Cracking in Concrete Bridge Decks

Tony R. Schmitt 1995

The causes of cracking in bridge decks are investigated and procedures are recommended to alleviate the problem. Forty continuous steel girder bridges, thirty-seven composite and three noncomposite bridges are evaluated. Field surveys conducted to document cracking patterns and to determine the crack density of each bridge are described. Information collected from construction documents, field books, and weather data logs is presented and compared to the observed levels of cracking to identify correlations between cracking and the variables studied. Thirty-one variables are considered as material properties, site conditions, construction procedures, design specifications, age of bridge and traffic volume. Based on the research reported herein, cracking in monolithic bridge decks increases with increasing values of concrete slump, percent volume of water and cement, water content, and compressive strength, and decreasing values of air content (especially below 6.0%). Bridge deck overlays placed with zero slump concrete consistently exhibit high levels of cracking. Cracking in overlays also increases as placement lengths increase. High maximum air temperatures and large changes in air temperature on the day of casting aggravate cracking in monolithic bridge decks. High average air temperatures and large changes in air temperature similarly aggravate cracking in bridge deck overlays. Both monolithic and two layer bridges with fixed-ended girders exhibit increased cracking near the abutments compared to those with pinned girders.

Engineering of Bridge Deck Rehabilitation

Frank M. Fuller 1983

This book provides a thorough review of bridge deck rehabilitation with an emphasis on design and construction practices. It includes case studies of bridge deck rehabilitation projects worldwide and discusses the challenges and solutions encountered in those projects. The book covers a wide range of topics, including the causes of deck distress, design considerations, and construction methods. It is intended for professionals involved in bridge management and rehabilitation, as well as students and researchers in the field.

Concrete Pavements, Volume I

Portland Cement Association 1995

This volume presents a comprehensive guide to the theory and practice of concrete pavement construction. It is intended for professionals in the industry, including engineers, contractors, and materials suppliers. The book covers a wide range of topics, including concrete pavement design, materials, construction, and maintenance. It includes case studies and practical examples to illustrate the concepts discussed. The book is useful for both new professionals and experienced practitioners looking to stay up-to-date with the latest developments in concrete pavement technology.

The Code of Federal Regulations is the codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal Government.

Index and Directory of U.S. Industry Standards

The Code of Federal Regulations of the United States of America

Tony S. Poole 2006

Information on the current status of knowledge of curing hydraulic-cement concrete and on current curing practice was gathered by means of a literature review and a review of current standard guidance. From this information, a draft guide for curing hydraulic-cement concrete pavements was developed. Draft guidance was based around type of curing used (water added, water retention by sheet, or curing compound) and around temperature effects. As a result of review by the project technical advisory panel, additional information was gathered from existing sources on several subjects. Laboratory studies were conducted on topics for which information was needed but not currently available. The result of the investigation was a set of guidelines that focused particularly on attention to details of moisture retention and temperature immediately after placing (initial curing period) and on details of selection of materials for final curing and determining when to apply final curing. Test methods for evaluating application rate of curing compound and effectiveness of curing were also reported. A separate report (FHWA RD-02-099 Guide for Curing of Portland Cement Concrete Pavements, Volume I) has been written that captures the details of the recommended guidance. That report is intended to be the principal technology transfer medium.

Building Design and Construction Handbook

Frederick S. Merritt 1982

Provides updated, comprehensive, and practical information and guidelines on aspects of building design and construction, including materials, methods, structural types, components, and costs, and management techniques.

ACI Manual of Concrete Practice 2004

The Code of Federal Regulations is the codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal Government.

Index and Directory of U.S. Industry Standards 1985

Franklin S. Kurtz 1997

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