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Editorial

This issue leads off with a paper by Najm on "Assessment of AASHTO LRFD Guidelines for analysis of regular bridges subjected to transverse earthquake ground motions." The author evaluates the two procedures given in AASHTO LRFD specifications for the transverse analysis of regular bridges subjected to transverse earthquake ground motions. The Single Mode Spectral Analysis (SMSA) method and the Uniform Load (UL) method are evaluated for different bridge geometries, rigidities, and ground motion levels and were also compared to the sine shape function approximation and the computer methods. Two-span, three-span and four span continuous units were investigated. The effect of reduced column stiffness was also evaluated. The results from this study showed that for some bridges in certain seismic zones, the differences in column elastic shears and deformations from the UL method can be about 10% to 12% lower than those from the SMSA method and the other methods. Abutment elastic forces from the UL method were about 25% to 300% higher than those from the SMSA and other methods. The paper concludes that the UL method, although permitted by AASHTO LRFD, may not be a conservative analysis method for predicting pier forces for certain bridges. The method also significantly over estimates abutment forces for certain bridges making their design uneconomical. Load test of existing concrete and masonry bridges appears to be an alternative way of verifying structural safety. Throughout the last decade, methods and equipment for in situ loading tests have been improved significantly. In "Loading Vehicle BELFA development and experience gained in 10 years of practice," Gutermann and Schröder discuss the underlying concept. Speed of construction, particularly for bridge replacement and repair projects, has become a critical issue to minimize disruption of traffic. A precast bridge system using decked bulb tee prestressed concrete girders provides an attractive solution for rapid construction. This type of bridge includes manufacturing the bridge deck precast and pretensioned with the girder in the precast plant under controlled environment. Then, the precast girders are transported to the construction site, and placed over the abutments and piers beside each other with flanges of adjacent girders field connected. Longitudinal joints parallel to traffic direction provide load transfer between adjacent girders. In "Development and study of deck joints in prefabricated concrete bulb-tee bridge girders: Conceptual design," Sennah and Afefy present a new bridge deck slab flange-to-flange connection system for precast Deck Bulb Tee (DBT) girders. The objective of this study is to develop moment-transferred and intermittent-bolted connections for DBT bridge girders in view of the ultimate strength of the connection system. Two types of moment-transferring connection and two types of intermittent-bolted connection are developed. The paper presents design procedure of the developed joints based on available design equations in North American design codes for bridges and structures as well as related design equations available in the literature. In "Development and study of deck joints in prefabricated concrete bulb-tee bridge girders: Experimental evaluation," Afefy et al provide details of fabrication and loading to failure of five actual-size bridge panels, to qualify these joints for use in acceleration bridge construction. The authors examined the effect of the detailing of the moment-transferred connection along with the level of the fixity of the connecting steel plates of intermittent-bolted connection. The developed joint is considered successful if the theoretical resistance satisfies the requirements specified in North American Bridge Codes. The authors conclude that the type and details of the deck slab joint affect the ultimate load carrying capacity of the developed connections and that bridge engineers can use the proposed connection system in order to design bulb-tee girder system to accelerate bridge construction.

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