

ABSTRACT

Title: Pushover Analysis In Evaluation Of Building Structure Performance Using Modified Seismic Isolation In The Form Of High Damping Rubber Bearing (HDRB), Name: Deanada Nabilah Yudani, NIM: 41118010079, Counsellor Lecturer: Ivan Jansen Saragih, S.T., M.T, 2022.

High earthquake risk is directly proportional to the risk of building damage, plan for buildings that resist earthquakes is needed to reduce the damage risk due to earthquake loads. Base isolation on structures functions as passive structural control when an earthquake occurs. This study discusses structural planning using base isolation type High Damping Rubber Bearing (HDRB). The purpose of the analysis is to determine the behavior of the structure against earthquakes and the performance level using a large earthquake load in the Bengkulu area, which has a high earthquake potential. The method used is non-linear Pushover static analysis according to ATC-40, FEMA-356, and FEMA-440. Will be a comparison between the result analysis of base isolation structure and without base isolation or with a perfectly clamped support (Fixed Base). This research building model has 16 floors and functions as an office and a reinforced concrete double structure system. The results of the analysis of the use of HDRB reduce earthquake loads by an average of 3% (X direction) and 7% (Y direction), reduce story drift by 0.646% (X direction) and 5.938% (Y direction), and reduce base shear in the value of 89.263% in the (X direction) and 89.58%. (Y direction). The HDRB structure increases the displacement value by 3.23% (X direction) and 2.798% (Y direction) and extends the period by 4.798%. The performance level achieved for both structural models is Immediate Occupancy (IO).

Keywords: *Base isolation, High Damping Rubber Bearing (HDRB), Performance-Based Design, Pushover, Performance Level*

ABSTRAK

Judul: Analisis Pushover Pada Evaluasi Kinerja Struktur Gedung Menggunakan Modifikasi Seismic Isolation Berupa High Damping Rubber Bearing (HDRB), Nama: Deanada Nabilah Yudani, NIM: 41118010079, Dosen Pembimbing: Ivan Jansen Saragih, S.T., M.T, 2022.

Risiko gempa yang tinggi berbanding lurus dengan risiko kerusakan bangunan, perencanaan bangunan tahan gempa diperlukan untuk mengurangi risiko kerusakan bangunan akibat beban gempa. Alternatif perencanaan adalah penggunaan base isolation pada struktur yang berfungsi sebagai pasif kontrol struktur saat gempa terjadi. Penelitian ini membahas tentang perencanaan struktur menggunakan base isolation jenis High Damping Rubber Bearing (HDRB). Analisis dilakukan untuk menentukan perilaku struktur terhadap gempa dan level kinerja (Performance Level) dengan menggunakan beban gempa besar daerah Bengkulu yang memiliki potensi gempa tinggi. Metode yang digunakan adalah analisis statik non-linear Pushover menurut ATC-40, FEMA-356, dan FEMA-440. Akan dibandingkan hasil analisis struktur base isolation dengan struktur yang tidak menggunakan base isolation atau struktur dengan tumpuan terjepit sempurna (Fixed Base). Model gedung penelitian ini memiliki 16 lantai dengan fungsi sebagai kantor dan sistem struktur ganda beton bertulang. Dari hasil analisis struktur HDRB dapat mereduksi beban gempa rata-rata 3% (arah X) dan 7% (arah Y), mereduksi story drift senilai 0,646% (arah X) dan 5,938% (arah Y), dan mereduksi base shear senilai 89,263% (arah X) dan 89,58% (arah Y). Struktur HDRB meningkatkan nilai displacement senilai 3,23% (arah X) dan 2,798% (arah Y), dan memperpanjang 4,798% periode. Level kinerja yang dicapai untuk kedua model struktur adalah Immediate Occupancy (IO).

Kata kunci: Base isolation, High Damping Rubber Bearing (HDRB), Performance Based Design, Pushover, Level Kinerja Struktur