

ABSTRAK

Salsabilla Glendra Siregar: *Pengaruh Tata Letak Shear Wall terhadap Respon Struktur pada Gedung Apartemen Princeton Boutique Living Medan. Skripsi. Fakultas Teknik Universitas Negeri Medan. 2025*

Penelitian ini mengkaji pengaruh tata letak dinding geser terhadap respon struktur pada Gedung Apartemen Princeton Boutique Living Medan yang memiliki 20 lantai dan sistem struktur ganda beton bertulang. Latar belakang penelitian adalah kerentanan gedung bertingkat terhadap gaya lateral gempa, terutama pada bangunan dengan denah tidak simetris. Meskipun desain struktur sudah mempertimbangkan gaya lateral, kinerja nyata di lapangan sering berbeda akibat perubahan beban, material, dan fungsi ruang.

Metode penelitian menggunakan pendekatan kuantitatif dengan pemodelan numerik menggunakan perangkat lunak analisis struktur. Beban gempa dihitung melalui metode statik ekuivalen dan dinamik respon spektrum. Analisis dilakukan pada tiga model: model eksisting dan dua model modifikasi dengan variasi tata letak dinding geser. Beban yang diterapkan meliputi beban mati, hidup, dan gempa. Parameter utama yang dianalisis adalah gaya geser dasar, simpangan antar lantai, dan efek P-Delta.

Hasil menunjukkan bahwa tata letak dinding geser sangat berpengaruh pada respon struktur. Model 1 dan Model 2, dengan dinding geser lebih dekat ke pusat massa, menurunkan eksentrisitas dan gaya geser dasar dibanding model eksisting. Model 1 paling optimal dengan penurunan gaya geser dasar yang signifikan. Efek P-Delta meningkatkan simpangan antar lantai, terutama pada konfigurasi kurang simetris, namun tetap di bawah batas aman. Penempatan dinding geser di area inti bangunan efektif mengurangi gaya geser dasar sekaligus menjaga stabilitas dan keamanan struktur terhadap beban gempa.

Kata kunci: Dinding Geser, Simpangan Antar Lantai, Gaya Geser Dasar, Efek P-Delta, Struktur Gedung.



ABSTRACT

Salsabilla Glendra Siregar: *The Effect of Shear Wall Layout on the Structural Response of Princeton Boutique Living Medan Apartment Building*. Thesis. Faculty of Engineering, State University of Medan. 2025.

This study examines the effect of shear wall layout on the structural response of the Princeton Boutique Living Medan Apartment Building, which consists of 20 stories and employs a dual reinforced concrete structural system. The research background concerns the vulnerability of high-rise buildings to lateral seismic forces, particularly those with asymmetric floor plans. Although structural design typically accounts for lateral forces, actual performance in the field often differs due to variations in loads, materials, and functional space usage.

The research adopts a quantitative approach using numerical modeling through structural analysis software. Earthquake loads are determined using both the equivalent static method and the dynamic response spectrum method. The analysis is conducted on three models: the existing model and two modified models with variations in shear wall layout. The applied loads include dead load, live load, and seismic load. The main parameters analyzed are base shear, interstory drift, and P-Delta effects.

The results indicate that the shear wall layout has a significant influence on the structural response. Model 1 and Model 2, which position the shear walls closer to the center of mass, reduce eccentricity and base shear compared to the existing model. Model 1 demonstrates the most optimal performance with a substantial reduction in base shear. The P-Delta effect increases interstory drift, particularly in less symmetrical configurations, but remains within safe limits. Positioning shear walls near the building core effectively reduces base shear while maintaining structural stability and safety against seismic loads.

Keywords: *Shear Wall, Interstory Drift, Base Shear, P-Delta Effect, Building Structure.*

