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| Soggetti                | Bridges - Design and construction<br>Bridges - Evaluation<br>Bridges - Maintenance and repair<br>Load factor design  |
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| Note generali           | Description based upon print version of record.  |
| Nota di bibliografia    | Includes bibliographical references and index.   |
| Nota di contenuto       | Cover; Title Page; Copyright; Contents; Preface; Chapter 1 Introduction;<br>1.1 Bridge Engineering and Highway Bridge Network; 1.2 Types of<br>Highway Bridges; 1.3 Bridge Construction and Its Relation to Design;<br>1.4 AASHTO Specifications and Design and Evaluation Methods; 1.5<br>Goals for Bridge Design and Evaluation; 1.6 Preliminary Design versus |

Detailed Design; 1.7 Organization of This Book; References; Chapter 2 Requirements for Bridge Design and Evaluation; 2.1 General Requirements; 2.2 Limit States; 2.2.1 General Formulation of Limit State Load Combination; 2.2.2 Strength Limit State 2.2.3 Extreme-Event Limit State; 2.2.4 Service Limit State; 2.2.5 Fatigue and Fracture Limit State; 2.3 Constructability; 2.4 Safety; 2.4.1 Uncertainty in Design and Evaluation; 2.4.2 Modeling Uncertainty Using Probability Theory; 2.4.3 Reliability Index for Quantifying Bridge Reliability or Safety; 2.4.4 Reliability Considerations for Bridge Design and Evaluation (Load Rating); 2.4.5 Calibration for AASHTO LRFD Specifications; 2.4.6 Determination of Load and Resistance Factors for AASHTO LRFD Specifications; 2.4.7 Calibration for AASHTO LRFR Specifications 2.4.8 Future Research Work for Calibration; 2.5 Serviceability; 2.5.1 Clearance; 2.5.2 Durability; 2.5.3 Maintainability; 2.5.4 Rideability; 2.5.5 Deformation Control; 2.5.6 Utilities; 2.5.7 Allowance for Future Widening; 2.6 Inspectability; 2.7 Economy; 2.8 Aesthetics; 2.9 Summary; References; Problems; Chapter 3 Loads, Load Effects, and Load Combinations; 3.1 Introduction; 3.2 Permanent Loads; 3.2.1 Dead Loads DC, DW, and DD; 3.2.2 Permanent Earth Loads EH, EV, and ES; 3.2.3 Other Permanent Loads; 3.3 Transient Loads; 3.3.1 Vehicle-Related Transient Loads 3.3.2 Non-Vehicle-Related Transient Loads; 3.4 Load Combinations; 3.4.1 General Formulation of Load Combination; 3.4.2 Strength Limit States and Load Factors; 3.4.3 Extreme-Event Limit States and Load Factors; 3.4.4 Service Limit States and Load Factors; 3.4.5 Fatigue Limit States; References; Problems; Chapter 4 Superstructure Design; 4.1 Introduction; 4.2 Highway Bridge Superstructure Systems; 4.2.1 Beam Bridges; 4.2.2 Truss Bridges; 4.2.3 Arch Bridges; 4.2.4 Cable-Stayed Bridges; 4.2.5 Suspension Bridge Systems; 4.3 Primary Components of Highway Bridge Superstructure; 4.4 Deck Systems 4.4.1 Reinforced Concrete Slab System; 4.4.2 Timber Deck System; 4.4.3 Metal Grid Deck System; 4.4.4 Orthotropic Steel Deck System; 4.4.5 Fiber-Reinforced Polymer Deck System; 4.5 Deck-Supporting Systems; 4.5.1 Prestressed Concrete Beams; 4.5.2 Steel Beams; 4.5.3 Slab Superstructure; 4.5.4 Steel Trusses; 4.5.5 Concrete Arches; 4.5.6 Steel Arches; 4.6 Design of Reinforced Concrete Deck Slabs; 4.6.1 Design Requirement and Parameters; 4.6.2 General Traditional Design Method and Empirical Design Method; 4.6.3 Traditional Design; 4.6.4 Dead- and Live-Load Effects for Interior Bays; 4.6.5 Strength I and Service I Limit State Design for Interior Bays

## Sommario/riassunto

A succinct, real, world approach to complete bridge system design and evaluation/b/ Load and Resistance Factor Design (LRFD) and Load and Resistance Factor Rating (LRFR) are design and evaluation methods that have replaced or offered alternatives to other traditional methods as the new standards for designing and load, rating U.S. highway bridges. Bridge Design and Evaluation covers complete bridge systems (substructure and superstructure) in one succinct, manageable package. It presents real, world bridge examples demonstrating both their design and evaluation using LRFD and LRFR. Designed for a 3, to 4, credit undergraduate or graduate, level course, it presents the fundamentals of the topic without expanding needlessly into advanced or specialized topics. Important features include: Exclusive focus on LRFD and LRFR/Hundreds of photographs and figures of real bridges to connect the theoretical with the practical. Design and evaluation examples from real bridges including actual bridge plans and drawings and design methodologies/Numerous exercise problems/Specific design for a 3, to 4, credit course at the undergraduate or graduate

level/The only bridge engineering textbook to cover the important topics of bridge evaluation and rating, Bridge Design and Evaluation is the most up, to, date and inclusive introduction available for students in civil engineering specializing in structural and transportation engineering

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