

## ABSTRAK

Penelitian ini bertujuan untuk mengevaluasi kinerja struktur bangunan rumah susun 10 lantai dengan 2 lantai basement terhadap beban gempa menggunakan analisis statik *nonlinier* metode *pushover*. Latar belakang penelitian berangkat dari meningkatnya pembangunan gedung bertingkat dengan konfigurasi basement di wilayah rawan gempa, sehingga diperlukan pendekatan *performance-based design* untuk memastikan ketahanan struktur. Secara teoritis, analisis ini mengacu pada *ATC-40*, *FEMA 356*, serta standar nasional SNI 1726:2019 yang digunakan untuk menentukan kurva kapasitas, titik kinerja, rasio drift, dan tingkat kerusakan elemen struktur.

Penelitian menggunakan metode kuantitatif analitis dengan pemodelan struktur pada perangkat lunak Robot Structural Analysis Professional. Pembebanan terdiri atas beban mati, hidup, angin, serta beban gempa statik ekuivalen sebelum dilanjutkan dengan analisis *pushover* pada arah X dan Y. Hasil penelitian menunjukkan bahwa nilai *performance point* pada arah X mencapai perpindahan 179,29 mm dengan *base shear* 15.843,35 kN, sedangkan arah Y mencapai perpindahan 200,51 mm dengan *base shear* 15.479,03 kN. Nilai *maximum drift ratio* sebesar 0,004 pada kedua arah memenuhi kriteria level kinerja *Immediate Occupancy (IO)*.

Kata Kunci: Analisis pushover, kinerja struktur, FEMA 356, ATC-40.

## **ABSTRACT**

*This study aims to evaluate the structural performance of a 10-story reinforced concrete residential building with two basement levels under seismic loading using the nonlinear static pushover analysis method. The research is motivated by the growing development of high-rise buildings with basement configurations in seismic zones, requiring a performance-based design approach to ensure structural safety. The theoretical foundation refers to ATC-40, FEMA 356, and the Indonesian seismic code SNI 1726:2019, which guide the determination of capacity curves, performance points, drift ratios, and structural damage levels.*

*A quantitative analytical method was applied, and the structural model was developed using Robot Structural Analysis Professional. The loading considered includes dead load, live load, wind load, and equivalent static seismic load prior to conducting pushover analysis in both X and Y directions. The results show that the performance point in the X direction is achieved at a displacement of 179.29 mm with a base shear of 15,843.35 kN, while the Y direction reaches a displacement of 200.51 mm with a base shear of 15,479.03 kN. The maximum drift ratio of 0.004 in both directions satisfies the Immediate Occupancy (IO) performance level according to ATC-40.*

**Keywords:** *Pushover analysis, structural performance, FEMA 356, ATC-40*