GEO-CONGRESS 2019
8th International Conference on Case Histories in Geotechnical Engineering
Philadelphia, Pennsylvania | March 24-27

Case Histories – Capturing the Accomplishments of Our Profession

Pennsylvania Convention Center/Loews Philadelphia Hotel
www.geocongress.org

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Welcome to Geo-Congress 2019

Schedule at a Glance  (Subject to change)
All functions take place in the Pennsylvania Convention Center, unless otherwise noted.

Sunday, March 24, 2019
7:00 a.m. – 12:00 p.m. Short Course Registration Only – Loews Philadelphia Hotel, 2nd floor
8:00 a.m. – 12:00 p.m. Short Course 1: Geotechnical Earthquake Engineering, with Emphasis on the Central and Eastern U.S. – Loews Philadelphia Hotel, Commonwealth A1
8:00 a.m. – 12:00 p.m. Short Course 5: Soil Shear Strength – Loews Philadelphia Hotel, Commonwealth C
8:00 a.m. – 12:00 p.m. Short Course 7: Foundation Cost Estimating for Geotechnical Engineers – Loews Philadelphia Hotel, Commonwealth D
8:00 a.m. – 4:30 p.m. Short Course 11: 2D/3D Slope Stability and Seepage – Loews Philadelphia Hotel, Washington C
12:00 – 7:00 p.m. Conference Registration Open – Broad Street Entrance
1:00 – 5:00 p.m. Short Course 4: Introduction to Tunneling – Loews Philadelphia Hotel, Commonwealth C
1:00 – 5:00 p.m. Short Course 6: Geotechnical Site Characterization – Loews Philadelphia Hotel, Commonwealth A1
1:00 – 5:00 p.m. Short Course 8: Practical, Qualitative Risk Evaluation for Geotechnical Projects – Loews Philadelphia Hotel, Commonwealth D
1:00 – 5:00 p.m. Short Course 10: Ethics in Geotechnical Engineering – Loews Philadelphia Hotel, Commonwealth B
1:00 – 5:00 p.m. Exhibitor Setup – Exhibit Hall E
2:00 – 2:30 p.m. G-I Student Orientation – Room 122B
3:30 – 4:30 p.m. G-I Geo-Wall Captains Meeting – Room 123
4:30 – 5:00 p.m. AGP Induction Ceremony – Terrace Ballroom IV
5:00 – 6:30 p.m. Opening Remarks and H. Bolton Seed Award Lecture – Terrace Ballroom IV
6:30 – 8:00 p.m. Welcome Reception – Exhibit Hall E

Monday, March 25, 2019
7:00 a.m. – 6:30 p.m. Registration Open – Broad Street Entrance (12:15 – 1:15 p.m. Registration Closed for lunch)
8:00 – 8:30 a.m. Welcoming Remarks from the Honorable Edward G. Rendell – Terrace Ballroom IV
8:30 – 10:00 a.m. GeoPIT: Powerful, Informative Talks on Geotechnical Topics – Terrace Ballroom IV
10:00 – 10:30 a.m. Morning Networking Break – Exhibit Hall E
10:30 a.m. – 12:00 p.m. Special Session: History of Case Histories in Geotechnical Engineering; Legacy of Dr. Shamsher Prakash – Room 120B
10:30 a.m. – 12:00 p.m. Panel Session: Deep Foundations in Urban Environments – Room 126A
10:30 a.m. – 12:00 p.m. Technical Sessions – See pages 12-13
10:00 a.m. – 3:00 p.m. Student Competitions – Exhibit Hall E
12:00 – 1:30 p.m. Lunch – Exhibit Hall E
1:00 – 2:30 p.m. Panel Session: MSE Walls – Milestone Case Histories that Changed the Profession – Room 126A
1:30 – 3:00 p.m. Special Session: A 50-Year Tribute to Ralph Peck and the Observational Method, Part I – Room 120B
1:30 – 3:00 p.m. Technical Sessions – See pages 14-15
3:30 – 5:30 p.m. Special Session: A 50-Year Tribute to Ralph Peck and the Observational Method, Part II – Room 120B
3:30 – 5:00 p.m. Panel Session: State Department of Transportation Executives (Invitation Only) – Room 126A
3:30 – 5:30 p.m. Poster Session – See pages 16-18
6:00 – 7:30 p.m. Organizational Member Executive Leadership Dinner and Workshop (Invitation Only) – Loews Philadelphia Hotel – Lescaze Room, 33rd Floor
6:30 – 9:00 p.m. Organizational Member Executive Leadership Dinner and Workshop (Invitation Only) – Loews Philadelphia Hotel – Lescaze Room, 33rd Floor
7:45 – 8:45 p.m. GH Student Program: Organizational Members and Student Travel Grant Winners Career Fair (Invitation Only) – Room 122B
8:45 – 9.45 p.m. GH Student Program: Organizational Member and Student Reception – Room 122B

CONFERENCE APP

Be sure to download the mobile app to create a personalized schedule, see all the session details and speakers, last minute changes, and contact other attendees.

To download the app, visit: https://attendify.com/attendify_app/download and search for GeoCon 2019.

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**Tuesday, March 26, 2019**

7:00 a.m. – 5:30 p.m. Registration Open – Broad Street Entrance
(12:15 – 1:15 p.m. Registration Closed for lunch)

8:00 – 8:30 a.m. Inspiring Remarks from Bibop G. Gresta – Terrace Ballroom IV

8:30 – 10:00 a.m. Geo-PIT: Powerful, Informative Talks on Geotechnical Topics – Terrace Ballroom IV

10:00 – 10:30 a.m. Morning Networking Break – Exhibit Hall E

10:30 a.m. – 12:00 p.m. Panel Session: GBA: Events That Changed Our Practice – Room 120B

10:30 a.m. – 12:00 p.m. Panel Session: Fostering Innovation in Tunneling and Underground Construction – Room 126A

10:30 a.m. – 12:00 p.m. Technical Sessions – See pages 19-20

12:00 – 1:30 p.m. Lunch – Exhibit Hall E

12:30 – 1:30 p.m. Geo-Institute Business Meeting – Room 126A

1:30 – 3:00 p.m. Panel Session: Urban Excavation Support – Room 126A

1:30 – 3:00 p.m. Technical Sessions – See pages 21-22

3:00 – 3:30 p.m. Afternoon Networking Break – Exhibit Hall E

3:30 – 5:00 p.m. Panel Session: 7 Year Itch: What Have We Learned from Hurricane Sandy – Room 126A

3:30 – 5:30 p.m. Poster Session – See pages 23-25

5:30 – 6:00 p.m. Professional and Student Competition Awards Presentation – Terrace Ballroom IV

6:00 – 7:00 p.m. Terzaghi Award Lecture – Terrace Ballroom IV

7:30 – 10:00 p.m. Terzaghi Dinner (Invitation Only) – Loews Philadelphia Hotel – Lescaze Room, 33rd Floor

**Wednesday, March 27, 2019**

7:30 a.m. – 1:00 p.m. Registration Open – Broad Street Entrance

8:00 – 9:30 a.m. Geo-PIT: Powerful, Informative Talks on Geotechnical Topics – Terrace Ballroom IV

9:30 – 10:00 a.m. Morning Networking Break – Exhibit Hall E

10:00 – 11:30 a.m. Panel Session: Changing the Paradigm for Large Landslides: Forecasting Time-to-Failure – Room 126A

10:00 – 11:00 a.m. Special Session: Robert M. Koerner Lecture - Lessons Learned: An Adventure in 4 Decades of Geosynthetics Engineering – Terrace Ballroom III

10:00 – 11:30 a.m. Technical Sessions – See pages 26-27

11:30 a.m. – 1:00 p.m. Lunch – Exhibit Hall E

1:00 – 2:00 p.m. Ralph B. Peck Award Lecture – Terrace Ballroom IV

2:00 – 2:30 p.m. Closing Ceremony – Terrace Ballroom IV
Loews Philadelphia Hotel Floor Plans

Short Courses 1-10 and Committee Meetings

Commonwealth Hall
A1
A2

Prefunction

Second Floor

Washington Room
A
B
C

Short Course 11 and Committee Meetings

Third Floor

Organizational Member Executive Leadership Dinner and Workshop and Terzaghi Dinner

33rd Floor
Welcome from the Conference Co-Chairs

The Program Committee hopes you enjoy your experience here at the Geo-Congress 2019: The Eighth International Conference on Case Histories in Geotechnical Engineering and the wonderful experiences the City of Philadelphia has to offer.

From the early days of modern geotechnical engineering, sharing field experiences of the performance of geostructures – dams, foundations, tunnels, landfills – in the form of case histories has driven the advancement of knowledge for the geo-profession. Starting in 1984, Professor Shamsher Prakash formalized this tradition and organized the First International Conference on Case Histories in Geotechnical Engineering. This conference brought together more than 190 engineers from 30 countries to share their experiences, learn from each other, and advance the profession. By 2013, the 7th conference in this series drew nearly 320 engineers from 40 countries spanning the globe, culminating in symposia to honor Ralph B. Peck and Clyde Baker. But the essence of the conference had not changed: to advance our profession through shared engineering judgment.

Geo-Congress 2019 continues this tradition and features experiences and observations from hundreds of geoengineering projects. The conference includes a wide range of informative technical and panel sessions, short courses, and workshops. Join us in celebration of our geo-accomplishments!
Proud to be a Platinum Sponsor of Geo-Congress 2019 and the Karl Terzaghi Award Lecture.

Congratulations to this year’s winner, Dr. Izzat M. Idriss.

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**SUNDAY, MARCH 24, 2019**

**SHORT COURSE 1:** Geotechnical Earthquake Engineering, with Emphasis on the Central and Eastern U.S.*
8:00 a.m. – 12:00 p.m., Loews Philadelphia Hotel - Commonwealth A1
Instructor: Russell A. Green, Ph.D., P.E., M.ASCE, Virginia Tech

**SHORT COURSE 5:** Soil Shear Strength*
8:00 a.m. – 12:00 p.m., Loews Philadelphia Hotel - Commonwealth C
Instructor: Dan Vanden Berge, Ph.D., P.E., M.ASCE, Tennessee Tech

**SHORT COURSE 7:** Foundation Cost Estimating for Geotechnical Engineers*
8:00 a.m. – 12:00 p.m., Loews Philadelphia Hotel - Commonwealth D

**SHORT COURSE 11:** 2D/3D Slope Stability and Analysis*
8:30 a.m. – 4:30 p.m., Loews Philadelphia Hotel - Washington C

*Additional ticket purchase required

**SHORT COURSE 4:** Introduction to Tunneling*
1:00 – 5:00 p.m., Loews Philadelphia Hotel - Commonwealth C
Instructor: Fulvio Tonon, Ph.D., P.E., M.ASCE, University of Colorado-Boulder

**SHORT COURSE 6:** Geotechnical Site Characterization*
1:00 – 5:00 p.m., Loews Philadelphia Hotel - Commonwealth A1
Instructor: Mark Styler, Ph.D., ConeTec

**SHORT COURSE 8:** Practical, Qualitative Risk Evaluation for Geotechnical Projects*
1:00 – 5:00 p.m., Loews Philadelphia Hotel - Commonwealth D
Instructor: Gregory Baecher, Ph.D., M.ASCE, University of Maryland; Scott Raschke, Ph.D., P.E., M.ASCE, Schnabel Engineering; Robert Patev, U.S. Army Corps of Engineers

**SHORT COURSE 10:** Ethics in Geotechnical Engineering*
1:00 – 5:00 p.m., Loews Philadelphia Hotel - Commonwealth B
Instructor: Victor R. Donald, P.E., M.ASCE, Terracon

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**GlobaL Leaders In**

**Site Characterization**

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**Sectors**

- Mining
- Infrastructure
- Energy
- Environmental
- Commercial Development
- Earthquake Engineering

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**Better Information Better Decisions**

**ConeTec.com**
SUNDAY, MARCH 24, 2019

AGP Induction Ceremony – Terrace Ballroom IV
4:30 – 5:00 p.m.

Opening Remarks
5:00 – 5:30 p.m., Terrace Ballroom IV

Conference Co-Chairs: Scott M. Olson, Ph.D., P.E., M.ASCE, University of Illinois at Urbana Champaign; Allen Cadden, P.E., D.GE, F.ASCE, Schnabel Engineering

H. Bolton Seed Award Lecture
Geotechnical Judgment and Risk
5:30 - 6:30 p.m., Terrace Ballroom IV
W. Allen Marr, Ph.D., P.E., D.GE, NAE, F.ASCE
Sponsored by JACOBS

Welcome Reception in the Exhibit Hall
6:30 – 8:00 p.m., Exhibit Hall E

Be among the first to see innovations in the industry by attending the Welcome Reception and touring the exhibits. Join colleagues and friends in the Exhibit Hall for this opportunity to network and make valuable future contacts.

