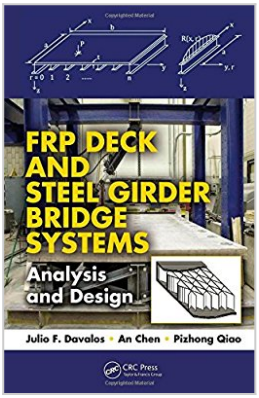

FRP Deck and Steel Girder Bridge Systems: Analysis and Design (Composite Materials)

By Julio F. Davalos, An Chen, Pizhong Qiao

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Fiber-reinforced polymer (FRP) decks have been increasingly used for new construction and rehabilitation projects worldwide. The benefits of using FRP bridge decks, such as durability, light weight, high strength, reduced maintenance costs, and rapid installation, outweigh their initial in-place material costs when implemented in highway bridge projects. **FRP Deck and Steel Girder Bridge Systems: Analysis and Design** compiles the necessary information to facilitate the development of the standards and guidelines needed to promote further adoption of composite sandwich panels in construction. It also, for the first time, proposes a complete set of design guidelines.

Providing both experimental investigations and theoretical analyses, this book covers three complementary parts: FRP decks, shear connectors between the deck and steel girders, and the behavior of bridge systems. The text presents stiffness and strength evaluations for FRP deck panels and FRP deck-girder bridge systems. While the FRP deck studies focus on honeycomb FPR sandwich panels over steel girder bridge systems, they can be adapted to other sandwich configurations. Similarly, the shear connection and bridge system studies can be applied to other types of FRP decks. Chapters discuss skin effect, core configuration, facesheet laminates, out-of-plane compression and sheer, mechanical shear connectors, and FRP deck–steel girder bridge systems.

Based on the findings described in the text, the authors propose design guidelines and present design examples to illustrate application of the guidelines. In the final chapter, they also provide a systematic analysis and design approach for single-span FRP deck-stringer bridges. This book presents new and improved theories and combines analytical models, numerical analyses, and experimental investigations to devise a practical analysis procedure, resulting in FRP deck design formulations.

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Editorial Review

About the Author

Dr. Julio F. Davalos is a professor and chair of the Department of Civil Engineering at the City College of New York – CUNY. His expertise is in mechanics and structural engineering, and his research work includes theoretical and experimental studies on advanced materials and systems. His work is directed to civil infrastructure rehabilitation, protection, and sustainable construction, with particular emphasis on highway bridges, buildings, and mass transit tunnels. Dr. Davalos has been honored with over 60 academic/state/national awards for teaching, research, and innovative designs and concepts, and he holds several patent applications in materials and structures. His publications record, approximately 300 articles, includes several position papers and book chapters.

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