The Aashto Lrfd Bridge Design Specifications Section 5

Developed to comply with the fifth edition of the AASHTO LFRD Bridge Design Specifications [2010]--Simplified LRFD Bridge Design is "How To" use the Specifications book. Most engineering books utilize traditional deductive practices, beginning with in-depth theories and progressing to the application of theories. The inductive method in the book us

Up-to-date coverage of bridge design and analysis—revised to reflect the fifth edition of the AASHTO LRFDspecifications Design of Highway Bridges, Third Edition offers detailedcoverage of engineering basics for the design of short- andmedium-span bridges. Revised to conform with the latest fifthedition of the American Association of State Highway andTransportation Officials (AASHTO) LRFD Bridge DesignSpecifications, it is an excellent engineering resource for bothprofessionals and students. This updated edition has beenreorganized throughout, spreading the material into twenty shorter,more focused chapters that make information even easier to find andnavigate. It also features: Expanded coverage of computer modeling, calibration of servicelimit states, rigid method system analysis, and concrete shear Information on key bridge types, selection principles, andaesthetic issues Dozens of worked problems that allow techniques to be appliedto real-world problems and design specifications A new color insert of bridge photographs, including examples ofhistorical and aesthetic significance New coverage of the "green" aspects of recycled steel Selected references for further study From gaining a quick familiarity with the AASHTO LRFDspecifications to seeking broader guidance on highway bridgedesign—Design of Highway Bridges is the one-stop, readyreference that puts information at your fingertips, while alsoserving as an excellent study guide and reference for the U.S.Professional Engineering Examination.

The latest in bridge design and analysis—revised to reflect the eighth edition of the AASHTO LRFD specifications Design of Highway Bridges: An LRFD Approach, 4th Edition, offers up-to-date coverage of engineering fundamentals for the design of short- and medium-span bridges. Fully updated to incorporate the 8th Edition of the AASHTO Load and Resistance Factor Design Specifications, this invaluable resource offers civil engineering students and practitioners a a comprehensive introduction to the latest construction methods and materials in bridge design, including Accelerated Bridge Construction (ABC), ultra high-performance concrete (UHPC), and Practical 3D Rigorous Analysis. This updated Fourth Edition offers: Dozens of end-of-chapter worked problems and design examples based on the latest AASHTO LRFD Specifications. Access to a Solutions Manual and multiple bridge plans including cast-in-place, precast concrete, and steel multi-span available on the Instructor’s companion website From gaining base knowledge of the AASHTO LRFD specifications to detailed guidance on highway bridge design, Design of Highway Bridges is the one-stop reference for civil engineering students and a key study resource for those seeking engineering licensure through the Principles and Practice of Engineering (PE) exam.

An up-to-date introduction to the theory and principles of highway bridge design Design of Highway Bridges offers detailed coverage of engineering basics for the design of short- and medium-span bridges. Based on the new American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications, this comprehensive text is an excellent engineering resource. The book contains: * A historical overview of bridge engineering * Information on key bridge types, selection principles, and aesthetic issues * An in-depth examination of design considerations-including limit states, load and resistance factors, and substructure design * Separate chapters on concrete, steel, and timber structures * System analysis procedures for gravity and lateral loads, plus influence functions and girder-line analysis * Sample problems covering different bridge systems * Selected references for further study, and more Bridges are the lynchpin of the transportation network. They are expensive to build, and how well their design handles the parameters of strength, durability, capacity, and safety can determine the viability of the entire system. Design of Highway Bridges provides a complete introduction to this important area of engineering, with comprehensive coverage of the theory, specifications, and procedures for the design of short- and medium-span bridges. Beginning with an overview of bridge engineering history, the book examines key bridge types, selection principles, and aesthetic considerations. Design issues are then discussed in detail, from limit states and loads to resistance factors and substructure design. Up-to-date with the latest American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications and current system analysis techniques, the text features discrete coverage of concrete, steel, and timber structures. Selected sample problems and references are included to reinforce the concepts presented and give the material a real-world edge. Whether you are aiming to gain quick familiarity with the new AASHTO guidelines or are seeking broader guidance on highway bridge design, this ready reference puts the information you need right at your fingertips.

