

Studi pemodelan eksperimen spun pile dengan memasukkan efek tanah = Experimental modelling study of spun pile by including soil effects

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Abstrak

Peningkatan seismic demand di Indonesia khususnya pulau Jawa mengharuskan peningkatan perencanaan bangunan tahan gempa di Indonesia. Spun pile merupakan fondasi yang paling sering digunakan di Indonesia sebagai struktur bawah belum memasukkan konsep performance-based design sehingga struktur masih berperilaku elastis dan kurang ekonomis. Studi pemodelan pushover analysis dengan software Opensees berdasarkan hasil uji eksperimen dilakukan untuk mendapatkan pemodelan yang tepat serta dengan memasukkan efek tanah untuk melihat pengaruhnya terhadap perilaku spun pile seperti parameter daktilitas, pembentukan plastic hinge, dan level kinerja menurut ASCE 61-14. Pembebanan aksial ($0.1fc'Ag$) didapatkan pemodelan dengan material concrete 07 untuk beton spun pile yang didefinisikan confined dalam sengkang untuk spun pile dengan beton pengisi memberikan hasil yang lebih mendekati hasil eksperimen. Hasil dari kuat geser tanah yang semakin tinggi meningkatkan kekuatan pile-soil system dan daktilitas dari spun pile serta lokasi dari sendi plastis kedua di dalam tanah. Berdasarkan ASCE 61-14, level kinerja spun pile saat terjadinya sendi plastis masih berada dalam level minimal damage.

.....The increasing of seismic demand in Indonesia, especially in the Java region, requires increased planning for earthquake-resistant buildings. The spun pile, as the commonly used substructure in Indonesia, is not implementing a performance-based design concept, therefore resulting in elastic behavior and less economical. A pushover analysis modeling study using Opensees software based on experimental test results was performed to get the right modeling and also to see its impact on spun pile behavior, such as ductility parameters, plastic hinge formation, and performance level by including soil effect according to ASCE 61-14. The result of modeling using material concrete 07 for spun pile concrete which is given an axial load of $0.1fc'Ag$ and defined as confined for spun pile with infill concrete, is closer to the experiment results. The result of the higher shear strength of the soil increases the strength of pile-soil system and ductility of the spun pile, as well as the location of the second plastic hinge in the soil. According to ASCE 61-14, the performance level of the spun pile when the plastic hinges occur is minimal damage.