بحث رقم (٣)

عنوان البحث (باللغة التى نشر بها) :

Behavior of Eccentrically Loaded Hybrid Fiber-Reinforced High Strength Concrete Columns Exposed to Elevated Temperature

مكان النشر (بلغة مكان النشر)

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The aim of this study is to evaluate the effect of elevated temperature on the properties of hybrid fiber reinforced high strength concrete (HFRHSC) and columns under eccentric loading. For this purpose, seven high-strength concrete (HSC) mixtures were prepared, one mixture without fiber and six mixtures containing steel fiber (SF), polypropylene fiber (PP), glass fiber (GF), (SF þ PP), (SF þ GF), and (GF þ PP). Fourteen HSC columns were cast (i.e. two columns for each mixture) and tested under eccentric loading with an eccentricity ratio of (e/t ¼ 0.75). Seven columns were kept at room temperature and the other seven were tested after being exposed to 600 _C for 1 h. The experimental results indicated that addition fibers lead to an increase in compressive, tensile and flexural strengths of HSC, while the influence of PP and GF fibers is insignificant in an increase of compressive strength. The elevated temperatures had an adverse influence on the mechanical properties of HSC. The results also revealed that HSC columns containing fibers had ultimate loads, ultimate moment capacities, toughness and temperature resistance higher than those of HSC concrete columns without fibers. The ultimate load, ductility and toughness decreased after exposure to elevated temperature. Finally, the load-moment (P-M) interaction diagrams of the tested columns were generated theoretically to compare the experimental results with theoretical ones.