SUMMARY

I Made Surya Wisnu Pangestu, Department of Civil Engineering, Faculty of Engineering, University of Brawijaya, March 2017, Nonlinear Static Pushover Analysis on Design Optimization of FKUB College Building Using Variation of Steel Brace Configuration , Ari Wibowo and Ming Narto Wijaya.

The phenomenon of earthquakes is one of the causes of damage to building structures. To reduce the impact of damage to buildings due to earthquake, then the retaining structure required for strengthening the building of the earthquake. Steel Bracing is one of the components of the structure of the earthquake burden bearer that is often used on high structures. This research aims to know the influence of variations in the use of steel bracing on the model of the building. The influence is, among others, the lateral deformation, level of service, time of the vibrating natural, as well as the junction between the floor.

This research uses the college building of The Faculty of Medicine University of Brawijaya as an object of study, which modeled the program of SAP 2000 v18 in three dimensions into seven model i.e. The Original Structure with Dilation (OD), The Original Structure Without Dilation (OND), an Alternative Structure Without Bracing (Type A), an Alternative Structure with Single Brace (Type B), an Alternative Structure with X Brace (Type C), Alternative Structures with The V Brace (Type D) , and Alternative Structures with A Brace (Type E). Elements of beams, columns plates, and steel bracing modeled in accordance with the quality of the materials and dimensions of each element of the structure. As well as the Foundation of the structure is modeled with the object of flops. To evaluate the performance of each structure, conducted the analysis with the method of non-linear static pushover. This method of analysis refer to ATC 40, and SNI 03-1726-2012. The analysis is done by analyzing the Structure of the Alternatives Without Bracing (Type A) then from the analysis results can be planned placement location of the diagonal reinforcement purposes (bracing) based on the plastic joint which popped on the structure column. After that, the analysis was done back in the building with a combination of retaining the diagonal (bracing) for Type B, C, D, and E.

The results of the analysis showed that the use of an alternative on the structure of Brace X can improve the ability of the structure to receive the base shear force because this structure is able to receive the most base shear force (51,500 tf) to produce the same junction (0.599 m). Level of service structure for all types of structures is B-IO (immediate occupancy), so the use of steel bracing variation has no effect on the changes in the level of service structure. The natural vibration period is uniform between the structure of the OND, type A, type B, Type C, Type D and Type E, this shows the use of the bracing variation has no effect on the natural period of vibration of the structure. But the difference in the structure of OD that have greater natural period of vibration because the structure OD has the most weight of the structure. As well as the use of an alternative structure X Brace can proceeds the most small junction between floor, compared to other types of use of bracing variations.

Keywords: steel brace, pushover analysis, performance point, performance levels