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Widening Of Existing Bridges On State Highway 16 In Auckland

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NHS-027-1(37), 11238, Newington to Dover, Strafford and Rockingham Counties

Widening Of Existing Bridges On State Highway 16 In Auckland ***OMB No. 6534432980175 edited by***

NADIA MOODY

Staten Island Bridges Program, Modernization and Capacity Enhancement Project
Extending the Service Life of Existing Bridges by Increasing Their Load Carrying CapacityA catalog of bridge deficiencies is developed based on the inspection of over 140 deficient bridges located in Illinois, Florida, Pennsylvania, California, and Tennessee. A classification of structure types is developed for concrete, steel and timber bridges. Deficiencies are related to the structure classification

system and a hierarchy of the most common deficiencies established. Techniques presently utilized by state highway departments to correct deficiences are described and evaluated. Several innovative techniques for increasing the load carrying capacity are also described. Utilizing these techniques, increased capacity values are developed. Cost factors are also analyzed and graphic presentations which show the relative merit of each system are presented.Guidelines for the Assessment of Existing Bridges for WideningEvaluation of Waiting Time for Closure Pour in Concrete Bridge WideningCurrent practice in California requires up to 60 days waiting period for closure pour after the release of falsework for both staged construction and widening of existing bridges. The relatively long waiting time is intended to reduce the stress build-up and mitigate the damage in the bridge deck due to the potential differential displacement between the newly constructed deck and previously constructed deck. The current waiting period does not take into account the displacement capacity of the closure slab, which varies depending on

the dimensions and reinforcement details, and the time-dependent differential displacement that will be imposed on the closure slab. In this research, closure pour waiting time is evaluated in three steps. In step 1, a predictive model based on an age-adjusted effective modulus with traditional elastic analysis is used to predict the time-dependent displacement of the bridge. The predictive model is shown to correlate well with field-measured deflections for two concrete box-girder bridges. In step 2, four full-size closure slabs were tested to determine the displacement capacity of typical California closure slabs. Closure slabs with current California details exhibit rather brittle shear failure with limited displacement capacity. In step 3, a procedure based on the predictive model of differential displacements and laboratory-determined displacement capacity is proposed to determine the closure pour waiting time. Preliminary numerical examples in this research indicate that the current waiting time is conservative, especially in staged construction or bridges with small instantaneous deflections, and shortening of

closure pour waiting time is warranted.Effectiveness of Attached Bridge WideningGuide for Widening Highway Bridges"Many highway bridges become functionally obsolete due to inadequate width before they become structurally deficient. Widening is generally more economical than complete replacement. Thus, there is a mandate to share the results of research and experience pertaining to bridge widening. This guide discusses technical issues related to the widening of concrete bridges and bridges with concrete decks. The primary focus of this document is on bridge decks, even though substructure issues are raised and discussed. The effects of differential movements between the existing and new portions are discussed, including movements due to traffic on the existing structure during construction. General recommendations are made pertaining to the choice of structure type, design details, and construction methods and materials. The materials, processes, quality-control measures, and inspections described in this document should be tested, monitored, or performed as applicable only by individuals

holding the appropriate ACI certifications or equivalent." -- Publisher's summary, page 1Bridge Rehabilitation Named after the 40th governor of Louisiana, the Huey P. Long Bridge, just outside of New Orleans in Jefferson Parish, is the longest railroad bridge in the United States. For 15 years after it opened in 1935, it was the longest railroad bridge in the world. Initially conceived in 1892, the "Huey P." was the first bridge to span the deep-draft navigation channel of the lower Mississippi River, opening the path for a southern transcontinental railroad. The highway and pedestrian portions of the bridge provided additional transport, which previously had only been available by ferry. New Orleans and its surrounding regions grew in population and economic importance as the publicly owned bridge connected the Port of New Orleans to the rest of the United States through six Class I railroads. The Huey P. continues to function in its original, now undersized, capacity. In April 2006, the state began a widening of the bridge to double its automobile lanes from 18 feet to 43 feet. In September 2012, the American Society of Civil Engineers dedicated the

