

ABSTRAK

Kinerja struktur adalah tingkat performa terhadap gempa yang direncanakan. Evaluasi terkait performa struktur penting terkait kerugian material dan korban jiwa dapat diminimalisir. Struktur bangunan harus mampu menerima gaya gempa dalam memberikan perilaku nonlinier pada kondisi pasca-elastic. Metode analisis nonlinier meliputi pushover analysis dan time history analysis. Analisis pushover adalah analisis perilaku keruntuhan struktur dengan gaya dorong beban lateral statik ekuivalen bertahap. Sedangkan analisis time history adalah analisis perilaku struktur terhadap beban dinamis yang bervariasi terhadap waktu. Penelitian ini membandingkan kinerja dari analisis pushover dan time history dengan menggunakan rekaman gempa El Centro, Kobe, dan Supersition Hills pada gedung Wihara Prasadja Jinadhammo. Evaluasi kinerja bangunan dapat dengan berdasarkan acuan ATC 40, FEMA 356, dan pedoman aturan lainnya untuk menentukan target perpindahan struktur bangunan berdasarkan perpindahan (drift) dan sendi elastisitas yang dihasilkan. Dalam membandingkan kinerja struktur yang dilakukan memerlukan acuan pedoman evaluasi yang sejenis atau seragam. Hal ini penting dalam memastikan hasil yang dibandingkan dapat valid dan memberikan interpretasi yang akurat mengenai kinerja struktur. Hasil penelitian didapatkan bahwa level kinerja Wihara Prasadja Jinadhammo pada analisis pushover dan time history adalah Immediate Occupancy (IO). Berdasarkan acuan FEMA 356 rasio perpindahan (maksimum total drift) pada analisis pushover 0,272% . Sedangkan analisis time history gempa El-centro arah x didapatkan 0,05%, El-centro arah y 0,09%, kobe arah x 0,001%, kobe arah y 0,063%, supersition arah x 0,07%, dan supersition hills <0,07%. Perbandingan kinerja pada kedua metode diperoleh nilai rasio perpindahan paling besar terjadi pada analisis pushover yaitu 0,272% sedangkan pada analisis time history terjadi pada El-centro arah y 0,09%. Namun kedua metode ini masih termasuk kategori Immediate Occupancy (IO) dengan drift ratio <1%.

Kata Kunci: Level Kinerja, *Pushover Analysis*, *Time History Analysis*, Rasio Perpindahan, FEMA 356

ABSTRACT

Structural performance is the level of performance against a planned earthquake. Evaluation related to the performance of important structures related to material losses and casualties can be minimized. The building structure must be able to accept earthquake forces in providing nonlinear behavior in post-elastic conditions. Nonlinear analysis methods include pushover analysis and time history analysis. Pushover analysis is an analysis of the collapse behavior of a structure with a gradual equivalent static lateral load thrust force. While time history analysis is an analysis of the behavior of a structure against dynamic loads that vary over time. This study compares the performance of pushover and time history analysis using earthquake recordings from El Centro, Kobe, and Superstition Hills on the Prasadja Jinadhammo Temple building. Evaluation of building performance can be based on ATC 40, FEMA 356, and other regulatory guidelines to determine the target displacement of the building structure based on the resulting displacement (drift) and elastic joints. In comparing the performance of the structure that is carried out, it requires a reference to similar or uniform evaluation guidelines. This is important in ensuring that the results compared are valid and provide an accurate interpretation of the structure's performance. The results of the study showed that the performance level of the Prasadja Jinadhammo Temple in the pushover and time history analysis was Immediate Occupancy (IO). Based on the FEMA 356 reference, the displacement ratio (maximum total drift) in the pushover analysis was 0.272%. While the time history analysis of the El-centro earthquake in the x direction was 0.05%, El-centro in the y direction 0.09%, Kobe in the x direction 0.001%, Kobe in the y direction 0.063%, supersition in the x direction 0.07%, and supersition hills <0.07%. Comparison of performance in the two methods obtained the largest displacement ratio value in the pushover analysis, which was 0.272%, while in the time history analysis it occurred in the El-centro in the y direction 0.09%. However, both of these methods are still included in the Immediate Occupancy (IO) category with a drift ratio of <1%.

Keywords: Performance Level, Pushover Analysis, Time History Analysis, Displacement Ratio, FEMA 356