

ANALISIS KINERJA SEISMIK STRUKTUR RANGKA PEMIKUL MOMEN KHUSUS MENGGUNAKAN METODE *PUSHOVER ANALYSIS* (Studi Kasus: Proyek Pekerjaan Fisik Gedung Inspektorat D.I. Yogyakarta)

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ABSTRAK

Daerah Istimewa Yogyakarta merupakan daerah yang di kenal sebagai kota pelajar karena memiliki fasilitas yang baik guna menunjang proses belajar dan jika di bandingkan dengan daerah lain mutu pendidikan di kota Yogyakarta lebih baik sehingga banyak pelajar yang tertarik untuk melanjutkan pendidikan di kota Yogyakarta. Daerah Istimewa Yogyakarta sendiri terletak di zona gempa dengan intensitas gempa sedang hingga berat sehingga perencanaan struktur bangunan tahan gempa menjadi hal yang wajib. Gedung Inspektorat D.I. Yogyakarta merupakan bangunan gedung yang berada di wilayah Daerah Istimewa Yogyakarta, sehingga dalam perencanaannya harus diperhatikan kekuatan struktur terhadap gempa bumi. Metode analisis *pushover* merupakan metode analisis gempa yang digunakan dalam perencanaan struktur tahan gempa. Metode ini mempunyai keterkaitan dengan *Performance Based Design* dimana mampu memberikan informasi pola keruntuhan bangunan ketika terbebani gaya gempa yang melebihi kapasitas bangunan. Penelitian tugas akhir ini adalah untuk mengevaluasi kinerja tahanan gempa Gedung Inspektorat D.I. Yogyakarta untuk mengetahui nilai *performance point* dan menentukan level kinerja struktur dengan metode analisis *pushover* berdasarkan peraturan *code Applied Technology Council (ATC-40)*. Berdasarkan hasil analisis *software SAP2000.v.14* dengan nilai *performance point* untuk arah x, dimana nilai $V = 8965,923$, $D = 0,043$, $S_a = 0,431$, $S_d = 0,041$, $T_{eff} = 0,625$, dan $B_{eff} = 0,191$ dan hasil analisis untuk *performance point* untuk arah y dimana nilai $V = 8568,828$, $D = 0,050$, $S_a = 0,433$, $S_d = 0,041$, $T_{eff} = 0,618$ dan $B_{eff} = 0,188$. Hasil evaluasi *performance based design* penelitian ini menunjukkan bahwa struktur gedung yang ditinjau termasuk dalam tingkat kinerja *Immediate Occupancy*. Dapat disimpulkan jika terjadi gempa struktur mampu menahan gempa, gedung tidak mengalami kerusakan struktural dan non struktural sehingga gedung dapat langsung digunakan kembali.

Kata kunci: *Immediate Occupancy, pushover, performance point.*

SEISMIC PERFORMANCE ANALYSIS OF SPECIAL MOMENT RESISTANCE FRAME STRUCTURES USING PUSHOVER ANALYSIS METHOD

(Case Study: Physical Work Project of the Yogyakarta D.I. Inspectorate Building)

ABSTRACT

The Special Region of Yogyakarta is known as a student city because it has good facilities to support the learning process. Compared to other areas, the quality of education in Yogyakarta is better, so many students are interested in continuing their education. The Special Region of Yogyakarta itself is located in an earthquake zone with moderate to severe earthquake intensity, so earthquake-resistant building structure planning is mandatory. Inspectorate Building D.I. Yogyakarta is a building located in the Special Region of Yogyakarta, so in its planning, it must be considered the strength of the structure against earthquakes. The pushover analysis method is an earthquake analysis method used in the design of earthquake-resistant structures. This method has a relationship with Performance-Based Design, which can provide information on the pattern of building collapse when burdened by earthquake forces that exceed the building's capacity. This final project research evaluates the earthquake resistance performance of the Inspectorate Building D.I. Yogyakarta to determine the value of the performance point and determine the level of structural performance with the pushover analysis method based on the Applied Technology Council (ATC-40) code regulation. Based on the results of the SAP2000.v.14 software analysis with a performance point value for the x-direction, where the value of $V = 8965.923$, $D = 0.043$, $S_a = 0.431$, $S_d = 0.041$, $T_{eff} = 0.625$, and $B_{eff} = 0.191$ and the analysis results for performance point for the y-direction where the value of $V = 8568,828$, $D = 0.050$, $S_a = 0.433$, $S_d = 0.041$, $T_{eff} = 0.618$ and $B_{eff} = 0.188$. The evaluation results of the performance-based design of this study indicate that the structure of the building being reviewed is included in the Immediate Occupancy performance level. It can be concluded that if an earthquake occurs, the structure can withstand an earthquake, the building does not suffer structural and non-structural damage so that the building can be directly used again.

Keywords: Immediate Occupancy, Pushover, Performance point