

Effect of Reinforcement Steel Ratio on the Behavior of R. C. Columns Exposed to Fire

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Abstract : This research paper experimentally investigates the effect of burning by fire flame from one face on the behavior and load carrying capacity for reinforced columns. Residual ultimate load carrying capacity, axial deformation, crack pattern and maximum crack width for column specimens with and without burning were recorded and discussed. Tested six reinforced concrete columns were divided into control specimen and two groups. The first group was exposed to a fire with a different temperature (300, 500, 700 °C) for an hour with reinforcement ratio 0.89% and the second group was exposed to a fire with a temperature 500 °C for an hour with different reinforcement ratio (0.89%, 2.18%, and 3.57%), then all columns were tested under short-term axial loading. From the obtained results, it could be concluded that the fire parameters significantly influence the fire resistance of R.C columns. The fire parameters cause axial deformation and moment on the column due to the eccentricity that generated from the difference in temperature and consequently the compressive stresses of both faces of the columns but the increased reinforcement ratio enhanced the resistance of columns for axial deformation and moment on the column due to the eccentricity.

Keywords : columns, reinforcement ratio, strength, time exposure

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