The Pressuremeter and Its Marine Applications

Second International Symposium

Briaud/Audibert editors

STP ASTM 950
THE PRESSUREMETER AND ITS MARINE APPLICATIONS: SECOND INTERNATIONAL SYMPOSIUM

A symposium sponsored by
ASTM Committee D-18 on
Soil and Rock,
Minerals Management
Service/Technology Assessment and
Research Program, and
U.S. Army Engineer Waterways
Experiment Station
Texas A&M University
College Station, Texas, 2–3 May 1986

ASTM SPECIAL TECHNICAL PUBLICATION 950
Jean-Louis Briaud, Texas A&M University, and
Jean M. E. Audibert, Earth Technology
Corporation, editors

ASTM Publication Code Number (PCN)
04-950000-38

1916 Race Street, Philadelphia, PA 19103
Foreword

The Second International Symposium on the Pressuremeter and Its Marine Applications was presented at Texas A&M University, College Station, Texas, on 2–3 May 1986. The symposium was sponsored by ASTM Committee D-18 on Soil and Rock, Minerals Management Service/Technology Assessment and Research Program, and the U.S. Army Engineer Waterways Experiment Station. Jean-Louis Briaud, Texas A&M University and Jean M. E. Audibert, Earth Technology Corporation, served as chairmen of the symposium and as editors of this publication.
Related
ASTM Publications

Strength Testing of Marine Sediments: Laboratory and In-Situ Measurements, STP 883 (1985), 04-883000-38

Hydraulic Barriers in Soil and Rock, STP 874 (1985), 04-874000-38

Measurements of Rock Properties at Elevated Pressures and Temperatures, STP 869 (1985), 04-869000-38


Behavior of Deep Foundations, STP 670 (1979), 04-670000-38
A Note of Appreciation to Reviewers

The quality of the papers that appear in this publication reflects not only the obvious efforts of the authors but also the unheralded, though essential, work of the reviewers. On behalf of ASTM we acknowledge with appreciation their dedication to high professional standards and their sacrifice of time and effort.

*ASTM Committee on Publications*
ASTM Editorial Staff

Bill Benzing
Janet R. Schroeder
Kathleen A. Greene
Contents

Introduction 1

PRESSUREMETER TESTING

Use of PAM and Pressuremeters in Offshore Foundation Design—FRANCOISE BRUCY AND PIERRE LE TIRANT 5

The Push-In Pressuremeter: 5 Years of Offshore Experience—STANLEY FYFFE, WILLIAM M. REID, AND JAMES B. SUMMERS 22

The Development of the Full Displacement Pressuremeter—NICK J. WITHERS, LEO H. J. SCHAAP, AND CLIVE P. DALTON 38

Self-Boring Pressuremeter Tests in Po River Sand—DOMENICO BRUZZI, VIDIO GHIONNA, MICHELE JAMIOLKOWSKI, RENATO LANCELLOTTA, AND GIOVANNI MANFREDINI 57

The Calibration and Use of High Capacity Pressuremeter to Determine Rock Stiffness—ROBERT E. BACCIARELLI 75

Field Evaluation of French Self-Boring Pressuremeter PAF 76 in a Soft Deltaic Louisiana Clay—JEAN CANOU AND MEHMET T. TUMAY 97

THEORY AND THE PRESSUREMETER

Numerical Analysis of Pressuremeter Tests by the Finite Element Method—FRANCOIS M. LASSOUDIERE AND FRANCOIS B. ZANIER 121

Principal Stresses Derived from Self-Boring Pressuremeter Tests in Soft Clay—JEAN BENOIT AND G. WAYNE CLOUGH 137
Effective Stress Analysis of Soil Response in a Pressuremeter Test — ILAN JURAN AND J. F. BEECH 150

A Theoretical Study of the Pore Pressure Generation and Dissipation Around the Pressuremeter — FRANCOIS J. BAGUELIN, ROGER A. FRANK AND RAFIC NAHRA 169

Relating Undrained Triaxial and Pressuremeter Stress-Strain-Characteristics by Using Multiyield Surface Model Parameters — JOSEPH L. KAUSCHINGER 187

Interpretation of Pressuremeter Tests Using Laboratory Simulated Tests — CHITTA R. GANGOPADHYAY AND ATHANACIOS N. NASR 214

Expansion of a Cylindrical Cavity in a Very Deformable Medium: A Theoretical Study — MICHEL SOULIÈ, BRANKO LADANYI, AND PHILIPPE DEGENNE 232

Analysis of the Unloading of a Pressuremeter in Sand — GUY T. HOULSBY, BARRY C. CLARKE, AND C. PETER WROTH 245

SOIL PROPERTIES FROM PRESSUREMETER DATA

Conventional Parameters from Pressuremeter Test Data: Review of Existing Methods — GUY Y. FELIO AND JEAN-LOUIS BRIAUD 265

Determination of Properties of Sand from Self-Boring Pressuremeter Tests — PETER K. ROBERTSON AND JOHN M. O. HUGHES 283

Pressuremeter Standard and Pressuremeter Parameters — JEAN-LOUIS BRIAUD, LARRY M. TUCKER, AND CHAIDIR A. MAKARIM 303

Undrained Strength and Deformation Parameters from Pressuremeter Test Results — WILLIAM F. ANDERSON AND IAN C. PYRAH 324

Correlations of LLT Pressuremeter, Vane, and Dutch Cone Tests in Bangkok Marine Clay, Thailand — DENNES T. BERGADO AND MD. ABDUL KHALEQUE 339
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Methods for Application of Pressuremeter Test Results to</td>
<td>Jean-Pierre Bécue, Francoise Brucy, and Pierre Le Tirant</td>
<td>357</td>
</tr>
<tr>
<td>Designing of Offshore Foundations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressuremeter and Deep Foundation Design</td>
<td>Jean-Louis Briaud</td>
<td>376</td>
</tr>
<tr>
<td>Settlement Prediction Using the Pressuremeter</td>
<td>R. G. Lukas</td>
<td>406</td>
</tr>
<tr>
<td>Analysis and Verification of Louisiana Pile Foundation Design Based</td>
<td>Richard R. Davidson and Daniel G. Bodine</td>
<td>423</td>
</tr>
<tr>
<td>on Pressuremeter Results</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRESSUREMETER AND LATERALLY LOADED PILES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design of Laterally Loaded Piles Using the Pressuremeter</td>
<td>Peter K. Robertson, John M. O. Hughes, Richard G. CampANELLA, Peter Brown, and Shawn McKeeown</td>
<td>443</td>
</tr>
<tr>
<td>Application of Pressuremeter Testing to Assess Lateral Pile Response</td>
<td>Stephen Kay, D. Vaughan Griffiths and Harry J. Kolk</td>
<td>458</td>
</tr>
<tr>
<td>in Clays</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Side Friction Mobilization Rates for Laterally Loaded Piles from the</td>
<td>Trevor David Smith and Robert Slyh</td>
<td>478</td>
</tr>
<tr>
<td>Pressuremeter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index</td>
<td></td>
<td>493</td>
</tr>
</tbody>
</table>