



## Comparison of Base Isolation and Concentric Braced Frame Systems For EQRD - A Case Study

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### Abstract

Swift and effective measures are needed to sustain economic growth and the general welfare of earthquake-struck countries. The economic consequence of earthquakes may occur both before and after the seismic event itself. Base isolators, bracings, and shear walls are three major systems to meet the demand for earthquake-resistant structures. The base-isolated system isolates the structure from the horizontal component of the ground motion by placing an element having lower horizontal stiffness between the structure and the foundation. The study has been broadly classified into two parts. In 1<sup>st</sup> part, an economic comparison is made between the fixed base braced steel building and the base-isolated steel building. Both buildings have been designed for MCE (Maximum Considered Earthquake). From this study, fixed base braced system is found to be more economical than base-isolated system under MCE conditions. In the 2<sup>nd</sup> part, non-linear time history analysis (NLTHA) has been performed to evaluate the dynamic characteristics of ground motion on the base isolation system. It is observed that the base-isolation system is most efficiently used for those structures that are in resonance with ground motion.

**Keywords:** Base-isolated system, Braced frame system, Cost effectiveness, Non-linear time history analysis