

ABSTRACT

Performance-based seismic design procedure has been in progress in recent decades. A vital constituent to develop performance-based design methods is the accurate estimation of seismic demand parameters. Since displacement is one of these parameters that has the best correlation with damage, displacement-based seismic design procedure has been used as an important concept regarding this topic. The main aim of this research is to develop an analytical procedure on the basis of displacement-based seismic design methodology. Generalized interstory drift spectrum is used as an important tool in this new method called drift pushover analysis. In order to evaluate the behavior of structures, three demand parameters including lateral displacement, story shear and plastic hinge rotation computed from conventional pushover analysis (CPA), modal pushover analysis (MPA) and drift pushover analysis (DPA) are compared with those of nonlinear time history analysis (NTA). It is shown that the new method DPA predicts peak response measures more precisely than the other nonlinear pushover procedures investigated in this study, with less effort.

KEY WORDS: displacement-based seismic design; drift spectrum; conventional pushover; modal pushover; drift pushover; nonlinear time history analysis.