

## Effects of Ground Motion Characteristics on Damage of RC Buildings: A Detailed Investigation

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**Abstract :** The damage status of RC buildings is greatly influenced by the characteristics of the imposed ground motion. Peak Ground Acceleration and frequency contents are considered the main two factors that affect ground motion characteristics; hence, affecting the seismic response of RC structures and consequently their damage state. A detailed investigation on the combined effects of these two factors on damage assessment of RC buildings, is carried out. Twenty one earthquake records are analyzed and arranged into three groups, according to their frequency contents. These records are used in an investigation to define the expected damage state that would be attained by RC buildings, if subjected to varying ground motion characteristics. The damage assessment is conducted through examining drift ratios and damage indices of the overall structure and the significant structural components of RC building. Base and story shear of RC building model, are also investigated, for cases when the model is subjected to the chosen twenty one earthquake records. Nonlinear dynamic analyses are performed on a 2-dimensional model of a 12-story R.C. building.

**Keywords :** damage, frequency content, ground motion, PGA, RC building, seismic

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