

Piling and Deep Foundations

Edited by

DEEP FOUNDATIONS INSTITUTE
Sparta, N.J., USA

VOLUME I



Table of contents

Preface	V
<i>Special topic on EUROCODE 7 and standardization</i>	
Probabilistic evaluation of bearing capacity of drilled piles in clays <i>C.Cherubini</i>	3
Design values for bearing capacities of piles derived by use of statistical methods <i>H.E.Eriksson</i>	9
EUROCODE safety approach as applied to single piles <i>E.Franke</i>	13
Risk model for pile capacity analysis <i>V.R.Greco & F.Politi</i>	19
Hazards and safety in piling and drilling <i>K.Waninger</i>	29
1. Recent technological developments in deep foundations with soil excavation	
Design and construction of drilled shafts in coarse gravel and cobble deposits <i>G.H.Beckwith & A.Hirany</i>	33
Quality aspects of reinforced augercast piles <i>M.Bottiau & K.R.Massarsch</i>	41
Earth pressure distribution on diaphragm wall during excavation <i>Chin-Su Ting, Xin-Jie Wang & Qi-Shun Wang</i>	51
Testing and analysis of preliminary test piles in very weak chalk <i>S.P.Corbet, D.S.Culley, D.E.Sherwood & J.E.M.Cockcroft</i>	57
The deep foundation of the extension of the 'Nederlandsche Bank building' in Amsterdam <i>H.J.Everts, E.Janse & J.Kruizinga</i>	65
Construction debris landfill offers challenge for foundation support <i>J.H.Gould & T.F.Mullin</i>	73
Diaphragm walls, load bearing piles and piled soil reinforcement for a deep top down basement construction <i>J.R.Hollingsworth</i>	79
Strengthening the foundation of the church at Skien, Norway by the Root-filling method <i>B.E.Lundahl</i>	85
The performance of bored piles, used as foundation and retaining walls, in the Middle Coal Measures <i>H.Mirzabaigian & D.C.Curtis</i>	89
Large diameter, rock socket, base grouted piles in Bristol <i>M.Mojabi & M.J.Duffin</i>	97
Analysis of CFA-pile-behaviour with DMT-results at Geel test site <i>H.Peiffer, W.F.Van Impe, G.Cortvrindt & M.Van den Broeck</i>	101

Establishing an island and a dry excavation in the sea bottom for a tunnel crossing <i>M.Porsvig & L.Løvgren</i>	107
Post Office Square garage, Boston, USA: A challenging 'top down' project in a congested urban area <i>A.Ressi di Cervia & G.J.Tamaro</i>	117
Construction of pile foundation of the 'Postal Cittadel' in the direction center of Naples <i>M.Santosuosso, G.Rizzi & L.Diamanti</i>	123
Circular slurry wall sets record in Africa <i>J.M.Seitz</i>	133
Messe Turm, foundations for the tallest building in Europe <i>H.Sommer, G.Tamaro & C.DeBenedittis</i>	139
Farmers Avenue Road Crossing, Castle Mall development, Norwich <i>D.Twine & R.H.Wright</i>	147
Measures on the application of concrete filling pile in the cold areas of China <i>Wang Li-hua</i>	157
Bearing capacity of large diameter piling by the Internal Boring and Bottom Enlarging Installation Method: NAKS Method <i>I.Yanashima</i>	161
2. Recent technological developments in deep foundations without soil excavation	
Deep mixing technology to improve the bearing capacity of a very soft clayey soil under an earth embankment <i>A.Balossi Restelli, M.Bertero & E.Lodigiani</i>	171
The development of a new type precast concrete pile <i>R.A.Bullivant</i>	181
Predicting the bearing capacity of sheet piles under vertical load <i>M.G.Bustamante & L.Gianeselli</i>	185
The effect of bitumen slip coating on the driveability of precast concrete piles <i>G.A.Chapman, J.P.Seidel & J.P.Wagstaff</i>	193
Some limits to the use of jet-grouting <i>A.Chiari & P.Croce</i>	201
Steel bottom/driven piles in coral formations problems: Skin friction improvement method <i>F.Danese & G.Botto</i>	205
A monitoring system for the quality assessment of the jet grouting process through an energy approach <i>B.De Paoli, C.Stella, A.Perelli Cippo & L.Locatelli</i>	211
Reinforcement of subsoil under the foundations of historical buildings in Cracow using deep injection techniques <i>J.J.Domski</i>	217
Example applications of a new type of steel, driven pile: 'Multiton' <i>A.Fioruzzi, P.Ceretti, L.F.Albert & S.Marchetti</i>	221
Measurement and analysis on the bearing behaviour and driving effects of piles in Shanghai region <i>D.Z.Gao & H.L.Xu</i>	231
The gravel piles as an alternative method of deep foundations <i>Z.Grabowski & Z.Szwech</i>	237
Field tests of soft clay stabilized by stone columns in coastal areas in China <i>Jie Han & Shulin Ye</i>	243
The use of high strength H bearing piles in Hong Kong <i>J.Ho & L.Weber</i>	249
Increased project economy by field monitoring of deep soil compaction <i>B.Lindberg & K.R.Massarsch</i>	255
P-y curves from DMT data for piles driven in clay <i>S.Marchetti, G.Totani, M.Calabrese & P.Monaco</i>	263

