

Seismic Performance Point of RC Frame Buildings Using ATC-40, FEMA 356 and FEMA 440 Guidelines

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Abstract : The seismic design codes in the world allow the analysis of structures considering an elastic-linear behavior; however, against earthquakes, the structures exhibit non-linear behaviors that induce damage to their elements. For this reason, it is necessary to use non-linear methods to analyze these structures, being the dynamic methods that provide more reliable results but require a lot of computational costs; on the other hand, non-linear static methods do not have this disadvantage and are being used more and more. In the present work, the nonlinear static analysis (pushover) of RC frame buildings of three, five, and seven stories is carried out considering models of concentrated plasticity using plastic hinges; and the seismic performance points are determined using ATC-40, FEMA 356, and FEMA 440 guidelines. Using this last standard, the highest inelastic displacements and basal shears are obtained, providing designs that are more conservative.

Keywords : pushover, nonlinear, RC building, FEMA 440, ATC 40

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