

Effect of Variant in Concrete Cover and Percentage of Steel Reinforcement on Residual Load Capacity for Reinforced Concrete Columns Exposed to Fire

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This paper presents the effect of variant in concrete cover and percentage of steel reinforcement for reinforced concrete scalar models column residual load capacity under fire exposure using finite element analysis program (Ansys10). The temperature distribution in the section of concrete columns according to ISO-834 Standard Fire curve at 600 °C and at 30 min. of fire time, which is then input in F.E.A program ANSYS. Forty-five scalar models under investigation were classified according to columns model cross-sections to three groups. The effective parameters presented in this study are concrete cover and percentage of steel reinforcement of concrete column cross-section. The variance of the concrete cover is 1, 2 and 3 cm of concrete cover, the variance of percentage of steel reinforcement nearly 1, 2 and 3% of concrete column cross-section. The numerical results indicated that FEM was found to be an effective method for analyzing the behavior of reinforced concrete columns subjected to elevated temperature. Also, residual load capacity after fire were increased by increasing concrete cover and increased by increasing the percentage of main steel reinforcement. However, column load capacity for square cross-section columns was more than that for rectangular cross-section columns due to reduction in perimeter which was exposed to fire.

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أسماء المشرفين على الرسالة :

أ.د./ مجدي علي عبد العزيز اليماني - أ.د./ أيمن أحمد عيد شاهين - د/ خالد محمد أحمد عثمان

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