Sponsored by SALTUS

MONDAY, MARCH 25, 2019

Welcoming Remarks from
The Honorable Edward G. Rendell
8:00 – 8:30 a.m., Terrace Ballroom IV

The Honorable Edward G. Rendell
News Analyst, NBC - Special Counsel, Ballard Spahr, LLP

After 34 years of public service, including 24 years as an elected official, Governor Rendell continues to pursue many of the same issues he was passionate about while serving. His commitment to making America a cleaner, more efficient place and to fostering investment in our nation’s crumbling infrastructure is as strong as it has ever been.

Geo-PIT: Powerful, Informative Talks on Geotechnical Topics
8:30 – 10:00 a.m., Terrace Ballroom IV

Speakers:
Lelio Mejia, Ph.D., P.E., M.ASCE, Geosyntec: The Panama Canal: A Wonder of Engineering
James Mitchell Sc.D., P.E, D.GE(Ret), NAE, Dist.M.ASCE, Virginia Tech: Geotechnics Goes Out Of This World
Nina Stark, Ph.D., Virginia Tech: Of Ice and Erosion: Geotechnics in the Arctic Coastal Zone
Mary Ellen Large, P.E., D.GE, M.ASCE, DFI: Non-Profit Profits

Morning Networking Break
10:00 – 10:30 a.m., Exhibit Hall E

Student Competitions
10:00 a.m. – 3:00 p.m., Exhibit Hall E

Special Session: History of Case Histories in Geotechnical Engineering |
Legacy of Dr. Shamsher Prakash
10:30 a.m. – 12:00 p.m., Room 1208

Moderator: Sanjeev Kumar, Ph.D., P.E., F.ASCE, Southern Illinois University Carbondale


Shamsher Prakash, Ph.D., P.E., D.GE(Ret), Dist.M.ASCE

Shamsher Prakash has been nationally and internationally recognized for his work in the area of earthquake engineering and soil dynamics, including pioneering work on liquefaction of fine-grained soils, seismic design of piles, and seismic analysis of rigid retaining walls. He revolutionized the use of geotechnical engineering case histories in professional practice and education, chaired six international conferences on case histories in geotechnical engineering, and wrote several books. Prakash was elected Distinguished Member of the American Society of Civil Engineers in 2011 and was certified a Diplomate of the Academy of GeoProfessionals in 2010. Prakash received the Distinguished Alumnus Award from the Indian Institute of Technology, Roorkee in 2008.

Panel: Deep Foundations in Urban Environments
10:30 a.m. – 12:00 p.m., Room 126A

Moderator: George E. Leventis, P.E., F.ASCE, Langan

Panelists: Peggy Hagerty Duffy, P.E., D.GE, ADSC, Charlie Huynh, Case Foundation Company; Thomas Joussellin, Soletanche Bachy; Tony Mazzo, P.E., Urban Foundation Engineering; Silas Nichols, P.E., FHWA; Kathryn Petek, Ph.D., P.E., Sharron & Wilson, Inc.

Lunch
12:00 – 1:30 p.m., Exhibit Hall E

Panel: MSE Walls: Milestone Case Histories that Changed the Profession
1:30 – 3:00 p.m., Room 126A

Moderator: Barry R. Christopher, Ph.D., P.E., M.ASCE, Christopher Consultants


Special Session: A 50-Year Tribute to Ralph B. Peck and the Observational Method, Part I
1:30 – 3:00 p.m., Room 1208

Use of the Observational Method as the Sole Basis for Design
Speakers: J. Michael Duncan, Ph.D., P.E., D.GE(Ret.), Dist.M.ASCE, Virginia Tech; Thomas L. Brandon, Ph.D., P.E., M.ASCE, W.C. English Geotechnical Research Laboratory, Virginia Tech

Repairs to Whitehouse Lake Dam
Program Highlights

**Afternoon Networking Break**
3:00 – 3:30 p.m., Exhibit Hall E

**Special Session: A 50-Year Tribute to Ralph B. Peck and the Observational Method, Part II**
3:30 – 5:00 p.m., Room 120B

**An Irrefutable Case for Case Histories: Seismic Design of Municipal Solid Waste Landfills**
Speakers: Edward Kavazanjian, Jr., Ph.D., P.E., D.GE, NAE, Dist.M.ASCE, Arizona State University

**Two Observational Method Applications: An Ideal Solution for Geotechnical Projects with Uncertainty**
Speakers: Suzanne M. Lacasse, D.Eng., P.E., D.GE(Ret.), F.ASCE, Norwegian Geotechnical Institute

**Poster Session**
3:30 – 5:30 p.m., Exhibit Hall E
See pages 16-18 for listing.

**Organizational Member Executive Leadership Dinner and Workshop (Invitation Only)**
6:00 – 7:30 p.m., Loews Philadelphia Hotel – Lescaze Room, 33rd floor

**G-I Student Program: Organizational Members and Student Travel Grant Winners Career Fair (Invitation Only)**
7:45 – 8:45 p.m., Room 122B

**G-I Student Program: Organizational Member and Student Reception**
8:45 – 9:45 p.m., Room 122B

**TUESDAY, MARCH 26, 2019**

**Inspirational Remarks from Bibop G. Gresta**
8:00 – 8:30 a.m., Terrace Ballroom IV

**Bibop G. Gresta**
Chairman, Co-Founder at Hyperloop Transportation Technologies - Founder Digitalmagics - TedX Speaker - WEF Tech Pioneer

As the Co-Founder and current Chairman of Hyperloop Transportation Technologies (HTT), Bibop Gresta leads a team of 800 professionals in 40 countries across six continents. HTT was the first company to begin development of the Hyperloop™ and is the largest company ever built upon a collaborative business ecosystem. HTT, under Gresta’s leadership, has been revolutionizing both mobility and the outdated business models. In 2018 HTT has been declared Technology Pioneer by the World Economic Forum.

**Geo-PIT: Powerful, Informative Talks on Geotechnical Topics**
8:30 – 10:00 a.m., Terrace Ballroom IV

**Speakers:**
Jennifer Nicks, P.E., M.ASCE: Leap Not Creep: A Case History of a Technology Gone Rogue
Paul Schmall, P.E., D.GE., F.ASCE: Moretrench, Sharing the Underground Experience

**Menzer Pehlivan, Ph.D., P.E., M.ASCE:** Inclusion starts with I
**Silas Nichols, M.ASCE:** Could we have known?

**Morning Networking Break**
10:00 – 10:30 a.m., Exhibit Hall E

**Panel Session: GBA: Events That Changed Our Practice**
10:30 a.m. – 12:00 p.m., Room 120B
Moderator: Victor R. Donald, P.E., M.ASCE, Terracon
Panelists: Michael Yost, P.E., Esq., Terracon; James Hamilton, P.E., Esq., GAI

**Panel Session: Fostering Innovation in Tunneling and Underground Construction**
10:30 a.m. – 12:00 p.m., Room 126A
Moderator: Elizabeth M. Dwyre, P.E., D.GE, M.ASCE, WSP

**Lunch**
12:00 – 1:30 p.m., Exhibit Hall E

**Panel Session: Urban Excavation Support**
1:30 – 3:00 p.m., Room 120B
Moderator: Andrew Burns, P.E., M.ASCE, Skanska
Panelists: Arthur Alzamora, P.E., M.ASCE, WSP; Theodore Civetta Jr., P.E., M.ASCE, John Civetta & Sons; Joseph A. Sopko, Ph.D., P.E., M.ASCE, Moretrench; Greg Sanchez, Treviicos; Andrew Burns, Underpinning & Foundation Skanska; Toben Jerry, GFI Infrastructure

**Afternoon Networking Break**
3:00 – 3:30 p.m., Exhibit Hall E

**Poster Session**
3:00 – 5:00 p.m., Exhibit Hall E
See pages 23-25 for listing.

**Panel Session: 7-Year Itch: What Have We Learned from Hurricane Sandy**
3:30 – 5:00 p.m., Room 126A
Hurricane Sandy affected metropolitan New York in ways that no storm previously had. In this panel discussion, Geo-Institute members involved in Sandy reconnaissance and 3 local public officials will present their experiences during and after the 2012 superstorm. The discussion will focus on engineering aspects of the immediate aftermath, as well as resilience, mitigation, and adaptation strategies employed in the years since. Each panelist will give a brief prepared presentation followed by discussion and Q&A.

Moderator: Nadine M. Post, ENR
Panelists: Aspasia Nikolou, WSP USA; Youssef Hashash, University of Illinois at Urbana-Champaign; Thomas O’Rourke, Cornell University; Michael Moriarty, Federal Emergency Management Agency; Carter Strickland, The Trust for Public Land; Anthony Fevola, NJ Transit (invited)

**Professional and Student Competition Awards Presentation**
5:30 – 6:00 p.m., Terrace Ballroom IV
Conference Co-Chairs: Scott M. Olson, Ph.D., P.E., M.ASCE, University of Illinois at Urbana-Champaign; Allen Cadden, P.E., D.GE, F.ASCE, Schnabel Engineering
**Karl Terzaghi Award Lecture**
Response of Soil Sites During Earthquakes
A 60-Year Perspective
6:00 – 7:00 p.m., Terrace Ballroom IV
Speaker: Izzat M. Idriss, Ph.D., P.E., NAE, Dist.M.ASCE, University of California, Davis
Sponsored by Schnabel Engineering

**Terzaghi Dinner (Invitation Only)**
7:30 – 10:00 p.m., Loews Philadelphia Hotel – Lescaze, 33rd Floor

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**WEDNESDAY, MARCH 27, 2019**

**Geo-PIT: Powerful, Informative Talks on Geotechnical Topics**
8:00 – 9:30 a.m., Terrace Ballroom IV
Speakers:
Michelle L. Barry, Ph.D., P.E., M.ASCE, University of Arkansas
Kevin Franke, P.E., M.ASCE, Brigham Young University; Drones: An Engineering Reconnaissance Tool of Tomorrow - Here Today!
Jason DeJong, Ph.D., M.ASCE, University of California at Davis
Kord Wissmann, Ph.D., P.E., D.GE, M.ASCE, Geopier Foundation Co.; GeoTransformation – Getting it All Back Again
Scott Anderson, P.E., M.ASCE, BGC Engineering; We All Saw It the Same Way

**Morning Networking Break**
9:30 – 10:00 a.m., Exhibit Hall E

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**Special Session: Robert M. Koerner Lecture**
Lessons Learned: An Adventure in 4 Decades of Geosynthetics Engineering
10:00 – 11:00 a.m., Terrace Ballroom III
Speaker: Barry R. Christopher, Ph.D., P.E., M.ASCE, Christopher Consultants

**Panel: Changing the Paradigm for Large Landslides: Forecasting Time-to-Failure**
10:00 – 11:30 a.m., Room 126A
Moderator: Joseph Wartman, Ph.D., P.E., M.ASCE, University of Washington
Panelists: Siobhan Whadcoat, UBC; Paolo Mazzanti, Sapienza Università di Roma; Steve Borron, IDS GeoRadar

**Lunch**
11:30 a.m. – 1:00 p.m., Exhibit Hall E

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**Ralph B. Peck Award Lecture**
Observations and Findings from Christchurch Case Histories on Soil Liquefaction
1:00 – 2:00 p.m., Terrace Ballroom IV
Speaker: Misko Cubrinovsky, Ph.D.
Sponsored by ConeTec

**Closing Ceremony**
2:00 – 2:30 p.m., Terrace Ballroom IV
Technical Program

Monday, March 25, 2019

8:00 – 8:30 a.m. Welcoming Remarks from the Honorable Edward G. Rendell, Terrace Ballroom IV

8:30 – 10:00 a.m. Geo-PIT: Powerful, Informative Talks on Geo-Topics, Terrace Ballroom IV

10:00 – 10:30 a.m. Morning Networking Break, Exhibit Hall E

10:30 a.m. – 12:00 p.m. Special Session: History of Case Histories in Geotechnical Engineering; Legacy of Dr. Shamsher Prakash, Terrace Ballroom III

