

Performance of Buildings with Base-Isolation System under Geometric Irregularities

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Abstract : Earthquake causes significant loss of lives and severe damage to infrastructure. Base isolator is one of the most suitable solutions to make a building earthquake resistant. Base isolation consists of installing an isolator along with the steel plates covered with pads of strong material like steel, rubber, etc. In our study, we have used lead rubber bearing (LRB). The basic idea of seismic isolation is based on the reduction of the earthquake-induced inertia forces 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 designed for this purpose. In this paper, RC frame buildings have been modeled and analyzed by response spectrum method using ETABS software. The LRB used in the model is designed as per uniform building code (UBC) 97. It is found that time period for the base isolated structures are higher than that of the fixed base structure and the value of base shear significantly reduces in the case of base-isolated buildings. It has also been found that buildings with vertical irregularities give better performance as compared to building with plan irregularities using base isolators.

Keywords : base isolation, base shear, irregularities in buildings, lead rubber bearing (LRB)

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020