EVALUASI KINERJA STRUKTUR BANGUNAN GEDUNG FAKULTAS KEDOKTERAN UIGM PALEMBANG DENGAN METODE *PUSHOVER ANALYSIS*

M Fathan Akbar[1] Johan Budianto, S.T., M.T.[2]

Program Studi Teknik Sipil Fakultas Sains dan Teknologi Universitas Teknologi Yogyakarta;

e-mail: [1] ffathanakbar@gmail.com [2]johan.kampus01@gmail.com

ABSTRAK

Universitas Indo Global Mandiri adalah fasilitas pendidikan untuk mengembangkan ilmu pengetahuan dimana kategorinya tergolong paling tinggi keamanan untuk mempertahankan fungsi struktur dari guncangan gempa sehingga bangunan tetap aman untuk pengguna gedung dan didapatkan keselamatan dan kesiapan pakai. Menggunakan analisis pushover untuk mengetahui perilaku keruntuhan bangunan dengan memberi beban lateral statik yang ditingkatkan sampai terjadi deformasi yang tujuannya mengetahui kurva kapasitas dari SAP2000 V.14, mengetahui kinerja bangunan dari hasil *Performance point* dari arah x maupun arah y sehingga bangunan tersebut aman digunakan. Pemodelan menggunakan SNI 1726:2019 dan 2847:2019, pembebanan menggunakan SNI 1727:2020. Metode melihat level kinerja menggunakan *pushover analysis* aturan ATC-40 dengan SAP2000 V.12. Berdasarkan hasil perhitungan analysis pushover , kurva kapasitas dapat disimpulkan bahwa kurva kapasitas x menghasilkan *base force* maksimum sebesar 0,212582 kN dan *displacement* sebesar 0.086363 m. Sedangkan kurva kapasitas y menghasilkan base force maksimum sebesar 0,246207 kN dan displacement sebesar 0,133058 m. Kurva kapasitas X dan kurva kapasitas Y, memiliki kekakuan yang sama yaitu sama-sama kaku tidak terjadi kelelehan. Kekauan tersebut karena bangunan yang terdiri dari 6 lantai tersebut memiliki struktur yang besar. Sedangkan *Performance point* gedung adalah sebagai berikut: Berdasarkan hasil perhitungan analysis pushover , *Performance point* diatas dapat disimpulkan bahwa kurva kapasitas x menghasilkan nilai V (Ton), D (m) 454,278 Ton ; 0,013, Sa (g), Sd (m) 0,026 g ; 0,010, Teff (second), Beff 1,259 detik ; 0,050%. Sedangkan kurva kapasitas y menghasilkan nilai V (Ton), D (m) 414,332 Ton ; 0,017, Sa (g), Sd (m) 0,024 g ; 0,011, Teff (second), Beff 1,357 detik ; 0,050%. Jadi Level kinerja gedung Nonlinear adalah Immediate Occupancy. Maka kinerja gedung saat mencapai gaya geser dasar sebesar V = 454,278 ton.

Maka Gedung termasuk dalam level kinerja ***immediate Occupancy*** yakni ada kerusakan pada struktur dimana kekuatan dan kekakuannya hampir sama

Kata kunci: ATC-40, *Damage Control*, *Pushover Analysis*, *immediate Occupancy*

BUILDING STRUCTURE PERFORMANCE EVALUATION ON UIGM PALEMBANG FACULTY OF MEDICAL BUILDING USING THE PUSHOVER ANALYSIS METHOD

M Fathan Akbar[1] Johan Budianto, S.T., M.T.[2]

Civil Engineering Study Program, Faculty of Science and Technology, University of Technology Yogyakarta;

e-mail: [1] ffathanakbar@gmail.com [2] johan.kampus01@gmail.com

ABSTRACT

Indo Global Mandiri University is an educational facility to develop science which is classified as the highest safety category to maintain structural function from earthquake shocks so that the building remains safe for building users and safety and readiness for use is achieved. Using pushover analysis to determine the collapse behavior of the building by applying static lateral loads which are increased until deformation occurs with the aim of knowing the capacity curve of SAP2000 V.14, knowing the building performance from the performance point results in the x direction and y direction so that the building is safe to use. Modeling uses SNI 1726:2019 and 2847:2019; loading using SNI 1727:2020. The method for viewing performance levels uses ATC-40 pushover analysis rules with SAP2000 V.12. Based on the results of the pushover analysis calculation, the capacity curve can be concluded that the x capacity curve produces a maximum base force of 0.212582 kN and a displacement of 0.086363 m. Meanwhile, the y capacity curve produces a maximum base force of 0.246207 kN and a displacement of 0.133058 m. The capacity curve X and the capacity curve Y have the same stiffness, that is, they are both stiff without yielding. This stiffness is because the building which consists of 6 floors has a large structure. Meanwhile, the building's performance point is as follows: based on the results of the pushover analysis calculation, the performance point above can be concluded that the x capacity curve produces a value of V (Ton), D (m) 454,278 Ton; 0.013, Sa (g), Sd (m) 0.026 g ; 0.010, Teff (second), Beff 1.259 seconds ; 0.050%. Meanwhile, the y capacity curve produces values of V (Ton), D (m) 414,332 Tons; 0.017, Sa (g), Sd (m) 0.024 g ; 0.011, Teff (second), Beff 1.357 seconds ; 0.050%. So the level of nonlinear building performance is Immediate Occupancy. The building performance when reaching the base shear force is V = 454,278 tons.

So the building is included in the immediate occupancy performance level, namely there is damage to the structure where the strength and stiffness are almost the same

Keywords: ATC-40, Damage Control, Pushover Analysis, immediate Occupancy