ABSTRAK

EVALUASI KINERJA STRUKTUR BANGUNAN *LOW RISE BUILDING* DAN *MEDIUM RISE BUILDING* DENGAN MENGGUNAKAN PUSHOVER *ANALYSIS*

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Penelitian ini bertujuan untuk mengevaluasi kinerja struktur bangunan dengan meninjau gedung 4 lantai yang termasuk bangunan *low rise building* dan gedung 5 lantai yang mendapatkan penambahan tingkat dari keadaan eksisting menjadi bangunan *medium rise building* menggunakan analisis *pushover*. Analisis *pushover* adalah analisis statik nonlinier dimana pengaruh gempa rencana terhadap struktur bangunan gedung dianggap sebagai beban-beban statik yang bekerja pada pusat massa masing-masing lantai. Dengan studi kasus gedung Bank Tabungan Negara Kantor Cabang Karawang, peraturan yang digunakan dalam analisis sesuai dengan SNI 1726:2019, SNI 1727:2020, FEMA 356, dan ATC-40.

Berdasarkan hasil analisis *pushover* dengan metode ATC-40 diperoleh nilai *drift ratio* arah x = 0,0088 m dan arah y = 0,0090 m untuk gedung 4 lantai (*low rise building*). Sedangkan untuk gedung 5 lantai (*medium rise building*) diperoleh nilai *drift ratio* arah x = 0,0091 m dan arah y = 0,0092 m. Berdasarkan hasil perhitungan dari kedua gedung yang ditinjau termasuk dalam level kinerja *Damage Control.* Sedangkan dengan metode FEMA 356 diperoleh nilai target perpindahan arah x = 0,0078 (0,7835%) dan arah y = 0,0080 (0,8039%) untuk gedung 4 lantai (*low rise building*). Sedangkan untuk gedung 5 lantai (*medium rise building*) diperoleh nilai target perpindahan arah x = 0,0081 (0,8101%) dan arah y = 0,0083 (0,8318%). Berdasarkan hasil tersebut kedua struktur gedung termasuk kedalam level kinerja *Immediate Occupancy* (IO).

Kata kunci: *pushover, low rise building*, *medium rise building*, level kinerja.

ABSTRACT

EVALUATION OF LOW RISE BUILDING AND MEDIUM RISE BUILDING STRUCTURE PERFORMANCE USING PUSHOVER ANALYSIS

By

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This study aims to evaluate the performance of the building structure by reviewing a 4-storey building which includes a low-rise building and a 5-storey building that gets an additional level from the existing state to a middle-rise building using pushover analysis. Pushover analysis is a nonlinear static analysis where the influence of the design earthquake on the building structure is considered as static loads acting on the center of mass of each floor. With a case study of the State Savings Bank Karawang Branch Office building, the rules used in the analysis are in accordance with SNI 1726:2019, SNI 1727:2020, FEMA 356, and ATC-40.

Based on the results of pushover analysis using the ATC-40 method, the drift ratio value in the direction of x = 0.0088 m and direction of y = 0.0090 m for a 4-storey building (low rise building). Meanwhile, for a 5-story building (medium rise building), the drift ratio value in the direction of x = 0.0091 m and direction of y = 0.0092 m is obtained. Based on the results of calculations from the two buildings reviewed, they are included in the Damage Control performance level. Meanwhile, with the FEMA 356 method, the target value for the displacement of the direction x = 0.0078 (0.7835%) and the direction of y = 0.0080 (0.8039%) for a 4-storey building (low rise building). Meanwhile, for a 5-story building (medium rise building), the target value for the displacement of the direction x = 0.0081 (0.8101%) and the direction of y = 0.0083 (0.8318%) is obtained. Based on these results, the two building structures are included in the Immediate Occupancy (IO).

Key words: pushover, low rise building, medium rise building, performance level.