

Editor's Note

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The November 2011 issue of *Practice Periodical on Structural Design and Construction* contains seven papers and a forum. These papers deal with a variety of engineering problems that appeal to practicing engineers.

This issue is unique, since it has two articles covering historical aspects of bridge engineering—both by Francis Eugene Griggs. One of these papers provides an overview of nineteenth-century metal arch bridges, including historical data on the use of cast iron and steel replacing wooden arch systems by the late nineteenth century. The second paper deals with an overview of moveable bridges. This paper provides a history of movable bridges built in the United States. These two papers are informative and provide readers with some historical aspects of structural engineering pertaining to the two types of bridges noted.

This issue of the *Journal* includes a paper by Joseph Danatzko and Halil Sezen on the subject of sustainability as applied to structural design. This is an important and timely topic, and the authors include examples of applications that describe and address issues associated with the methodologies for the most sustainable structural designs. The paper explains that combinations of two or more methodologies may enable design professionals to produce more sustainable designs.

On the subject of limiting effects of construction vibrations, Ungar et al. address concerns regarding the effects of construction-related vibrations on sensitive instrumentation and activities. The availability of related vibration criteria is noted, the limitations of these criteria are explored, and difficulties in meeting some of the vibration limits are discussed in the paper. The paper is among the very few addressing these issues in the *Journal*, and it educates the readers on what design engineers may face when dealing with vibration effects on sensitive equipment at construction sites.

Jingjuan Li and Genmiao Chen present a paper on live load computations in bridges. The model presented is intended as a

means to simplify the analysis needed for the computation of live loads using elastic spring elements to simulate the reaction of main girders to the deck system. Live load distribution factors are also derived according to the maximum reaction of each spring element under random truck loads. Results from the proposed model are compared with those from bridge design specifications. The model presented is practical and can be useful in situations in which a quick estimate of live loads with adequate accuracy is needed.

This issue of the *Journal* includes a paper by Attanayake et al. discussing three-dimensional modeling and analyses of orthotropic bridge decks using a representative volume element. For those readers unfamiliar with “representative element,” this paper provides some general information and a practical application on the subject. The purpose of this type of analysis is to simplify complex structures utilizing a rather small segment of the system as a representative of the entire structure. The paper provides a numerical example of the application of the model to a prototype bridge superstructure analysis. As explained in the paper, such three-dimensional simplified models can be developed for calculating load demands using stiffness matrices of representative elements in conjunction with available structural analysis programs.

Finally, the paper by Kim et al. presents a case study on the settlement rehabilitation of a 35-year-old building. As discussed in the paper, the foundation system of the northwest wing of the building consists of strip footings and slab on grade. Differential settlements resulted in cracking of the masonry partition walls located on the footing, and hence, rehabilitation of the footing was required to stabilize the foundation system. The paper provides a practical solution to repair a building by implementing a push-pile method to terminate the continuous settlement of the foundation system of the building.

The seven papers and the forum in this issue present important design and construction subjects of much interest. Readers are invited and encouraged to discuss the topics included in the forum and provide their comments on the other subjects covered in this issue of the *Journal*.