

Site Characterization and Modeling

Held at GeoFrontiers 2005

Geotechnical Special Publication Number 138

Austin, Texas, USA
24 – 26 January 2005

Editors:

**Paul W. Mayne
Ellen Rathje
Jasong DeJong
Amy Rechenmacher**

**Jerry Yamamuro
Sunil Sharma
Clinton Willson**

ISBN: 978-1-7138-5270-4

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2005) by American Society of Civil Engineers
All rights reserved.

Printed with permission by Curran Associates, Inc. (2022)

For permission requests, please contact American Society of Civil Engineers
at the address below.

American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, VA 20191
USA

Phone: (800) 548-2723
Fax: (703) 295-6333

www.asce.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Landslide Mapping with Airborne Laser Swath Mapping (ALSM): Accuracy Assessment.....	1
<i>V. R. Schaefer, S. R. Burckhard, J. A. Boomer</i>	
3D Laser Scanning for Tracking Supported Excavation Construction.....	13
<i>Y. M. A. Hashash, J. N. Oliveira Filho, Y. Y. Su, L. Y. Liu</i>	
Remote Sensing Techniques for Highway Earthworks Assessment	23
<i>C. G. Duffell, D. M. Rudrum</i>	
Advanced Sensing for Real-Time Monitoring of Geotechnical Systems	36
<i>T. Abdoun, L. Danisch, D. Ha</i>	
Monitoring of Coastal Bluff Stability Using High Resolution 3 D Laser Scanning.....	46
<i>Brian D. Collins, Nicholas Sitar</i>	
Advanced Airborne Geophysics for Environmental and Engineering Solutions.....	57
<i>Bill Brown, Greg Hodges</i>	
Cost Effective Geophysical Approaches for Various Geotechnical Problems	68
<i>Sandra Takata, Martin Miele, Lester Tyrala, Finn Michelsen</i>	
Needle Probe Application for High-Resolution Assessment of Soil Spatial Variability in the Centrifuge.....	83
<i>Zhihua Li, Bruce L. Kutter, Daniel W. Wilson, Kenneth Sprott, Jong-Sub Lee, J. Carlos Santamarina</i>	
Detection of Stratigraphic Interfaces and Thin Layering Using a Miniature Piezoprobe.....	98
<i>Nicholas Yafrate, Jason T. Dejong</i>	
CPT Readings, VisCPT Observations, and Advanced FEM modeling of Penetration through Soil Interfaces	109
<i>Roman D. Hryciw, Endra Susila, Seungcheol Shin</i>	
Improved Site Stratigraphy and Layer Characterization Using Cone Penetration Testing Methods on Minnesota DOT Projects	121
<i>Derrick Dasenbrock</i>	
Characterizing Geologic Interfaces in Sand, Gravel, and Cobble Deposits	131
<i>J. N. Dismuke, M. L. Rucker, D. B. Durkee, D. E. Smith, J. A. Langer</i>	
Material Unit-Based Rock Core Logging for Geotechnical Applications	142
<i>Brian K. Banks</i>	
2-D Shear-Wave Velocity Profile Along Test Segment of Interstate I-70, St. Louis, Missouri.....	152
<i>T. Thitimakorn, N. L. Anderson, R. Stephenson, Wanxing Liu</i>	
Use of Integrated Geophysics to Characterize Paleo-Fluvial Deposits	161
<i>Ronald T. Green, Richard V. Klar, James D. Prikryl</i>	
Seismic Reflection Attribute Analysis and Inversion Techniques to Map Stratigraphic Interfaces and Thin Beds.....	174
<i>Michael G. Waddell, William J. Domoracki</i>	

