

MICHIGAN  
STATE HIGHWAY DEPARTMENT  
Charles M. Ziegler  
State Highway Commissioner

REPORT ON CONDITION SURVEY  
OF  
CONCRETE CAPPING PROJECTS IN MICHIGAN

By

E. A. Finney  
A. E. Matthews

Research Project 44 F-10

Research Laboratory  
Testing and Research Division  
Report No. 50  
March 10, 1944

MICHIGAN  
STATE HIGHWAY DEPARTMENT  
Charles M. Ziegler  
State Highway Commissioner

INTEROFFICE COMMUNICATION

March 10, 1944

TO: G. W. Tiedeman  
From: A. E. Matthews  
Subject: Condition Summary and Report on Concrete Capping Projects in Michigan

In accordance with your request of January 14, we have made a behavior study of all the concrete capping projects in Michigan. These observations have been made by Mr. E. A. Finney, Mr. E. A. Dahlman, Mr. S.T. Byam, and myself. This report includes a group of pictures taken by Mr. Finney and two sheets of tabulations entitled "Progress Report on Behavior of Concrete Capping Projects in Michigan." Five copies of this report are attached. In case additional copies are desired, we will be pleased to furnish them.

The summary of these projects includes a location description, design information, soil conditions, and behavior observations. Under the heading of remarks we have made a comparison of concrete capping with a new slab of standard design which was used for replacement or for widening. The soil notations refer to the character of the soil directly under the slab.

It was noted on these surveys that the concrete capping was free from faulting at the joints. On some of the new capping projects, transverse cracks appeared shortly after construction which may be due to temperature differentials between the old and new concrete slab at time of construction. Further study of this problem seems warranted in order to avoid similar cracking on future work. It was also observed that the condition of the old concrete base and the subgrade is reflected in the behavior of the concrete capping with respect to cracking and riding qualities.

The older concrete capping projects (6" reinforced) have been in use a sufficient number of years to provide design data for future projects. From the facts established from this survey, we can readily conclude that a 6" reinforced capping on an old concrete pavement has been very satisfactory.

A. E. Matthews (Signature

A. E. Matthews  
Engineer of Soils

AEM:PB  
cc: W. W. McLaughlin  
E. A. Finney

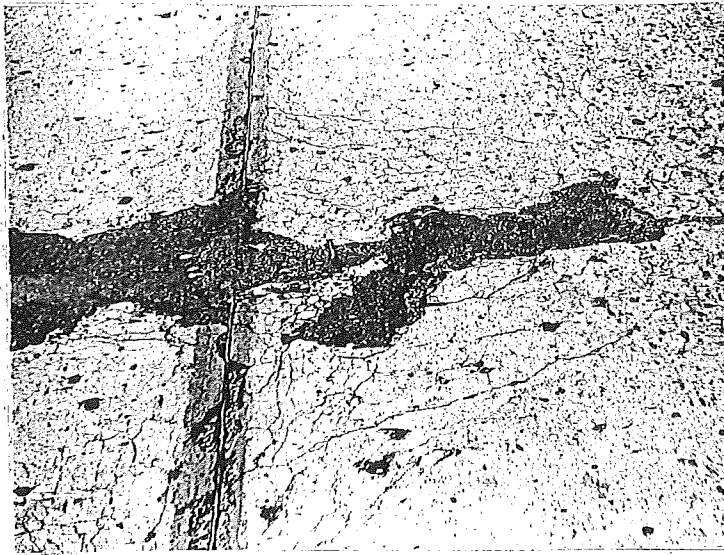


Figure 1. Project 12-19, C2, Sta. 797+60, 1-25-44. Quality of concrete throughout project is questionable. Progressive disintegration is prevalent adjacent to cracked areas and joints manifested by crazing as illustrated. 9 years old.

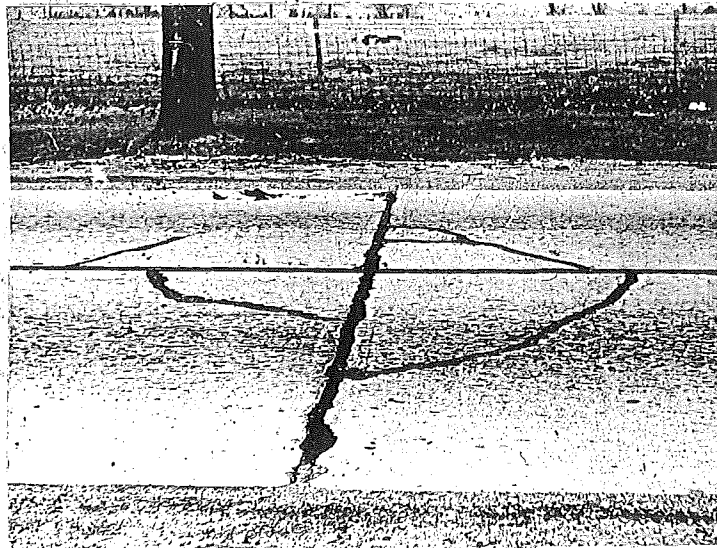


Figure 2. Project 15-19, C2, Sta. 786, 1-25-44. Corner breaks such as illustrated above are quite common on project.



