

ABSTRACT

Earthquakes are natural disasters that cannot be predicted by time and location appropriately. Indonesia is an area with a high level of earthquake risk. The earthquake will make the buildings vibrate or sway so that it will attack weak spots in the structure which will cause the building collapse. To reduce the loss of material and life caused by the collapse of buildings, especially multi-story buildings, earthquake load analyzes are developed on the structure of multi-story buildings. In general there are two methods that are often used to determining the earthquakes load, there are static equivalent and dynamic analysis. Dynamic analysis itself has two methods, namely spectrum responses and time history analysis.

This study is compare of the structural response between response spectrum and time history analysis of a set-back building with a total level of 27. The building is located in the Solo with a medium soil type. The earthquake recordings used for dynamic time history are Bucharest (low frequency), El Centro 40NSC (medium frequency), and Kobe (high frequency). Furthermore, the maximum results of structural response between them will be used for redesign purposes. The study analysis was done by ETABS version 16.2.

Analysis of the comparison of structural responses of all earthquake loads is seen from the displacement values, story drift, moments, shear forces, and axial forces in buildings. The results of the analysis show that the maximum structural response is caused by the Bucharest earthquake load. The next sequence is caused by the Kobe earthquake load, spectrum response, and the smallest is caused by the earthquake load El Centro 40NSC. Then for the redesign calculation is done using the results of the time history analysis with Bucharest earthquake load, because the earthquake load produces the maximum structural response value in the building used.

Keywords: *Spectrum Response, Dynamic Time History, Structure Response, Design*