

Keynote Paper

Review of ASCE-41 acceptance criteria for performance-based assessment of existing steel frame buildings

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ABSTRACT

Current procedures in ASCE-41 (2017) for performance-based assessment were applied to a three-story steel moment frame building. A computer model of the perimeter frame that comprises the primary lateral system of the building in one direction was developed using OpenSees (McKenna et al. 2000) and validated against available instrumented data from two earthquakes. Both linear and nonlinear procedures were used in the assessment. Findings from the study indicate that both linear procedures (static and dynamic) as well as both nonlinear procedures (static and dynamic) generally produced consistent results. However, linear procedures, in this study, resulted in a more conservative estimate of performance. Considering the fact that acceptance criteria in ASCE-41 is assessed at the component level, a separate investigation was carried out at the system level by examining interstory drifts for different performance levels. It is expected that these findings will lead to the development of acceptance criteria at the system level.

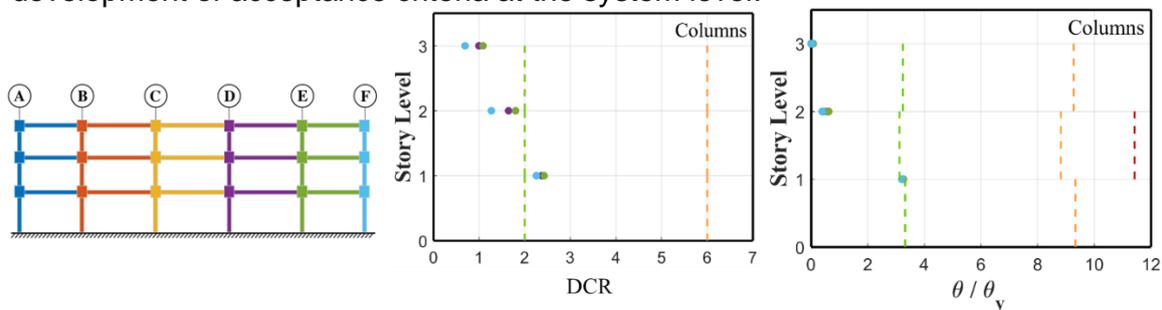


Fig. 1 Comparing linear and nonlinear procedures for 3-story building

REFERENCES

- ASCE (2017), Seismic Evaluation and Retrofit of Existing Buildings, ASCE/SEI 41-17, American Society of Civil Engineers, Reston, Virginia.
- McKenna, F., Fenves, G. L, and Scott, M. H. (2000), Open System for Earthquake Engineering Simulation. University of California, Berkeley, <http://opensees.berkeley.edu>

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