

Abstract

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Seismic rehabilitation of existing structures using FRP confinement of columns

Designing FRP confined concrete columns requires reliable analytical tools that predict the level of performance and ductility enhancement. Finite element investigation is made for the purpose of exploring confinement mechanism of concrete columns wrapped in FRP. Numerical procedure is developed aiming at determining the type and thickness of FRP jacket needed to achieve a certain level of ductility enhancement. This study presents defining displacement ductility factor of concrete columns subjected to axial load and lateral displacement based on a published recent study which developed a stress strain curve, which was used to obtain moment curvature relationship. 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. A Finite Element investigation is conducted through three models to explore confinement mechanism of concrete columns wrapped with FRP.