Studi Eksperimen Sambungan Spun Pile - Pile Cap dengan Beton Pengisi dan Perkuatan Steel Jacket akibat Pembebanan Siklik = Experimental Study of Spun Pile - Pile Cap Connection with Concrete Infill and Steel Jacket Reinforcement Due to Cyclic Loading

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Abstrak

Studi perkuatan sambungan spun pile terhadap pile cap menggunakan zincalume diusulkan sebagai persyaratan untuk memenuhi rasio confinement spun pile buatan Indonesia. Selain itu, perkuatan bertujuan untuk meningkatkan kekuatan, daktilitas, dan serapan energi gempa oleh spun pile. Oleh karena itu, dilakukan studi eksperimen pada spun pile dengan beton pengisi dan perkuatan steel jacket akibat pembebanan siklik dan dibandingkan dengan benda uji tanpa perkuatan. Dilakukan juga pushover analysis secara monotonik untuk mengamati proses terjadinya sendi plastis dan strain pada material. Terdapat dua benda uji eksperimen berupa spun pile berdiameter 450 mm dengan perkuatan steel jacket yang diberikan beton pengisi bertulang dan salah satu benda uji tanpa beton pengisi bertulang, serta satu benda uji referensi berupa spun pile tanpa perkuatan steel jacket. Hasil eksperimen menunjukan perkuatan steel jacket terbukti dapat meningkatkan kekuatan dan daktilitas benda uji, tetapi masih belum dapat meningkatkan serapan energi gempa. Pengaruh tulangan pada beton pengisi terbukti dapat meningkatkan kekuatan dan daktlitas pada spun pile dengan adanya perkuatan steel jacketing. Parameter penelitian yang diguanakan untuk membandingkan benda uji adalah daktilitas, energi disipasi dan input, degradasi kekuatan dan kekakuan, momen – rotasi, dan kurva histeretik akibat pembebanan siklik.

.....The study of strengthed spun pile to pile cap connection using zincalume is proposed as a requirement to meet the confinement ratio of spun pile made in Indonesia. In addition, the reinforcement added aims to increase the strength, ductility, and earthquake energy absorbtion by spun pile. Therefore, an experimental study was conducted on the spun pile with reinforced concrete and steel jacket reinforcement due to cyclic loading and compared with the specimen without steel jacket reinforcement. A monotonic pushover analysis was also carried out to observe the process of plastic hinge and strain on the material. There are two experimental specimens in the form of a spun pile with a diameter of 450 mm with steel jacket reinforcement provided with reinforced concrete and one other specimen without reinforced concrete, and one reference test object in the form of a spun pile without steel jacket reinforcement. The experimental results show that steel jacket reinforcement is proven to increase the strength and ductility of the test object, but still cannot increase the absorption of earthquake energy. The effect of reinforcement on infill concrete is proven to increase the strength and ductility of the spun pile with the presence of steel jacketing reinforcement. The research parameters used to compare the specimens were ductility, energy dissipation and input, strength and stiffness degradation, moment-rotation, and hysteretic curve due to cyclic loading.