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Editorial

This issue of *Bridge Structures* leads off with a paper by Yarnold *et al.* on "Local buckling analysis of trapezoidal rib orthotropic bridge deck systems". The paper studies the behavior of local buckling in trapezoidal rib orthotropic bridge deck systems. Parametric analyses were performed using the finite element method to compare local buckling of the rib walls (webs) and deck plate by varying the corresponding width-to-thickness ratios. The results demonstrate a reduction in the capacity of the deck system at which local buckling is initiated in the rib walls due to the existence of negative bending moment near the floorbeams in addition to the global axial forces.

Filled grid decks offer a lightweight and high strength deck alternative to reinforced concrete decks. Better understanding of grid deck behavior accompanied with optimized manufacturing process and improved design can avoid poor details and provide optimum grid deck performance. In "Strength behavior of filled steel grid decks for bridges", Huang *et al.* present the results of three full-scale experimental tests on filled grid decks to quantify their structural behavior. The authors conducted parametric studies to quantify the effect of variations in the significant design parameters.

In "Evaluation of creep effects on the time-dependent deflections and stresses in prestressed concrete bridges", Hedjazi *et al.* investigate time-dependent deflections, stresses and internal forces in prestressed concrete box-girder bridges due to the creep of concrete. The authors utilize ABAQUS software to develop three-dimensional finite-element models, which include the effects of the load history, material nonlinearity, creep and aging of concrete, for the analysis of balanced-cantilever segmental bridges. The three-dimensional shell elements are used for modeling box-girder walls, while rebar elements are used for modeling prestressing tendons. The step-by-step procedure allows simulating construction stages, effects of time-dependent deformations of materials and changes in the bridges' structural system.

Several fascia beams of an existing prestressed concrete box-girder bridge, located in the City of Defiance, Ohio, USA, were severely deteriorated due to the influence of deicing salt applied during wintertime. An in-depth visual inspection and subsequent full-scale load tests were conducted to identify the extent of deterioration. A strengthening strategy was devised involving advanced carbon fiber reinforced polymer (CFRP) composite strips, post-tensioned via the StressHead System that was developed and patented in Switzerland. In "Preservation of Hopkins Street Bridge via externally bonded prestressed CFRP laminates", Zoghi and Foster present the application of this technique, which is sponsored by the US Federal Highway Administration (FHWA) through the Innovative Bridge Research and Construction (IBRC) Program. The IBRC Program promotes the use of new materials and construction techniques for the repair, rehabilitation, replacement, or new construction of bridges and other structures.

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