Huey P. Long Bridge as a Historic Civil Engineering Landmark. Report on the Administration of the Road Fund Arcadia Publishing Over the past several years, repairing the local highway network, along its course, the width of the road and subbase, has meant that countless bridges (walls, large culverts, bridges, etc.) remained out of service because of the need to improve the traced routes, or, because the level of deterioration was such that its restoration was no longer economically viable. In spite of the above, restoring and upgrading a large proportion of small bridges that are still in acceptable condition for current needs would be a very positive step because they represent living testimony to civil engineering at the time. The physical maintenance of arch bridges, of one or more stonework bays, ashlar masonry, and other stone materials, require imaginative formulae for widening its floor, as well as upgrading the rest of its parts to support heavier loads, for which these bridges had not been originally designed. Bridges, such as those of the famous engineer E. Ribera, arch bridges with an upper deck, and those of the Marquis of Zafra, with a deck in the form of p,

have been widened and reinforced, given that there are just so many of them along local highways. This paper deals with the experiences of one local administration s highway department, the Regional Government of Valencia, where a bridge construction and rehabilitation programme has included several of the types mentioned . For the covering abstract of this conference see IRRD number 872978. *Guide for Widening Highway Bridges* Elsevier Abstract: Bridges play a vital role in resolving transportation problems in Egypt. The Objective of this research is to predict the conditions of bridges expansion joints, with the aim of proposing appropriate maintenance and repair strategies in order to extend their lifespans. A thorough literature review of existing bridges expansion joints maintenance and repair strategies are conducted. Furthermore, visual inspections and surveying of existing bridges expansion joints in Egypt are conducted, with the findings of such observations documented and recorded. Moreover, an expansion joint management

system (EJMS) is developed with the aim of recommending the optimum maintenance strategy for bridges that optimizes annual condition index (ACI) and cost. This model uses a combination of Fuzzy Logic (FL) and Genetic Algorithm (GA) in order to provide optimal recommendations. In addition, a transition matrix for predicting Deterioration of expansion joints EJ using Markov Chain (MC) is developed. In order to test the model, several case studies of existing bridges in Egypt are used and the results are assessed against those documented through visual inspection. The comparison indicated that the developed EJMS is efficient in predicting the bridge EJs condition, where there is a deviation of 5% between the predicted condition from EJMS and the actual conditions observed through visual inspections. In addition, EJMS can play an important role in supporting decision makers in selecting the optimum maintenance and repair strategy that would maximizes the overall condition of expansion joints while meeting a certain budget constraint.

Dynamic Impact Factors for

Bridges

Thomas Telford
Reconnection alternatives include a limited access bicycle and pedestrian bridge, widening existing bridges, and a cut and cover tunnel.

I-74 Iowa-Illinois Corridor Study News

Springer
In the last two decades, the rapid deterioration of bridge structures has become a serious technical and economical problem in many countries, including highly developed ones. Therefore, bridge rehabilitation has also become a very essential factor (sometimes even a decisive one) in contemporary bridge engineering. The book covers in synthetic form nearly all the most important problems concerning bridge rehabilitation, such as bridge superstructure and substructure, the typical damage observed in bridges as well as the assessment and evaluation techniques of their technical condition. The book is intended mainly for postgraduate university students. Therefore, all the problems are mostly presented in their physical, chemical and technical as well as economical aspects. The relevant requirements are treated as

objective ones, i.e. irrespective of the rules, standards, regulations or guidelines particular to any country. This approach to the subject gives the book a more general character and therefore makes it a useful text for most civil engineering courses./a

Twin Bridges Replacement Project, Grosscup Road, Benton County CRC Press

The traveling public has no patience for prolonged, high cost construction projects. This puts highway construction contractors under intense pressure to minimize traffic disruptions and construction cost. Actively promoted by the Federal Highway Administration , there are hundreds of accelerated bridge construction (ABC) construction programs in the United States, Europe and Japan. Accelerated Bridge Construction: Best Practices and Techniques provides a wide range of construction techniques, processes and technologies designed to maximize bridge construction or reconstruction operations while minimizing project delays and community disruption. Describes design methods for accelerated bridge substructure construction; reducing foundation

construction time and methods by using pile bents Explains applications to steel bridges, temporary bridges in place of detours using quick erection and demolition Covers design-build systems' boon to ABC; development of software; use of fiber reinforced polymer (FRP) Includes applications to glulam and sawn lumber bridges, precast concrete bridges, precast joints details; use of lightweight aggregate concrete, aluminum and high-performance steel

