

ABSTRACT

Seismic Performance Analysis of Circular-Shaped Buildings in Padang

Hovifah Indra Parawansyah¹⁾, Agustinus Agus Setiawan²⁾

¹⁾ Student of Civil Engineering Department, Universitas Pembangunan Jaya

²⁾ Lecturer of Civil Engineering Department, Universitas Pembangunan Jaya

Indonesia is a country with high seismic activity due to its location on the convergence of several tectonic plates, making earthquake-resistant structural design a crucial aspect of construction. This study aims to analyze the seismic performance of circular-shaped buildings based on displacement, story drift, and base shear, as well as to calculate the structural work volume. The modeling was carried out using Robot Structural Analysis Professional (RSAP 2025) software. The earthquake load analysis was performed using the equivalent static lateral force procedure in accordance with SNI 1726:2019, with the research location in Padang City. The analysis results show that the 8-story building experiences a maximum displacement of 22.56 mm in the X direction and 51.08 mm in the Y direction; the 5-story building has a maximum displacement of 6.33 mm in the X direction and 35.86 mm in the Y direction; and the 3-story building experiences 1.37 mm in the X direction and 7.98 mm in the Y direction. The maximum story drift for the 8-story building is 19.91 mm (X) and 43.34 mm (Y); for the 5-story building, 8.36 mm (X) and 48.51 mm (Y); and for the 3-story building, 2.86 mm (X) and 17.71 mm (Y). The base shear values are 4,950.56 kN for the 8-story building, 4,485.20 kN for the 5-story, and 2,691.12 kN for the 3-story building. The concrete requirement ratio is $0.287 \text{ m}^3/\text{m}^2$, and the steel reinforcement requirement ratio is 150.31 kg/m^3 .

Keywords: Base Shear, Circular Building, Displacement, RSAP, Story Drift

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