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Editorial

This issue of *Bridge Structures* leads off with a paper by Cisneros and White on "Building steel bridges in New York, Virginia, Pennsylvania and Maryland: progressive application of LRFD to steel bridge erection engineering." The authors provide illustrations from several highway bridge projects in four states to explain the transition from Service Load/Allowable Stress (SLD/ASD) to Load and Resistance Factor Design (LRFD) in steel bridge superstructure erection. The paper discusses the preference often exercised by bridge erectors in applying construction means and methods toward achieving specified geometry within alignment tolerances. In "Application of diagnostic load testing and 3D-FEA in load rating of RC box culverts," Das performs load rating analysis on four reinforced concrete box culverts using a combination of 3-D finite element analysis and diagnostic load testing. Three of these culverts were constructed prior to the 1940s whereas the fourth one was constructed in 1985. Based on the conventional rating analysis procedures, the majority of these culverts would currently be posted for North Carolina legal loads. Culvert types included in this project are comprised of double, triple and quadruple barrels that are either skewed or square and having their unique geometric, material and structural characteristics. The author compares results of the analysis based on 3D-FEA versus those obtained using the conventional rating analysis procedures. Accounting for the effects of waterway vessel collision is a necessary consideration in the analysis of bridge pier structures that span navigable waterways. During collision events, impact forces are transferred along the interface between the impacting vessel and the impacted pier component. Vessel collision forces are dynamic in nature, and in turn, are coupled with dynamic bridge response. Further, the maximum magnitude of the impact forces is sensitive to the geometry of the impacted pier component. In "Computing the responses of bridges subject to vessel collision loading using dynamic analysis," Davidson et al. highlight this coupling effect in vessel-bridge collisions. Under the effect of medium and large intensity ground motions, the seismically-induced lateral cyclic displacements in steel H-piles of integral bridges could be considerable. As a result, the piles may experience cyclic plastic deformations following a major earthquake. This may result in the reduction of their service life due to low-cycle fatigue effects. Dicleli and Erhan investigate "Low cycle fatigue effects in integral bridge steel H-piles under seismic displacement reversals." The authors consider three different existing integral bridges; with one, two and three spans. The authors report that fatigue analyses results reveal that earthquakes with large intensity may reduce the service life of the piles with non-compact sections.

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