

Perbandingan kinerja struktur sistem transfer prategang dan struktur konvensional dengan menggunakan analisa pushover = Performance comparison between prestress transfer system structure and regular structure using pushover analysis / Wisnu Pratama Putra

Wisnu Pratama Putra, author

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Abstrak

[ABSTRAK

Semakin bertambahnya kebutuhan ruang vertikal di kota besar seperti Jakarta membuat para ahli membangun banyak bangunan bertingkat. Meski demikian, rencana ini tidak selalu efektif oleh karena keberadaan bangunan purbakala (heritage) yang harus dilestarikan. Oleh karena itu, bangunan baru harus dibangun menggunakan sistem transfer yang dalam penelitian ini berupa kombinasi antara balok transfer prategang parsial dan kolom-kolom pendukung. Analisa pushover akan dilakukan untuk bangunan ini sehingga kinerja bangunan pada fase inelatis dapat diketahui. Hasil bangunan sistem transfer akan dibandingkan dengan hasil analisa pushover pada bangunan regular untuk mengetahui pengaruh keberadaan sistem transfer terhadap kinerja inelastik struktur. Sebelum dilakukan analisa pushover, bangunan didesain secara dinamik linear dengan mengacu pada peraturan SNI 03-1726-2012 dan SNI 03-2847-2002. Hasil perbandingan menunjukkan pertambahan degree of prestressing akan memperkecil daktilitas dan kemampuan disipasi energi bangunan. Rasio pengurangan kemampuan disipasi energi bervariasi antara 15% - 23%. Kinerja terendah seluruh bangunan pada saat target perpindahan ialah Life Safety, yang mana merupakan level kinerja Basic Safety Objectives berdasarkan FEMA 356. Dari sini dapat ditarik kesimpulan bahwa peraturan yang digunakan dalam desain mampu menghasilkan bangunan dengan performa cukup baik.

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ABSTRACT

The increasing need of vertical room in Jakarta made experts build a lot of multistoried buildings. Nonetheless, this plan is not always effective because of the presence of heritage building which must be preserved. Consequently, new building must be built using a transfer system which in this research is a combination between partially prestressed transfer beam and supporting columns below the beam. To determine the inelastic performance of the building, pushover analysis will be applied. The pushover analysis result for transfer system building later will be compared with the result for regular building to understand the effect of transfer system to structure's inelastic performance. Prior to applying pushover analysis, both buildings are designed based on SNI 03-1726-2012 and SNI 03-2847-2002 codes. The comparison shows the degree of prestressing accretion will

reduce the ductility and energy dissipation capacity of the building. The reduction of energy dissipation capacity ratio varies between 15% - 23%. The lowest performance of both buildings at target displacement is Life Safety, which is the Basic Safety Objectives performance based on FEMA 356. From this, it can be concluded that the codes used in designing the building is able to produce building with quite good performance., The increasing need of vertical room in Jakarta made experts build a lot of multistories buildings. Nonetheless, this plan is not always effective because of the presence of heritage building which must be preserved. Consequently, new building must be built using a transfer system which in this research is a combination between partially prestressed transfer beam and supporting columns below the beam. To determine the inelastic performance of the building, pushover analysis will be applied. The pushover analysis result for transfer system building later will be compared with the result for regular building to understand the effect of transfer system to structure's inelastic performance. Prior to applying pushover analysis, both buildings are designed based on SNI 03-1726-2012 and SNI 03-2847-2002 codes. The comparison shows the degree of prestressing accretion will reduce the ductility and energy dissipation capacity of the building. The reduction of energy dissipation capacity ratio varies between 15% - 23%. The lowest performance of both buildings at target displacement is Life Safety, which is the Basic Safety Objectives performance based on FEMA 356. From this, it can be concluded that the codes used in designing the building is able to produce building with quite good performance.]