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A New Lateral Load Pattern for Pushover Analysis of RC Frame Structures

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Abstract : Non-linear static analysis, commonly referred to as pushover analysis, is a powerful tool for assessing the seismic response of structures. A suitable lateral load pattern for pushover analysis can bring the results of this simple, quick and low-cost analysis close to the realistic results of nonlinear dynamic analyses. In this research, four samples of 10- and 15 story (two- and four-bay) reinforced concrete frames were studied. The lateral load distribution patterns recommended in FEMA 273/356 guidelines were applied to the sample models in order to perform pushover analyses. The results were then compared to the results obtained from several nonlinear incremental dynamic analyses for a range of earthquakes. Finally, a lateral load distribution pattern was proposed for pushover analysis of medium-rise reinforced concrete buildings based on the results of nonlinear static and dynamic analyses.

Keywords : lateral load pattern, nonlinear static analysis, incremental dynamic analysis, medium-rise reinforced concrete frames, performance based design
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