Bearing capacity of precast concrete piles with step tapered base <i>H. Murakami & A. Ohshima</i>	273
Construction of piled raft foundation for high rise building using precast concrete piles <i>K. Nishio & K. Maehara</i>	277
Founding in dolomitic formations in Southern Africa with a history of the development of the design and installation of predrilled precast piles <i>H.G. Norton & G.S. Paterson</i>	281
A new deep foundation composed of soil-cement mixture and steel tubular pile <i>T. Okamoto, T. Tamura, K. Takano, M. Hayashi, H. Shimaoka, T. Homma & S. Chida</i>	287
Tubex grout injected pile: loading test <i>E. Revoort & E. Janse</i>	297
Instrumented loading tests to failure on a very long, steel, driven, cast in situ multiton pile <i>G.F. Rocchi, L.F. Albert, O. Vacca & G. Totani</i>	307
Bearing capacity of precast nodular piles in Tianjin soft clayey soil <i>Xu You-zai & S. Yabuuchi</i>	319
3. Recent developments in pile design	
Analysis of seawalls on pile foundations subject to dynamic breaking wave forces <i>A.F. Abouleid, H.H. Elmamlouk & T.M. Hassan</i>	327
Use of highly stressed piles to control settlement <i>C.N. Baker, Jr, B.E. Smith & H. Nielsen</i>	331
Oslo City: Deep basement with permanent sheet pile walls. High strength concrete piles <i>O. Bruskeland</i>	337
A study on compression of shaft of individual pile <i>Chen Zhuchang & Song Rong</i>	343
Reinforced concrete pile design for lateral loading <i>T.G. Davies & M. Budhu</i>	349
Construction of a deepwater bulk terminal in the Port of Rotterdam: Pile installation aspects <i>J.G. de Gijt, C.N. van Schaik & R.E. Roelfsema</i>	357
Solution methods for deep foundations in the Vistula River delta <i>E. Dembicki & F. Loska</i>	365
Analysis of changes in the state of the capacity of soils consolidated by injections in the light of numerical studies <i>W. Domski</i>	369
Channel Tunnel: Foundation engineering at the UK Portal <i>J.C. Duggleby, P.J. Avgherinos & A.J. Powderham</i>	373
Behaviour of driven piles estimated from stresswave measurements on dynamic probes <i>H.E. Eriksson</i>	383
Royal Christianina Hotel: Basement with permanent sheet pile wall, 'up-and-down' method <i>J.A. Finstad</i>	387
Plastoelastic analysis of bearing capacity for soil anchor <i>Hui Yongning & Xu Ronglie</i>	393
Prediction of load-settlement curve of pile groups in Egyptian soils <i>M.M. Kurkur</i>	401
Load-displacement behavior of laterally loaded rigid drilled shafts in clay <i>P.W. Mayne & F.H. Kulhawy</i>	409
Steel sheet piling used in the combined role of bearing piles and earth retaining members <i>G. McShane</i>	415
A three dimensional model for single piles in sand <i>T.Q. Nguyen & A.M. Hanna</i>	421

