

Assessment of Fema356 nonlinear static procedure and modal pushover analysis for seismic evaluation of buildings

Abstract

Nonlinear static analysis as an essential part of performance based design is now widely used especially at design offices because of its simplicity and ability to predict seismic demands on inelastic response of buildings. Since the accuracy of nonlinear static procedures (NSP) to predict seismic demands of buildings affects directly on the entire performance based design procedure, therefore lots of research has been performed on the area of evaluation of these procedures. In this paper, one of the popular NSP, FEMA356, is evaluated and compared with modal pushover analysis. The ability of these procedures to simulate seismic demands in a set of reinforced concrete (RC) buildings is explored with two level of base acceleration through a comparison with benchmark results determined from a set of nonlinear time history analyses. According to the results of this study, the modal pushover analysis procedure estimates seismic demands of buildings like inter story drifts and hinges plastic rotations more accurate than FEMA356 procedure.