6th International Conference on Civil, Architectural & Environmental Sciences
6ICCAE
June 19, 2019 | Stockholm - Sweden

Determining the effect of mass and geometric irregularities using LRB under near-field earthquakes

Behnam Tavakoli Moghadam* **– Shahriar Tavousi Tafreshi**

1-MSc in Earthquake Engineering, Engineering Faculty, Islamic Azad University Central Tehran Branch, Tehran, Iran, Email: behnam.tavakolimoghadam@gmail.com

2- Ph.D. in Civil Engineering, Engineering Faculty, Islamic Azad University Central Tehran Branch, Tehran, Iran, Email: shtavousi@yahoo.com

Abstract

Near-field earthquakes have 4 effects of directivity control and higher frequency content, the effect of a hanging wall, the effect of Fling-Step and the effect of increasing the vertical acceleration component. Adding greenhouse structures to existing structures in order to increase agricultural products is considered as a challenge. Important buildings such as hospitals play a crucial role after earthquakes and have to remain stable. Base isolation is an effective instrument that decreases demands of a structure and in concludes declines wrecks. Seismic isolations have two missions: (1) protecting the integrity and (2) protecting the contents of a structure by reducing floor accelerations to target limits and concurrently keeping base displacements below practical and economical limits. To this end, while seismic isolation has proven to be successful under far-field earthquakes, its success in case of near-field earthquakes is being questioned for over a decade now; the main reason being the threat of excessive base displacements due to the presence of long-period large velocity pulses. In this study, a hospital is placed in high seismic hazard area with mass and geometric irregularities, a greenhouse is installed on the roof and also a helicopter landing site is installed too. It is clear that, by utilize time history analysis in Opensees software, base isolation has an effective performance and decreases roof displacement, base shear, roof acceleration compares to fix base status.

Key Words: Near-field Earthquakes, Seismic Isolation, Environmental Engineering, Time History Analysis

1-Introduction

Base isolation systems (BISs) are being employed in several earthquake-prone regions for the design of new and existing critical facilities building structures, e.g. hospitals, schools, city halls, fire stations, and computer centers. The use of BISs gained wide acceptance in