

A STUDY OF CRCP PERFORMANCE: NEW CONSTRUCTION VS. OVERLAY

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SUMMARY REPORT 177-12(S)

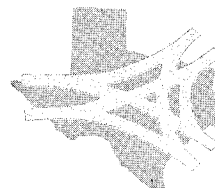
SUMMARY OF
RESEARCH REPORT 177-12

PROJECT 3-8-75-177

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Foreword

Research Report Number 177-12 is the twelfth in a series of reports which describe work done on Project 3-8-75-177, Development and Implementation of the Design, Construction and Rehabilitation of Rigid Pavements. This report presents a study of several continuously reinforced concrete pavements which have been in service in Texas for the past 15 to 20 years. Specifically, it involves a comparison of the performances of CRCP overlays and new CRCP construction for three Texas projects: I35-2(45)175, located in Guadalupe County; I35-4(13)317, located in Falls and McLennan Counties (a two-county project); and I35W-5(44)401, located in Johnson County. Each project was constructed by the Texas State Department of Highways and Public Transportation and includes both overlay and new construction.

Pavement Performance

The performance of a pavement is a measure of how well it serves traffic over a period of time. A pavement which had low serviceability during much of its life would not have performed its function of serving traffic as well as one which had high serviceability during most of its life, even though both ultimately reached the same state of distress at the same time (Ref 1). The performance of a pavement is also a function of riding quality and pavement distress. The ride quality and distress manifestations are subjectively measured in the field by a condition survey. With the analysis of these condition survey data the present serviceability of the pavement structure can be determined, along with the subsequent determination of the relative pavement performance when compared with an adjoining pavement of a different construction. In this study the pavement performance of a new CRCP construction was determined as being either better or worse than the performance of a CRCP overlay constructed over an older JCP.

The condition survey made in this study measured pavement distress in several categories, including

- (1) transverse cracking,
- (2) localized cracking,
- (3) spalling,
- (4) pumping,
- (5) punchouts, and
- (6) repair patches.

The condition survey also measured the transverse crack spacings and the present serviceability rating (Ref 2).

Analytical Approach

As stated in the foreword, the intent of this study was to determine which type of pavement structure was giving better performance, overlay or new construction. Statistical tests were performed on the performance data to determine whether there was any significant difference between the performances of the CRCP overlays and the new construction CRCP pavements. Using the results of these tests and engineering judgment, the pavement type which performed better could be determined for each category in the condition survey.

Study Findings

The findings of this study have shown somewhat conclusively that, for the 7-inch CRCP overlay and the 8-inch new construction CRCP of the Falls-McLennan Project, the overlay performed better. For the 6-inch CRCP overlay and the 8-inch new construction CRCP of the Guadalupe and Johnson Projects, no difference in performance could be noted between the two pavement types. This was due primarily to the relatively short in-service period, only 12 years, which didn't allow enough distress to accumulate for a satisfactory performance comparison. A recommendation was made to carry on the investigation at a later date, after enough distress has been sustained to cause a significant difference

between the performances of the CRCP overlay and the new construction CRCP for the Guadalupe and Johnson Projects.

Implementation

This study has evaluated and compared the performances of several CRCP overlays with the performances of several new construction CRCP built side by side in Texas. Such a study is a first step in the documentation of pavement performance, which is necessary to progress in pavement design and rehabilitation. Through such field investigations the pavement engineer can gain the necessary knowledge to change and improve invalid or approximate design methods and can verify already valid methodologies.

KEY WORDS: continuously reinforced concrete pavement (CRCP), CRCP overlay, new construction CRCP, statistical comparison, pavement performance, present serviceability, distress manifestation, condition survey

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The

contents do not necessarily reflect the official views or policies of the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

The full text of Research Report 177-12 can be obtained from Mr. Phillip L. Wilson, State Planning Engineer, Transportation; Transportation Planning Division; File D-10R; State Department of Highways and Public Transportation; P. O. Box 5051; Austin, Texas 78763.

References

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