

MICHIGAN
STATE HIGHWAY DEPARTMENT
Charles M. Ziegler
State Highway Commissioner

RESEARCH LABORATORY REPORT

1945 - 1946

By

E. A. Finney

Research Laboratory
Testing and Research Division
Report No. 85
July 9, 1946

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H. B. Dirks
Dean of Engineering
Olds Hall of Engineering
Michigan State College
East Lansing, Michigan

Dear Dean Dirks:

As requested in your communication of June 15, I am submitting herewith a brief report summarizing the activities of the Research Laboratory for the year ending June 30, 1946.

During the past year there has been a marked increase in the activities of the laboratory due to the fact that many former employees have returned from war service thus making it possible to resume progress on many projects which have been inactive during the war period.

Considerable progress has been made in the development and study of hot-poured bituminous rubber joint seal compounds and their application under field conditions. These materials when properly applied should last practically the life of the structure thereby greatly reducing maintenance costs.

New concrete pavement design standards were developed and accepted by the Department for use in their post war construction program. The new design departs considerably in certain respects from former practice in Michigan and is based on the results of recent studies, including wheel load frequencies, load-stress relationships in pavement slabs on known subgrade support and analysis of data obtained from the Michigan Test Road during the past years. It is anticipated that future concrete pavements embodying these new design features shall provide superior riding qualities at reduced operating costs and should possess a greater economic life.

Independent studies and joint movement measurements have been continued on the Michigan Test Road and considerable work has been done towards the preparation of a comprehensive progress report of the project covering the first 5 years of its life. This report will be published by the Department sometime this fall.

The laboratory work in connection with the cooperative research project between the Engineering Research Laboratory of the University of Michigan and the Highway Department on the study of slab action using model slabs has been transferred to East Lansing. A concrete slab 9 inches thick, 11 feet wide and 26 feet long was cast in the basement of Olds Hall for further load-stress studies on a concrete slab simulating in certain respects full scale pavement conditions. Load deflection and stress measurements are now being made.

Dean Dirks

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A research fellowship has been established at Michigan State College by the Trueson Laboratories of Detroit for the purpose of studying certain phases of the problem of curing concrete pavements with impervious membrane compounds. This research project will be conducted jointly by the Engineering Experiment Station and the Research Laboratory of the Highway Department. Progress on this project has been most satisfactory.

Another important investigation pertaining to the design and construction of pavement foundations was established as a cooperative research project between the Highway Department and the Engineering Experiment Station. Considerable work has been done on this project to date.

Additional new important research projects were started by the Research Laboratory. They include:

1. Preserving and reconditioning concrete bridges.
2. Wheel load frequencies as related to pavement design.
3. Concrete paving form investigation.
4. Compressed wood as an expansion joint filler material.

The research laboratory is fortunate in being so located as to enjoy the many academic advantages available at Michigan State College. As conditions permit we hope to make the most of this opportunity by seeking the cooperation of certain departments of the College on problems of actual interest. In this respect the Engineering College has been most outstanding.

Very truly yours,

WJF:lc

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

Report #85

CONCRETE RESEARCH PROGRAM, JUNE 1, 1948

<u>Project No.</u>	<u>Title</u>
30 F-1	Evaluation of Load Transfer Devices
33 B-11	Concrete Durability Investigation <ul style="list-style-type: none"> (1) Laboratory Durability Studies (2) Michigan Test Road, Durability Project (7) Air-Entraining Concrete Study
42 B-14 (2)	Membrane Curing of Concrete Pavements
42 B-15	Concrete Admixtures <ul style="list-style-type: none"> (1) V.R. Baileton H.F. 7 Belleville Road, US 112, South (2) H.F. 7 Project H-71-24, CI, Rogers City
42 B-16	Effect of Low Temperatures on Concrete Containing Admixtures
45 B-15	Preserving and Reconditioning Concrete Bridges
46 B-15	Concrete Failure, Project F-14-11, CI, US 131 East County Line, South
47 F-3	Concrete Pavement Failure, Project 3-15, CI and 40-11, CI Kalamazoo to Manassas
53 G-1	Changes in Characteristics of Slow Curing Asphaltic Oils <ul style="list-style-type: none"> (5) Accelerated Weathering Study (8) Oxidation Inhibitors and Rubber Admixtures
55 E-5	Soil Stabilization <ul style="list-style-type: none"> (1) Grayling Project, H-40-10, CI (2) Stockbridge Project, H-33-20, CI
41 E-9	Turf Growth on Highway Shoulders
44 E-10	Soil Action Under Bridge Piers on D.I.E.
45 E-11	Design and Construction of Pavement Foundations <ul style="list-style-type: none"> (1) Evaluation of Foundations Under Existing Pavements (2) Study of Consolidation Methods and Equipment in Relation to <ul style="list-style-type: none"> A. Highway Foundation B. Bridge Backfills (3) Subbase Construction in Relation to Pavement Design (4) Determination of Foundation Bearing Value

Project No.Title

30 F-7

Concrete Pavement Design

- (1) Theoretical Considerations
- (2) Michigan Test Road, Design Project
- (3) Grand Rapids Experimental Project F-41-5a, 5b
- (4) Evaluation of Existing Concrete Pavements
- (5) Theoretical Consideration of Multiple Axle Loadings
- (6) Physical Characteristics of Concrete at Early Ages
- (7) Concrete Base Course Design
- (8) Concrete Curb Design in Relation to Future Design Requirements
- (9) Wheel Load Frequencies as Related to Pavement Design
- (10) Grand Lodge - Hallikes Experimental Project F-22-3

44 F-11

Model Study of Slab Action in Concrete Pavements

38 G-5

Snow Removal and Ice Control

35 G-4

Bituminous-Rubber Joint Seal Investigation

38 G-1 (7)B

Compressed Wood Joint Filler Materials

41 G-18

Highway Costs in Michigan

42 G-22

Maintenance of Highway Signs

43 G-30

Concrete Paving Form Investigation