

HIGH-RISE TOWER CRANE CONTINUUM MODELING AND OPERATIONAL ANALYZING

Zhi Sun, Yuxiong Yan

Summary

Tower crane is the most generally used construction equipment for civil engineering structures. This paper proposes a method on dynamic modeling and vibration response analysis for high-rise tower cranes in operation. Concerning that tower crane structure is a beam-like lattice structure; a continuum modeling technique is firstly proposed to model the tower crane segment as a box girder element. The modeling based on this element will greatly reduce the number of degrees of freedom for tower crane dynamic analysis and thus improve analyzing efficiency. Based on the equivalent beam model, dynamic response of the tower crane induced by lifting, rotation and pendulum motion of the payload will be analyzed. The obtained responses are used for safety and serviceability assessment of the tower crane in operation.