Bridge Rehabilitation

CRC Press This synthesis will be of interest to state department of transportation and consulting bridge, structural, and research engineers. The synthesis describes the current state of the practice for determining dynamic impact factors for bridges. Information for the synthesis was collected by surveying U.S. and Canadian transportation agencies and by conducting a literature search using domestic and foreign sources. This report of the Transportation Research Board documents relevant background and recent information with regard to vehicular dynamic load effects on bridges. It provides details on the basic concepts of bridge

dynamics, including identification of the main variables affecting bridge dynamic response. In addition, current code provisions for accounting for vehicular dynamic load effects for new bridge design and load evaluation of existing bridges are reported, including a discussion on the background of the provisions. Finally, a discussion of observed field problems associated with vehicular dynamic load effects, as obtained from the survey, are included.

Concrete Bridges: Inspection, Repair, Strengthening, Testing and Load Capacity Evaluation

Imperial College Press

This volume consists of papers presented at the First International Conference on Bridge Management, held at The University of Surrey, Guildford, UK, from 28-30 March 1990.

Evaluation of Waiting Time for Closure Pour in Concrete Bridge Widening

CRC Press

Maintaining bridges in good condition has extended service life and proven to be more cost effective than allowing degradation to advance, necessitating costlier bridge rehabilitation or replacement projects. Preventive maintenance is therefore an important tool to retard deterioration and sustain

the safe operation of bridges. This includes a continuous effort of periodic inspections, condition evaluations and prioritizing repairs accordingly. The above measures define the framework for asset management of bridges. On August 21-22, 2017, bridge engineering experts from around the world convened at the 9th New York City Bridge Conference to discuss issues of construction, design, inspection, monitoring, preservation and rehabilitation of bridge structures. This volume documents their contributions to the safe operation of bridge assets.

Five Lane Widening of Tasman Bridge

Springer

As the amount of traffic on our roads increases, the bridges which carry that traffic have to be modified to meet the changing demands on them. This book consists of over 20 papers covering areas of policy, design, construction, widening strengthening techniques and alternatives to strengthening. It addresses the practitioners in the industry.

Huey P. Long Bridge

McGraw Hill Professional

Bridge Maintenance, Safety, Management, Life-Cycle Sustainability and

Innovations contains lectures and papers presented at the Tenth International Conference on Bridge Maintenance, Safety and Management (IABMAS 2020), held in Sapporo, Hokkaido, Japan, April 11–15, 2021. This volume consists of a book of extended abstracts and a USB card containing the full papers of 571 contributions presented at IABMAS 2020, including the T.Y. Lin Lecture, 9 Keynote Lectures, and 561 technical papers from 40 countries. The contributions presented at IABMAS 2020 deal with the state of the art as well as emerging concepts and innovative applications related to the main aspects of maintenance, safety, management, life-cycle sustainability and technological innovations of bridges. Major topics include: advanced bridge design, construction and maintenance approaches, safety, reliability and risk evaluation, life-cycle management, life-cycle sustainability, standardizatio n, analytical models, bridge management systems, service life prediction, maintenance and management strategies, structural health monitoring, non-destructive testing and field testing, safety,

resilience, robustness and redundancy, durability enhancement, repair and rehabilitation, fatigue and corrosion, extreme loads, and application of information and computer technology and artificial intelligence for bridges, among others. This volume provides both an up-to-date overview of the field of bridge engineering and significant contributions to the process of making more rational decisions on maintenance, safety, management, life-cycle sustainability and technological innovations of bridges for the purpose of enhancing the welfare of society. The Editors hope that these Proceedings will serve as a valuable reference to all concerned with bridge structure and infrastructure systems, including engineers, researchers, academics and students from all areas of bridge engineering.

Extending the Service Life of Existing Bridges by Increasing Their Load Carrying Capacity

Transportation Research Board

The major expansion of transport networks in the twentieth century has been accompanied by extensive bridge construction. At the end of the century, the field of bridge engineering continues to grow and develop. Recent years

have seen the construction of revolutionary new bridges, advances in materials and construction techniques and the development of international codes and standards aimed at producing more durable and reliable structures.

Bridge Management

Paris, France : Organisation for Economic Co-operation and Development ; [Washington, D.C. : OECD Publications and Information Center

This book provides a guide to movement and restraint in bridges for bridge engineers and will enable them to draw up design calculations and specifications for effective installation, and satisfactory service and durability of bearings and joints. It has been fully revised and updated in line with current codes and design practice, modern developments and products.