10:30 a.m. – 12:00 p.m. Panel Session: Deep Foundations in Urban Environments, Room 126A

Technical Sessions

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#### Shallow Foundations
Moderators: Xiong Zhang, A.M.ASCE, Hosam Salman, P.E., F.ASCE

- **Comparison of Estimated Soil Settlements Using Strain-Dependent and High-Strain Elastic Moduli**
  - John Davie, Ph.D., P.E., CEng, A.M.ASCE, Tyler Liu; Michael Lewis; Jose Clemente, Iberdrola

- **Conical Load Test-Induced Settlement in Central Florida Soils**
  - A. Felipe Uribe-Henao, University of Central Florida; Luis Arbeloa-Manuel, Ph.D., University of Central Florida; Sergio Savatter, University of Central Florida; Manoj Chopra, Ph.D., University of Florida; Larry Jones, Florida DoT

- **A New Analysis of Circular Raft on Layered Elastic Soil**
  - Hesham Elhuni, University of Central Florida; Luis Arbeloa-Manuel, Ph.D., University of Central Florida; Sergio Savatter, University of Central Florida; Manoj Chopra, Ph.D., University of Florida; Larry Jones, Florida DoT

#### Embankments, Dams, and Slopes: Dams and Levees
Moderators: Ben A. Leschinsky, A.M.ASCE, Michael R. Simar, P.E., F.ASCE

- **Centrifuge Investigation of the Effects of Liquefiable Soil Interlayering and Structural Strength on the Seismic Performance of Soil-Structure Systems**
  - Balaj Paramasivam, University of Colorado Boulder; Shidhe Dahi, University of Colorado Boulder; Abbie Liel, University of Colorado Boulder

- **Seismic Performance of Buildings at CentrePort Wellington, New Zealand**
  - Joseph Bryant, Ph.D., P.E., M.ASCE; Shadlo, University of Canterbury, Christchurch, NZ; Christopher de la Torre, Ph.D., University of Canterbury, Christchurch, NZ; King, Ph.D., P.E., Dist. M.ASCE, University of Washington

- **Rigid Inclusions Ground Improvement for a New Energy Facility: Design, Construction, and Performance**
  - S. B. Kim, Ph.D., P.E., Bradley University; Ethan Druskiewicz, Bradley University; Jingtao Zhang, University of Nebraska-Lincoln; Shenghao Kim, Ph.D., University of Nebraska-Lincoln

#### Earthquake Engineering and Soil Dynamics: Soil-Structure Interaction
Moderators: Sidihi Dahi, Ph.D., A.M.ASCE, Despomik Choudhury, Ph.D., F.ASCE

- **A Study on the Quality of Improved Bases Constructed by Jet Grouting Utilizing a Cutting Condition**
  - Takashi Shimada, Dr.Eng., P.E., Sun Prov.C.E., Singapore; Kazuo Komiyama, Chiba Institute of Technology

- **Numerical Study on Thermally-Induced Displacement Ratcheting of a Thin Rock Slab**
  - S. Y. Kim, Ph.D., P.E., Bradley University; Ethan Druskiewicz, Bradley University; Jingtao Zhang, University of Nebraska-Lincoln; Shenghao Kim, Ph.D., University of Nebraska-Lincoln

#### Soil Improvement: Case Histories
Moderators: Joseph F. Lubcz, Ph.D., PE, F.ASCE, Martin Woodard, Ph.D., P.G., P.E.

- **Soil Improvement: A Case History**
  - Robert Holmes, Ph.D., P.E., Dist. M.ASCE, University of Washington

#### Rock Mechanics
Moderators: Joseph F. Lubcz, Ph.D., PE, F.ASCE, Martin Woodard, Ph.D., P.G., P.E.

- **Rock Mechanics**
  - S. D. Dashti, Ph.D., A.M.ASCE, Mohammad Jafari, P.Eng., F.Eng.; Khoshoo, Ph.D., A.M.ASCE

#### Geosynthetics
Moderators: Marco Iola, Ph.D., M.ASCE, Melissa S. Beauregard Et, A.M.ASCE

- **Geosynthetics**
  - Sharif Farrag, M.S., M.ASCE, Rutgers University; Nenad Gugucuz, Rutgers University; Rady Cox, The University of Texas, Austin; Farzaneh Mena, The University of Texas, Austin; Franklin Moy, Rutgers University; John Davie, Ph.D., Rutgers University

#### Engineering Geology and Site Characterization: Part I
Moderators: David A. Safin, Ph.D., A.M.ASCE, Ara G. Mouradian, P.E., F.ASCE

- **Engineering Geology and Site Characterization: Part I**
  - Barbara Butler, Ph.D., U.S. Army Corps of Engineers; Ribu Dhakal, The University of Texas, Austin; O. T. Kulatilake, University of Nebraska-Lincoln; Mingbing Yan, University of Colorado Boulder; Abbie Liel, University of Colorado Boulder; Marta Szabo, University of Colorado Boulder; Robert Holmes, Ph.D., P.E., Dist. M.ASCE, University of Washington

#### On-Site Particle Size Distribution by FieldSed
- Andrea Ventola S.M.ASCE, University of Michigan; Raman Hrywotz, Ph.D., M.ASCE, University of Michigan

#### Site Variability
Characterization Using Cone Penetration Test Data
- Estan Gujju, S.M.ASCE, Purdue University; Rodrigo Salgado, Ph.D., P.E., D.GE, F.ASCE, Purdue University; Monica Preezi, Purdue University

#### Comparison of Dispersion-Based Analysis of Surface Waves and Full Waveforms in Characterizing Unknown Foundations
- Srinath Mahvelati, Temple University; Joseph Coo, Ph.D., Temple University

#### Interpretation of Distribution of Ancient Rivers in Singapore using 3D Geologic Model
- Xiaolu Pan, Ph.D., Nanyang Technological University; Zarki Aung, Nanyang Technological University; Aung Nyo, Nanyang Technological University; Kiefer Chiam, Building and Construction Authority, Singapore; Dufu Wu, Building and Construction Authority, Singapore; Jian Cho, Ph.D., Nanyang Technological University
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<td>Soil Improvement: Biopolymers Moderators: Michael G. Gomez, A.M.ASCE, Maria Chrysochoou A.M.ASCE</td>
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A Continuum Based Nonlinear Analysis of Laterally Loaded Piles, Bipin Gupta, Ph.D. Candidate, University of Waterloo; Dipanjali Basu, Ph.D., CEng., M.ASCE, University of Waterloo

Coupled Numerical Analysis of Variations in the Capacity of an Energy Pile in Clay Soil, Arvin Farid, Ph.D., P.E., M.ASCE, Boise State University; Daniel Zimmermann, Boise State University


Soil-Structure Interaction Analysis of a Large Diameter Tank on Piled Foundations in Liquefiable Soil, Frederick T. Tajirian, Ph.D., P.E., F.ASCE, Chevron Energy Technology Company; Monomur Tubabataha, Ph.D., P.E., M.ASCE, MITR and Associates; Promod Rao, Ph.D., P.E., P.M.ASCE, Chevron Energy Technology Company

Valuation of a Bounding Surface Plasticity Model against the Experimental Response of (Bio-) Cemented Sands, Naya El Korbaoui, P.E., University of California, Davis; Katerina Ziostopoulou, University of California, Davis; Michael G. Gomez, University of Waterloo; Mianyong Lee, University of Washington, Seattle; Mi Songin Lee, University of Washington, Seattle

Impact of Hysteretic Nonlinear Dynamic Soil-Underground Structure-Structure Interaction Analyses, Yuvaraj Imarravan Basarah, S.M.ASCE, University of Illinois at Urbana-Champaign; Oguz A. Numamoglu S.M.ASCE, University of Illinois at Urbana-Champaign; Youcef M.A. Hashash, Ph.D., P.E., F.ASCE, University of Illinois at Urbana-Champaign; Shishir Doshi, Ph.D., P.M.ASCE, University of Colorado Boulder

Filler-Stabilized Xanthum Gum for Soil Improvement, Justin Antone A.S.M.ASCE, Stony Brook University; Karan Jaradat, Stony Brook University; Johnny Donza, Stony Brook University; Zuhair Darabi, Stony Brook University; Shireen Abelaziz, Ph.D., Stony Brook University

Case Study: Use of Geopolymers to Evaluate the swell-Shrink Behavior of Native Clay in North Texas, Rino Samuel, EIT, S.M.ASCE, University of Texas at Arlington; Oscar Huang, Texas A & M; Anbra Banieje, University of Texas at Arlington; Jasswinder Das, University of Texas at Arlington; Anand Poppula, University of Texas at Arlington; Miladzan Radovic, Ph.D., Texas A & M University

Shear behavior of Hydrogel-Type Biopolymer-treated Coarse Soils Evaluated by Laboratory Tri-Axial Test, Soojung Lee, M.S., University of New South Wales (UNSW); Jooyoung Im, Korea Advanced Institute of Science and Technology (KAIST); Gye-Chun Cho, Ph.D., Korea Advanced Institute of Science and Technology (KAIST), Ilhan Chang, Ph.D., A.M.ASCE, University of New South Wales (UNSW)

Influence of Temperature Variation on Rainsplash Erosion Performance of Natural Fiber RECPs, Jennifer L. Smith, Ph.D., John P. Stopen Engineering Partnership; Shabha K. Bhatia, Ph.D., Syncrude Canada

Innovative and Sustainable Uses of Volcanic Ash as a Natural Pozzolan for Dust Abatement and Unpaved Roadway Improvement, Matthew Sleep, Ph.D., Oregon Institute of Technology; Morgan Musley, Oregon Institute of Technology

Application of Triple Bottom Line Sustainability Framework to Select Remediation Method at Industrial Contaminated Site, Krishna R Reddy PhD, P.E., D.GE, F.ASCE, ENV SP, University of Illinois at Chicago; Ghirish Kumar, S.M.ASCE, University of Illinois at Chicago


Shear Behavior of Weathered Compacted Shales, Lindsey Sebastian Bryson, Ph.D., P.E., M.ASCE, University of Kentucky; Faisal Ahmed, Ph.D., P.E., M.ASCE, University of Kentucky

Sinkhole Stability Charts in Central Florida Soils, Moontaz Sollman, University of Central Florida; Luis Arbela, University of Central Florida; David Horhote, Florida Department of Transportation; Booy Hoon Nam, University of Central Florida


GIS-Based Geotechnical Engineering Data Management: A Case Study at the Alabama DOT, Andrew J. Greentree, Ph.D., M.ASCE, The University of Alabama; Rich McElroy, P.E., D.GE, M.ASCE, Century Engineering; Randy K. Smith, P.E., The University of Alabama; Rachel Robinson, The University of Alabama
## Technical Program

**Monday, March 25, 2019**

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| **Deep Foundations: Piles**  
Moderators: Bernardo A. Castellanos, A.M.ASCE, Peter A. Norvase, P.E., M.ASCE | **Earthquake Engineering and Soil Dynamics: Numerical Modeling**  
Moderators: Michael G. Gomez, A.M.ASCE, Maria Chrysoucho A.M.ASCE | **Soil Properties and Modeling**  
Moderators: Michelle L. Bernhardt, Ph.D., A.M.ASCE, Inthunnom Sisanakul, P.E., M.ASCE | **Sustainability in Geotechnical Engineering**  
Moderators: Boo Hyun Nam, Ph.D., A.M.ASCE, Eric S. Backlund, P.E., M.ASCE | **Engineering Geology and Site Characterization: Part II**  
Moderators: Paula Bandini, Ph.D., P.E., D.GE, M.ASCE, Jon Carmack, P.E., M.ASCE | **Data and Software for Geotechnical Engineering**  

