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Editorial

This issue of *Bridge Structures* leads off with a paper by Azizinamini and Yakel on "Delayed development of composite action in steel girder bridges". Development of a bridge system where composite action is developed after the concrete has hardened would reduce the extent of cracking observed in bridge decks, while elimination of shear studs would reduce the potential tripping hazard to workers. To achieve these goals, the authors performed a number of component level tests along with two prototype beam tests, and details of the testing are described in the paper. Structural health monitoring involves the scaling of time and space variables. The use differs widely with reference to ranges of the space and time scales, even when the application is narrowed down to aeronautics and civil engineering structures. Reliable evaluation of the structural integrity depends on the connection between data acquisition and interpretation. The fulfillment of this link can vary from the most obvious to the very subtle. Therefore it is prudent that the effectiveness of the monitoring technology be identified with signal recognition.

In his paper, "Signal recognition of fatigue crack growth in bridge structures connected to specimen behavior", Sih investigates the failure of bridge structural members by fatigue crack propagation. The current AASHTO LRFD provisions were developed for short span bridges, whereas typical cable-stayed bridges have much longer spans. Therefore, a factor of 1.4 is recommended in the Post-Tensioning Institute (PTI) Guide Specifications entitled "Recommendations for Stay Cable Design, Testing and Installation". The engineer is also given the option of performing "a more rigorous analysis" in lieu of using the 1.4 factor. However, the adequacy of the recommended 1.4 factor has not been examined for different types of cable-stayed bridges.

In their paper, "Monte Carlo simulation of cable fatigue stresses in two cable-stayed bridges", Tabatabai and Lee aimed to test the validity of the PTI fatigue factor on two cable-stayed bridges with differing structural systems, one with two planes of stays terminating at concrete edge girders on either side of the roadway, and the other with a single plane of stays terminating at the center of a box girder superstructure. The authors conclude that their limited study of two bridges indicates that the PTI recommended factor of 1.4 times the effect of AASHTO LRFD fatigue truck is a reasonable and generally conservative approximation for calculating the live-load-induced fatigue effects in stay cables.

Possible limit states associated with flange and web deformations in W and HP sections, and posts used in bridge falsework constructions, are investigated in "Design of bridge falsework for gravity loads", by Pekcan *et al.* The authors found that critical limit states are related to flange bending, post compression, and the interactions associated with complex patch loading. Other limit states are associated with web deformations. Two alternative methods, based on a yield line analysis that establishes upper-bound limiting loads for these limit states, are proposed. The first method accounts for an interaction between flange bending and post compression strength, whereas the second method uses an effective bearing area of the post. The critical web limit state was due to web yielding. Design recommendations and equations are presented with two design examples.

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