BEHAVIOR OF DEEP FOUNDATIONS

A symposium sponsored by ASTM
Committee D18 on Soil and Rock
for Engineering Purposes
AMERICAN SOCIETY FOR
TESTING AND MATERIALS
Boston, Mass., 28 June 1978

ASTM SPECIAL TECHNICAL PUBLICATION 670
Raymond Lundgren, Woodward-Clyde Consultants,
editor

04-670000-38

AMERICAN SOCIETY FOR TESTING AND MATERIALS
1916 Race Street, Philadelphia, Pa. 19103

Contents

Introduction 1

Design and Evaluation of Load Tests on Deep Foundations—L. C. REESE 4

Soil Capacity for Supporting Deep Foundation Members in Clay—M. I. ESRIG AND R. C. KIRBY 27

Stresses in Piles—M. T. DAVISSON 64

Discussion 78

State-of-the-Art Pile Design Practice—Current and Proposed as Reflected in Building Codes—F. M. FULLER 84

Discussion 105

Structural Properties of Timber Piles—R. M. ARMSTRONG 118

Discussion 139

Analysis of Load Tests on Instrumented Steel Test Piles in Compressible Silty Soil—M. BOZOZUK, G. H. KEENAN, AND P. E. PHEENEY 153

Interpreting End-Bearing Pile Load Test Results—G. S. BRIERLEY, D. E. THOMPSON, AND C. W. ELLER 181

Analytical Methods to Predict Pile Capacities—J. R. CHEEKS 199

Failure During Construction and Subsequent Rehabilitation and Performance of a Dynamically Cast-in-Place Concrete Pile Foundation—J. I. CLARK 209

Influence of Residual Installation Forces on the Stress Transfer and Settlement Under Working Loads of Jacked and Bored Piles in Cohesive Soils—R. W. COOKE 231

Load Transfer from Bored, Cast-*in-Situ* Piles in London Clay—R. W. COOKE 250

Timber Piles in Standards, Codes, and Practice—E. F. DIEKMANN 264

Discussion 275

Behavior of Steel Piles During Installation and Service—T. D. DISMUKE 282

Influence of Codes and Standards on the Use of Steel Piles—T. D. DISMUKE 300

Capacity of Reinforced and Prestressed Concrete Pile Sections—W. L. GAMBLE 306

Design of High-Performance Prestressed Concrete Piles for Dynamic Loading—B. C. GERWICK, JR. AND H. A. BRAUNER 323

A Rational Procedure for Evaluating the Behavior of Impact-Driven Piles—D. M. HOLLOWAY, G. W. CLOUGH, AND A. S. VESIĆ 335

Load Testing of Instrumented 225-Foot-Long Prestressed Concrete Piles—H. S. LACY 358

Special Requirements for Testing Auger-Placed Grout Piles—G. E. LAMB 381

Interpretation of Load Tests on High-Capacity Driven Piles—G. A. LEONARDS AND D. LOVELL 388

Static and Cyclic Axial Load Tests on a Fully Instrumented Pile—T. D. LU, J. A. FISCHER, AND V. G. MILLER 416

Cyclic Pile Load Testing—Loading System and Instrumentation—T. D. LU, V. G. MILLER, AND J. A. FISCHER 435

Pile Load Tests to Evaluate Load Transfer Mechanisms—M. W. MONTGOMERY 451

Field Tests on Vertical Piles Under Static and Cyclic Horizontal Loading in Overconsolidated Clay—G. PRICE 464

A Simple Approach to Pile Design and the Evaluation of Pile Tests—M. F. RANDOLPH AND C. P. WROTH 484

Determination of Pile Damage by Top Measurements—F. RAUSCHE AND G. G. GOBLE 500

Building Code Requirements for Maximum Design Stresses in Piles—D. M. REMPE 507

Horizontal Subgrade Reaction Estimated from Lateral Loading Tests on Timber Piles—K. E. ROBINSON 520

Field Evaluation of Caisson-Shale Interaction—M. SPANOVICH AND R. G. GARVIN 537

General Discussion—Comments on Working Loads for Pile Foundations—W. F. SWIGER 558

Influence of Driving Stresses on the Development of High Pile Capacities—C. D. THOMPSON AND D. E. THOMPSON 562

Stress and Deformation in Single Piles Due to Lateral Movement of Surrounding Soils—M. C. WANG, A. H. WU, AND D. J. SCHEESSELE 578

Capacity of Axially Loaded Bent Piles in a Bearing Stratum Overlain by a Thick Layer of Soft Clay—A. H. WU AND R. R. FOX 592

Index 607