

BEHAVIOR OF POST AND PRE-HEATED RC SHORT COLUMNS WRAPPED WITH FERROCEMENT

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Abstract.

In this work, experimental and numerical studies were carried out to investigate the behavior of pre- and post-heated RC short columns wrapped by ferrocement overlays. Ten RC columns were constructed and tested experimentally under axial load. The tested columns were divided into unheated columns, post-heated columns, post-heated columns repaired with ferrocement, and heated wrapped columns. All heated columns were heated to a temperature of 300°C for 3 hours. The experimental results were utilized for validation of the finite element models which developed by using ANSYS 13 software package. Based on the experimental and numerical results an equation was suggested to predict the ultimate load of post heated RC short columns wrapped by ferrocement. Afterwards, a wide range of the analysis was conducted models were analyzed to observe the effect of other parametric studies on the enhancement of axial load of post-heated columns confined by ferrocement. The results of the design equation were mutually compared with both the experimental and numerical ones. The research proved that the repairing scheme has an efficiency in surpassing the failure load and improving the ultimate strength of heated columns significantly. The results of both the finite element and the prediction of the equation gave a satisfactory agreement with experimental ones.