

EVALUASI LEVEL KINERJA STRUKTUR GEDUNG TERHADAP GEMPA DENGAN MENGGUNAKAN *PUSHOVER ANALYSIS*

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ABSTRAK

Pembangunan struktur tahan gempa di Indonesia sangat penting, mengingat di sebagian besar wilayahnya terletak dalam wilayah gempa dengan intensitas moderat hingga tinggi. Gedung Integrated Academic Building Universitas Jenderal Soedirman merupakan salah satu fasilitas kampus Universitas Jenderal Soedirman yang memiliki peran sangat penting dalam upaya menaikkan tingkat kinerja dosen "Unsoed" Tujuan penelitian ini adalah untuk mengetahui performance point yang didapat dari pertemuan antara kurva kapasitas dan kurva respon Spektrum dari bangunan tersebut, serta Peraturan perencanaan yang digunakan mengacu pada metode ATC-40, FEMA 356 dan FEMA 440, untuk mengetahui tingkat level kinerja gedung pasca gempa.

Hasil analisis pushover dari metode ATC-40 diperoleh *base shear* pada push x 20421.901 kN, displacement (Dt) 0,021 m, redaman efektif (β_{eff}) 0.63% dan waktu efektif (Teff) 1.322 detik. Hasil analisis pada push y diperoleh *base shear* 19079.583 kN, *displacement* (Dt) 0,022 m, redaman efektif (β_{eff}) 0.63% dan waktu efektif (Teff) 1.404 detik. Sedangkan hasil analisis dari FEMA 356 diperoleh nilai gaya geser pada push x sebesar 25728.611 kN, displacement (Dt) 0,037 m dan target perpindahan (δ_t) 0,00917 m. Pada push y diperoleh *base shear* 24611.705 kN, *displacement* (Dt) 0,041 m dan target perpindahan (δ_t) 0,0102 m. Dan FEMA 440 diperoleh nilai gaya geser pada push x sebesar 25728.611 kN, *displacement* (Dt) 0,037 m dan target perpindahan (δ_t) 0,00917 m. Pada push y diperoleh nilai *base shear* 24611.705 kN, *displacement* (Dt) 0,041 m dan target perpindahan (δ_t) 0,0102 m. Dari hasil evaluasi menyimpulkan bahwa, gedung *Integrated Academic Building* Universitas Jenderal Soedirman berada dalam kategori kinerja *Immediate Occupancy* (IO).

Kata kunci: *Pushover Analysis, Level Kinerja, ATC 40, FEMA 356, Immediate Occupancy (IO).*

EVALUATION OF BUILDING STRUCTURE PERFORMANCE LEVEL AGAINST EARTHQUAKE USING PUSHOVER ANALYSIS

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ABSTRACT

The construction of earthquake-resistant structures in Indonesia is very important, considering that most of its areas are located in earthquake areas with moderate to high intensity. The Integrated Academic Building of Jenderal Soedirman University is one of the facilities of the General Sudirman University campus which has a very important role in efforts to increase the performance level of "Unsoed" lecturers. The purpose of this study was to determine the performance point obtained from the confluence of the capacity curve and the response spectrum of the building, as well as the planning regulations used referring to the ATC-40, FEMA 356 and FEMA 440 methods, to determine the level of post-earthquake building performance. The results of the pushover analysis from the ATC-40 method obtained base shear at push x 20421.901 kN, displacement (Dt) 0.021 m, effective damping (β_{eff}) 0.63% and effective time (Teff) 1.322 seconds. The results of the analysis on push y obtained base shear 19079,583 kN, displacement (Dt) 0.022 m, effective damping (β_{eff}) 0.63% and effective time (Teff) 1.404 seconds. While the results of the analysis from FEMA 356 obtained the value of the shear force at push x of 25728,611 kN, displacement (Dt) 0.037 m and target displacement (δ_t) 0.00917 m. At push y, the base shear is 24611.705 kN, displacement (Dt) 0.041 m and displacement target (δ_t) 0.0102 m, and FEMA 440 the shear force value at push x is 25728.611 kN, displacement (Dt) 0.037 m and displacement target (t) 0.00917 m. At push y, the base shear value is 24611.705 kN, displacement (Dt) 0.041 m and target displacement (δ_t) 0.0102 m. From the results of the evaluation, it was concluded that the Integrated Academic Building of Jenderal Sudirman University was in the Immediate Occupancy (IO) performance category.

Keywords: *Pushover Analysis, Performance Level, ATC 40, FEMA 356, Immediate Occupancy (IO).*