EVALUASI OPTIMASI PENEMPATAN *SHEAR WALL* PADA BANGUNAN TINGGI DIBEBANI GEMPA KUAT

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ABSTRAK

Indonesia merupakan salah satu negara rawan gempa terbesar di dunia yang dapat menimbulkan gelombang tsunami. Hal ini disebabkan letak geografis Indonesia yang diapit oleh dua samudra yaitu samudra Hindia dan samudra Pasifik dan posisi geologis Indonesia yang berada pada pertemuan tiga lempeng utama dunia yaitu lempeng Indo-Australia, lempeng Eurasia, dan lempeng Pasifik. Sehingga pada penelitian ini, peneliti ingin menganalisis gaya-gaya dalam akibat gempa yang bekerja pada konstruksi gedung yang menggunakan dinding geser dengan penempatan yang berbeda-beda serta menganalisis besarnya pengaruh dari dinding geser dan efektifitas penempatan dinding geser.

Dari hasil analisis menunjukkan, terjadi penurunan gaya dalam pada kolom yaitu Posisi *Shear Wall* 1 sebanyak 80.768%, Posisi *Shear Wall* 2 sebanyak 82.858% kecuali pada Posisi *Shear Wall* 3, kolom mengalami peningkatan gaya geser sebanyak 104.522%, hal ini disebabkan kolom pada Posisi *Shear Wall* 3 melekat pada dinding geser, dimana gaya geser terbesar suatu gedung diakomodasi langsung oleh *shear wall*. Begitu pula pada balok mengalami penurunan gaya geser yaitu Posisi *Shear Wall* 1 sebanyak 24.649%, Posisi *Shear Wall* 2 sebanyak 27.556%, dan Posisi *Shear Wall* 3 sebanyak 29.933%. Sama halnya dengan gaya dalam geser, gaya dalam momen juga mengalami penurunan, pada kolom yaitu Posisi *Shear Wall* 1 sebanyak 79.399%, Posisi *Shear Wall* 2 sebanyak 81.305%, Posisi *Shear Wall* 3 sebanyak 76.456% dan penurunan gaya dalam momen pada balok yaitu Posisi *Shear Wall* 1 sebanyak 31.339%, Posisi *Shear Wall* 2 sebanyak 35.057% dan Posisi *Shear Wall* 3 sebanyak 31.955% dari gedung tanpa *shear wall*, sedangkan urutan posisi *shear wall* yang paling optimal dalam mengurangi simpangan lateral yang terjadi pada arah x dan y akibat beban gempa yaitu Posisi *Shear Wall* 3 sebanyak 38.360% dan 39.762% , Posisi *Shear Wall* 1 sebanyak 17.955% dan 22.297%, dan Posisi *Shear Wall* 2 sebanyak 15.068% dan 19.063% dari gedung tanpa *Shear Wall*.

Kata Kunci : Optimasi penempatan *shear wall*, *shear wall*, simpangan lateral

EVALUATION OF SHEAR WALL PLACEMENT OPTIMIZATION ON HIGH BUILDINGS SUBJECTED TO STRONG EARTHQUAKES

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ABSTRACT

Indonesia is one of the largest earthquake-prone countries in the world that can cause tsunami waves. This is due to the geographical location of Indonesia which is flanked by two oceans namely the Indian Ocean and the Pacific Ocean and the geological position of Indonesia which is at the confluence of three major world plates namely the Indo-Australian plate, the Eurasian plate, and the Pacific plate. So that in this study, researcher wanted to analyze the forces in the earthquake that work on building construction using shear walls with different placement and analyze the magnitude of the influence of shear walls and the effectiveness of shear wall placement.

From the results of the analysis show, there is a decrease in the forces that work in building, in the column that is the position of the Shear Wall 1 as much as 80,768%, the position of the Shear Wall as much as 82,858% except in the position of the Shear Wall 3, the column has increased shear force as much as 104,522%, this is due to the column on the position of the Shear Wall 3 is attached to a shear wall, where the largest shear force of a building is directly accommodated by the shear wall. Similarly, the beam shear forces decreased, namely the position of the Shear Wall 1 as much as 24,649%, the position of the Shear Wall 2 as much as 27,556%, and the position of the Shear Wall 3 as much as 29,933%. Similar to the force in shear, the force in moment also decreases, in the column that is the position of the Shear Wall 1 as much as 79.399%, the position of the Shear Wall 2 as much as 81.305%, the position of the Shear Wall 3 as much as 76.456% and decreasing force in moment on the beam that is the position of the Shear Wall as much as 31,339%, the position of the Shear Wall 2 as much as 35,057% and position of the Shear Wall 3 as much as 31,955% of buildings without shear wall, while the most optimal order of shear wall position in reducing building drifts that occurs in the x and y directions due to earthquake loads is the position of the Shear Wall 3 were 38,360% and 39,762%, the position of the Shear Wall 1 were 17,955% and 22,297%, and the position of the Shear Wall 2 were 15,068% and 19,063% of buildings without Shear Wall

Keywords : Lateral drift, optimization of shear wall placement, shear wall