

UNIVERSITAS INTERNASIONAL BATAM

Faculty of Civil Engineering and Planning
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Odd Semester 2019/2020

THE ANALYSIS OF STRUCTURAL PERFORMANCE OF STEEL CONSTRUCTION AND REINFORCED CONCRETE CONSTRUCTION WITH NON-LINEAR STATIC PUSHOVER ANALYSIS USING ETABS SOFTWARE

(Case Study : Hotel Santika, Batam)

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ABSTRACT

In Indonesia, there have been many enormous earthquakes that certainly damage the existing infrastructure, especially for residential buildings, hotels or offices. The earthquake did not cause the buildings to completely collapse. By knowing the level of performance of a post-earthquake structure, we can find out whether the structure is still suitable to use or not. To support this, the planning concept used earthquake-resistant building planning based on performance (performance-based seismic design). This concept can be used for old or new building types.

One method that can be used to determine the level of performance is pushover analysis (non-linear static) which is useful for predicting the structural performance of a given lateral earthquake load. The load will be increased in one direction (monotonic) until there are elements of the structure that have broken/collapsed conditions. In this study, the object under study is a 10-story hotel located in the Zone 1 Earthquake Area with medium soil types. The type of construction studied is steel and reinforced concrete.

The results of this study show that steel construction can withstand earthquake loads of 9847.9285 kN and maximum roof floor displacement of 617.58 mm, whereas for reinforced concrete construction can only withstand a load of 4485.89 kN and for displacement of the roof floor, i.e. 59.97 mm. However, both types of construction are still able to withstand the planned earthquake load of 466.92 kN for steel construction and 813.51 kN for reinforced concrete construction. The level of structure performance for both of them is still included in the Immediate Occupancy so that both structures are still quite safe and able to withstand greater earthquake loads.

Keywords : *pushover analysis, structure performance level, inelastic, steel, reinforced concrete*