

MICHIGAN
STATE HIGHWAY DEPARTMENT
Charles M. Ziegler
State Highway Commissioner

AIR-ENTRAINING CONCRETE ON
BRIDGE PROJECT F B 2 OF 3-8-1, C1
PLAINWELL, MICHIGAN

Highway Research Project 42 B-13

Research Laboratory
Testing and Research Division
Report No. 131
May 16, 1949

C O P Y

MICHIGAN
STATE HIGHWAY DEPARTMENT
Lansing 13
Charles M. Ziegler
State Highway Commissioner

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Interoffice Communication

May 16, 1949

TO: W. W. McLaughlin
Testing and Research Engineer

SUBJECT: Air Entraining Concrete on Bridge Project F B 2 of 3-8-1, C1
Plainwell, Michigan

Research Project 42 B-13. Research Report No. 131

During the construction of Bridge Project F B 2 of 3-8-1, C1 in 1941, permission was granted by the Bridge Division to include Orvus as an air-entraining admixture in the concrete used only in the sidewalk sections. The bridge is located on M-131 in the city of Plainwell and crosses the Kalamazoo River.

The purpose of this work was to study the effectiveness of air entrainment in the prevention of scale on bridge sidewalks. G. A. Mansfield, then with the Research Laboratory, was present at the time the sidewalk sections were poured. The amount of Orvus used was .015 pounds per sack of cement. This quantity of Orvus gave the required drop in weight of 4 to 6 pounds per cubic foot. The last visual inspection was made by the writer in October, 1948. The following conditions have been observed:

1. The concrete has not scaled on the sidewalk sections which contain Orvus. See Figures 1 & 2.
2. The sidewalk surfaces on the bridge approaches at the south end of the bridge have considerable light scale. See Figures 3, 4, 5, & 6.
3. Curb section at the south approach is starting to crack and spall. See Figure 7.
4. Slight scaling has begun to develop on the bridge deck, at the south end. See Figure 8.
5. The bridge deck has been resurfaced recently with bituminous concrete as part of a general pavement resurfacing program through the city of Plainwell on M-131.



E. A. Finney
Assistant Testing and Research
Engineer in charge of Research

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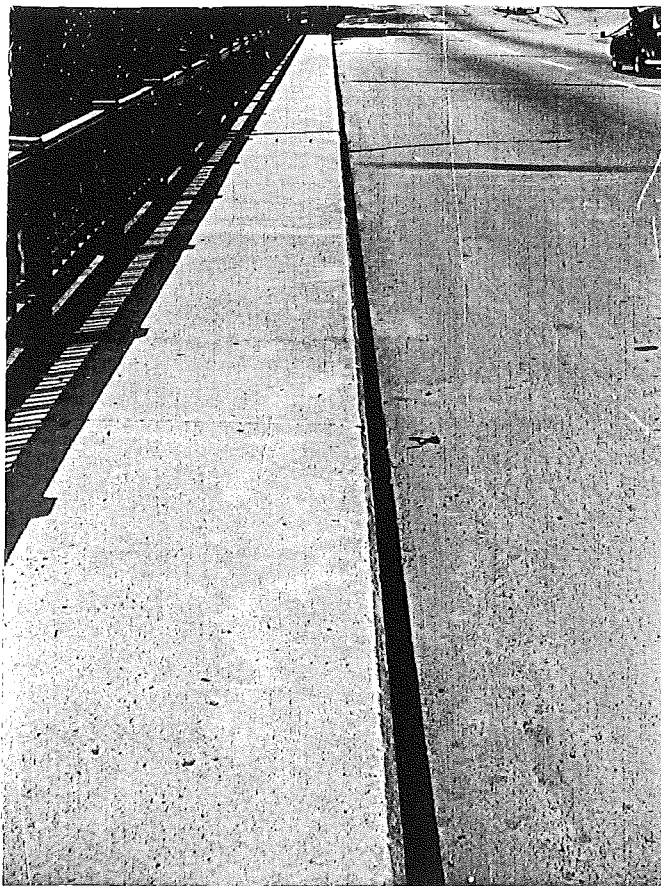


Fig. 1. West walk - no scale.
Constructed with Orvus.



Fig. 2. East walk - no scale.
Constructed with Orvus.

