ABSTRACT

COMPARATIVE ANALYSIS OF THE USE OF SINGLE FRICTION PENDULUM SYSTEM (SFPS) AND NON SFPS IN REINFORCED CONCRETE BUILDINGS
(Case Study: Building B of Muhammadiyah Metro General Hospital)

By

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Judging from its geographical location, Indonesia is a country that is often hit by earthquakes. Conventionally, building damage due to earthquake forces can be prevented by strengthening the building structure. The use of a damping system is specifically for buildings that are at risk of experiencing large acceleration and lateral displacement when subjected to earthquake loads. The concept of using an isolation system (base isolator) is to increase the natural period of the structure and provide additional damping. One type of isolation system is the Single Friction Pendulum System (SFPS). The purpose of this study was to determine the influence, period, interstory drift, and base shear force received by buildings with SFPS base isolators compared to non-SFPS buildings. Based on the analysis calculations, the results showed that buildings with SFPS (T = 2.7410 seconds; base shear force in the X direction = 909.6857 kN; Y direction = 916.9172 kN) experienced greater displacement compared to buildings without base isolators (T = 2.1426 seconds; base shear force in the X direction = 1045, 9049 kN; Y direction = 2017.4889 kN). For interstory drift and earthquake acceleration, buildings with SFPS are smaller compared to non-SFPS buildings

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Key words : Base Isolator, Earthquake, Friction Pendulum System, Structure.

ABSTRAK

ANALISIS PERBANDINGAN PENGGUNAAN *SINGLE FRICTION PENDULUM SYSTEM* (SFPS) DAN NON SFPS PADA BANGUNAN BETON BERTULANG (Studi Kasus : Gedung B Rumah Sakit Umum Muhammadyah Metro)

Oleh

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Dilihat dari letak geografis, Indonesia menjadi negara yang kerap dilanda gempa bumi. Secara konvensional, kerusakan bangunan akibat gaya gempa dapat dicegah dengan memperkuat struktur bangunan. Penggunaan sistem peredam dikhususkan untuk bangunan yang beresiko mengalami percepatan dan perpindahan lateral yang besar bila terkena beban gempa. Konsep penggunaan sistem isolasi (*base isolator*) adalah untuk meningkatkan perioda alami struktur dan memberikan tambahan redaman. Salah satu jenis sistem isolasi adalah *Single Friction Pendulum System* (SFPS). Tujuan dari penelitian ini adalah untuk mengetahui pengaruh, periode, simpangan antar lantai (*interstory drift*), gaya geser dasar yang diterima bangunan dengan *base isolator* SFPS dibandingkan dengan bangunan non SFPS. Berdasarkan perhitungan analisis diperoleh hasil bahwa bangunan dengan SFPS (T = 2,7410 detik; gaya geser dasar arah X = 909,6857 kN; arah Y = 916,9172 kN) mengalami perpindahan yang lebih besar dibandingkan dengan bangunan tanpa *base isolator* (T = 2,1426 detik; gaya geser dasar arah X = 1045, 9049 kN; arah Y = 2017,4889 kN). Untuk i*nterstory drift* dan percepatan gempa bangunan dengan SFPS lebih kecil dibandingkan dengan bangunan non SFPS.

Kata kunci : *Base Isolator, Friction Pendulum System*, Gempa, Struktur.