

K 6281174 D 5930835

GTEC- 512

INGEGNERIA

Sezione n. 1



L. 628 1174

GEOTECHNICAL SPECIAL PUBLICATION NO. 153

## FOUNDATION ANALYSIS AND DESIGN INNOVATIVE METHODS

## PROCEEDINGS OF SESSIONS OF GEOSHANGHAI

June 6–8, 2006 Shanghai, China

HOSTED BY Tongji University Shanghai Society of Civil Engineering, China

IN COOPERATION WITH
The Geo-Institute (GI) of the American Society of Civil Engineers
Georgia Institute of Technology
The University of Kansas
The University of Tennessee
International Association of Foundation Drilling
Deep Foundations Institute
Saga University
Delft University of Technology

EDITED BY Robert L. Parsons Limin Zhang Wei Dong Guo K. K. Phoon Michael Yang





Published by the American Society of Civil Engineers

## **Contents**

Keynote P	anau

H. G. Poulos	1
Limit State Design in Geotechnical Engineering Practice	
A Probabilistic Model for Liquefaction Triggering Analysis Using SPT S. Y. Fang, C. H. Juang, and W. H. Tang	23
Optimization of Composite Piled Raft Foundation with Varied Rigidity of Cushion	29
Sensitivity Analysis of Settlement of Single Piles	35
Case-Based Reasoning System for Optimal Decision of Pile Foundation Y. Yang	42
Establishing Serviceability Limit State in the Design of Bridge Foundations	49
Progress Towards Harmonized Geotechnical Design in Europe	59
Statistical Analysis of Kwangyang Marine Clay for Compression Index	67
A Statistical Method to Determine Sample Size to Estimate Characteristic Value of Soil Parameters	76
Characterization of Model Uncertainties for Augered Cast-In-Place (ACIP) Piles under Axial Compression  K. K. Phoon, J. R. Chen, and F. H. Kulhawy	82
Cost-Benefit Analysis of Routine Quality Assurance for Bored Piles D. Q. Li, L. M. Zhang, and W. H. Tang	90
A New Narrow-Bound Method for Computing System Failure Probability Z. Wu, J. Chen, and B. Wen	98
Code Calibration of Designing Open-Type Wharf on Vertical Steel Pipe Piles based on the Partial Factor Approach	103
Variance of the Subgrade Reaction for Estimating the Resistance of a Pile Perpendicular to Pile Axis  Y. Kikuchi and M. Suzuki	111

The Role of Favourable and Unfavourable Actions in the Design of Shallow Foundations according to Eurocode 7
Serviceability Considerations in Reliability-Based Foundation Design
Pile Foundations and Drilled Shafts
Discussion on the Bearing Capacity of a Bored Pile with Reamed Enlargements137 L. Cai, Y. Li, and H. Zhou
Centrifuge Model Study on Pile Responses due to Adjacent Excavation145  D. Choudhury, R. F. Shen, C. F. Leung, and Y. K. Chow
A New Hyperbolic p-y Curve Model for Laterally Loaded Piles in Soft Clay152 D. M. Dewaikar and P. A. Patil
An ANFIS Based Approach for Predicting the Ultimate Bearing Capacity
of Single Piles
A Case Study on Load Transfer Law of Long Piles in Soft Soil167 P. Fang, K. Jiang, and X. Zhu
Behavior of Axially Loaded Pile Groups Subjected to Lateral Soil Movement174 W. D. Guo and E. H. Ghee
Vibration, Energy, and Pile Embedment Relationships during Driven Pile
Installation
Numerical Modeling of Some Features of Heat Exchanger Pile
Field Studies on Effect of Jacked Pile on Adjacent Buildings and Roads in Clay195 Z. Y. Luo, X. R. Zhu, and L. F. Wang
Effects of Drilling Tools on Rock Socket Roughness in Soft Clay Shale203 M. S. Nam, C. Vipulanandan, and Y. Choi
Observed and Predicted Skin Friction Capacity of Auger Cast-in-Place Piles211 D. E. Ott and E. C. Drumm
Study on the Interaction Law between Squeezed Branch Pile and Soil218 D. Qian, C. Sun, and D. Wang
Methodology for Design of Piled Raft for 5-Storey Buildings on Very Soft Clay226 Y. C. Tan, S. W. Cheah, and M. R. Taha
Experimental Study on Behavior of Pile Foundation in Lacustrine Deposits Area234 J. Chen, J. Wang, K. Wang, and J. Shen
Experimental Study on Bearing Capacity of Doubled Steel Tubular Piles242 H. Wei, H. Wang, H. Akira, and J. Yang
Evaluation of Lateral Response of Drilled Shafts in Rock

Lateral Capacity Design of Prestressed High Strength Concrete Piles
in Soft Clay
Liquefaction Effects on Lateral Pile Behavior for Bridges
Analysis of Soil Heave Due to Pile-Sinking in Soft Clay
Development of Negative Skin Friction of Piles on Soft Ground
The Origin, Application, and Development of Piles in China
Prediction of Ground Displacement and Deformation Induced by Large Diameter Piles293
S Oigo I Fang and B. Liu
Examining Productivity of Foundation Construction
Stress and Safety Analysis of Pile Based on the Unified Strength Theory308  I. Cao, I. Zhao, X. Wei, and L. Ji
Analysis of Settlement of Pile Foundations for the High-Speed Rail
Shallow Foundations
A New Method for Calculating the Final Settlement of Soft Clay Ground—The Geometric Progression Method
Optimization Forecasting Model of Foundation Settlement Based on Grey Model Groups
J. Sun and O. Gao
Parameter Estimation for Settlement Prediction Model Using Bayesian Inference Approach330
Y. P. Zhang  Indexes
Subject Index
Author Index34