

ABSTRACT

DESIGN AND SEISMIC PERFORMANCE EVALUATION OF MULTI-STORY REINFORCED CONCRETE BUILDINGS USING PUSHOVER ANALYSIS

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Indonesia is a country with a high risk of earthquakes, which makes the development of earthquake-resistant building design methods very important. Currently, earthquake-resistant building designs in Indonesia mostly follow a prescriptive approach based on SNI 2847:2019. Despite expected to achieve structural performance level of Life Safety (LS), this approach does not explicitly state the structural performance level when loaded with design seismic load. Meanwhile, Performance-Based Design (PBD) offers a design or evaluation method that explicitly defines the structural performance levels. This study aims to evaluate the results of prescriptive design. Evaluation was conducted on two similar building, one in city of Padang and the other in the city of Makassar. Those two cities were selected to represent structures that have the same Seismic Design Category (SDC) but has significant different of seismic load intensity. The analysis was conducted using pushover analysis to obtain capacity curves and plastic hinge. The results show that buildings designed prescriptively according to SNI 2847:2019 can achieve the minimum Life Safety (LS) performance level as specified in ASCE 41-23 for BSE-1N hazard levels. Based on base shear, spectral acceleration and plastic hinge rotation, The Padang structure has a higher structural capacity than that of Makassar structure based on base shear, spectral acceleration, and plastic hinge rotation. In addition, for both structural models, there is no plastic hinge developed in the column base.

Keywords: Performance-Based Design, Pushover Analysis, Capacity Curve, Plastic Hinge.

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