Thomas Telford

This book contains the proceedings of the fib Symposium “High Tech Concrete: Where Technology and Engineering Meet”, that was held in Maastricht, The Netherlands, in June 2017. This annual symposium was organised by the Dutch Concrete Association and the Belgian Concrete Association. Topics

addressed include: materials technology, modelling, testing and design, special loadings, safety, reliability and codes, existing concrete structures, durability and life time, sustainability, innovative building concepts, challenging projects and historic concrete, amongst others. The fib (International Federation for Structural Concrete) is a not-for-profit association committed to advancing the technical, economic, aesthetic and environmental performance of concrete structures worldwide.

Bridge Management

CRC Press

This volume consists of papers presented at the First International Conference on Bridge Management, held at The University of Surrey, Guildford, UK, from 28-30 March 1990.

Assessment of Bridges' Expansion Joints in Egypt

Extending the Service Life of Existing Bridges by Increasing Their Load Carrying Capacity

Bridge Maintenance, Safety, Management, Life-Cycle Sustainability and Innovations

Economical constraints on the design of bridges usually necessitate the use of as few girders as possible across the bridge width. The girders are typically uniformly spaced transversely

with the deck extending past the fascia girders, thereby resulting in an overhang. While designers commonly employ rules of thumb with regard to the geometry of the overhang, these rules of thumb generally address only the deck in-service strength and deflection requirements, and the effect due to construction load is not considered. In particular, the impact of the overhang on fascia girder behavior during construction is not well understood. Overhang construction often leads to a torsional load on the girder system that can lead to problems in steel and concrete girder bridges during construction. The main issue with concrete girder bridges is excessive lateral rotation in the fascia girder, which can cause potential problems of construction safety and maintenance. Field problems on concrete bridges have been reported in the state of Texas where the fascia girders experienced excessive rotation during construction. For steel girder bridges, the unbalanced overhang loading can lead to both local and global instability. Locally, the overhang brackets often exert a large force on the web plate that can distort the

web and increase the magnitude of the plate imperfection. Global stability problems have occurred primarily on bridge widening projects where a few girders are added to an existing bridge system. The girders in the widening are usually isolated from the existing bridge and the unbalanced load from the overhang can cause excessive twist that intensifies the global stability of the girder system. The objective of this study was to improve the understanding of the bridge behavior due to the unbalanced loading from the overhangs and to identify critical factors affecting the girder behavior. The study was also aimed at developing simple design methodologies and design recommendations for overhang construction. The research included field monitoring, laboratory tests, and parametric finite element analyses. The data from the field monitoring and laboratory tests were used to validate finite element models for both concrete and steel girder bridges. Based on the validated models, detailed parametric studies were conducted to investigate the effects of the unbalanced loading. Results from the parametric studies were used to

identify the geometries of girder systems that are prone to problems with the overhangs as well as to provide design suggestions. In addition, a closed-form solution for lateral rotation in the fascia girder in a concrete girder bridge was derived using a rigid-body model, and was used to develop design methodology and design recommendations for overhang construction.

Spaulding Turnpike Improvements NHS-027-1(37), 11238, Newington to Dover, Strafford and Rockingham Counties

A catalog of bridge deficiencies is developed based on the inspection of over 140 deficient bridges located in Illinois, Florida, Pennsylvania, California, and Tennessee. A classification of structure types is developed for concrete, steel and timber bridges. Deficiencies are related to the structure classification system and a hierarchy of the most common deficiencies established. Techniques presently utilized by state highway departments to correct deficiences are described and evaluated. Several innovative techniques for increasing the load carrying capacity are also described. Utilizing these techniques, increased capacity

values are developed. Cost factors are also analyzed and graphic presentations which show the relative merit of each system are presented.

Compiled Statutes of New Jersey: Abatement - Civil service

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this document should be tested, monitored, or performed as applicable only by individuals holding the appropriate ACI certifications or equivalent." -- Publisher's summary, page 1

Interstate 93 Improvements from Salem to Manchester, Hillsborough and Rockingham Counties

A guide to inspecting, maintaining, and rehabilitating various types of concrete and composite bridges. It also discusses emergency measures you can take to keep bridges operating safely until they can be rehabilitated. It provides civil and structural engineers with methods for conducting safety inspections, condition surveys, and more.

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