Figure 3. Project 25-5, Cl, 1-26-44. General view of pavement showing comparative transverse cracking of the recapped section in center to the widened section. Pavement 13 years old.

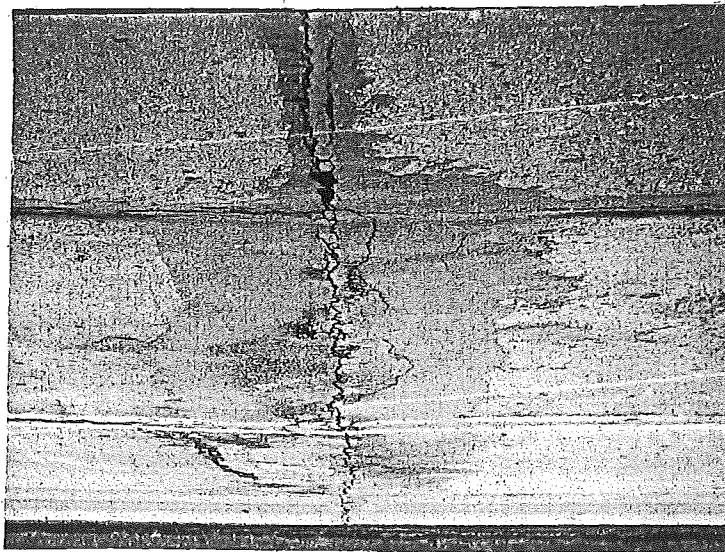


Figure 4. Project 25-5, Cl, 1-26-44. View illustrating type and condition of most expansion joints on project. There was evidence of water in some expansion joints and differential movement due to frost action. Practically all expansion joints are in some degree of disintegration.

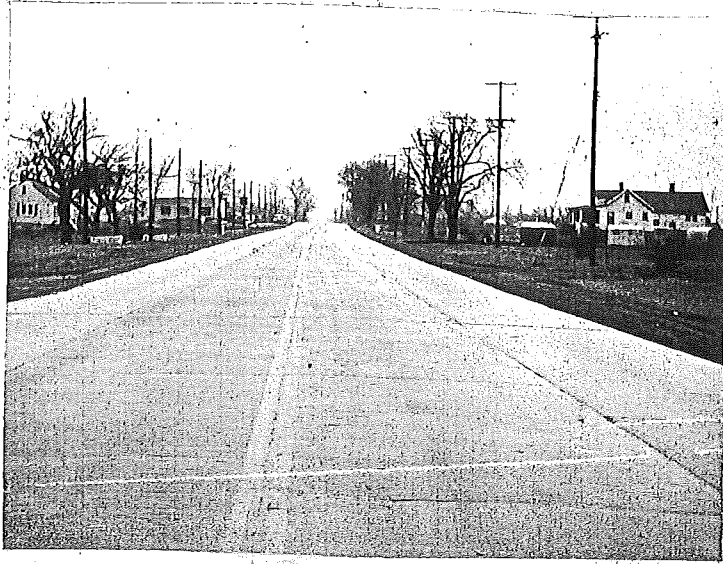


Figure 5. Project 25-21, C2, Sta. 179+00, 1-26-44. General view of recapped surface and widened section. Note excellent condition of recapped surface after 12 years.

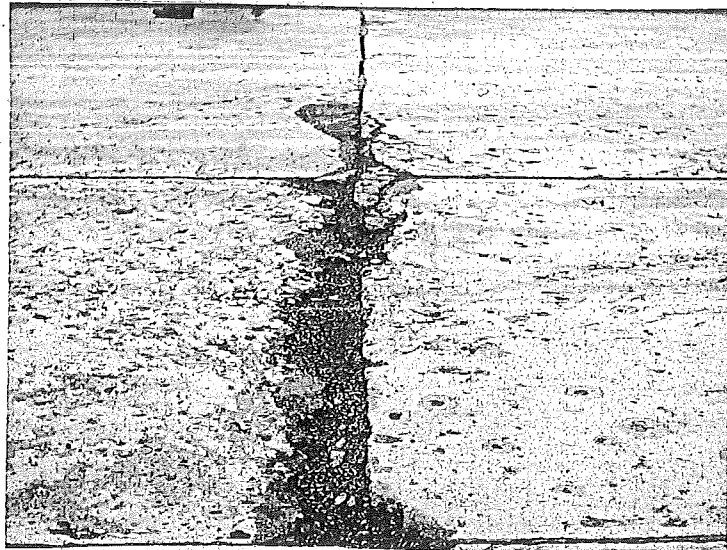


Figure 6. Project 39-12, C4, Sta. 555+30, 1-25-44. Quality of concrete questionable. Note disintegration at joints. Surface pitted from inferior aggregates and considerable longitudinal and transverse cracking was evident. Pavement 14 years old.

