

Geo-China 2016

Advances in Numerical and Experimental Analysis of Transportation Geomaterials and Geosystems for Sustainable Infrastructure

Selected Papers from the Fourth Geo-China International Conference

Geotechnical Special Publication Number 257

**Shandong, China
25 – 27 July 2016**

Editors:

**Rifat Bulut
Xinbao Yu
Shu-Rong Yang**

ISBN: 978-1-5108-2967-1

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© (2016) by American Society of Civil Engineers
All rights reserved.

Printed by Curran Associates, Inc. (2016)

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

Contents

Exploring the Geomechanics of Sinkholes: A Numerical Study of Sinkhole Subsidence and Collapse	1
Kishor Rawal, Zhong-Mei Wang, and Liang-Bo Hu	
Reliability Assessment of Wedge Failure in Rock Slopes by the Random Sets Theory	9
Rodrigo Hernández-Carrillo and Gloria Inés Beltrán	
Experimental and Numerical Analysis on the Specific Storage of Low Permeable Sandstone for Supercritical CO₂	18
Ardy Arsyad and Yasuhiro Mitani	
Experimental Study on the Drained Shear Strength of Unsaturated Clayey Sand.....	35
Nigui Qian, Duanyi Wang, and Qingyan Tian	
Application of the Low Strain Method to the Nondestructive Detection of the Integrity of Highway Bridge Rock-Socketed Piles	43
Laisheng Xue and Xiangxing Kong	
Performance Evaluation of Pier Foundation Excavations at an Existing Freeway Embankment	50
James C. Ni and Wen-Chieh Cheng	
Microstructural Damage-Induced Localized Fracturing of Brittle Rocks	58
Tao Xu, Shengqi Yang, Mike Heap, Chongfeng Chen, and Tianhong Yang	
Numerical Simulation of Built-In Oblique Circular 3D Crack Propagation under Uniaxial Compression by the Element Free Galerkin Method	66
Dun-Fu Zhang, Sheng-Hua Huang, Bo Zhang, Shu-Cai Li, and Wei-Shen Zhu	
Seismic Stability Analysis of Un-Reinforced and Reinforced Soil Slopes	74
S. Sahoo, B. Manna, and K. G. Sharma	
Use of Retaining Walls with Relief Shelves as an Economic Solution	82
Hany Farouk Shehata	
Effect of Supporting Soil Rigidity on the Apparent Earth Pressure	91
Hany Farouk Shehata and Tamer M. Sorour	

Reliability Analysis of Strain-Softening Slopes Using the First Order Reliability Method (FORM)	100
Subhadeep Metya, Gautam Bhattacharya, and Robin Chowdhury	
Probabilistic Stability Analysis of Unsaturated Soil Slopes under Rainfall.....	108
Bai Tao and Deyu Zhang	
Rainfall-Induced Failure of Volcanic Embankments Subjected to Cyclic Loadings in Cold Regions	116
Shima Kawamura, Seiichi Miura, Hieu Minh Dao, and Ryoichi Yamada	
Computation of the Rotational Displacements of Gravity Retaining Walls by the Pseudo-Dynamic Method.....	124
Anindya Pain, Deepankar Choudhury, and S. K. Bhattacharyya	
Statistical Correlations between Pressuremeter Tests and SPT for Glacial Tills.....	133
Kanagaratnam Balachandran, Jinyuan Liu, Laifa Cao, and Scott Peaker	
Prediction of the Field Response of Soil-Support Systems in Deep Excavations.....	141
A. M. Hefny, T. M. Sorour, and M. E. Ezzat	
Sustainable Mitigation of Slope Failure by Compacted Soil-Cement Fill.....	152
Jason Y. Wu, Kaiming Huang, and Munira Sungkar	
A Numerical Approach to Solve 3D Geotechnical Problems with 2D Codes....	160
Guangxian Hou and Shanzhi Shu	
Risk Assessment Study on Long Oil and Gas Pipeline Construction-Induced Landslide Disasters	167
Mingzhou Bai, Yanqing Du, Zhihua Da, Yujian Xing, and Pingyuan Zhao	
Probabilistic Assessment of Fill Slope Stability	175
Kelvin Lim, Alexander Schmid, and An-Jui Li	
Probability of Liquefaction in Sabkha Soils under Different Earthquakes.....	183
Ahmed T. M. Farid	
Site-Specific Seismic Response Analyses of a Municipal Solid Waste Dump Site at Delhi, India	191
B. J. Ramaiah, G. V. Ramana, and B. K. Bansal	