

ABSTRAK

Perencanaan struktur bangunan gedung tahan gempa sangat penting dilaksanakan. Perencana dituntut untuk mendesain bangunan yang mampu menahan respon inelastik (daktail) hingga mencapai daktilitas penuh. Pada penelitian ini, material yang digunakan adalah struktur baja. Lokasi penelitian terletak pada suatu daerah di Kabupaten Karo yang merupakan wilayah dengan tingkat kegempaan yang tinggi dan belum tersedia penelitian sejenis pada wilayah tersebut.

Metode yang digunakan dalam penelitian ini yaitu metode respon spektrum yang sesuai dengan SNI 1726:2019 serta peneliti menggunakan program ETABS 2018 untuk dukungan analisa struktur. Sistem yang digunakan adalah Sistem Rangka Pemikul Momen Khusus (SRPMK). Pemodelan struktur baja yang direncanakan terdiri dari empat model yaitu model 1 (16 lantai), model 2 (8 lantai), model 3 (4 lantai), model 4 (2 lantai). Keempat model dianalisa dan dibandingkan terhadap simpangan yang terjadi dan distribusi beban gempa masing-masing model.

Berdasarkan analisa yang dilakukan, didapatkan hasil berupa persentase perbandingan *base shear* serta persentase perbandingan simpangan antar tingkat yang terjadi pada setiap model, sehingga *base shear* dan simpangan yang telah ditemukan oleh peneliti menjadi dasar dari tingkat keamanan kasus model yakni kenaikan *base shear* arah X adalah 39.77%, 46.23%, 53.13%; kenaikan *base shear* arah Y 39.77%, 47.66%, 60.51%; kenaikan simpangan atap arah X adalah 21.81%, 20.58%, 43.90%; kenaikan simpangan atap arah Y adalah 21.25%, 27.02%, 53.23%; kenaikan simpangan lantai arah X adalah 42.03%, 52.28%, 57.57%; dan kenaikan lantai arah Y adalah 40.18%, 52.04%, 58.35%. Oleh sebab itu persentase kenaikan pada studi kasus dan diharapkan menjadi suatu referensi bagi penelitian sejenis yang dapat dilakukan berikutnya.

Kata Kunci : Daktail, SRPMK, simpangan antar tingkat, *base shear*



ABSTRACT

The planning of earthquake resistant building structures is very important. Planners are required to build buildings that are able to withstand inelastic (ductile) responses until they reach full ductility. In this study, the material used is steel structure. The research location is located in an area in Karo Regency which is an area with a high level of seismicity and there is no similar research available in that area.

The method used in this research is the response spectrum method according to SNI 1726: 2019 and the researchers use the 2018 ETABS program to support structural analysis. The system used is the Special Moment Resisting Frame System (SRPMK). The planned steel structure modeling consists of four models, namely model 1 (16 floors), model 2 (8 floors), model 3 (4 floors), model 4 (2 floors). The fourth model is analyzed and compared with the deviations that occur and the load distribution of each model.

Based on the analysis carried out, the results obtained are the proportion of base shear comparisons and the proportion in the form of a comparison of the level deviations that occur in each model, so that the base shear and deviations that have been found by researchers become the basis of the safety level of the model case, namely the increase in base shear in the X direction is 39.77% , 46.23%, 53.13%; increase in Y direction base shear 39.77%, 47.66%, 60.51%; the increase in roof savings in the X direction was 21.81%, 20.58%, 43.90%; the increase in roof savings in the Y direction was 21.25%, 27.02%, 53.23%; the increase in floor deviation in the X direction was 42.03%, 52.28%, 57.57%; and the increase in the floor in the Y direction is 40.18%, 52.04%, 58.35%. because of that the proportion of increase in case studies and is expected to be a reference for similar research that can be carried out next.

Keywords : Ductility, SRPMK, the deviation, base shear