This research study is aimed at assisting the Texas Department of Transportation(TxDOT) in making a transition from the use of the AASHTO Standard Specifications for Highway Bridges to the AASHTO LRFD Bridge Design Specifications for the design of prestressed concrete bridges. It was identified that Type C and AASHTO Type IV are among the most common girder types used by TxDOT for prestressed concrete bridges. This study is specific to these two types of bridges. Guidelines are provided to tailorTxDOT's design practices to meet the requirements of the LRFD Specifications. Detailed design examples for an AASHTO Type IV girder using both the AASHTO Standard Specifications and AASHTO LRFD Specifications are developed and compared. These examples will serve as a reference for TxDOT bridge design engineers. A parametric study for AASHTO Type IV and Type C girders is conducted using span length, girder spacing, and strand diameter as the major parameters that are varied. Based on the results obtained from the parametric study, two critical areas are identified where significant changes in design results are observed when comparing Standard and LRFD designs. The critical areas are the transverse shear requirements and interface shear requirements, and these are further investigated. The interface shear reinforcement requirements are observed to increase significantly when the LRFD Specifications are used for design. New provisions for interface shear design that have been proposed to be included in the LRFD Specifications in 2007 were evaluated. It was observed that the proposed interface shear provisions will significantly reduce the difference between the interface shear reinforcement requirements for corresponding Standard and LRFD designs. The transverse shear reinforcement requirements are found to be varying marginally in some cases and significantly in most of the cases when comparing LRFD designs to Standard designs. The variation in the transverse shear reinforcement requirement is attributed to differences in the shear models used in the two specifications. The LRFD Specifications use a variable truss analogy based on the Modified Compression Field Theory (MCFT). The Standard Specifications use a constant 45-degree truss analogy method for its shear design provisions. The two methodologies are compared and major differences are noted.

It is important to develop and incorporate the knowledge needed to design, construct, and maintain bridges to have the longest

service life as possible. Consequently, the fatigue effects on bridges need to be considered and more accurately reflected within the proper bridge design specifications. This thesis describes the calibration process used to select the load and resistance factors for the fatigue limit states of steel bridge members within the AASHTO LRFD Bridge Design Specifications. The process presented within this thesis builds upon work completed as part of the Strategic Highway Research Program No. 2 including the determination of the fatigue load model. The resistance model was developed using available fatigue test data and statistically analyzed using specially developed techniques. Load and resistance factors were finally chosen for both Fatigue I and Fatigue II service limit states. We expect the new load and resistance factors for the fatigue service limit states to more accurately capture the fatigue effects of steel bridges and thus increase their service life.

"This report presents the analytical study of the shear capacity of reinforced concrete columns using both the AASHTO LRFD bridge design specifications and the AASHTO guide specifications for the LRFD seismic bridge design. The study investigates various levels of axial load, transverse reinforcement and longitudinal reinforcement to determine who the two specifications compare. The AASHTO guide specifications for the LRFD seismic bridge design permits the designer to use the AASHTO LRFD bridge design specifications or equations within the AASHTO guide specifications for the LRFD seismic bridge design with predetermined values. [...] A parametrical study was extended to conventional full-scale columns, using both the AASHTO LRFD bridge design specifications and the AASHTO guide specifications for the LRFD seismic bridge design to predict shear strength in order to analyze the direct effects of the parameters on the shear strength predictions."--Abstract

The AASHTO LRFD Bridge Construction Specifications are intended for use in the construction of bridges. The specifications employ the Load and Resistance Factor Design (LRFD) methodology, and are designed to be used in conjunction with the AASHTO LRFD Bridge Design Specifications. Revisions from the 3rd edition of this title include a complete revision of Section 3, Temporary Works, and changes to Section 10, Prestressing; Section 11, Steel Structures; Section 19, Bridge Deck Joint Seals; and Section 27, Concrete Culverts.

AASHTO LRFD Bridge Design SpecificationsSI UnitsAASHTO LRFD Bridge Design Specifications Set(Metric Units)Design of Highway BridgesAn LRFD ApproachJohn Wiley & Sons

Glass fiber reinforced polymer (GFRP) materials have emerged as an alternative material for producing reinforcing bars for concrete structures. GFRP reinforcing bars offer advantages over steel reinforcement due to their noncorrosive nature and nonconductive behavior. Due to other differences in the physical and mechanical behavior of GFRP materials as opposed to steel, unique guidance on the engineering and construction of concrete bridge decks reinforced with GFRP bars is needed. These guide specifications offer a description of the unique material properties of GFRP composite materials as well as provisions for the design and construction of concrete bridge decks and railings reinforced with GFRP reinforcing bars.

This work offers guidance on bridge design for extreme events induced by human beings. This document provides the designer with information on the response of concrete bridge columns subjected to blast loads as well as blast-resistant design and detailing guidelines and analytical models of blast load distribution. The content of this guideline should be considered in situations where resisting blast loads is deemed warranted by the owner or designer.