In 1996, WisDOT constructed a concrete inlay test section on I-43 in Manitowoc County. The existing pavement was CRCP constructed in 1978 and was badly deteriorated with punch-outs. In the area of the 2777-foot test section, the existing pavement was removed, the foundation was replaced with a drained system, and an 11-inch JPCP concrete inlay was constructed. The remainder of the project, including a control section, received CRCP patching and an HMA overlay ranging in thickness from 3 to 6 inches. The pavement was evaluated after 14 years in service. The concrete inlay was in excellent condition. Only isolated slab cracking was noted. The 6-inch HMA overlay control section had more distresses, most notably transverse cracking. The PDI values for the test and control sections were 7 and 43, respectively. A series of LCCAs using 1996 construction costs showed that the HMA overlay rehabilitation alternative was more cost-effective than concrete inlay. Because it is not the most cost-effective large-scale pavement rehabilitation alternative, concrete inlay is not recommended for routine use on Wisconsin roadways. A study of the performance of Continuously Reinforced Concrete Pavement (CRCP) constructed on the Interstate highway system in Illinois has been conducted. The major purpose is to determine the types, severities, amounts, and causes of distress. This information will then be used to develop optimum maintenance procedures to repair the distress that occurs, and preventative maintenance procedures to reduce the rate of distress occurrence. The distress data collected can also be used to update CRCP design procedures. Approximately 1230 miles of Interstate highway was surveyed, consisting of 7 to 10 in. (17-25 cm) slabs over granular and stabilized subbases. Distress found includes edge punchouts, steel ruptures, “D” cracking, blowups, construction joint failures, lug rotation, longitudinal cracking, distress related to construction problems, pumping, and shoulder deterioration.
Heavy truck loads, excess free moisture, deicing salts, construction practice and poor aggregate quality in the CRCP slab are the major factors causing distress. CRCP slab thickness and foundation support have a very significant effect on structural distress development. "D" cracking is causing severe deterioration of several projects. Overall, the performance of the thicker CRCP slabs (i.e., 9-10 in.) has been very good under heavy truck traffic; however, the performance of many sections of thinner CRCP (i.e., 7-8 in.) has been poor, and is showing an accelerated rate of distress development over time. The amount of distress expected to occur, and the maintenance effort required in the next several years points strongly toward a need for the development of more efficient and durable ways of maintaining CRCP.

Continuously reinforced concrete pavement (CRCP) provides long-life performance with minimal maintenance at a competitive cost. CRCP contains continuous longitudinal steel reinforcement and has no transverse joints, except as required at end-of-day construction and at bridge approaches and transitions to other pavement structures. Continuous reinforcement is a mechanism for managing the transverse cracking that occurs in all new concrete pavements. Continuously reinforced concrete pavement (CRCP) is enjoying a renaissance across the United States and around the world. CRCP has the potential to provide a long-term, "zero-maintenance," service life under heavy traffic loadings and challenging environmental conditions, provided proper design and quality construction practices are utilized. This book provides an overview of the CRCP technology and the major developments that have led to what are referred to herein as the "best practices" for CRCP design and construction. The purpose of this book is to provide the best practices information on rehabilitation strategies for extending the service life of continuously reinforced concrete pavements (CRCP). The procedures described in this book consist of defining the problem, identifying potential solutions, and selecting the preferred alternatives. (Imprint: Novinka)

The Illinois Department of Transportation (IDOT) currently has an existing jointed plain concrete pavement (JPCP) design based on mechanistic-empirical (M-E) principles. However, their continuously reinforced concrete pavement (CRCP) design procedure is empirical and based on a modified AASHTO nomograph for jointed reinforced concrete pavement. The objective of this study was to develop and implement an M-E design procedure that IDOT could use for routine CRCP design. The proposed procedure is based on mechanistic empirical design principles taken largely from the models presented in NCHRP 1-37A and on work completed by Dr. Dan Zollinger of Texas A & M University. The equations for calculating the mean crack spacing and the number of punchouts per mile at the end of the design life for a given traffic volume, pavement layer and CRC slab geometry, shoulder type, and layer material properties have been implemented in a user-friendly spreadsheet. Several new developments in the proposed design process are fatigue damage accumulations at the critical top and bottom location in the CRCP slab, equations for calculating the equivalent damage ratio for several shoulder types and crack stiffness values, application of a strength reduction factor to the concrete stress ratio calculated at the surface of the CRCP, and a new logistic-type punchout prediction model. Due to the numerous measured and assumed input variables in this CRCP design framework, the mechanistic analysis was calibrated against CRCP field performance data from Illinois and CRCP accelerated pavement test data completed at the University of Illinois. The use of continuously reinforced concrete (CRC) pavement, as an alternative that eliminates the necessity for most crack control joints, has a proven record of good service performance extending back more than 30 years. CRC pavement is a portland cement concrete pavement with continuous longitudinal reinforcement achieved by lapping the reinforcing bars. The construction practices treated in this manual encompass activities that influence the performance of CRC pavement including subgrade, subbase, drainage construction practices, construction joints, terminal joints, ramps and shoulders, and other details. Continuously reinforced concrete pavement (CRCP) is enjoying a renaissance across the United States and around the world. CRCP has the potential to provide a long-term, "zero-maintenance," service life under heavy traffic loadings and challenging environmental conditions, provided proper design and quality construction practices are utilized. This book provides an overview of the CRCP technology and the major developments that have led to what are referred to herein as the "best practices" for CRCP design and construction. The purpose of this book is to provide the best practices information on rehabilitation strategies for extending the service life of continuously reinforced concrete pavements (CRCP). The procedures described in this book consist of defining the problem, identifying potential
solutions, and selecting the preferred alternatives. (Imprint: Novinka) This report details the results of an in-depth study of methods and costs of repairing failures in continuously reinforced concrete pavement. The study was conducted in 1977 by teams of Engineers from four States: Arkansas, Louisiana, Mississippi, and Texas. Similarities were revealed in the methods of repair used by maintenance personnel in the four States. Subtle differences were also discovered which can be considered for implementation by all of the participants and others to improve their maintenance techniques. Introductory technical guidance for civil engineers and construction managers interested in resurfacing continuously reinforced portland cement concrete pavement for streets and highways. Introductory technical guidance for civil engineers and construction managers interested in continuously reinforced concrete pavements for streets and highways. Here is what is discussed: 1. INTRODUCTION TO MECHANISTIC-EMPIRICAL DESIGN OF CRCP 2. AASHTO PAVEMENT ME DESIGN GUIDE PRINCIPLES 3. AASHTO PAVEMENT ME DESIGN USER INPUTS 4. PAVEMENT TYPE SELECTION AND PORTLAND CEMENT CONCRETE MATERIAL PROPERTIES 5. SELECTING SUPPORT LAYERS FOR DESIGN 6. SELECTING REINFORCEMENT AND OTHER PAVEMENT PARAMETERS. 7. TRAFFIC 8. CLIMATE 9. CRCP FAILURE ANALYSIS AND DESIGN THICKNESS OPTIMIZATION 10. AASHTO PAVEMENT ME DESIGN INPUT SENSITIVITY 11 SUMMARY.

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