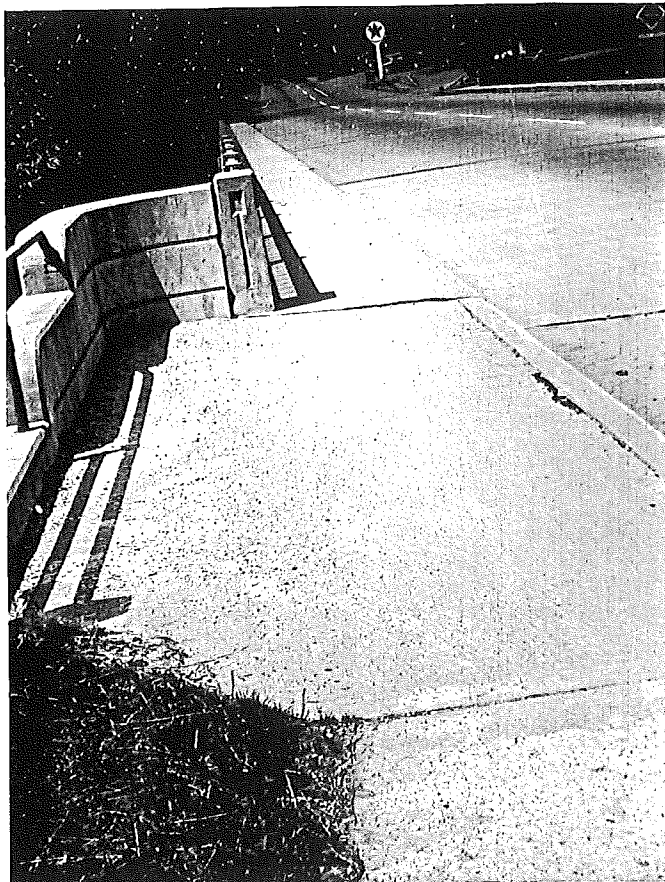


Fig. 3. Sidewalk, south approach, west side.
Note scaled surface. Standard concrete.

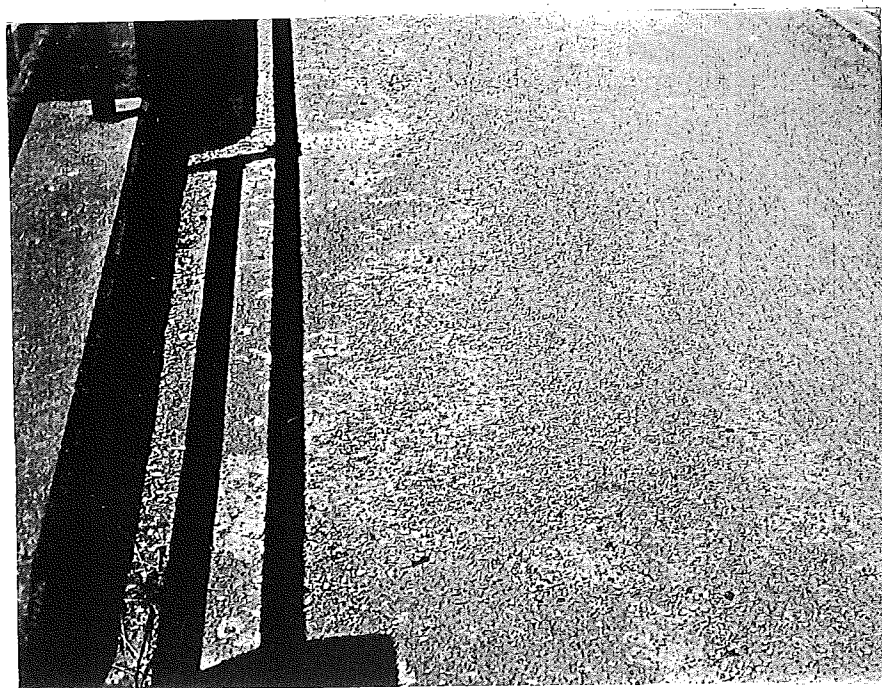


Fig. 4. Close view of surface described in
Figure 3.

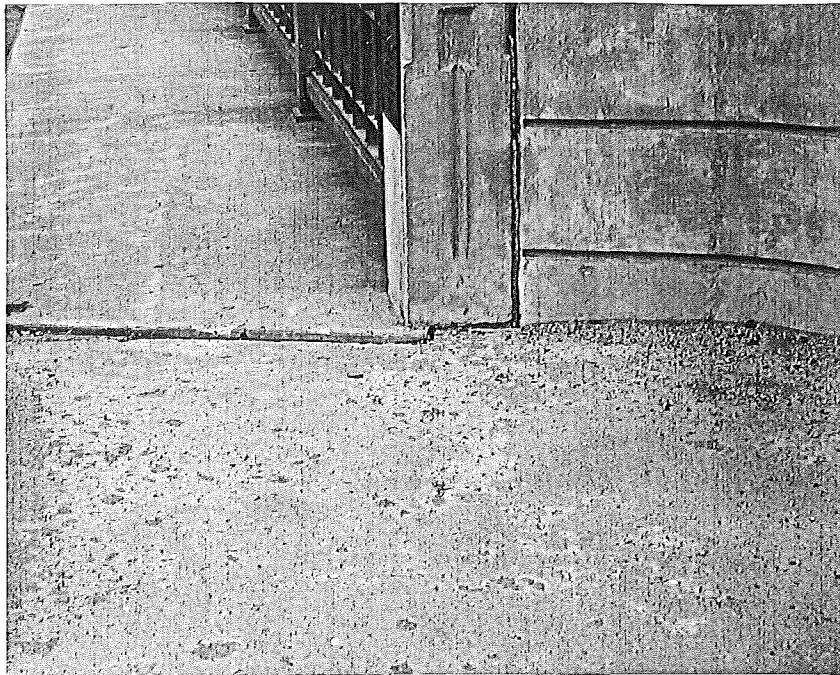


Fig. 5. Scaling of sidewalk, south approach, East side. Standard concrete.



