



# Bridge Engineering, Third Edition (Mechanical Engineering)

By Jim J. Zhao, Demetrios E. Tonias

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- Highway bridge structures
- Project inception
- Project funding
- Design standards
- Bridge inspection and site survey
- Physical testing
- As-built plans and other record data
- Superstructure types
- Deck types
- Wearing surface types
- Deck joint types
- Design loads
- Design methods
- Internal forces
- Load distribution
- Concrete deck slabs
- Composite steel members
- Plate girder design
- Continuous beams

- Protecting steel superstructures
- Load rating
- Prestressed concrete
- Substructure design
- Abutments
- Piers
- Bearings
- Managing the design process
- Contract documents
- Bridge management systems

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### About the Author

**Jim J. Zhao, P.E.**, is Chief Bridge Engineer with Nolan Associates, Inc., where he is in charge of bridge design and overall project management. He is experienced in design, teaching, and research in structural engineering and serves on the ASCE-ACI joint committees on Concrete Bridge Design and on Prestressed Concrete Design. Mr. Zhao is also the president of the Structural Engineering Institute, ASCE Maryland Chapter. He is the author of two books on bridge design and one on risk management.

**Demetrius Tonnias, P.E.**, is an award-winning author of numerous works on civil and transportation engineering. As a member of the Adjunct Engineering Faculty of Union College, he taught a variety of courses, including Bridge and Highway Engineering, Infrastructure Management Systems, and refresher courses for the E.I.T. and PE professional licensing examinations. Mr. Tonnias is an accomplished software developer with extensive experience in the development of civil engineering computer applications.

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