1. Record Nr. UNINA9910254100403321

Autore	Wang Rui
Titolo	Single Piles in Liquefiable Ground : Seismic Response and Numerical Analysis Methods / / by Rui Wang
Pubbl/distr/stampa	Berlin, Heidelberg : , : Springer Berlin Heidelberg : , : Imprint : Springer, , 2016
ISBN	3-662-49663-1
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (131 p.)
Collana	Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5053
Disciplina	550
Soggetti	Geotechnical engineering Engineering geology Engineering—Geology Foundations Hydraulics Mechanics Mechanics, Applied Geotechnical Engineering & Applied Earth Sciences Geoengineering, Foundations, Hydraulics Solid Mechanics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Introduction -- Unified plasticity model for large post-liquefaction shear deformation of sand and its numerical implementation -- Seismic response analysis of single piles in liquefiable ground -- Downdrag analysis of single piles in post-liquefaction reconsolidating ground -- Conclusions.
Sommario/riassunto	This thesis focuses on seismic response of piles in liquefiable ground. A three-dimensional unified plasticity model for large post-liquefaction shear deformation of sand was formulated and implemented for parallel computing, based on which a three dimensional dynamic finite element analysis method for piles in liquefiable ground was developed. Through a combination of case analysis, centrifuge shaking table experiments and numerical simulations using the proposed methods,

the seismic response patterns of single piles in liquefiable ground were revealed, including: basic force-resistance mode, kinematic and inertial interaction coupling mechanism and major influence factors. A beam on nonlinear Winkler foundation (BNWF) solution and a modified neutral plane solution were developed and validated against centrifuge experiments for piles in consolidating and reconsolidating ground. The axial pile force and settlement during post-earthquake reconsolidation was studied, showing pile axial force to be irrelevant of the reconsolidation process while settlement to be process dependent.