INTISARI

Retrofitting atau perkuatan pada bangunan dilakukan agar bangunan dapat memenuhi persyaratan terbaru ataupun mampu memiliki kekuatan yang layak. Analisis struktur terhadap beban gempa sangatlah penting bagi struktur yang akan diberikan penambahan kekuatan/retrofitting. Teknik retrofitting pada gedung asrama mahasiswa menggunakan instrumen *Fluid Viscous Damper* dimodelkan dan dianalisis pada proyek akhir ini. Analisis dinamis menggunakan respons ragam modal dan statis eqivalen dilakukan menggunakan software ETABS V.17 pada tiga buah pemodelan yaitu model existing, model menggunakan damper minimal sesuai SNI 1726-2019, dan pemodelan instrumen damper yang berfokus pada ujung dan bagian yang mengalami *displacement* antar lantai terbesar. Perbandingan penempatan instrumen damper terbaik didasarkan pada perhitungan damping effektif dan seberapa besar energi yang mampu terdisipasi.

Analisis struktur menggunakan instrumen *Fluid Viscous Damper* minimal mampu mereduksi gaya geser dasar hingga 267,92kN, mereduksi displacement pada lantai atap arah sumbu Y sebesar 39mm, serta mendisipasi energi pada struktur terhadap beban gempa sebesar 24,404kJ. Instrumen damper mampu mereduksi drift antar lantai yang sebelumnya tidak aman pada struktur existing pada arah sumbu Y menjadi aman pada beberapa lantai.

Analisis struktur menggunakan instrumen *Fluid Viscous Damper* pada ujung bangunan dan lantai dengan *displacement* terbesar mampu mereduksi gaya geser dasar hingga 767,479kN, mereduksi displacement pada lantai atap arah sumbu Y sebesar 39mm, serta mendisipasi energi pada struktur terhadap beban gempa sebesar 24,857kJ. Instrumen damper mampu mereduksi drift antar lantai yang sebelumnya tidak aman pada struktur existing pada arah sumbu Y menjadi aman pada seluruh lantai. Berdasarkan perbandingan hasil analisis dapat diambil kesimpulan bahwa pemodelan instrumen damper yang berfokus pada ujung dan bagian yang mengalami *displacement* antar lantai terbesar lebih baik dari pemodelan damper minimal berdasarkan segi gaya geser dasar, displacement antar lantai, storey drift, damping effektif, dan energi terdisipasi pada struktur.

Katakunci: Fluid Viscous Damper, SNI 1726-2019, Analisis dinamis

ABSTRACT

Strengthening or retrofitting of buildings is carried out so that the building can meet the latest requirements and is able to have the proper strength. Structural analysis against loads is very important for structures that will be given additional strength / retrofitting. Retrofitting techniques in student dormitories using the Fluid Viscous Damper instrument are modeled and analysed in this final project. Dynamic analysis using modal variance response and equivalent statistics was carried out using ETABS V.17 software on three models, namely the existing model, the model using the minimal damper according to SNI 1726-2019, and modeling the damper instrument which is placed at the end and the part that has moved between floors the biggest. The assessment of the best damper instrument based on the calculation of effective and energy efficient damping that can be at the forefront.

Structural analysis using the Fluid Viscous Damper instrument can at least reduce the basic shear force to 267.92kN, reduce the displacement on the roof floor in the Y axis direction of 39mm, and anticipate the energy of the structure against earthquake loads of 24.404kJ. Damper instruments that are able to reduce drift between floors that were previously unsafe on existing structures in the Y-axis direction are safe on several floors.

Structural analysis uses the Fluid Viscous Damper instrument at the end of the building and floor with the largest displacement which is able to reduce the basic shear force to 767,479kN, reduce displacement on the roof floor in the Y axis direction of 39mm, and anticipate the energy of the structure against earthquake loads of 24,857kJ. Damper instruments that are able to reduce drift between floors that were previously unsafe on existing structures in the Y-axis direction are safe on all floors. Based on the comparison of the analysis results, it can be concluded that the damper instrument modeling based on the tip and the part that has the largest inter-floor displacement is better than minimal damper modeling based on the basic shear force, displacement between floors, floor drift, effective damping, and leading energy in the structure.

Keywords: Fluid Viscous Damper, SNI 1726-2019, Dynamic analysis