RESPONSE SPECTRUM ANALYSIS OF MULTI STOREYED BASE-ISOLATED BUILDING

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ABSTRACT

The basic idea of seismic isolation is based on reduction of the earthquake induced inertia loads by shifting the fundamental period of the structure out of dangerous resonance range, and concentration of the deformation and energy dissipation demands at the isolation and energy dissipation systems, which are design for this purpose. In this paper, after a brief introduction, the response spectrum to the earthquake resistant structure is described. As a numerical example, a fourteen storey structure analyzed with three different seismic protection alternatives as fixed base, rubber bearing, friction pendulum bearing. In determining the specifications of isolators, such device features are taken into consideration, which would transfer minimum effects on to the structure as tested by numerous experiments on the basis of the criteria, including base and storey shear forces, storey and relative storey drifts while the isolators would undergo reasonable displacements. Nevertheless, such analysis could not provide full optimization; the main objective here is to make a comparison between the seismic isolation and fixed based building, rather than comparing the seismic isolation alternatives within themselves. In the analysis, total base shear forces, storey shear forces and relative storey drifts are compared and results are discussed.

KEYWORDS: Base isolator, Seismic analysis, Base shear, Displacement, Relative Drift.