Numerical analysis of reinforced concrete columns strengthened by steel tubes under sustained and short-term loadings

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Abstract:

This paper used the finite element method to predict models of strengthening RC columns under short-term loading and long-term loading. The present study is an attempt to predict time-dependent behaviour of reinforced concrete columns confined by steel square tube using model proposed by ACI 209R. Comparison of calculating results using this model shows a good agreement with the test results. Based on the results of an available experimental study of concrete filled steel tube, this paper presents a parametric study using finite element models carried out with the aim of analyzing the long-term behaviour of plain concrete columns strengthened by steel plate. The results of the study are used to analyse the effect of different factors on strengthened column (the magnitude of sustained load, the concrete compressive strength and length/thickness ratio).