

Numerical Approach of RC Structural Members Exposed to Fire and After-Cooling Analysis

Authors : Ju-young Hwang, Hyo-Gyoung Kwak, Hong Jae Yim

Abstract : This paper introduces a numerical analysis method for reinforced-concrete (RC) structures exposed to fire and compares the result with experimental results. The proposed analysis method for RC structure under the high temperature consists of two procedures. First step is to decide the temperature distribution across the section through the heat transfer analysis by using the time-temperature curve. After determination of the temperature distribution, the nonlinear analysis is followed. By considering material and geometrical non-linearity with the temperature distribution, nonlinear analysis predicts the behavior of RC structure under the fire by the exposed time. The proposed method is validated by the comparison with the experimental results. Finally, Prediction model to describe the status of after-cooling concrete can also be introduced based on the results of additional experiment. The product of this study is expected to be embedded for smart structure monitoring system against fire in u-City.

Keywords : RC structures, heat transfer analysis, nonlinear analysis, after-cooling concrete model

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