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 550 Disciplina 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. This thesis focuses on seismic response of piles in liquefiable ground. Sommario/riassunto 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.