**Comparison of Settlement Response of Piled-Raft Foundation Subjected to Combined Loads Computed from Finite Element and Analytical Models, Naderjah Kavichi, Ph.D., Civil Engineer; Shweta Shrestha, University of Western Australia; and its Effect on Laterally Loaded Piles; Jongjung Li, Southeast University of China; The University of Western Australia; Songyu Liu, Ph.D., M.ASCE, Southeast University; Yuanyu Tong, P.E., Southeast University; Tao Yang, Southeast University | **Unmanned Aircraft System (UAS) Photogrammetry for Tracking Streambank Erosion and Geomorphic Change Along a Protected River Corridor, Scott D. Hamsho, Ph.D., P.E., University of Vermont; Kristen L. Underwood, University of Vermont; Donna M. Rizzo, Ph.D., P.E., University of Vermont; Juliet O’Neill-Dunne, University of Vermont; Mander M. Dewoolkar, Ph.D., P.E., University of Vermont | **Cyclic Behavior and Liquefaction Resistance of Fine Soil Core Refuse**  
Experimental and Numerical Modelling: Saajid Sabar, Pennsylvania State University; Xiaojia Xiao, P.E., Pennsylvania State University; Jianwei Wang, University of Colorado Boulder; Linh Tran, Ph.D., P.E., Portland State University; Jianlin Wang, Pennsylvania State University | **Revisiting the Role of Particle Shape on 2D Inter-Particle Fluid Flow Using a Transparent Soil, Surrogate, Linzhu (Lynn) Li M.S.C., New York University; Suhil Chandra, Ph.D., A.M.ASCE, Manchester College; Matthew Rege, Ph.D., P.E., F.ASCE, New York University | **Performance of a Field-Scale Shallow Horizontal Thermal Energy Storage System, Tugue Boese, Ph.D., University of Alberta; Candice Hano, University of California San Diego; John S. McCartney, P.E., Ph.D., M.ASCE, University of California San Diego | **Rockfall in New Jersey:**  
A Proactive and Collaborative Approach, Amir B. Granger P.D., Halsey & Aldrich; Edward M. Zamanik, P.E., Halsey & Aldrich; Scott J. Deock, P.E., New Jersey Department of Transportation; John P. Jamerson, New Jersey Department of Transportation | **Slope Stability Monitoring and Early-Warning System for Kariba Dam South Bank Slope**  
Proctor, Kudakwashe Moto, MSc (candidate), University of Cape Town; Denis Kalumba, P.E., University of Cape Town; Lunga Mapakula, University of Cape Town; Charles Chibvura, University of Southern Queensland | **Performance of Upgraded Fibers to Decrease Hydraulic Conductivity without Compromising Load Restrictions in Urban Roof Farms, Ivan L. Guzman, Ph.D., M.B.A., P.E., M.ASCE, New York City College of Technology; Sandra M. Torres M.ASCE, New York City College of Technology | **Geotechnical Resilience Engineering Guidelines for Upland Confined Disposal Facilities: A Case Study Approach, Matthew M. Lunemann, P.E., ENV SP, M.ASCE, WSP USA; W. Scott Daughes, New Jersey Department of Transportation | **Afternoon Networking Break, Exhibit Hall E** |

**Technical Sessions**

**Technical Program**

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<td>1:30 – 3:30 p.m.</td>
<td><strong>Special Session:</strong> A 50-Year Tribute to Ralph Peck and the Observational Method, Part II, Room 120B</td>
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<td>3:00 – 5:30 p.m.</td>
<td><strong>Poster Session I, Exhibit Hall E (see pages 16-18)</strong></td>
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<td>6:00 – 7:30 p.m.</td>
<td><strong>Organizational Member Executive Leadership Dinner and Workshop (Invitation Only), Loews Philadelphia Hotel – Lescaze Room, 33rd Floor</strong></td>
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<td>7:45 – 8:45 p.m.</td>
<td><strong>G-I Student Program: Organizational Members and Student Travel Grant Winners Job Fair (Invitation Only), Room 122B</strong></td>
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<td>8:45 – 9:45 p.m.</td>
<td><strong>G-I Student Program: Organizational Member and Student Reception, Room 122B</strong></td>
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Technical Program

Monday Poster Session (continued)

3:30 – 5:30 p.m., Exhibit Hall E

Earthquake Engineering and Soil Dynamics: Seismic Hazard Analysis, Site Response, liquefaction
PB90 | Assessment of Lateral Spreading Estimations through the Lens of Centrifuge Modeling, Mona Daostomohamadii, North Carolina State University; Ashby Gabas Ph.D., North Carolina State University; Brina Montoya Ph.D., PE, North Carolina State University

PB91 | Theoretical Study on the Seepage Field of Single-Well Recharge in Confined Aquifer Considering Permeability Degradation, James L. Hanson, Ph.D., PE, M.ASCE, California Polytechnic State University; Nazli Yezdi, Ph.D., California Polytechnic State University

PB92 | In situ Characteristics of Fine Coal Refuse, Cyrus Jedari, M.S., University of Tennessee; Angelica M. Palomino, Ph.D., PE, M.ASCE, University of Tennessee; Eric C. Drumm, Ph.D., PE, M.ASCE, University of Tennessee; Daniel Bolas, P.E, M.ASCE, SCAE, Inc.

PB93 | Improved Prediction of Permeability Rates and Performance for Green Infrastructure using Standard Penetration Testing, Erica A. Vigliardi, E.I.T., M.ASCE, Matt MacDonald; Vetal A. Shah, P.E., Ph.D., PE, Matt MacDonald

PB94 | Determination of Sand Void Ratio Using CPT and SPT, Shirin Wissa Agady, Dar Al-Handasah; Sayed Mohamed Ahmed, Ain Shams University

PB95 | Sinkhole Vulnerability Assessment Using Groundwater Monitoring and Internal Soil Raveling Analysis – A Central Florida Case Study, Ryan Shumate, University of Central Florida; Boo Hyun Nam, University of Central Florida; Dae Ho Kim, University of Central Florida; Daniel W. Wilson, Ph.D., University of California, Davis

PB96 | Effect of Acid Rain on the Structure Integrity of Red Clay, Xiang Zhang, Ph.D., P.E., Missouri University of Science and Technology; Shahnoor Shahnawaz Rehman, Ph.D., University of California, Davis

PB97 | A Centrifuge Study on the Effects of Soil Gradation on CPT Tip Resistance, Alexander F. Sturm, M.S., University of California, Davis; Greg M. Shepard, M.S., ConeTec Investigations; Jim Greig, MASc, ConeTec Investigations; Mary Nguyen, ConeTec Investigations

PB98 | Development of a Probabilistic Spatio-Magnitude Sinkhole Hazard Model, Yong Ye Kim, University of Central Florida; Boo Hyun Nam, University of Central Florida; Heejoun Youn, Hongik University

PB99 | Centrifuge Study on the Effects of Soil Gradation on CPT Tip Resistance, Alexander F. Sturm, M.S., University of California, Davis; Greg M. Shepard, M.S., University of California, Davis; Jason T. Dalong, Ph.D., University of California, Davis; Daniel W. Wilson, Ph.D., University of California, Davis

PB100 | Effect of Acid Rain on the Structure Integrity of Red Clay, Xiang Zhang, Ph.D., P.E., Missouri University of Science and Technology; Shahnoor Shahnawaz Rehman, Ph.D., University of California, Davis

PB101 | A First Step in Building on a Mine Tailings Superfund Site Part 2: Full-Scale Footing Load Tests, Byron Foster, Kleinfelder, Inc.; Bret N Lingwall, Ph.D., P.E., M.ASCE, South Dakota School of Mines and Technology; Trent Parkhill, P.E., Kleinfelder, Inc.; Matt Moriarty, P.E., Kleinfelder, Inc.

Engineering Geology and Site Characterization: Part I

PB102 | Inferring Drainage Conditions During In-Situ Cone Penetration, Mark Anthony Styler, Ph.D., PE, ConeTec Investigations; Jim Greig, MASc, ConeTec Investigations; Mary Nguyen, ConeTec Investigations

PB103 | Development of a Probabilistic Spatio-Magnitude Sinkhole Hazard Model, Yong Ye Kim, University of Central Florida; Boo Hyun Nam, University of Central Florida; Heejoun Youn, Hongik University

PB104 | A Centrifuge Study on the Effects of Soil Gradation on CPT Tip Resistance, Alexander F. Sturm, M.S., University of California, Davis; Greg M. Shepard, M.S., University of California, Davis; Jason T. Dalong, Ph.D., University of California, Davis; Daniel W. Wilson, Ph.D., University of California, Davis

PB105 | Effect of Acid Rain on the Structure Integrity of Red Clay, Xiang Zhang, Ph.D., P.E., Missouri University of Science and Technology; Shahnoor Shahnawaz Rehman, Ph.D., University of California, Davis


PB107 | Investigating the Yield Anisotropy of Resedimented Nile Silty Clay, Sherif A.Y. Akil, Ph.D., AFF.ASCE, Cairo University; Karim M. Salaheldin, Cairo University; Hani A. Leffi, Ph.D., Cairo University

PB108 | Surface Wave Testing and Analyses at a Gravelly site near Jackson Wyoming for Transportation Infrastructure, Shawn C. Griffiths, Ph.D., University of Wyoming; Jedosh D. Frazier, B.S., University of Wyoming

PB109 | Electromagnetic Soil Heating Using Magnetic Nanoparticle-Coated Geomaterials, Jiaying Kim, Ph.D., Western New England University; Caroline Best, Western New England University; Sunghee Kim, Ph.D., University of Nebraska-Lincoln

PB110 | A First Step in Building on a Mine Tailings Superfund Site Part 1: Large Test A First Step in Building on a Mine Tailings Superfund Site Part 1: Large Test A First Step in Building on a Mine Tailings Superfund Site Part 1: Large Test A First Step in Building on a Mine Tailings Superfund Site Part 1: Large Test

PB111 | Geosynthetics

PB112 | Black Resonance Test on Geosynthetics Reinforced Foundation Beds, Hashim Venkateswarlu, Indian Institute of Technology Patna; Amarnath Hegde, Ph.D., Indian Institute of Technology Patna

PB113 | Applicability of Mobile Photogrammetry to Measure Facing Displacement of Reinforced Soil Walls, Toshimoh Fujita, Public Works Research Institute; Hiroaki Miyatake, Public Works Research Institute; Toshinari Miyata, National Defense Academy

PB114 | SEM Analyses on the Long-term Performance of H2R2I Wicking Geotextile, Xiang Zhang, Ph.D., P.E., Missouri University of Science and Technology; Jianhao Yin, Missouri University of Science and Technology


PB116 | Influence of Long-term Stiffness of Geogrid on the Reinforcement Load of Reinforced Soil Retaining Wall, Huabei Liu, M.ASCE, Huazhong University of Science and Technology

PB117 | Optimization of Permeability Methods for Estimating Soil Properties, Anastasia Hally, Northwestern University; Zhenhao Shi, Ph.D., M.ASCE, Northwestern University; James P. Hambleton, Ph.D., M.ASCE, Northwestern University

PB118 | Improving Drainage Conditions During In-Situ Cone Penetration, Mark Anthony Styler, Ph.D., PE, ConeTec Investigations; Jim Greig, MASc, ConeTec Investigations; Mary Nguyen, ConeTec Investigations

PB119 | Development of a Probabilistic Spatio-Magnitude Sinkhole Hazard Model, Yong Ye Kim, University of Central Florida; Boo Hyun Nam, University of Central Florida; Heejoun Youn, Hongik University

PB120 | Multi-variate Global Sensitivity Analysis of Shallow Foundations Response under Controlled Rocking, Aria Fathi, MSCE, The University of Texas at El Paso; Mehran Mazdizi, Ph.D., M.ASCE, California State University Los Angeles; Mahdi Saghafi, MSCE, The University of Texas at El Paso

PB121 | Optimal Deformation Modes for Estimating Soil Properties, Anastasia Hally, Northwestern University; Zhenhao Shi, Ph.D., M.ASCE, Northwestern University; James P. Hambleton, Ph.D., M.ASCE, Northwestern University

PB122 | Soil Properties and Modeling

PB123 | Progressive Change in Shear Strength of Yazoo Clay Soil, Mohammad Sadik Khan, Ph.D., P.E., Jackson State University; John Ivake, Jackson State University; Masoud Nobahar, Jackson State University

PB124 | Effect of Wet Dry Cycle on the Void Ratio of Expansive Yazoo Clay Soil, Mohammad Sadik Khan, Ph.D., P.E., Jackson State University; John Ivake, Jackson State University; Masoud Nobahar, Jackson State University; Golam Kibria, Ph.D., PE, Aaros Geoprofessionals

PB125 | Permanent Deformation Characteristics of Coarse Grained Subgrade Soils using Repeated Load Triaxial Tests, Md Monirul Rahman, Ph.D., E.I.T. SCAE, Inc.; Sarah L. Gassman, P.E., Ph.D., University of South Carolina

PB126 | Fatigue Crack Propagation in Stiff Clays Forming Part of Earth Dams and Natural Slopes, Luis E. Valletto, P.E., M.ASCE, University of Pittsburgh; Mahiru Shettima, Ph.D., M.ASCE, Zell Engineers Inc.

