عنوان مقاله:

Cyclic and Monotonic Behavior of Strengthened and Unstrengthened Square Reinforced Concrete Columns

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خلاصه مقاله:

The use of composite materials is an effective technique to enhance the capacity of reinforced concrete columns subjected to the seismic loading due to their high tensile strength. In this paper, numerical models are developed in order to predict the experimental behavior of square reinforced concrete columns strengthened by glass fiber reinforced polymer and steel bars and unstrengthened column under cyclic and monotonic loadings, respectively. Two columns are modeled in the present work. The first one corresponds to the column without strengthening subjected to lateral monotonic loading, and the second one corresponds to the column strengthened by glass fiber reinforced polymer and steel bars subjected to lateral cyclic loading. Comparison of the numerical modeling and the experimental laboratory test results are performed and discussed. A good agreement between the numerical and experimental force-displacement responses is obtained. Moreover, improvements in the strength of the reinforced concrete column subjected to the cyclic loading along with the comparison of the behavior of the strengthened column with the unstrengthened reference column are discussed. The results show a good improvement in the load carrying capacity and ductility of the column. The main objectives of this numerical modeling are to contribute the comprehension of the monotonic and cyclic behavior of the square reinforced concrete columns and to compare the numerical results with the experimental ones.

کلمات کلیدی:

GFRP, RC Columns, Numerical modeling, Experimental tests, Strengthening

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