

Abstrak

Struktur penahan gaya gempa secara umum memakai konsep Force Based Design. Konsep dari Force Based Design hanya berdasarkan kondisi elastis struktur dan tidak sesuai dengan kondisi sebenarnya dimana struktur gedung mengalami kondisi inelastis ketika mengalami peristiwa gempa. Sehingga perlu dilakukan analisis evaluasi kinerja struktur untuk mengetahui kinerja gedung ketika mencapai kondisi inelastis yang merupakan konsep Performance Based Design. Dalam penelitian ini terdapat dua metode yang dipakai untuk analisis gedung ketika mengalami kondisi inelastis, yaitu metode Direct Displacement Based Design dan metode analisis Pushover. Tujuan dalam penelitian ini untuk mengidentifikasi dan membandingkan kinerja struktur bangunan antara metode-metode tersebut. Penelitian digunakan program ETABS untuk mengetahui berapa besar gaya dan perpindahan yang dapat ditahan oleh struktur. Melalui program ETABS dapat diketahui pula level kinerja struktur bangunan tersebut. Tipe struktur bangunan yang dimodelkan berupa bangunan dengan sistem ganda. Bangunan terbuat dari beton bertulang, jarak bentang arah memanjang 53.7 m, jarak bentang arah memendek 36.2 m, dengan ketinggian 64.5 m, tinggi tiap lantai 4.3 m. Penelitian mengacu pada SNI 1726:2012, ATC-40, FEMA 356, dan FEMA 440.

Kata kunci: *kinerja gedung, inelastis, pushover, sistem ganda, direct displacement based design.*

Abstract

Earthquake-resistant structures generally used the concept of Force Based Design. The concept of the Force Based Design is only based on the elastic condition of the structure and not in accordance with the actual conditions in which the building structure undergoes an inelastic condition when experiencing the earthquake phenomena. So, it is necessary to analyze the performance evaluation of the structure to determine the performance of the building when it reaches the inelastic condition which is the concept of Performance Based Design. In this research there are two methods used for building analysis when experiencing inelastic condition, that is Direct Displacement Based Design method and Pushover analysis method. The purpose of this research is to identify and compare the performance of building structures between the methods. In this study used the ETABS program to find out how much force and displacement can be retained by the structure. Through the ETABS program can also note the performance level of the structure of the building. Type of building structure that is modeled in the form of building with dual system. The building is made of reinforced concrete, the distance span lengthwise 53.7 m, the distance of the span shortened 36.2 m, with the height of 64.5 m, the height of each floor 4.3 m. The study refers to SNI 1726: 2012, ATC-40, FEMA 356, and FEMA 440.

Keywords: *building performance, inelastic, pushover, dual system, direct displacement based design.*