Analisis riwayat waktu nonlinear pada pilar jembatan layang mutu beton rendah = Nonlinear time history analysis of low strength concrete pier / Martin Prasetio

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Abstrak

[ABSTRAK
Lokasi jembatan pada daerah rawan gempa dan penurunan mutu beton secara signifikan menyebabkan perlunya studi lebih mendetail mengenai perilaku inelastik pier jembatan tersebut. Perilaku inelastik jembatan dapat diidentifikasi melalui analisa nonlinear time history pada sendi plastis yang terjadi pada kolom pier. Untuk mendapatkan perbandingan perilaku sendi plastis, maka pier dimodelkan menjadi dua, yaitu model desain (mutu rencana) dan model eksisting (mutu rendah). Kondisi akhir penampang pasca eksitasi gempa dapat diketahui dengan menggunakan elemen fiber pada program MIDAS CIVIL. Hasil simulasi yang dilakukan menunjukkan bahwa hampir semua penampang model eksisting mengalami crushing beton, sementara penampang model desain hanya mengalami cracking. Selain itu, juga terjadi perubahan tipe kegagalan struktur dari kegagalan daktail pada model desain menjadi kegagalan getas pada model eksisting.
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ABSTRACT
Bridge located at seismic zone and the concrete strength deterioration lead to a more detailed investigation of the inelastic behaviour of the bridge. The inelastic behaviour can be identified by nonlinear time history analysis on the plastic hinge, which occur at the column. For results comparation, two models are used for the pier which are deign model (initial design compressive strength) and existing model (low compressive strength). Final condition of the column section after lateral excitation can be obtained by assigning fiber element on MIDAS CIVIL. Simulation results show that concrete crushing occur at the existing model section overall, while on design model section only concrete cracking exist. Furthermore, change of failure mode develops from ductile failure (design model) to brittle failure (existing model)., Bridge located at seismic zone and the concrete strength deterioration lead to a more detailed investigation of the inelastic behaviour of the bridge. The inelastic behaviour can be identified by nonlinear time history analysis on the plastic hinge, which occur at the column. For results comparation, two models are used for the pier which are deign model (initial design compressive strength) and existing model (low compressive strength). Final condition of the column section after lateral excitation can be obtained by assigning fiber element on MIDAS CIVIL. Simulation results show that concrete crushing occur at the existing model section overall, while on design model section only concrete cracking exist. Furthermore, change of failure mode develops from ductile failure (design model) to brittle failure (existing model).]