

Analisis pengaruh penahan lateral sheet pile terhadap respon seismik riwayat waktu dari menara masjid eksisting dengan penambahan basement = Analysis of lateral resistance sheet pile effect towards time history seismic response of existing minaret with additional of basement

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Abstrak

ABSTRAK

Penambahan basement di sekitar menara masjid yang sudah terbangun memerlukan struktur pelindung seperti sheet pile terhadap galian tanah maupun gempa bumi. Tesis ini membahas tentang efek sheet pile yang dibangun di sekeliling menara masjid terhadap respon seismik struktur menara dan pondasinya pada kondisi nonlinier. Penelitian ini menggunakan tiga gempa yaitu Chichi Taiwan, Mentawai Indonesia, dan Iquique Chile yang telah dimodifikasi sesuai ketentuan SNI 1726-2012 dengan metode riwayat waktu direct integration untuk menganalisis karakteristik dan respon seismik menara yang menggunakan sheet pile dengan variasi diameter span sheetpile. Dari hasil penelitian, penggunaan sheet pile span 9 dan 14 meter dapat melindungi bored pile dari terjadinya sendi plastis. Selain itu, penggunaan sheet pile span 9 meter dapat mengembalikan performa struktur menara yang sudah digali menjadi seperti kondisi eksisting, sementara penggunaan sheet pile 14 meter dapat memperbaiki kondisi struktur menara eksisting tanpa galian.

ABSTRACT

The addition of basement around a built minaret needs structures, such as sheetpile, that protect the minaret against the excavation and earthquake. This study discussed about the effect of sheetpile built around the minaret towards seismic response of minaret and foundation in nonlinear condition. This study uses three earthquake data, there are Chichi Taiwan, Mentawai Indonesia, and Iquique Chile that is modified according to SNI 1726 2012 using direct integration time history method to analyze characteristics and seismic response of minaret with sheet pile with the variation of span diameter of sheetpile. The study showed that sheet pile with 9 and 14 meter span are able to give protection to bored pile from plastic hinge. Moreover, sheet pile with 9 meter span is able to bring back the structure performance with excavation approximately the same as the existing condition without excavation, while sheet pile with 14 meter span is able to fix the structure performance during existing condition without excavation.