

ABSTRAK

Judul : Evaluasi Desain Struktur Gedung Tipikal Dari Lokasi Resiko Gempa Rendah Ke Lokasi Resiko Gempa Tinggi, Nama: Danang Santoso, NIM: 41113110036, Dosen Pembimbing: Dr. Resmi Bestari Muin, MS., 2020

Pembangunan apartement sering di desain tipikal di berbagai wilayah karena telah dinilai berhasil dari tingkat kenyamanan dan estetika arsitektur, tetapi jika ditinjau dari segi desain struktur banyak yang harus diperhitungkan khususnya pengaruh dari beban gempa, karena sebagian wilayah di Indonesia merupakan wilayah yang memiliki tingkat kerawanan yang tinggi terhadap gempa.

Penelitian ini dilakukan dengan analisis respon dinamik menggunakan software ETABS, analisis partisipasi ragam massa terkombinasi dengan mempertahankan paling sedikit 90% (persen) dari massa aktual, serta kinerja simpangan antar lantai tingkat desain (Δ) tidak boleh melebihi simpangan antar lantai tingkat ijin (Δ_a) sesuai dengan SNI 1726:2012.

Dari hasil analisa dengan nilai respons spectrum percepatan desain periode pendek (S_{DS}) dan periode 1 detik (S_{D1}) yang berbeda menunjukkan hasil perhitungan kontrol desain dari simpangan antar lantai tingkat (Δ) pada model struktur gempa Padang melebihi batas simpangan antar lantai izin (Δ_a). struktur gempa Padang mengalami pembesaran nilai simpangan, pada simpangan antar lantai arah gempa x rata-rata sebesar 62 % untuk arah gempa y rata-rata sebesar 65% dan untuk displacement arah gempa x rata-rata sebesar 64% dan arah beban gempa y sebesar 65%. dan ditinjau pada desain penulangan struktur terjadi perubahan luas tulangan (A_s), terjadi kenaikan A_s tulangan memanjang pada struktur balok pada daerah tumpuan tulangan longitudinal arah x (sumbu lemah) rata – rata sebesar 54.40% dan tulangan sengkang terjadi kenaikan A_v/s sebesar 66.96%. Sedangkan ditinjau dari penulangan struktur yang sudah dianalisa pada kolom K4 kebetulan tulangan terpakai yang berada di model gempa Solo over strength, jadi tidak ada penambahan luas tulangan A_s pada model gempa Padang. Sehingga di tinjau dari analisa kinerja simpangan antar lantai dan penulangan bangunan struktur gempa existing Solo tidak aman jika ditempatkan di wilayah gempa Padang.

Kata kunci : Gempa kuat, Kinerja Simpangan Antar Lantai, Analisa Respon Dinamik, Desain Struktur

ABSTRACT

Title: Design Evaluation of Typical Building Structural From Low Earthquake Risk Locations To High Earthquake Risk Locations, Name: Danang Santoso, NIM: 41113110036, Counsellor: Dr. Resmi Bestari Muin, MS., 2020

The construction of apartments often has a typical design in various regions because it succeeds in terms of comfort level and architectural aesthetics, but when viewed from a structural design perspective, there are many things that must be considered, especially the influence of earthquake loads, because some areas in Indonesia have a high level of earthquakes.

This study was carried out by dynamic response analysis using ETABS software, combined mass variance participation analysis by maintaining at least 90% (percent) of the actual mass, and the design floor drift performance (Δ) should not exceed the floor drift allowable level (Δa) according to SNI 1726:2012.

From the results of the analysis with different short period (SDS) and 1 second period (SD1) design acceleration spectrum response values, it shows that the design control calculation results of the story drift (Δ) in the seismic earthquake structure model exceed the allowable floor drift limit (Δa). The seismic structure of the desert experiences a displacement value, the deviation between the floors of the earthquake direction x is an average of 62%, for the direction of the earthquake, the average is 65% and for the displacement of the direction of the earthquake, the average is 64% and the direction of the earthquake load is y, 65% and review of the design of the reinforcement structure there is a change in the area of reinforcement (A_s), there is an increase in the longitudinal reinforcement A_s in the beam structure in the area of the longitudinal reinforcement in the x direction (weak axis) an average of 54.40% and the stirrup reinforcement has an increase in A_v/s of 66.96%. Meanwhile, the review of the structural reinforcement that has been analyzed in column K4 happens to be used reinforcement in the overstrength Solo earthquake model, so there is no additional area of A_s reinforcement in the Padang earthquake model. So based on the performance analysis of the deviation between floors and building reinforcement, Solo's existing seismic structures are not safe if placed in the Padang earthquake area.

Keywords: strong earthquake, drift performance between floors, dynamic response analysis, structural design