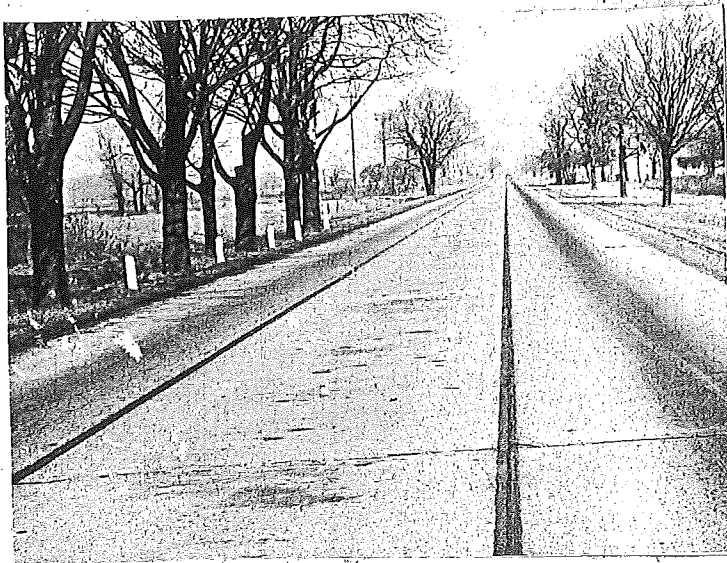


Figure 7. Project 50-24, C4, Sta. 685+00, 1-26-44. General view of capped and widened pavement. Both surfaces are in good condition after 11 years service.



Figure 8. Project 50-30, C2, 1-26-44. General view showing recapped section in center and widening on sides. All surfaces were in excellent condition. View also shows contrast in color of surfaces. Concrete on recapped section was colored by using Emulsified Carbon Black. Pavement 2 years old.

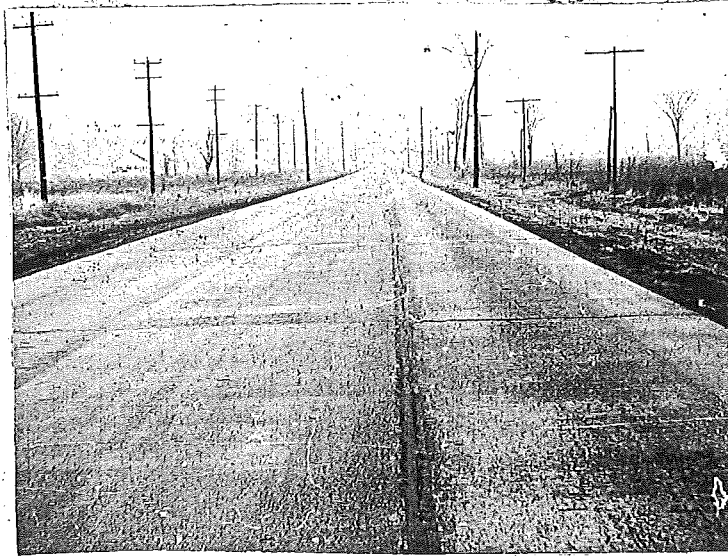


Figure 9. Project 77-4, C4, 1-26-44. General view of pavement showing excellent condition of both the recapped and widened surfaces in the limestone section.

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INTEROFFICE COMMUNICATION

March 21, 1944

TO: C. A. Weber, Assistant Road Engineer  
SUBJECT: Concrete Capping Projects

Prior to our work on Post War Surveys and Plans, I requested information from our Research Division concerning the life of our concrete capping projects. At that time, I submitted a complete list of projects upon which capping was done and from this information Mr. Matthews has reported, as outlined in the attached tabulation and comments.

From this information, it is quite evident that concrete capping has been very satisfactory to date. It is noted however in the detailed analysis that the capping of old pavements over soils of poor foundation has not given us results that are noted on sub-grade soils which are relatively well-drained. It is also noted that limestone aggregate sections are giving better results than those where gravel aggregate is used.

I am passing this information on to you for your review, since the general history of this type of construction has never been assembled.

G. W. Tiedeman (Signature)

G. W. Tiedeman  
Engineer of Road Design

GWT:DP

cc: H. C. Coons  
H. L. Brightman  
R. E. Plambech  
W. W. McLaughlin  
E. A. Finney  
A. E. Matthews

Att.