PB127 | Scale Effects in the Indirect Tensile and Unconfined Compressive Strength Tests of Cement-Stabilized Base Materials, Mohammad Raeeih, University of Texas at El Paso; Reza S. Ashkiani, Ph.D., University of Texas at El Paso

PB128 | Bayesian Probabilistic Approach to Assess Rock Compression and Reconfiguration Indices of Over-Consolidated Expansive Clays, Yasser Solhanpour, Ph.D., M.ASCE, E.I.T., WSP USA; Hossam Salman, M.Sc., PE, EACSE, WSP USA

PB129 | Estimating Optimal Additive Content for Soil Stabilization Using Machine Learning Methods, Amit Gujerald, BSCE, Boise State University, Parthu Sarathi Mukherjee, Ph.D., Boise State University; Shaikh C. S. Chihoori, Ph.D., PE, M.ASCE, Boise State University

PB130 | Oedometric Behavior of a Diatom-Kaolin Mixture, Hend H. Al Shatweh, S.M.ASCE, New Mexico State University; Paula Bandini Ph.D., P.E., M.ASCE, New Mexico State University

PB131 | Soil Properties and Modeling

PB132 | Development of a 1-D Heat Soil Test Cell for Coupled Hydro and Thermal Processes, Geng Lai, S.M.ASCE, University of Texas at Arlington; Nick Kenezas, University of Texas at Arlington; Xindao Yu, Ph.D., PE, University of Texas at Arlington; Tong Li Omid Habizadeh-Bigardis, The University of Texas at Arlington
Technical Program

Monday Poster Session (continued)

3:30 – 5:30 p.m., Exhibit Hall E

PB87 | Prediction of Unconfined Deformation Behavior of Soils Using Electrical Properties, Majid Mahmoodabadi, M.ASCE, University of Kentucky; Lindsay Sebastian Bryson, Ph.D., P.E., M.ASCE, University of Kentucky

PB88 | Potential of Tire Waste as infill Material in Geocells for Soil Retention Systems, Sreevalsa Kolathayar, Ph.D., Amrita Vishwa Vidyapeetham; Rajesh Kumar C., Amrita Vishwa Vidyapeetham

Sustainability in Geotechnical Engineering

PB89 | Numerical Simulation of Cellular Reinforced Fly Ash Slopes, Babuabab Nidhal, Ph.D., IIT Bombay; Janendranath Mandal II, Ph.D., IIT Bombay

PB90 | Evaluation of Composite Subgrade Reaction Modulus of Geosynthetic-Stabilized Recycled Subbase over Subgrade, Tanya N. Walkenbach, EIT, M.ASCE, Chancellor’s Fellow University of Kansas; Jie Han, Ph.D., P.E., F.ASCE, University of Kansas; Zexiu Li EIT, M.ASCE, University of Kansas; Robert L. Parsons, Ph.D., P.E., University of Kansas

PB91 | Experimental Studies on Bottom Ash and Blast Furnace Slag Based Geomaterial under Compressive Loading, Ram Rathana Lai Birali, Ph.D., Kavikulguru Institute of Technology and Science; Vicky Hinge, M.Tech. K.I.T.S., Ramnath, Somali Rawhtare, M.E., Phayadhari College of Engineering; Shankar Panditokari, Ph.D., K.I.T.S., Suravaram

PB92 | Strength and Deformation Characteristics of Bottom-Ash Reinforced with Single Eo-cell Mattress Made of Waste PET Bottles, Anil Kumar Chaudhury, Ph.D., National Institute of Technology Jamshedpur; Jagannath Jha, Government of Bihar; Sujata Fulambarkar, NIT, Jamshedpur

PB93 | Experimental Study of Load and Settlement Behaviour of Bamboo Grid Reinforced Sand, Sunil Kumar Ahirwar, M.Tech., Indian Institute of Technology Bombay; Janendranath Mandal, Ph.D., Indian Institute of Technology Bombay; Aditya Kumar Bhat, M.Tech., Indian Institute of Technology Bombay

PB94 | Evaluation of Waste Foundry Sand and Blast Furnace Steel Slag as Geomaterials, Bhargav Kumar K. P., Ph.D., Indian Institute of Technology Hyderabad; Geethakrishna K. N., M.Tech, Indian Institute of Technology Hyderabad; Umashankar Balunani, Ph.D., Indian Institute of Technology Hyderabad

PB95 | Performance Evaluation of Municipal Solid Waste as a Sustainable Backfill Material in RE Wall, Kinal Gajjar, B.E. CIVIL ENG; L.D. College of Engineering; Manoj V Shah, Ph.D., L.D. College of Engg; Arpit Shah M.ASCE, L.D. College of Engineering

PB96 | From Sky to Sea: Geotechnical Challenges of Transforming a Former Philadelphia Airfield into Future Marine Terminal, Eric Pauli, P.E., M.ASCE, Mott MacDonald; Vatsal Shah, Ph.D., P.E., M.ASCE, Mott MacDonald

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Technical Program

Tuesday, March 26, 2019

8:00 – 8:30 a.m.
Inspirational Remarks from Bibop G. Gresta, Terrace Ballroom IV

8:30 – 10:00 a.m.
Geo-PIT: Powerful, Informative Talks on Geo-Topics, Terrace Ballroom IV

10:00 – 10:30 a.m.
Morning Networking Break, Exhibit Hall E

10:30 a.m. – 12:00 p.m.
Panel Session: GBA: Events That Changed Our Practice, Room 126A

Panel Session: Fostering Innovation in Tunneling and Underground Construction, Room 120B

Technical Sessions

Track A | Room 122A
Deep Foundations: Driven Piles
Modulators: Mohammad T. Soleiman, A.M.ASCE, Jareed M. Green, P.E., M.ASCE


Earthquake Engineering and Soil Dynamics: Laboratory Testing Moderators: Majid Ghaamooni, Ph.D., P.E., M.ASCE, James Kallamanos, Ph.D., EIT, A.M.ASCE

Soil Improvement: Microbially Induced Calcite Precipitation Moderators: Brut N. Lingwall, P.E., M.ASCE, Leon A. Van Pouzen, A.I.F.M.ASCE

Unsaturated Soils Moderators: Kaeliwoth Neng Mamalish, Ph.D., P.E., M.ASCE, Tusse Basem A.M.ASCE


Pavements: Part I Moderators: Reza S. Ashatini, Ph.D., P.E., Ahmed Faheem A.M.ASCE

Optimizing the Design of Driven Pile Foundations with Instrumented Static Load Tests, Peter A. Narasavage, P.E., M.ASCE, E.L. Robinson Engineering

Validation of Pile Design Methods for Closed-Ended Driven Pipe Piles, Fei Han, Ph.D., P.E., M.ASCE, Purdue University; Vidhur Bhall S.M.ASCE, Purdue University; Monica Prezzi, Ph.D., M.ASCE, Purdue University; Rodrigo Salgado, P.D., P.E., D.G., FASCE, Purdue University

New Technology Center Development Foundation System – A Case Study in Driven Pipe Piles, Frederick A. Brinker BSCE, M.SCE, P.E., M.ASCE, DI, AISC, Engineers Club of Philadelphia, DVGi Pennoni

Case History Summaries of 5 Slope Failures, Missed Predictions and Lessons Learned, Garry H. Gregory, Ph.D., P.E., D.GE, M.ASCE, Gregory Geotechnical

Influence of Hydrologic Behavior in Assessing Rainfall-Induced Landslides, Faisal S. Ahmed S.M.ASCE, University of Kentucky; Lindsey Stewart Bryant, Ph.D., P.E., M.ASCE, University of Kentucky

Effects of Particle Size on Impact Force from a Granular Sliding Mass on a Rigid Obstruction, Andrew W Grant, The Pennsylvania State University; Amie Ahmadour, The Pennsylvania State University; Tong Qu, Ph.D., The Pennsylvania State University

The Effect of Shaking History on Liquefaction Resistance of Sand Deposit Using Shake Table Testing, Jintai Wang S.M.ASCE, Geosynthetic Consultants; Sajjad Salam, The Pennsylvania State University; Ming Xiao, The Pennsylvania State University

Liquefaction Mitigation of California Sands via Microbial Induced Partial Saturation, Sayednasrul Moussavi, University of New Hampshire; Majid Ghaamooni, Ph.D., P.E., University of New Hampshire

Cyclic Behavior of a Reconstituted Gulf of Mexico Clay, Vashish Thakoor S.M.ASCE, University of Illinois at Urbana-Champaign; Cassandra J. Rutherford, Ph.D., P.E., M.ASCE, Iowa State University; Scott M. Olson, Ph.D., P.E., M.ASCE, University of Illinois at Urbana-Champaign

Nonlinear Failure Envelope for Microbial Induced Calcium Carbonate Precipitation Treated Sand, Ashkan Nafisi E.J., North Carolina State University; Brina Montoya, Ph.D., P.E., North Carolina State University

Microbial Induced Calcite Precipitation of Sand Using a Surface Spray Technique, Raphael Crowley, Ph.D., P.E., M.ASCE, University of North Florida; Matthew Davises M.S., University of North Florida; Terri N. Ellis, Ph.D., University of North Florida; Nick Hudyma, Ph.D., P.E., M.ASCE, University of North Florida; Paige Ammons, University of North Florida; Christian Maimone B.S., University of North Florida

Minimizing Wind Erosion using Microbial Induced Carbonate Precipitation, Pierre Bick, Lehigh University; Hirudaya Bostola, Lehigh University; Mohammad T. Soleiman, Ph.D., Lehigh University; Jianbo Gu, Lehigh University; Penyapisit Opalit, Ph.D., Lehigh University; Derrick Brown, Ph.D., Lehigh University; Nobu Zuvai, Ph.D., Qatar University


Effect of Lime Stabilization on the Unsaturated Hydraulic Conductivity of Clayey Soil in Texas, Purne Bhaskar M.S., University of Texas at Arlington; Burak Bulak, University of Texas at Arlington; Arifete Bayonerrie, Ph.D., D.M.ASCE, University of Texas at Arlington; Alshlahi, University of Texas at Arlington; Anand Pappula, Ph.D., P.E., FASCE, D.GE, University of Texas at Arlington

Measuring Thermal Conductivity of Unsaturated Sand under Different Temperatures and Stress Levels Using a Suction-Controlled Thermo-Mechanical Method, Jun Yu, Ph.D., CEMI Engineering Consultants Inc.; Fengfei Wang, Beijing Jiaotong University; William Likes, Ph.D., M.ASCE, University of Wisconsin-Madison


Design and Performance of a Temporary Concrete Diaphragm Wall Excavation Support System in South Boston, Wytsan Carswell, P.E., Haley & Aldrich; Damian Siebert, P.E., M.ASCE, Haley & Aldrich

Numerical Analysis of a TBM Retrieval Shaft Construction Using Deep Soil Mixing, Omar Kocar, Ph.D., P.E., Arup USA; Chu Ho, Sc.D., P.E.; Arup USA

Updated Reference Shear Wave Velocity Curves for Near-Surface Site Characterization, Solman Rahimi, University of Arkansas at Fayetteville; Clinton M. Wood, A.M.ASCE, University of Arkansas at Fayetteville; Michelle L. Bornhardt, A.M.ASCE, University of Arkansas at Fayetteville; Ashraf Kamal Heme, University of Arkansas at Fayetteville

Long-Term Monitoring of a Slow Moving Landslide before and after Remediation Using Ground-Based Radar Interferometry, Francisco Gomez, Ph.D., R.G., University of Missouri; Brent L. Rosenthal, Ph.D., P.E., M.ASCE, University of Missouri; J. Erik Lueh, Ph.D., P.E., FASCE, University of Missouri; Jared Smooth, University of Missouri; Ben Lowery, Colorado School of Mines

Theoretical Evaluation of the Internal Method Commonly Used for Downhole Seismic Testing, Mohamad M. Helal, B.E., M.S.M.ASCE, University of Texas at Austin; Brody R. Cox, Ph.D., P.E., M.ASCE, University of Texas at Austin


Long-Term Field Performance of Geosynthetics in Pavement Subgrades in Virginia, M. Shabbir Hussain, Ph.D., P.E., M.ASCE, Virginia Department of Transportation; Edward J. Hoppe, Ph.D., P.E., M.ASCE, Virginia Department of Transportation; Chaz Weaver, P.E., FASCE, Virginia Department of Transportation

