`

ANALISIS KEKUATAN BANGUNAN TERHADAP GAYA GEMPA DENGAN METODE *PUSHOVER*

(Studi Kasus Gedung *Innovative Program Cluster* (IPC) Universitas Katolik Soegijapranata, BSB City-Semarang)

Oleh:

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Abstrak

Indonesia merupakan Negara kepulauan yang terletak pada pertemuan tiga lempeng tektonik sehingga Indonesia berpotensi mengalami gempa. Akibat terjadinya gempa banyak bangunan yang mengalami kerusakan struktur bangunan. Saat terjadi gempa, diharapkan bangunan mampu menerima gaya gempa pada level tertentu tanpa terjadinya kerusakan yang signifikan pada strukturnya atau apabila struktur bangunan harus mengalami keruntuhan bangunan mampu memberikan perilaku non-linier pada kondisi pasca elastik sehingga tingkat keamanan bangunan terhadap gempa dan keselamatan jiwa penghuninya lebih terjamin. Gedung *Innovative Program Cluster* (IPC) Universitas Katolik Soegijapranata, Semarang merupakan gedung yang dalam perencanaan pembangunannya diharapkan mampu menerima gaya gempa dan berperilaku non-linier. Namun gedung asrama ini belum memiliki data ketahanan bangunan terhadap gaya gempa. Oleh karena itu diperlukan analisis terhadap bangunan ini dengan menggunakan salah satu metode analisis kekuatan bangunan terhadap gaya gempa yaitu metode pushover.

Pemodelan menggunakan Etabs disesuaikan dengan data proyek. Setelah dilakukan *run analysis* maka selanjutnya akan keluar output. seteah itu dilakukan analisis dan disesuaikan dengan peraturan SNI.

Kesimpulan dari hasil analisis menunjukkan bahwa semakin besar gaya (base force) yang diberikan maka semakin besar juga perpindahan (displacement) yang terjadi pada bangunan. Beban gempa maksimum yang mampu diterima oleh gedung sebesar 246115,95 kN. Berdasarkan ATC-40 batas kinerja bangunan berada pada level IO, menunjukkan bahwa bangunan aman digunakan saat terjadi gempa.

Kata kunci: analisis pushover; kurva kapasitas; batas kinerja; sendi plastis.

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ANALYSIS OF BUILDING STRENGHT TO EARTHQUAKE FORCE WITH PUSHOVER METHOD

(Case Study of Innovative Program Cluster (IPC) Building Soegijapranata Catholic University, BSB City-Semarang)

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Abstract

Indonesia is an archipelago country located at a meeting of three tectonic plates so that Indonesia has the potential to experience an earthquake. As a result of the earthquake many buildings are damaged building structures. When an earthquake happens, the building is expected to be able to accept a certain level of earthquake force without significant damage to the structure or if the collapsing structures must be able to give non-linear behavior in the postelastic conditions so that the building's safety level against earthquake and safety of the occupants is more secure. The Innovative Program Cluster (IPC) building Soegijapranata Catholic University, Semarang is a building which in its development planning is expected to be able to accept the earthquake force and behave non-linearly. But this dormitory building does not yet have data on building resistance to earthquake forces. Therefore it is necessary to analyze this building by using one method of building strength analysis to earthquake forces that is pushover method.

Modelling uses Etabs adapted with project data. After running done, output would come out from Etabs. After that, analysis was be doing then adapted with the rule of SNI.

The conclusion of the analysis shows that the greater the force (base force) given the greater the displacement that occurs in the building. The maximum earthquake load that the building can accept is 246115,95 kN. Based on the ATC-40 performance limit the building is at the level of IO, indicating that the building is safe to use during an earthquake.

Keywords: pushover analysis; capacity curve; perfomance level; plastic hinge.

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