Multichannel Analysis of Passive Surface Waves – Modeling and Processing Schemes	187
<i>Choon B. Park, Richard D. Miller</i>	
True Triaxial Apparatuses with Two Rigid Boundaries	201
<i>L. Q. Anhdan, J. Koseki, K. Hayano, T. Sato</i>	
Measurement of Suction in a Marine Clay as an Indicator of Sample Disturbance	211
<i>S. E. Poirier, D. J. Degroot, T. C. Sheahan</i>	
Strength and Deformation Characteristics of Recycled Concrete Aggregate in Triaxial Compression	221
<i>Umair Aqil, Fumio Tatsuoka, Taro Uchimura</i>	
Instrumenting Uniaxial Compressive Strength Tests to Assess the Anisotropic Deformability of a One-Dimensionally Consolidated Kaolinite	231
<i>D. J. M. Ngan-Tillard, A. T. Swart, A. Mulder</i>	
Digital Imaging Technique to Evaluate Shrinkage Strain Potentials of Fiber Reinforced Expansive Soils	241
<i>Venkat Bhadriraju, Anand J. Puppala, Saied Enayatpour, Siva Pathivada</i>	
EM-Wave Based Characterizations of Local Void Ratios in Soils	253
<i>Xiaobo Dong, Yu-Hsing Wang</i>	
Determination of Elastic Parameters in the Lateral Stress Oedometer	261
<i>L. F. Gareau, D. J. Ngan-Tillard, A. Swart</i>	
Advanced Direct Shear Testing for Collapsible Soils with Water Content and Matric Suction Measurement	271
<i>D. Hormdee, H. Ochiai, N. Yasufuku</i>	
Development of a New Soil Tensile Strength Test Apparatus	281
<i>Surendra B. Tamrakar, Toshiyuki Mitachi, Yasuo Toyosawa, Kazuya Itoh</i>	
3-D Shape Descriptors for Geomaterial Aggregates Using Multiple Projective Representations	291
<i>Jonathan Corriveau, Daniel Barrot, Shreekanth Mandayam, Beena Sukumaran</i>	
Ageing and Viscous Effects on the Deformation of Clay in 1D Compression.....	300
<i>J.-L. Deng, F. Tatsuoka</i>	
Drained and Undrained Creep Characteristics of Loose Saturated Sand.....	312
<i>T. Kiyota, F. Tatsuoka, J. Yamamuro</i>	
Basic Factors Controlling Strength and Deformation Characteristics of Cement-Mixed Gravel.....	322
<i>L. Kongsukprasert, F. Tatsuoka</i>	
The Yield Behavior of Leighton Buzzard Sand in a Hollow Cylinder Apparatus.....	332
<i>P. J. Naughton, B. C. O'Kelly</i>	
Automated Flexible-Boundary True Triaxial System for Cohesive Soils	342
<i>Dayakar Penumadu, Amit Prashant</i>	
Displacement Measurements for Cyclic Triaxial Tests Using Digital Image Correlation	352
<i>E. Montemayor, R. P. Ray</i>	
Application of Automated Laboratory Tests to Minnesota D.O.T. Highway Project Site Characterization.....	362
<i>Derrick Dasenbrock, W. Allen Marr, Rachid Hankour</i>	

A High Speed Resistivity System for Investigation of Processes on Geocentrifuges	372
<i>Roelof Versteeg, Doug Labrecque, Bruce Kutter, Earl Mattson, Alex Richardson, Roger Sharpe, Zhihua Li, Daniel Wilson, Alan Stadler</i>	
Application of X-ray Computed Tomography to Cone Penetration Tests in Sands	382
<i>D. J. M. Ngan-Tillard, X. H. Cheng, J. Van Nes, P. L. J. Zitha</i>	
Seismic Design Site Classification Using Spectral Analysis of Surface Waves (SASW) and Resistivity Imaging.....	394
<i>W. T. Dean, W. J. Seaton</i>	
Lossy Half-Space Born Approximation Modeling of Electromagnetic Wave Source and Scattering in Soil by Cross Well Radar	402
<i>H. Zhan, C. Rappaport, M. Farid, A. Alshawabkeh, H. Raemer</i>	
Challenges and Validation of Cross Tomography Experimentation for Inverse Scattering Problems in Soils.....	412
<i>M. Farid, A. N. Alshawabkeh, H. Zhan, C. M. Rappaport</i>	
Ultrasonic and X-ray Tomographic Imaging of Highly Contrasting Inclusions in Concrete Specimens.....	422
<i>M. Daigle, D. Fratta, L. B. Wang</i>	
Influence of Grain Size and Consolidation Pressure on Porosity of Rocks.....	434
<i>Bashar A. Alramahi, Khalid A. Alshibli, Attia M. Attia</i>	
The Application of Monochromatic Energies to Investigate Multiphase Porous Media Systems using Synchrotron X-ray Tomography.....	447
<i>Kyungmin Ham, Clinton S. Willson</i>	
Neural Network Material Model Enhancement: Optimization Through Visualization and Selective Data Removal.....	459
<i>Jeremy N. Butkovich, Youssef M. A. Hashash</i>	
Three-Dimensional Characterization and Visualization of Till in Boston, Massachusetts.....	469
<i>M. H. Balfe, L. G. Baise, L. Edgers</i>	

Author Index