ABSTRAK

Muhammad Yafizham Irsya: Pengaruh Getaran Gempa Terhadap Deformasi Struktur Baja Tipe Sistem Rangka Pemikul Momen Khusus. Skripsi. Fakultas Teknik, Universitas Negeri Medan. 2022.

Gempa bumi menyebabkan deformasi pada elemen struktur yang kemudian menimbulkan simpangan antar lantai (*interstory drift*) serta probabilitas keruntuhan pada struktur bangunan. Dengan *Incremental Dynamic Analysis* (IDA) akan diperoleh grafik berisi nilai *Response Spectral Acceleration* (RSA) untuk terjadinya *interstory drift ratio* maksimum, kemudian akan digunakan untuk menghitung probabilitas keruntuhan dengan *Fragility Curve*. Struktur direncanakan terletak di kota Biak pada kondisi tanah keras dengan model gedung 16 lantai dua dimensi SRPMK. Digunakan berbagai getaran gempa (*groundmotion*) yang diskalakan terhadap respon spektrum desain kota Biak dengan 2 metode berbeda. Berdasarkan analisis yang dilakukan diperoleh nilai *interstory drift* rata-rata untuk penskalaan RSA (T1) sebesar 0,33 meter dan penskalaan RSA (T1 = 0) sebesar 0,2 meter, yang kedua nya terjadi di lantai 1 struktur bangunan. Diperoleh nilai RSA terbesar melalui IDA untuk penskalaan RSA (T1) sebesar 1,63 g dan penskalaan RSA (T1 = 0) sebesar 1,89 g. Melalui *Fragility Curve* diperoleh probabilitas keruntuhan struktur pada nilai RSA 1,63 g sebesar 0,99 dan pada nilai RSA 1,89 g sebesar 0,75.

Kata kunci: Gempa, *Interstory Drift*, *Incremental Dynamic Analysis*, Probabilitas Keruntuhan.

ABSTRACT

Muhammad Yafizham Irsya: *Effect of Earthquake Vibration on Deformation of Steel Structure Type of Special Moment Resisting Frame System. Essay. Faculty of Engineering, State University of Medan. 2022.*

Earthquakes cause deformation of structural elements which then cause drift between floors (interstory drift) and the probability of collapse in the building structure. With Incremental Dynamic Analysis (IDA) a graph will be obtained containing the Response Spectral Acceleration (RSA) value for the occurrence of the maximum interstory drift ratio, will then be used to calculate the probability of collapse with the Fragility Curve. The structure is planned to be located in the city of Biak on hard ground conditions with a two-dimensional 16-storey building model SRPMK. Various earthquake vibrations (groundmotion) were used which were scaled to the response spectrum of the Biak city design with 2 different methods. Based on the analysis carried out, the average interstory drift value for RSA (T1) scaling is 0,33 meters and RSA (T1 = 0) scaling is 0,2 meters, both of which occur on the 1st floor of the building structure. The largest RSA value was obtained through IDA for RSA (T1) scaling of 1,63 g and RSA (T1 = 0) scaling of 1,89 g. Through the Fragility Curve, the probability of structural collapse at an RSA value of 1,63 g is 0,99 and at an RSA value of 1,89 g is 0,75.

Keywords: Earthquake, Interstory Drift, Incremental Dynamic Analysis, Probability of Collapse