Laterally loaded pile under large deflection <i>M.Okahara, S.Nakatani, T.Asama, M.Miki, S.Koyama & R.Ueno</i>	431
The effect of wall stiffness on bending moments <i>D.M.Potts & R.A.Day</i>	435
Quay walls for deep water <i>H.-H.Sass</i>	445
Pile bearing capacity prediction with cone penetration test and dynamic loading test <i>G.Strniša & I.Ajdič</i>	451
A finite element model for the design of pile foundations <i>M.Tanzini</i>	457
Settlement behavior of the raft foundation with friction piles <i>K.Yamashita & M.Kakurai</i>	461
4. Equipment installation: Recent developments	
The use of 'bounded fluid' preloading cells for the foundation piles of a viaduct on the high-speed freeway in Naples <i>A.Bellini, R.De Domenico, L.Gagliardi & P.Polenghi</i>	469
A new model of LPC removable extensometer <i>M.G.Bustamante & B.Doix</i>	475
Pile load test results using the Statnamic Method <i>M.Janes, P.Birmingham & B.Horvath</i>	481
Geotechnical instrumentation for a full-scale study of negative skin friction in soft clay <i>J.A.Little, G.Price & K.Ibrahim</i>	491
Ground vibrations caused by pile installation <i>A.R.Selby</i>	497
Drilling equipment for large diameter bored piles <i>E.Stötzer, M.Beyer & S.Schwank</i>	503
Underwater bracing without submersible maneuvers of driven piles <i>M.B.Wechsler</i>	517
The world's largest hydraulic vibratory hammer/extractor <i>R.H.Whisler Jr</i>	521
5. Pile testing	
Simplified modelling of the dynamic behaviour of berthing structures <i>A.Alem & J.-G.Sieffert</i>	525
A new method for determining the yield load of piles: $P - \Delta^2K/\Delta P^2$ method <i>Shen Baohan & Niu Dongsheng</i>	531
Study of the load bearing capacity of a pile of considerable length bored using bentonite mud <i>M.Bustamante, L.Gianeselli, M.Bertero & A.Paviani</i>	535
Behaviour of large diameter bored piles in overconsolidated cohesive soils <i>V.Cotecchia & L.Monterisi</i>	543
Load-deflection prediction for laterally loaded piles based on N-SPT values <i>L.Décourt</i>	549
Stress-wave analysis of large steel pipe piles and construction of underwater pile caps for bridge piers <i>K.Fujita, Y.Fuse, Y.Yamaguchi, A.Uchida & I.Sandanbata</i>	557
Stress development in sand due to installation and uplifting of screw anchors <i>A.Ghaly & A.Hanna</i>	565
Determination of the bearing capacity of screwed-in piles by dynamic pile testing <i>P.Gilles, E.Tancre, E.Lousberg & F.De Cock</i>	571
Short and long term shaft resistance of driven instrumented pile in soft clay <i>M.M.Hamza</i>	579

Stansted Airport vertical and lateral load tests on bored pile elements to be used in a retaining wall <i>S.Hope, K.Ho, G.Price & I.F.Wardle</i>	587
Shape estimation method for cast in-situ piles based on the stress wave theory <i>M.Honma, T.Sakai, H.Murakami, N.Koyama, H.Inagawa, T.Miyasaka & Y.Tanaka</i>	595
Prediction of bearing capacity of piles by pile dynamics <i>N.Kawabata, T.Sakai, S.Kondo, H.Kanai, Y.Kobayashi, T.Oki & S.Nishimura</i>	601
Bearing capacity of driven piles from tests on site <i>D.Levacher & J.P.Levillain</i>	605
Centrifugal modelling of stress-reducing piled foundations on sand <i>A.Lyndon, J.G.Turner & M.J.Wei</i>	611
Dynamic pile tests on in-situ concrete displacement piles <i>K.Meier & H.Meseck</i>	617
Faults detecting in foundation piles and sheet pile walls with ultrasonic investigations <i>G.Mor</i>	625
Negative skin friction on coated and uncoated model piles <i>V.K.Puri, B.M.Das & U.Karna</i>	627
Interpretation of Sonic Coring results: A research project <i>R.T.Stain & H.T.Williams</i>	633
Some practical experiences with low strain integrity test on driven and bored piles <i>G.Strniša & I.Lesjak</i>	641
Model pile tests to determine the effects of installation method and form on load transfer under static load <i>L.Stuckrath & F.Descoedres</i>	647
Optimal pile driving <i>H.v.Koten</i>	655
Bearing capacity of large diameter steel pipe pile determined by static loading test and dynamic testing <i>G.Vogrinič & G.Strniša</i>	659
Dynamic testing of H-piles and HDB sites <i>J.Wei, Y.S.Heng, C.S.Lok & M.K.Chong</i>	665
The prediction of load-displacement characteristics for axially loaded piles <i>Xu He & Chen Zhuchang</i>	673