

Effect of Concrete Characteristic Strength on Residual Load Capacity of Columns Subjected to Fire Load Using Numerical Analysis

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The current research work deals with the effect of variant concrete characteristic strength and different column cross-sectional dimensions (rectangularity ratio) of scalar reinforced concrete short columns model on the residual load capacity after firing using numerical analysis. The numerical analysis was conducted using three-dimensional nonlinear F.E.A program (Ansys10). The temperature distribution in the concrete columns sections is according to ISO-834 Standard Fire curve. The temperature introduced to F.E.A program is 600°C with 20 min of firing time. In the beginning, a comparison between previous experimental work and numerical analysis using F.E.A. program was done to show the conformity. Next, an extensive numerical analysis was done for twenty-seven scalar models classified to three groups according to column dimensions, fire duration, and concrete characteristic strength. The present study indicated that, the high effect of concrete characteristic strength and rectangularity ratio on columns residual load capacity after firing.

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