Using Soil-Moisture Active Passive Satellite Data to Evaluate the Performance of Transportation Infrastructure Foundations – A Feasibility Study, Simon Parkman, S.M.ASCE, California State University Los Angeles; Sonja R. Lopez, Ph.D., California State University Los Angeles; NASA Data Intensive Research and Education Center for STEM, Aria Fath, S.M.ASCE, The University of Texas at El Paso; Mehran Mezari, Ph.D., M.ASCE, California State University Los Angeles
**Technical Program**

**Tuesday, March 26, 2019**

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<td><strong>Earthquake Engineering and Soil Dynamics: Laboratory Testing</strong>&lt;br&gt;Modulators: Majid Ghayoomi, Ph.D., P.E., M.ASCE, James Kakfonmen, Ph.D., E.I.T., M.ASCE</td>
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<td><strong>Unsaturated Soils</strong>&lt;br&gt;Modulators: Kuhleht M. Manshadi, Ph.D., P.E., M.ASCE, Yegor Bauer, A.M.ASCE</td>
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<td><strong>Pavements: Part I</strong>&lt;br&gt;Modulators: Reza S. Aghinia, P.D., P.E., Ahmed Tahsem A.M.ASCE</td>
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**Development of Axial Load Transfer (T-Z) Analytical Model for the PSC Piles, Md. Nafidul Haque, Louisiana State University; Murali Abu-Farsakh, Louisiana State University**

**A Numerical Study of Pre-Boring Impacts on Side Friction of Piles, Shenghui Chen, P.D., Louisiana State University; Un Li, Ph.D., Louisiana State University; Zhanjie Zhang, P.D., P.E., Louisiana Department of Transportation and Development**

**Evaluation of Direct CPT Methods for Estimating the Ultimate Capacity of Driven Piles, Murali Abu-Farsakh, Ph.D., P.E., FASCE, Louisiana State University; Mohsen Antimagah, Louisiana State University**

**Hydraulic Behavior of an Infiltrated Underground in Colorado, USA, Alexandra Woytacz, Ph.D., P.E., Colorado School of Mines; Ning Lu, Ph.D., FASCE, Colorado School of Mines; Barbara Thunder M.S., Civil and Environmental Engineering Hart Center**

**Stabilization of Rainfall-Induced Slope Failure and Pavement Distresses using Recycled Plastic Pins and Modified Moisture Barrier, Anju Sapkota, The University of Texas at Arlington; Asif Ahmed, P.D., The University of Texas at Arlington; Prathiba Pandey, The University of Texas at Arlington; Md. Shahdat Hossain, P.D., P.E., The University of Texas at Arlington; Nisac LaCana, Louisiana Department of Transportation Investigation, Monitoring and Design of an Anchored Retaining Wall at the Base of a Moving Slope, Jason D. Ross, P.E., M.ASCE, SRAE Inc.; Michael G. Ridland, P.E., M.ASCE, SRAE Inc.; Brett A. Dregger, P.E., M.ASCE, American Electric Power; Charles A. Nitt, P.E., Yano Engineers, Inc.**

**Evaluating Seismic Behavior of Intermediate Silty Sands of Low Plasticity from Emilia Romagna, Italy, Daniela Dominicin Pucica, University of Mediterranea of Reggio, Calabria Pisa Monte Carlo, University of L’Aquilla; Laura Tomi III, University of Bologna**

**On the Effects of Inadequate Height Control in Constant Volume Monotonic and Cyclic Direct Simple Shear Test, Kareel Zehab, Geocorp Corp.; Seda Gokker, Ph.D., Geocorp Corp.; Salim K. Warden, Geocorp Corp.; W. Allen Marr, P.D., P.E., FASCE, NA.; Geocorp Corp.; Artur Apostolov, Geocorp Corp.**

**Centrifuge Modeling and Analysis of Level Site liquefaction Subjected to Biaxial Dynamic Excitations, Omar Elsheikh, Ph.D., Rossau Colloidal Polymeric Institute; Tarek Abdoun, Ph.D., Rossau Colloidal Polymeric Institute; Moustafa Zaghel, Ph.D., Rossau Colloidal Polymeric Institute**

**Microbiologically Induced Calcite Precipitation using Surfactants for the Improvement of Organic Soil, Matthew Davies M.S., University of North Carolina; Raphaeld Crowland, Ph.D., P.E., M.ASCE, University of North Carolina; Terri N. Ellis, P.D., University of North Florida; Nick Hudyma, Ph.D., P.E., M.ASCE, University of North Florida; Paige McInnes, Ph.D., University of North Carolina; Christian Maturu S.S., University of North Carolina; Scott Wasmann, Ph.D., University of Florida; Mohammad Taharka B.S., University of Florida; Jennifer Ford B.S., University of Florida; Andrew R. Zimmerman, University of Florida**

**Evaluation of Shallow Mixing Protocols as Application Methods for Microbial Induced Calcium Precipitation Targeting Expansive Soil Treatment, Bhaskar C.S. Chittoori, Ph.D., P.E., M.ASCE, University of Minnesota; Aaron P. Gallant, P.D., P.E., M.ASCE, University of Maine; Benjamin Mason, P.D., Oregon State University**

**Large-Scale Cyclic Plate Loading Tests of Wicking Geotextile-Stabilized Bases with Rainfall Simulation, Jun Guo, Shenzhen University; Jin Han, University of Kansas; Xiang Zhang, Missouri University of Science and Technology**

**Deep Excavations in Central Jakarta Area: A Case History and Numerical Simulations, Fuchen Teng, Ph.D., National Taiwan University of Science and Technology; Melissa Kivas, National Taiwan University of Science and Technology; Benson Huang, Ph.D., P.E., National Kaohsiung University of Science and Technology**

**Restoring RWS at Yeager Airport: Design and Construction of a Tall Retaining Wall on the Side of a Mountain, Johanna Simon, P.E., M.ASCE, Schlab Engineering; Alan Cadden, P.D., P.E., FASCE, Schlab Engineering; Phil Slul, P.D., M.ASCE, Schlab Engineering; Michael Senior E.I.T., M.ASCE, Schlab Engineering**

**Ultimate Limit State Design Using FEM and Advanced Soil Model – A Case History of a 30m Deep Excavation in London UK, Hoen-Choon Yew, Ph.D., CEng., MICE CICIL UK Ltd.**

**Detection of Voids in Karst Terrain With 3D Full Waveform Tomography, Khiem Tran, University of Florida; Michael McCoy, Ph.D., University of Florida; Majid Mirrannejad, University of Florida; Scott Wasmann, Ph.D., University of Florida**


**Performance Evaluation of Pavement Subgrade by In-Situ Moisture and Matric Suction Measurement, Prathiba Pandey, The University of Texas at Arlington; Asif Ahmed, P.D., E.I.T., State University of New York (SUNY) Polytechnic Institute; Anju Sapkota, The University of Texas at Arlington; Shahdat Hassai, P.D., P.E., The University of Texas at Arlington; Duan Tian, Texas Department of Transportation**


**Mechanical Assessment of Layered Pavement Foundation System using Validated Intelligent Compaction Measurements, David White, Ph.D., P.E., Ingens Geotechnics, Inc.; Pavana Venugopal, Ph.D., P.E., Ingens Geotechnics, Inc.; Erol Tutumluer, Ph.D., University of Illinois at Urbana-Champaign; Massimo Manara, P.D., P.E., University of Illinois at Urbana-Champaign**

12:00 – 1:30 p.m. Lunch, Exhibit Hall E
Technical Program

Tuesday, March 26, 2019 (continued)

1:30 – 3:00 p.m.
Panel Session: Urban Excavation Support, Room 126A

Technical Sessions

Deep Foundations: Drilled Shafts
Moderators: Michael B. Fritzge, P.E., M.ASCE, Jose Luiz Machado Clemente, Ph.D., P.E., D.GE, FASCE
Lessons Learned from Embankments, Dams, and Slopes: Case Histories
Moderators: Timothy D. Stark, Ph.D., P.E., D.GE, FASCE, Rafael A. Prieto

Earthquake Engineering and Soil Dynamics: Seismic Hazard Analysis, Site Response, and liquefaction
Moderators: Menzer Pelivien, Ph.D., P.E., M.ASCE, Remim Mohamed, Ph.D., P.E., M.ASCE

Soil Improvement: Fiber Reinforcement and Soil Stabilization
Moderators: Proib Kumar Koley, Ph.D., P.E., M.ASCE, Jonathan F. Hubler, A.M.ASCE

Computational Geotechnics
Moderators: Marta Miletić, Victor N. Kaliakin, Ph.D., M.ASCE

Geotechnics of Soil Erosion
Moderators: Stacey E. Tucker-Kulesza, P.E., M.ASCE, Junliang Tao, A.M.ASCE

Pavements: Part II
Moderators: Reza S. Achitonia, Ph.D., P.E.; Bora Cetin, Ph.D.


Modulus of Elasticity Impact on Equivalent Top-Loaded Curves from Bi-Directional Static Load Tests, Razbeh B Meghdadi, P.E., Ph.D., M.ASCE, Gannett Fleming, Inc.; Xiangyi S. Tadioglu, Ph.D., P.E., Gannett Fleming, Inc.; Kimberly Sharp, NUDOT

Hudson Yards: A New Look at High-Capacity Caissons to Bedrock in Manhattan, Michael Paquette, P.E., Langan; Saul Shapiro, P.E., Langan; Marc Gallagher, P.E., LEED AP, Langan

A Robust Approach for Selecting URFD Characteristic Values of Uncertain Soil Parameters for Design of Drilled Shaft in Sand, Sara Khoshnevisian, Ph.D., M.ASCE, Clarkson University; Xiaohui Tan, Ph.D., Hobit University of Technology; Menglan Shen, Clemson University; Chaoxing Jin Song, Ph.D., FASCE, Clemson University; Yongjie Zhang, Ph.D., Chunhua University of Science & Technology Hunan
## Technical Sessions

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<td><strong>Earth Retaining Structures: Bottom-Up Construction</strong></td>
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<td><strong>Technical Program</strong></td>
<td><strong>Poster Session II, Professional and Student Competition Awards Presentation, 5:30 – 6:00 p.m.</strong></td>
<td><strong>Karl Terzaghi Award Lecture, 6:00 – 7:00 p.m.</strong></td>
<td><strong>Technical Sessions</strong></td>
<td><strong>Tuesday, March 26, 2019</strong></td>
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### Visit Booth 501: The Heart of It All

Make sure to plan plenty of time for your visit to booth 501: that’s where you’ll find the Geo-Institute – and much, much more. Start at the G-I booth to learn more about programs and upcoming activities, and how you can get more involved. You can meet the staff and connect with fellow members, including members from the Delaware Valley G-I Chapter. Then stop by the ASCE Bookstore to see what’s new and to build your professional library. Learn more about professional certification from the Academy of Geo-Professionals (AGP), and how it can benefit you. ASCE Member Services will also be available: join ASCE and G-I, manage your membership, update your address, subscribe to a journal, or even make a quick donation to the Voluntary Fund for student activities. ASCE Government Relations can help you serve the public by advocating for the care and improvement of our infrastructure (ask about PR and GR Universities.)
Technical Program

Tuesday Poster Session (continued)

3:30 – 5:30 p.m., Exhibit Hall E


PB84 | Geophysical Engineering to Identify Seepage Channels in the Hager Slough Levee, Md Zahidul Karim, S.M.ASCE, Kansas State University; Stacey E. Tucker-Kulesza, Ph.D., P.E., M.ASCE, Kansas State University; Cassandre Rutherford, Ph.D., P.E., M.ASCE, Iowa State University; Michelle L. Barnhardt-Berry, Ph.D., P.E., M.ASCE, University of Arizona

Geotechnics of Soil Erosion

PB87 | Using Case Studies of Bridge Scour in Rhode Island to Evaluate Simplified Scour Equations, Aaron S. Bradshaw, Ph.D., P.E., University of Rhode Island; Wendy K. Laurent, Taylor Engineering, Inc.; Christopher D. Baxley, P.E., Ph.D., P.E., University of Rhode Island; M. Reza Hashemi, Ph.D., University of Rhode Island; Monique Lafrance Bartley, Rhode Island Island; Brian Ciacoppoli, Rhode Island Rhode Island; King King, University of Rhode Island

PB88 | Tracking Piping Phenomenon in Earth Dams, Fadi Salti, Notre Dame University-Louaize; Ronald Bounassar, Notre Dame University-Louaize; Neji Khoury, Ph.D., P.E., Notre Dame University-Louaize; Yara Maalouf, Notre Dame University-Louaize

