

Seismic Retrofit of Rectangular Columns Using Fiber Reinforced Polymers

Authors : E. L. Elghazy, A. M. Sanad, M. G. Ghoneim

Abstract : Over the past two decades research has shown that fiber reinforced polymers can be efficiently, economically and safely used for strengthening and rehabilitation of reinforced concrete (RC) structures. Designing FRP confined concrete columns requires reliable analytical tools that predict the level of performance and ductility enhancement. A numerical procedure is developed aiming at determining the type and thickness of FRP jacket needed to achieve a certain level of ductility enhancement. The procedure starts with defining the stress strain curve, which is used to obtain moment curvature relationship then displacement ductility ratio of reinforced concrete cross-sections subjected to bending moment and axial force. Three sets of published experimental tests were used to validate the numerical procedure. Comparisons between predicted results obtained by using the proposed procedure and actual results of experimental tests proved the reliability of the proposed procedure.

Keywords : columns, confinement, ductility, FRP, numerical

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