

ABSTRAK

Dalam rangka mitigasi bencana, evaluasi kinerja struktur bangunan perlu dilakukan untuk meminimalisasi risiko yang ditimbulkan akibat gempa bumi. Dengan berpedoman pada *Performance Based Evaluation Design* (PBSE), bangunan dievaluasi menggunakan analisis statik *nonlinear* (*Pushover Analysis*). Analisis *pushover* merupakan pilihan yang tepat dan relatif mudah dalam mengevaluasi kinerja gedung terhadap beban gempa. Metode ini mampu memberikan informasi pola keruntuhan bangunan eksis ketika terbebani gaya gempa yang melebihi kapasitas bangunan, apakah terjadi keruntuhan langsung atau bangunan mampu berperilaku *nonlinear* (progresif).

Evaluasi terhadap gedung Rektorat ITNY dengan Analisis *Pushover* dan Metode penelitian menggunakan prosedur ATC-40 bertujuan mengetahui hasil Kurva Kapasitas (*Pushover Curve*), Titik Kinerja (*Performance Point*) dan mengetahui tahap-tahap terbentuknya Sendi Plastis (Skema Kelelehan) saat terbebani gaya gempa yang melebihi kapasitas bangunan.

Hasil analisis berdasarkan *Performance Point* menunjukkan gaya geser dasar $V_t = 9455,716$ kN arah-X, *displacement* pada step ke-7 dan $V_t = 7448,18$ kN arah-Y *displacement* pada step ke-6, kinerja struktur tidak melewati batas LS (*Life Safety*). Tingkatan kondisi sendi plastis dilihat pada step terakhir berada pada tingkatan batas maksimum gaya geser yang masih mampu di tahan gedung, Belum mengalami degradasi kekuatan struktur yang besar yang membuat struktur mengalami *collaps*. Hal ini menunjukkan kinerja gedung yang ditinjau termasuk dalam level kinerja *Immediate Occupancy* (IO), yang artinya apabila terjadi gempa, gedung masih mampu menahan gempa namun menimbulkan resiko kerusakan yang cukup kecil.

Kata Kunci : Analisis *Pushover*, Evaluasi Gedung Tingkat, Metode Spektrum Kapasitas

ABSTRACT

In the context of disaster mitigation, it is necessary to evaluate the performance of buildings to minimize the risks caused by earthquakes. By referring to the Performance Based Evaluation Design (PBSE), the building uses nonlinear static analysis (Pushover Analysis). Pushover analysis is the right choice and relatively easy in building performance against earthquake loads. This method is able to provide information on the pattern of collapse of the existing building when it is loaded with earthquake forces that exceed the capacity of the building, whether there is a direct collapse or the building is capable of nonlinear (progressive).

The evaluation of the ITNY Rectorate building with Pushover Analysis and the research method using the ATC-40 procedure aims to determine the results of the Capacity Curve (Pushover Curve), Performance Point (Performance Point) and determine the stages of the formation of Plastic Joints (Yellowness Scheme) when loaded with earthquake forces that exceed building capacity.

The results of the analysis based on Performance Point show that the basic shear force $V_t = 9455,716$ kN in the X-direction, displacement at the 7th step and $V_t = 7448.18$ kN in the Y-direction, the displacement in the 6th step, the structural performance does not exceed the LS limit (Life safety). The level of the plastic hinge condition seen in the last step is at the maximum level of the shear force that the building is still able to withstand, has not experienced a large structural strength degradation that causes the structure to collapse. This shows that the performance of the building being reviewed is included in the Immediate Occupancy (IO) performance level, which means that if an earthquake occurs, the building is still able to withstand earthquakes but poses a fairly small risk of damage.

Keywords : *Pushover Analysis, Building Level Evaluation, Capacity Spectrum Method*