Abstract

The use of base isolation system has been increasingly popular in the past few decades in controlling seismic response of a building due to the earthquake. This kind of system may protect buildings from severe damage during major earthquake. Many heritage and important buildings which have been built in highly-seismic regions need to be protected from severe damage and collapse when earthquake strikes.

To come up with an optimum result in the design of buildings with base isolation system, it is important to select a proper base isolation model in the analysis. This effort govern an accurate prediction of the actual response of buildings with base isolation. The actual responses considered in the study are the vertical and horizontal displacements as well as the internal forces and moments.

To show the effectiveness of the use of base isolation system in a building, comparisons between building structures
with base isolation and those with conventional supports subjected to dynamic loading.

One of the seismic base isolation systems available is the Lead Rubber Bearing (LRB). LRB consist of several natural or synthetic rubber layers that have 2-5 percent critical damping ability. The impact of the earthquake forces to the foundation of a building will be reduced before reaching the super structure. In order to maintain the lateral deflection of LRB, several steel plates are inserted between rubber layers by vulcanizing method with a round shaped lead stick inserted to its centre to increase its damping ability.

Significant reduction was found in terms of shear forces and moments in the column of structures with LRB. The amount of shear force reduction was up to 42 percent, whereas the magnitude of the moment reduction could reach up to 65 percent. The support reactions of the fixed-based’s and LRB’s structures were 10964.28 kN and 5482.85kN, respectively with reduction of 50.01 percent. The horizontal drift between the roof top and the fixed-based support of the structure was 99.6 mm, whereas for the LRB’s structure was only 70.10 mm. The relative reduction was about 70.38 percent.

**Keywords:** base isolator; lead rubber bearing