IFCEE 2021

Geoenvironmental Engineering, Geomaterial Modeling, Transportation Geotechnics, and Case Histories

Selected Papers from Sessions of the International Foundations Congress and Equipment Expo 2021

Geotechnical Special Publication Number 326

Dallas, Texas, USA 10 – 14 May 2021

Editors:

Chadi El Mohtar Stacey Kulesza Tugce Baser Michael D. Venezia

ISBN: 978-1-7138-3437-3

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© (2021) by American Society of Civil Engineers All rights reserved.

Printed with permission by Curran Associates, Inc. (2021)

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 IFCEE 2021 GSP 326 x

Contents

Case Histories, Lessons Learned, and General Practice

Optimizing Construction Processes in Special Foundation Engineering with New Process Documentation Instruments
Christian Hoyme and Hans Regler
Investigation of Underground Water Leakage Using Ground Penetration Radar (GPR)10
M. S. Khan, M. Nobahar, P. L. Stanley, and J. Ivoke
Field Performance of a Highway Slope Made of Expansive Yazoo Clay in Mississippi21 M. S. Khan, M. Nobahar, and J. Ivoke
Two- and Three-Dimensional Slope Stability Analyses of Rock Cut Using Unmanned Aerial Photogrammetry Data
Surya Sarat Chandra Congress, Prince Kumar, Amit Gajurel, Ujwalkumar D. Patil, and Anand J. Puppala
The Reaction of Embankment to Longwall Mining Subsidence
I-690 Syracuse: Rigid Inclusion Design and Performance Monitoring for an MSE Wall Viaduct Replacement55
Mary C. Nodine, Alexander Erb, Nicholas Benedetto, and Michael Walker
A Practical Design and Innovative Construction Approach to Stabilizing a 140-Year-Old Historic Bulkhead70
Domenic D'Argenzio, Leszek Czajkowski, and Roderic A. Ellman Jr.
Case Study on Design and Installation of Displacement Auger Cast Piles into Franciscan Bedrock Formation83
William Heywood, Leroy Chan, and Ravi Vedantham
Tapertube Pile Capacity Prediction: Pile Driving Analyzer versus Static Load Test96 Aly Mohammad, Gisele R. Passalacqua, Joanna Smith, and Subhash C. R. Mahali
Common Pitfalls in Bi-Directional Static Load Testing

Case Histories in Unsuccessful Pressure Grouting to Remediate Sinkhole Related Subsurface Conditions for Residential Structures in Florida117 Said Iravani
Regional 3D Stability Analyses of the Egkremnoi Coastline and Comparison with Landslides Caused by the 2015 Lefkada Earthquake
Weibing Gong, Dimitrios Zekkos, Marin Clark, John Manousakis, and Dalia Kirshbaum
State of Practice of Deep Foundation Quality Control—A Comparison between
North America and Europe
George Piscsalko and Mattias Gravare
Working Platforms for Tracked Piling Plant—Current Worldwide
Practice and Guidance for the USA149
Paul A. Gildea, Peter Faust, and Thomas D. Richards
Geoenvironmental Engineering
Field-Scale Tests to Evaluate Foamed Glass Aggregate Compaction
Monitoring and Evaluation of Evapotranspiration of Water Balance Cover169 Md. Jobair Bin Alam, Naima Rahman, Farnaz Seraj, and Md. Sahadat Hossain
Sustainable, Low-Cost Waste Materials in Remediating Coal Mine Drain:
A Column Study179
Masrur Mahedi, Rayla Pinto-Vilar, Bora Cetin, Kaoru Ikuma, and Tuncer Edil
Soil Properties and Modeling
Study of Mechanical Improvement of Hydrogel-Treated Sandy Soil
Microscopic Insights on the Impact of Fabric Anisotropy on Shear Strength of Consolidated Clays196
Karam A. Jaradat and Sherif L. Abdelaziz
Numerical Modelling of Bamboo Geogrid Reinforced Fly Ash Walls under Applied Uniform Loads205
A. W. Mekonnen and J. N. Mandal
The Effect of Particle Breakage of Calcareous Sand on Shear Strength Using a Stress-Dilatancy Model215
Wenjing Cai and Cassandra Rutherford

IFCEE 2021 GSP 326 xiii

Interlaboratory Large-Scale Direct Shear Testing of Open-Graded Aggregates:	
Round One	361
Jennifer E. Nicks, Thomas Gebrenegus, and Michael T. Adams	
Predicting Soil Temperature and Moisture beneath Granular-Surfaced	
Roadways Using Regional Weather Data Network	371
Derya Genc, Jeramy C. Ashlock, Bora Cetin, Kristen Cetin, and Robert Horton	
Determination of the Resilient Modulus under Anisotropic Stress Conditions	381
Ceren Aydin, Mustafa Hatipoglu, Bora Cetin, and Halil Ceylan	
Evaluation of Optimized Compaction Energy for Coarse Aggregates by Gyratory	
Compactor	390
Sajjad Satvati, Bora Cetin, and Jeramy C. Ashlock	
Influence of Insulation Layer on the Thermal Behavior of Subgrade Soils	401
Zhuang Zhuo, Zhaoxing Xie, Ayman Ali, Yusuf Mehta, Cheng Zhu, Wade Lein,	
and Christopher DeCarlo	
and Christopher Decario	