PB89 | Erosion Mechanism of Claypan Soils in Southeastern Kansas, Mark A Mathio II, S.M.ASCE, Kansas State University; Tri V Tran, S.M.ASCE, Kansas State University; Stacey E. Tucker-Kulesza, Ph.D., P.E., M.ASCE, Kansas State University; Grethen F. Sassennon, Ph.D., Kansas State University

PB90 | Experimental and Analytical Studies on the Root Reinforcement Effect of a Grass Species, Spartina alterniflora, Sujuan Boral, M.S., Louisiana Tech University; Jyotiraj Xingyang Wang, Ph.D., P.E., Louisiana Tech University; Shaowen Alam, Ph.D., Louisiana Tech University; William Brown Patterson, Ph.D., Louisiana Tech University

Pavements

PB11 | Development of a Strength Prediction Model for Recycled Base Materials with Soil Intrusion, Prasad Bhardwaj, The University of Texas at Arlington; Sita Timisina, ECS Southwest, LLP; Saif Ahmed, Ph.D., P.E., State University of New York (SUNY) Polytechnic Institute; Sahadat Hossain, Ph.D., P.E., The University of Texas at Arlington; Boon Thian, Texas Department of Transportation

PB12 | Enhanced Lateral Drainage Geotextile to Mitigate the Effects of Moisture Migration from a High Water Table, Jorge Zumbenhorn, Ph.D., P.E., F.ASCE, The University of Texas at Arlington; Anthony E.H. Maclean, M.S., The University of Texas at Austin

PB16 | Subgrade Soil Stabilization Using Low-Quality Recycled Concrete Aggregate, Mounim Tabak, Ph.D., Candidate, S.M.ASCE, Kansas State University; Mustaque Hossain, Ph.D., P.E., F.ASCE, Kansas State University; Stacey E. Tucker-Kulesza, Ph.D., P.E., M.ASCE, Kansas State University

PB17 | Mechanical Concrete for Enhancing the Properties of Pavement Base/Subbase, PV Vipin, Ph.D., P.E., M.ASCE, West Virginia University; Justin Smith, West Virginia University

PB21 | Parametric Study of Moderate Strength Concrete Pavement Using Artificial Neural Network Approach, Sajib Saha, Ph.D., P.E., Texas A&M Transportation Institute; Fan Gu, Ph.D., A.M.ASCE, National Center for Asphalt Technology, Auburn University; Xin Luo, Ph.D., A.M.ASCE, Zhongjia University; Robert L. Lytton, Ph.D., P.E., F.ASCE, Texas A&M University

PB22 | Sustainable Design of Rigid Pavements Using a Hybrid GP and OLS Method, Abhijit TogdighiKalserali, S.M.ASCE, University of Texas at El Paso; Carlos M. Chang Albitanes, Ph.D., P.E., University of Texas at El Paso

PB23 | Development of the Virtual Load Method by Applying the Inverse Theory for the Analysis of Geosynthetic-Reinforced Pavement on Expansive Soils, Debjyoti Sarkar, B.S., Louisiana Tech University; Jyoti Xingyang Wang, Ph.D., P.E., M.ASCE, Louisiana Tech University; Md Adnan Khan, Ph.D., P.E., M.ASCE, Shannon & Wilson, Inc.

PB24 | Use of Pervious Concrete in Developing Countries for Stormwater Management, Louis Janier Said, Notre Dame University-Louaize; Neji Khoury, Ph.D., P.E., Notre Dame University-Louaize; Charles Said, Ph.D., Notre Dame University-Louaize

PB25 | Case Study of Military Airfields Emphasizing Asset Management, Rehabilitation, and Implementation of New Technologies, Thomas M. Synovec, P.E., M.ASCE, Mississippi State University; Isaac L. Howard, Ph.D., P.E., F.ASCE, Mississippi State University; Lucy P. Friddy, Ph.D., P.E., M.ASCE, U.S. Army Engineer Research and Development Center

PB26 | Effect of Fine Clay Particles on the Strength Characterization of Cement Treated Flex-Base Materials, Sita Timisina, ECS Southwest, LLP; Saif Ahmed, Ph.D., P.E., State University of New York (SUNY) Polytechnic Institute; Sahadat Hossain, Ph.D., P.E., The University of Texas at Arlington; Boon Thian, Texas Department of Transportation


PB28 | Cyclic Triaxial Tests on Crushed Limestone for Base Layers, Pradip Adhikari, S.M.ASCE; Abdrezaoul Osouli, Ph.D., P.E., M.ASCE, SIDÉ

Risk Assessment and Management

PB39 | Quantitative Coseismic and Precipitation-Induced Landslide Risk Mapping for the Country of Lebanon, William Pollock, University of Washington; Joseph Wartman, University of Washington; Greece Abou-Jaoude, Lebanese American University; Alex Grant, University of Illinois at Urbana Champaign

PB40 | An Adaptive Kriging-Based Approach with Weakly Stationary Random Fields for Soil Slope Reliability Analysis, Mehrdad Rahimi, The Ohio State University; Zeyu Wang, The Ohio State University; Abdullah Shafieezadeh, Ph.D., The Ohio State University; Dylan Wood, The Ohio State University; Ethan J. Kadobin, Ph.D., The Ohio State University

PB42 | Excavation-Induced Structural Responses Due to Inherent Variability of Soils, Zhe Luo, Ph.D., P.E., M.ASCE, Tongji University; Biao Hu, Ph.D., Tongji University; Youwen Wang, M.S., Tongji University

PB43 | Fuzzy Reliability Analysis for Elastic Settlement of Surface Footing, Rajashri Pramanik, M.E., Indian Institute of Technology Kharagpur; Dilip Kumar Bajpayee, Ph.D., Indian Institute of Technology Kharagpur; Nitin Dhang, Ph.D., Indian Institute of Technology Kharagpur


PB47 | Experimental Study and Evaluation on Surface Grouting in Shallow-Buried Section of Karst Tunnels, Xiu Huo, Southwest Jiaotong University; Peng Zhang, Southwest Jiaotong University; Jianman Chen, A.M.ASCE, Southwest Jiaotong University; Runfang Sun, Southwest Jiaotong University; Yiwu Liu, Southwest Jiaotong University


PB49 | Modification Techniques for the Christina River Bridge Approaches, Eric M. Klein, P.E., D.GE, F.ASCE, RK&K, LLP; Bibek S Bhattacharya, P.E., RK&K, LLP

PB50 | Soil Improvement: Biopolymers PB51 | Examining the Behavior of Compacted Soil-Biochar Specimens, Renee S. Lampiranakos, S.M.ASCE, University of Delaware; Kaledin Hmoj Moneahleh, Ph.D., P.E., M.ASCE, University of Delaware

PB52 | Strengthening of Dune Sand with Sodium Alginate Biopolymer, Shahid Beheshti University; Ali Noorzad, Shahid Beheshti University; Anil Kumar Choudhary, Ph.D., NIT, Jamshedpur

PB53 | Stress-Strain Behaviour of Steel Fiber-Reinforced Sand, Jagdandia Jha, Amrita Vishwa Vidyapeetham

PB54 | Strength Characterization of Expansive Soil Treated with Phosphogypsum and Curb Waste Rubble, Babu R. Dayakar, KT5 Divi; Raviteja KVNS II, KT5 Divi; Edith Cowan University; Anil Kumar Choudhary, Ph.D., NIT, Jamshedpur

PB55 | Unconfined Compressive Strength of Mine Tailings Amended with Fly Ash, Amin Benjamin Ghorbanpour, P.E., KCI Technologies, Inc.

Soil Improvement: Fiber Reinforcement and Soil Stabilization

PB18 | Comparative Study of Sisal and PVA Fiber for Soil Improvement, Anil Kumar Sharma, Ph.D., Amin Vishwa Vidyapeetham; Sweena Prasannan, Amin Vishwa Vidyapeetham; Sreevalsan Kalathayar, Ph.D., Amin Vishwa Vidyapeetham

PB19 | Characterization of Expansive Soil Treated with Phosphogypsum and Curb Waste Rubble, Babu R. Dayakar, KT5 Divi; Raviteja KVNS II, KT5 Divi; Edith Cowan University

PB20 | Stress-Strain Behaviour of Steel Fiber-Reinforced Sand, Jagdandia Jha, Amrita Vishwa Vidyapeetham

PB29 | Through-Soil Wireless Communication System for Embedded Geotechnical Instrumentation, Omar Balaji, MCE, Ph.D. Candidate, University of Illinois at Urbana Champaign; Siqiong Yang, M.Eng, Ph.D. Candidate, University of Illinois at Urbana Champaign; Youssel H. Hashish, Ph.D., P.E., F.ASCE, University of Illinois at Urbana Champaign; Andrew Singer, Ph.D., University of Illinois at Urbana Champaign
PB101 | A Procedure for Incorporating Climatic and Water Table Data in the Geotechnical Design of Driven Pile Subjected to Axial Load, Yadireza Mahmodzadok, Ph.D., Clemson University; Nodarakj Ravichandran, Ph.D., Clemson University

PB102 | Effect of Geotechnical Parameters on the Percollation Performance of an Established Rain Garden in Pennsylvania, Wessam Mohammed, Villanova University; Andrea L. Welker, Ph.D., P.E., M.ASCE, Villanova University; James Press, Villanova University

PB103 | Evaluation of Bimodal Water Retention Characteristics for Hydrating Chromium Ore Processing Residue (COPR), Mustafa Alzuhair, University of Nebraska-Lincoln; Jiannan Chen, Ph.D., University of Wisconsin-Madison

PB104 | Numerical Investigation of a Saturated/Unsaturated Soil-Atmosphere Model, Chao Yang, Ph.D., P.E., Missouri University of Science and Technology; Xuefeng Wang, University of Arkansas; Xue Li, University of Arkansas; Lijun Zhao, University of Arkansas

PB105 | Measurement of Thermal Conductivity and Suction for Sands Using a Modified Hanging Column Device, Xuelin Wang, University of Texas at Arlington; Xinbao Yu, Ph.D., P.E., University of Texas at Arlington

PB106 | A Bounding Surface Based Constitutive Model for Unsaturated Granular Soils, Mehdi Kadivar, S.M.ASCE, University of Delaware; Kalehivat Nega Manahiloh, Ph.D., P.E., M.ASCE, University of Delaware; Victor N. Kaliakin, Ph.D., P.E., M.ASCE, University of Delaware

PB107 | Monitoring-Assisted Large-Diameter Shield Tunneling Control in Soft Ground: A Case Study of Bund Tunnel Project, Xuefeng Zhang, Ph.D., P.E., Tongji University; Wei Chen, Tongji University; Dilu Xu, Tongji University; Guodong Gai, M.Eng., SGS Engineering Consulting (Group) Co., Ltd.; Yun Bai, Ph.D., Tongji University

PB108 | Overview of Typical Excavation Failures in China, Ye Lu, Ph.D., A.M.ASCE, Shanghai University; Yong Tan, Ph.D., A.M.ASCE, Tongji University; Songlin Liu, Ph.D., Shanghai SMI Water (Group) CO., LTD; Xiaoxian Zhang, Ph.D., Shanghai SMI Water (Group) CO., LTD; Shengliang Wang, Ph.D., Sichuan Railway Investment Group Co., LTD; Jie Zhang, Ph.D., Sichuan Railway Investment Group Co., LTD; Yanzhi Gao, Ph.D., Sichuan Railway Investment Group Co., LTD; Weihua Shi, Ph.D., Sichuan Railway Investment Group Co., LTD

PB109 | Time-History Analysis of Earth Pressure Test on Soil Arching Effect Caused by Deep-Buried Tunneling in Soft Soil, Liu Shujin, Ph.D., Shanghai SMI Water (Group) CO., LTD; Bai Tinghui II, P.E., Shanghai Water Authority; Liao Shaoming III, P.E., Tongji University; Shen Pangyong IV, P.E., Shanghai SMI Water (Group) CO., LTD; Bai Zhanyi, P.E., Shanghai SMI Water (Group) CO., LTD; Huang Shunyong, P.E., Shanghai SMI Water (Group) CO., LTD

PB110 | Effect of Segregation on the Geotechnical Properties Of Hydraulic Backfill, Jean Béket Dalché Master, École Polytechnique de Montréal; Li Li, Ph.D., École Polytechnique de Montréal; Pengyu Yang, Ph.D., École Polytechnique de Montréal

PB111 | Correlating EPB Chengdu Metro Settlement Data with Analysis Predictions in Sandy Cobble Stratum, Xin Liao, Ph.D., Southwest Jiaotong University; Qingfeng Wang, Southwest Jiaotong University; Lian Wang, Ph.D., Southwest Jiaotong University; Junhuan Pan, Ph.D., Southwest Jiaotong University; Ling Wei, Ph.D., Southwest Jiaotong University

PB112 | Overview of Typical Excavation Failures in China, Ye Lu, Ph.D., A.M.ASCE, Shanghai University; Yong Tan, Ph.D., A.M.ASCE, Tongji University; Songlin Liu, Ph.D., Shanghai SMI Water (Group) CO., LTD; Xiaoxian Zhang, Ph.D., Shanghai SMI Water (Group) CO., LTD; Shengliang Wang, Ph.D., Sichuan Railway Investment Group Co., LTD; Jie Zhang, Ph.D., Sichuan Railway Investment Group Co., LTD; Yanzhi Gao, Ph.D., Sichuan Railway Investment Group Co., LTD; Weihua Shi, Ph.D., Sichuan Railway Investment Group Co., LTD
Morning Networking Break, Exhibit Hall E

10:00 – 11:00 a.m.

