

INTISARI

Gedung Kanwil Kementerian Agama Provinsi Jawa Tengah yang berlokasi di Semarang berada di wilayah dengan aktivitas seismik dan vulkanik tertinggi di dunia, sehingga desain struktur tahan gempa menjadi sangat penting. Ketika gempa besar terjadi, struktur bangunan dapat memasuki fase plastis, sehingga analisis linier tidak cukup untuk memahami perilaku struktur secara menyeluruh. Penelitian ini bertujuan untuk mengevaluasi tingkat kinerja struktur berdasarkan standar terbaru.

Metode analisis *pushover* nonlinier diterapkan untuk menganalisis pola keruntuhan struktur, mengidentifikasi elemen-elemen yang kritis, serta menilai tingkat kinerja struktur dengan memanfaatkan *software open web* ETABS V18.1. Evaluasi dilakukan menggunakan dua metode, yaitu spektrum kapasitas (ATC-40) dan koefisien perpindahan (FEMA 440). Hasil dari metode ATC-40 menunjukkan level kinerja struktur berada pada tingkat *Damage Control* (DC), sedangkan metode FEMA 440 menunjukkan tingkat *Immediate Occupancy* (IO).

Metode ATC-40 dinilai lebih terperinci karena memberikan hasil yang lebih lengkap, sementara pada metode FEMA 440 nilai *drift* aktual, yaitu 1,68% untuk arah X dan 1,72% untuk arah Y, berada di antara batas *Immediate Occupancy* (IO) dan *Life Safety* (LS). Maka disimpulkan level kinerja struktur Gedung Kanwil Kementerian Agama adalah *Damage Control* (DC), sesuai hasil evaluasi yang lebih terperinci dari metode ATC-40.

Kata kunci: kinerja struktur, gempa bumi, analisis pushover, sendi plastis.

ABSTRACT

The Regional Office Building of the Ministry of Religious Affairs of Central Java Province, located in Semarang, is situated in a region with the highest seismic and volcanic activity in the world, making earthquake-resistant structural design highly essential. During major earthquakes, building structures may enter the plastic phase, rendering linear analysis insufficient to comprehensively understand structural behavior. This study aims to evaluate the structural performance level based on the latest standards.

The nonlinear pushover analysis method is utilized to examine structural collapse patterns, identify critical elements, and assess the overall structural performance using the open web – based software ETABS V18.1. The evaluation is conducted using two methods: the Capacity Spectrum (ATC-40) and the Displacement Coefficient (FEMA 440). Results from the ATC-40 method indicate that the structural performance level is classified as Damage Control (DC), whereas results from the FEMA 440 method classify it as Immediate Occupancy (IO).

The ATC-40 method is considered more detailed because it provides more comprehensive results, while the drift values obtained through the FEMA 440 method, 1.68% in the X direction and 1.72% in the Y direction, fall between Immediate Occupancy (IO) and Life Safety (LS) thresholds. Therefore, it is concluded that the performance level of the building structure is Damage Control (DC), consistent with the more detailed evaluations provided by the ATC-40 method.

Keyword: *performance point, earthquake, pushover analysis, plastic hinge.*