



Innovative Bridge Design Handbook: Construction, Rehabilitation and Maintenance

From Butterworth-Heinemann

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Innovative Bridge Design Handbook: Construction, Rehabilitation and Maintenance From Butterworth-Heinemann

As known, each bridge presents a unique set of design, construction, and maintenance challenges. The designer must determine the appropriate methods and level of refinement necessary to design and analyze each bridge on a case-by-case basis. *The Innovative Bridge Design Handbook: Construction, Rehabilitation, and Maintenance* encompasses the state of the art in bridge design, construction, maintenance, and safety assessment. Written by an international group of experts, this book provides innovative design approaches used in various parts of the world and explores concepts in design, construction, and maintenance that will reduce project costs and increase structural safety and durability. Furthermore, research and innovative solutions are described throughout chapters.

The Innovative Bridge Design Handbook: Construction, Rehabilitation, and Maintenance brings together the specific knowledge of a bevy of experts and academics in bridge engineering in the areas of design, assessment, research, and construction. The handbook begins with an analysis of the history and development of bridge aesthetics and design; various types of loads including seismic and wind loads are then described, together with fatigue and fracture. Bridge design based on material such as reinforced concrete, prestressed reinforced concrete, steel and composite, timber, masonry bridges is analyzed and detailed according to international codes and standards. Then bridge design based on geometry, such as arch bridges, girders, cable stayed and suspension bridges, is illustrated. This is followed by a discussion of a number of special topics, including integral, movable, highway and railway bridges, together with seismic component devices, cables, orthotropic decks, foundations, and case studies. Finally, bridge construction equipment, bridge assessment retrofit and management, bridge monitoring, fiber-reinforced polymers to reinforce bridges, bridge collapse issues are covered.

- Loads including seismic and wind loads, fatigue and fracture, local effects
- Structural analysis including numerical methods (FEM), dynamics, risk and reliability, innovative structural typologies
- Bridge design based on material type: RC and PRC, steel and composite,

timber and masonry bridges

- Bridge design based on geometry: arch bridges, girders, cable stayed and suspension bridges
- Special topics: integral, movable, highway, railway bridges, seismic component devices, cables, orthotropic decks, foundations
- Construction including construction case studies, construction equipment, bridge assessment, bridge management, retrofit and strengthening, monitoring procedures

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Editorial Review

From the Back Cover

Each bridge presents a unique set of design, construction and maintenance challenges. The designer must determine the appropriate methods and level of refinement necessary to design and analyze each bridge on a case-by-case basis. **Bridge Design and Construction Handbook** encompasses the state-of-the-art in bridge design, construction, maintenance and safety assessment. Written by an international group of contributors, this book provides innovative design approaches used in various parts of the world and develop concepts for design, construction, and maintenance that will reduce project cost and increase structural durability.

Bridge Design and Construction Handbook brings together the specific knowledge of bridge engineering dealing with design, assessment, research and construction. The handbook begins with an analysis of the history and development of bridges aesthetic and design, Loads including seismic, and wind loads, fatigue and fracture, creep and shrinkage, local effects, LRDF designs and Bridge Design based on Geometry: Arch bridges, curved bridges, Long span bridges and suspension bridges. This is followed by a discussion of Special bridge structures: segmental bridges, movable bridges, masonry bridges, timber bridges, railway bridges. Bridge foundations, construction practices, inspection and maintenance systems are also covered. Every chapter is subdivided into two parts, the first concerning design issues, and the second covering numerical modeling methods.

About the Author

Alessio Pipinato obtained a bachelor's degree in building and structural engineering from the University of Padua, and a bachelor's degree in architecture from the University of Venice-IUAV. He earned his PhD at the University of Trento in structural design. He served as an adjunct professor, teaching university courses in bridge engineering and structural design, and has been a research collaborator at the University of Padua for more than ten years in the structural engineering sector (ICAR09-08B3). His twelve years of engineering career encompasses founding his own engineering consulting firm, AP&P, serving as the CEO, scientific and technical director; and providing bridge, structural engineering, research and development (R&D) services. He is/has been a member of the American Society of Civil Engineers (ASCE), Structural Engineering Institute (SEI), International Association for Bridge and Structural Engineering (IABSE), Associazione Italiana Calcestruzzo Armato e Precompresso (AICAP), International Association of Railway Operations Research (IAROR), Collegio Tecnici dell'Acciaio (CTA), International Association for Life Cycle Civil Engineering (IALCCE), International Association for Bridge Maintenance and Safety (IABMAS), Collegio Ingegneri Ferroviari Italiani (CIFI), European Convention for Constructional Steelwork (ECCS), and American Institute of Architects (AIA). He is also the author of more than 200 scientific and technical papers on structures and bridges, the chair of international conference sessions (including IABMAS 2010, Philadelphia; and IABMAS 2012, Milan). In addition, he is peer revisor of many international structural engineering journals, including the ASCE Journal of Bridge Engineering, Engineering Structures, Structure and Infrastructure Engineering, International Journal of Fatigue, and Journal of Structural Engineering. He has participated in a number of international research projects. His research interests includes the design, analysis, and assessment of bridges; structural analysis and design; fatigue and fracture of steel bridges; reliability analysis; life cycle assessment; probabilistic analysis; design of innovative structure and application of new materials in structures; construction control design, and fast bridge construction. He has

won many international and national awards during his professional and academic career, and he served as a volunteer in the evaluation of structures during seismic emergencies for the National Service of the Civil Protection (L'Aquila 2009, Emilia Romagna 2012).

Users Review

From reader reviews:

William Vogt:

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