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عنوان البحث :

Behavior of Eccentrically Loaded R.C. Columns confined with CFRP Composites

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Abstract - The scope of this research is to study experimentally the behavior of reinforced concrete slender columns strengthened with carbon fiber-reinforced polymer (CFRP) under the effects of eccentric loadings. A total of twelve R.C. rectangular columns were cast and tested experimentally. Eight columns have a dimension of 100*150 *1700 mm whereas the other four specimens have 100*150*1900 mm. Among the tested samples, three unwrapped columns were chosen as reference specimens, while the other nine columns were wrapped by CFRP composites. The columns were tested under the effects of concentrated load accompanied with eccentricity. The investigated variables in this experimental program, include different wrapping schemes, the thickness of the CFRP layer, column slenderness, and load eccentricity. The experimental results show a significant enhancement on the performance of wrapped columns by CFRP sheets compared to unwrapped columns. The load carrying capacity and the ductility of columns were visibly improved by wrapping CFRP sheets around the columns. It was found that the partial and full CFRP jacket can significantly improve the ultimate load capacity by 55%–75% respectively.