Fig. 6. General view showing scaling of sidewalk, South approach, East side. Standard concrete

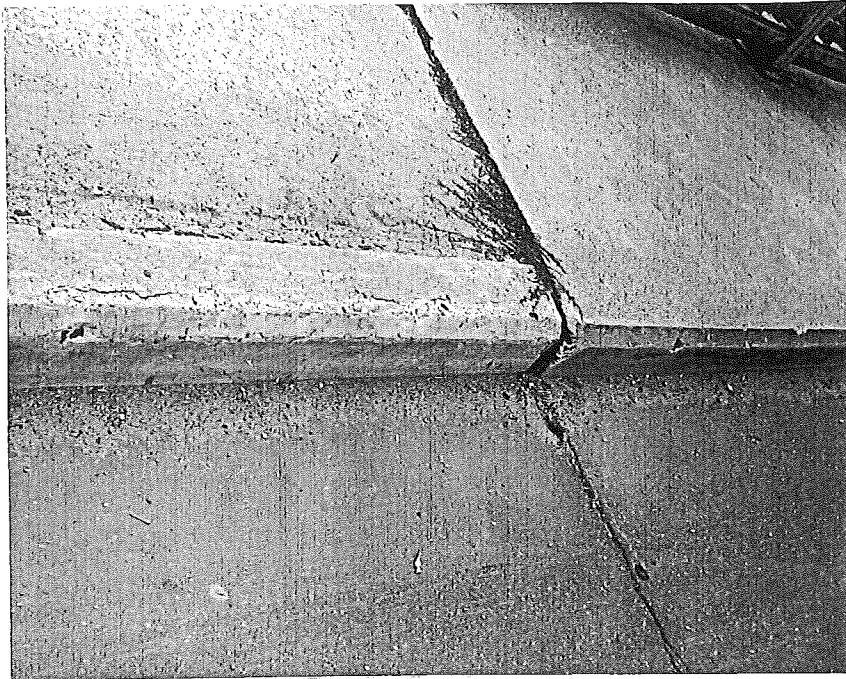


Fig. 7. Curb, South approach, West side, starting to crack and spall. Standard concrete.

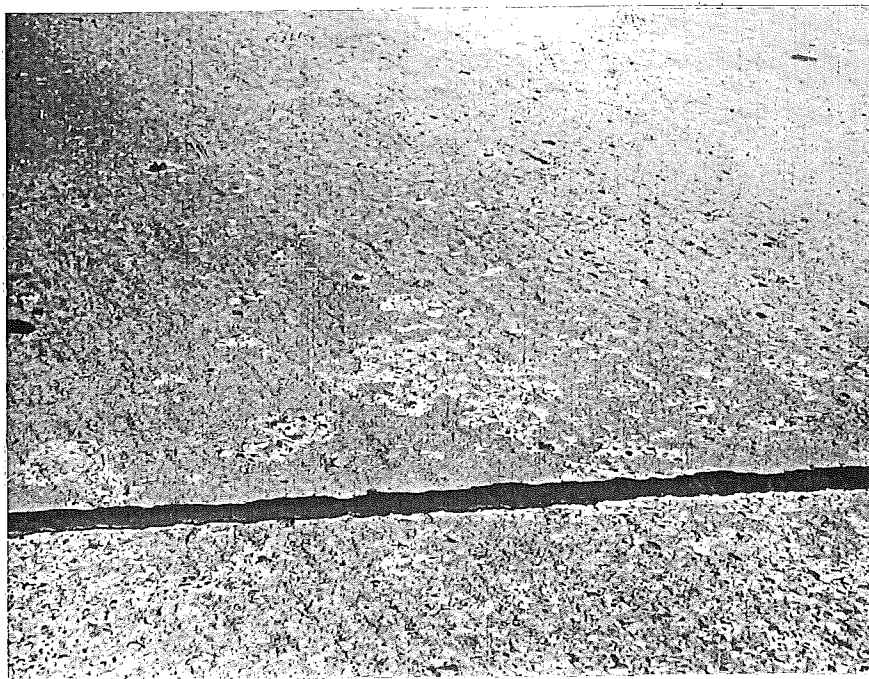


Fig. 8. Slight scale appearing on bridge deck. Standard concrete