

EVALUASI KINERJA STRUKTUR GEDUNG MENGGUNAKAN METODE NON-LINEAR STATIC PUSHOVER ANALYSIS (Studi Kasus: Gedung DPRD Kabupaten Gunungkidul)

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ABSTRAK

Gedung DPRD Kabupaten Gunungkidul adalah Struktur bangunan bertingkat yang terdiri dari 4 lantai yang rawan terhadap gaya lateral, terutama terhadap gaya yang ditimbulkan oleh gempa, 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.20, mengetahui kinerja kondisi gempa Serviceability Level Earthquake periode 30 tahun probabilitas 50%, Design Basis Earthquake periode 50 tahun probabilitas 10%, dan Maximum Credible Earthquake periode 50 tahun probabilitas 2% menggunakan SAP2000 V.20. Pemodelan struktur menggunakan software SAP2000 v.20.0.0 yang mengacu pada SNI 1726-2019 dan SNI 2847-2019. Perhitungan struktur meliputi beban hidup, beban mati, dan beban gempa mengikuti peraturan SNI 1727-2020 sedangkan pengecekan pada simpangan antar lantai, drift ratio dan gaya geser mengacu pada SNI 1726-2019 dan untuk desain struktur mengacu pada SNI 2847-2019. Kurva Kapasitas arah X nilai displacement 0,37833 m, dan nilai gaya geser maksimum 144897,089 kN. Kurva Kapasitas arah Y nilai displacement 0,3798 m, nilai gaya geser maksimum 128245,835 kN. Berdasarkan hasil analisis gempa SLE Arah X drift ratio 0,216 % level Immediate Occupancy, SLE Y drift ratio 0,295% level Immediate Occupancy, gempa DBE Arah X drift ratio 0,326 % level Immediate Occupancy, DBE Y drift ratio 0,442% level Immediate Occupancy, gempa MCE Arah X drift ratio 0,500% level Immediate Occupancy, MCE Y drift ratio 0,658% level Immediate Occupancy.

Kata kunci: *ATC-40, Immediate Occupancy, Pushover Analysis, Respon Spektrum, SAP2000*

EVALUATION OF BUILDING STRUCTURAL PERFORMANCE USING NON-LINEAR STATIC PUSHOVER ANALYSIS METHOD (Case Study: Gunungkidul Regency DPRD Building)

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ABSTRACT

The Gunungkidul Regency DPRD Building is a multi-storey building structure consisting of 4 floors which is vulnerable to lateral forces, especially to forces caused by earthquakes. Pushover analysis is used to determine the collapse behavior of buildings by providing static lateral loads which are increased until deformation occurs with the aim of knowing the capacity curve. from SAP2000 V.20, knowing the performance of Earthquake Serviceability Level Earthquake conditions for a 30 year period with a probability of 50%, Design Base Earthquake for a period of 50 years with a probability of 10%, and Maximum Credible Earthquake for a period of 50 years with a probability of 2% using SAP2000 V.20. Structural modeling uses SAP2000 v.20.0.0 software which refers to SNI 1726-2019 and SNI 2847-2019. Structural calculations include live load, dead load and earthquake load following the SNI 1727-2020 regulations, while checking the deviation between floors, drift ratio and shear force refers to SNI 1726-2019 and for structural design refers to SNI 2847-2019. Capacity curve in the X direction, the displacement value is 0.37833 m, and the maximum shear force value is 144897.089 kN. Capacity curve in Y direction, displacement value 0.3798 m, maximum shear force value 128245.835 kN. Based on the results of the analysis of the SLE Arah X earthquake the drift ratio was 0.216% Immediate Occupancy level, SLE Y drift ratio 0.295% Immediate Occupancy level, the DBE X drift ratio 0.500% Immediate Occupancy level, MCE Y drift ratio 0.658% Immediate Occupancy level.

Keywords: ATC-40, Immediate Occupancy, Pushover Analysis, Spectrum Response, SAP2000