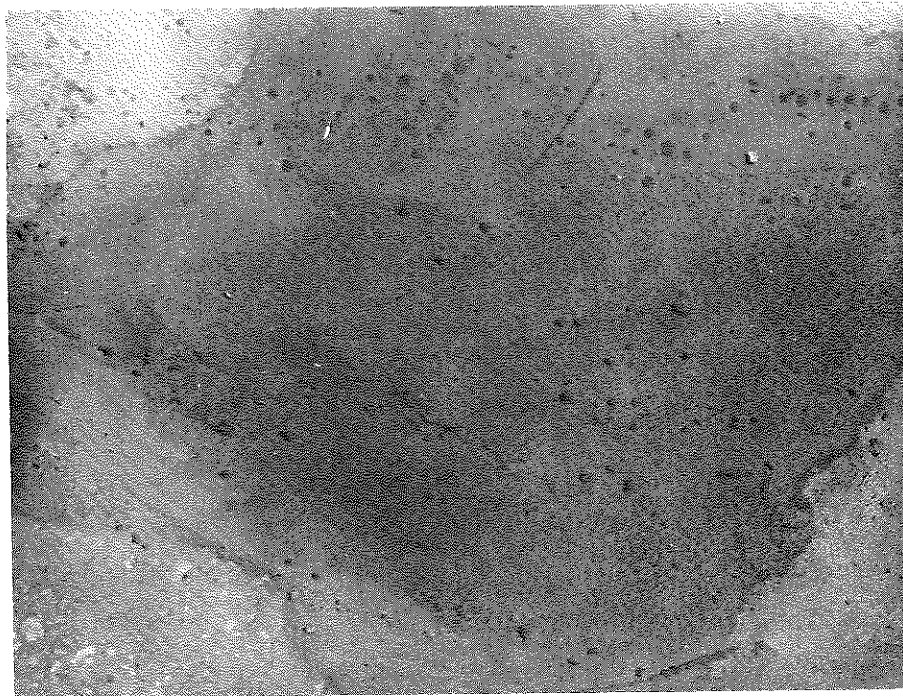
**Deteriorated Concrete is Removed by Use of 35-Pound Pavement Breakers in Preparation for Glazon.**



**Entire Surface of the Bridge that Will Come into Contact with Glazon is Sandblasted to a Like-New Concrete Appearance.**



**Top of Some Glazon Patches Peeled Off -- Reason Unknown.**



**Cracks Appeared in Some Glazon Patches Approximately Two Hours after Placement.**



**Glazon is Used to Patch Areas Where Deteriorated Concrete Has Been Removed.**



**Glazon Patches are Troweled to the Elevation of the Existing Bridge Deck.**



**Finished Product on Bridge Carrying KY 395 over Westbound I-64  
Three Days after Completion. Note Failure.**



**Finished Product on Bridge Carrying KY 395 over Westbound I-64  
Three Days after Completion. Note Failure.**





All Exposed Steel and Extremely Rough Areas are Painted with Unknown Glazon Solution.



Application of Glazon Is Made by Spraying.





**Finished Product on Bridge Near Clay City. Note Color Change.**