Special Session: Robert M. Koerner Lecture Lessons Learned: An Adventure in 4 Decades of Geosynthetics Engineering, Terrace Ballroom III

10:00 – 11:30 a.m.

Room 126A

Panel Session: Changing the Paradigm for Large Landslides: Forecasting Time-to-Failure

10:00 – 11:30 a.m.

Technical Sessions

Deep Foundations: Special Topics

Moderators: Joseph Thomas Coe, Jr., P.E., Matteo Montesi, P.E.

Moderators: John S. McCartney, Ph.D., P.E., F.ASCE; Sotiris Vardakos, Ph.D., C.Eng, M.ASCE

Risk Assessment and Management

Moderators: Halilham M. Dawood, Ph.D., P.E., M.ASCE; Nabil Seif, Ph.D., EIT, A.M.ASCE

Education for Geotechnical Engineering

Moderators: Andrea L. Welker, P.E., M.ASCE; Patricia M. Gallagher, Ph.D., P.E.

Geoenvironmental Engineering

Moderators: Kristin Sample-Lord, P.E., M.ASCE; Ehsan Ghazanfari, Ph.D., P.E., M.ASCE

Verification Load Testing of Micropiles Under Combined Axial and Lateral Forces


Emergency Bridge Abutment Repair with Pressed-in Pipe Piles

Takefumi Takuma, A.M.ASCE, Japan Press-in Association; Gregory S. Pink, P.E., Dougherty, Michalski & Associates; Christopher Paxson, P.E., D.WRE, Schnabel Engineering; Detlef H. Gorakhki, P.E., University of Colorado; John Brina, P.E., Colorado State University

Landslide Susceptibility: Geostatic Principal Stress Directions

Osvaldo P.M. Vital, M.S., Civil Engineer, Purdue University; Torcizio B. Cafelito, Ph.D., University of Sao Paulo; Antonio Babet, Ph.D., Purdue University

Photogrammetry for the Characterization of Rock Masses

Case History for Slopes and Caverns

Fulvio Tanon, Ph.D., P.E., M.ASCE, Tenon USA; Engineering, Measurements, and Testing, LLC

Jet Grouting for Excavation Support, Underpinning, and Groundwater Control

For the Construction of Sewage Treatment Plant Tanks


Shallow Tunnel Not Aligned to the Geostatic Principal Stress Directions

Oswaldo P.M. Vital, M.S., Civil Engineer, Purdue University; Torcizio B. Cafelito, Ph.D., University of Sao Paulo; Antonio Babet, Ph.D., Purdue University

Landslide Susceptibility

Updating Considering Real-Time Observations

Hoai D. Vu, BSc, The Hong Kong University of Science and Technology; Limin Zhang, Ph.D., F.ASCE, The Hong Kong University of Science and Technology

Geo-Hydro Forensic Investigation of an Earth Dam Failure

Christopher J. Brown, Ph.D., P.E., University of North Florida; Raphael Crowley, Ph.D., P.E., M.ASCE, University of North Florida; Nick Hudomy, Ph.D., P.E., M.ASCE, University of North Florida

George B. Stevenson Dam Rehabilitation – The Importance of Uncertainty and Confidence Evaluation

In Quantitative Risk Assessments (QRA), Scott A. Kaschke, Ph.D., P.E., M.ASCE, Schnaible Engineering; Gregory S. Paxson, P.E., D.WRE, Schnaible Engineering; Edward (Woody) Rapihosh, P.E., Pennsylvania Department of Conservation and Natural Resources (DCNR)

Developing An Exhumed Landfill Dieline System

George Robert Koerner, Ph.D., P.E., G.I.A., M.ASCE, Geosynthetic Institute (GSI); Robert M. Koerner, Ph.D., P.E., F.ASCE, Drexel University

Hydraulic Conductivity

and Soil Water Retention of Waste Rock and Tailings Mixtures

Mohammad H. Gorakhki, Colorado State University; Christopher A. Borelitz, Colorado State University; Joseph Scala, Colorado State University; Michael Jacobs, Goldcorp Inc.

Factors Affecting the Kinetics of Urea Hydrolysis via Sporosarcina Pasteurii

Shahin Safavizadeh, Ph.D., North Carolina State University; Brina Mortensen Montoya, Ph.D., P.E., North Carolina State University; Mohammad A. Ghar, Ph.D., P.E., North Carolina State University; Detlef R. U. Knappe, Ph.D., P.E., North Carolina State University

Professional Development Hours (PDHs) — earn up to 26 PDHs

You may earn PDHs, which are nationally recognized units of record, by attending Geo-Congress 2019 technical sessions and pre-conference seminars. Please note there are differences from state to state in continuing education requirements for professional engineering licensure. Each state licensing board has the final authority to approve course, credits, PDHs, and other methods of earning credits in that state. ASCE strongly recommends that individuals regularly check with their state licensing boards for specific continuing education requirements in their jurisdictions that affect professional engineering licensure and the ability to renew licensure.
## Technical Program
### Technical Sessions

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<td>Visualization of Torpedo Pile Penetration and Pullout in Transparent Synthetic Soil Representative of Soft Marine Clays, Abdelaziz Aaids, M.S., New York University; Mehdi Omidi, Ph.D., A.M.ASCE; Consulting P.A.; Maser Consulting P.A.</td>
<td>Overcoming Challenges for the Parallel Thimble Shaol Tunnel Site Investigation, Scott Kibby, P.E., M.ASCE; Matt MacDonald, Frank Perrone, P.E., M.ASCE; Matt MacDonald; Amanda Wachenfeld, EIT, A.M.ASCE; Matt MacDonald; Jose Ballesta, Dugadusa USA</td>
<td>Predicting Multiple Hazards Under Extreme Rainstorms, Shenyang Zhou, Hong Kong University of Science and Technology; Linmin Zhang, Hong Kong University of Science and Technology; Ping Shen, Hong Kong University of Science and Technology</td>
<td>Geotechnical Risk Assessment and Back Analysis of Ground Movements Induced by Tunnel and Open-Cut Excavations, Moha P. Poppa, Ph.D., P.E., EIT; HBK Engineering, LLC; Andrew J. Schwarz, S.E., P.E., LEED; HBK Engineering, LLC; Maser Engineering, Inc.</td>
<td>Off-Site Implementation of GeoExplorer – A Game-Based Module for Geotechnical Engineering Education, Victoria Bennett, Rensselaer Polytechnic Institute; Umny Mbah, Rensselaer Polytechnic Institute; Harpreet Kaur, Rensselaer Polytechnic Institute; Sven H. Kosecke, University of Colorado at Boulder; Paul J. McCallum, University of Iowa; Shamy E. Shamy, Southern Methodist University</td>
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### Additional Events

- **Lunch, Exhibit Hall E**
- **1:00 – 2:00 p.m.** Ralph B. Peck Award Lecture, Terrace Ballroom IV
- **2:00 – 3:00 p.m.** Closing Ceremony, Terrace Ballroom IV
Exhibit Hall Floor Plan

1003
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A.H. Beck Foundation Co., Inc. is a proven innovator in the deep foundation industry. Providing cost effective earth retention and ground improvement solutions since 1932.

1006
ACE Geosynthetics
www.geoace.com
ACE Geosynthetics is the leading manufacturer of geosynthetics in Asia providing integrated, geosynthetic-related products and solutions for worldwide engineering projects including MSE Walls, environmental remediation, erosion control, shoreline protection, and coastal structure construction.

801
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Aerix Industries is the world leading manufacturer of foam concentrate for the use in low density cellular concrete providing projects with a fast schedule cost saving alternative backfill material for roadways sub-base, bridge approaches backfill, and other pavement system solutions. Cellular concrete reduces soil loading while maintaining structural integrity.

212
Aero Aggregates
www.aerogaggregates.com
Foamed glass aggregates are ultra-lightweight and used on highways, bridge abutments and retaining walls. In addition, they provide drainage and insulation properties. Unit weights 10-20pcf.

222
Arizona State University: Center for Bio-Mediated and Bio-inspired Geotechnics
https://cbbg-engineering.asu.edu
CBBG, a consortium of ASU, UC Davis, Georgia Tech, and NMSU, develops nature-inspired solutions for hazard mitigation, infrastructure construction, environmental protection, and subsurface exploration.

906
Berkel*
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A specialty design-build contractor offering Augered Pressure Grouted (APG) and Drilled Displacement (APGD) Piles, Ground Improvement, Sheeteting & Shoring, Underpinning, Anchors, Driven Piles & Drilled Shafts. Full in-house engineering and design services are available.

1112
Campbell Scientific, Inc
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Campbell Scientific works with cities, states, governments, research scientists and the military to monitor critical infrastructure. Our equipment is used to track changes, evaluate performance, meet regulatory obligations, alert maintenance when repairs are needed, and prevent catastrophic failures from occurring. Our products are keeping citizens of the world safe from infrastructure disasters.

407
ChemGrout
www.chemgrout.com
For 55 years, ChemGrout has manufactured the world’s largest selection of grouting equipment. Their equipment remains an industry standard, offering reliability and durability.

809
CJGeo
www.cjgeo.com
CJGeo is a specialty contractor performing pipe abandonment and annular space grouting with low density cellular concrete.

124
Compaction Grouting Services
www.cgsinc.net
Compaction Grouting Services, Inc. is a geotechnical contracting firm that specializes in compaction grouting, micropiles (minipiles), sinkhole remediation, soil nail walls and shotcrete, and slabjacking.

219
ConeTec, Inc*
https://www.conetec.com
ConeTec is a full service geotechnical and environmental site investigation contractor. We safely solve problems by generating high quality subsurface information used in geotechnical, environmental, and mining geotechnique. Our team of experts are dedicated to safe, quality, and efficient site investigations using the best possible equipment.

102
CZM
www.czm-us.com
CZM offers a comprehensive line of equipment engineered in the USA for a variety of drilling applications. Located in Savannah, GA, CZM is recognized for superior after-sales service and innovative design.

209
Danbro Distributors
www.danbro.com
Danbro distributes IDEAL Foundation Products in the Northeast and mid-Atlantic states. Danbro distinguishes itself by providing unparalleled customer support and quality engineering services to the professional community.

1013
Dataforensics*/Keynetix
www.dataforensics.net
Dataforensics and Keynetix geotechnical and geo-environmental data management software helps geologists, geotechnical and environmental engineers accomplish field and office work in less time, with greater accuracy and data quality.

721
Deep Excavation
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Great software for geotechnical & structural engineers for the design and analysis of deep excavations. User-friendly, high-quality with multiple accepted design methods, calculations and training sessions.
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Duro Terra is the distributor of Ductile Iron Pipe products in North America. Ductile Iron Pipes are highly effective, fast and versatile Pile products in North America. Ductile Iron

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Enviroprobe Service, Inc. is a state of the art geophysical exploration and drilling company offering modern approaches to investigative needs in civil, geotechnical, and environmental applications.

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Fugro is the world’s leading, independent provider of site characterization and deep foundations testing for large constructions, infrastructure and natural resources.

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GEO-SLOPE develops, markets, and supports state-of-the-art software for geotechnical and geo-environmental modeling. Our customers include small engineering firms, large multinationals, government agencies, regulatory commissions, and leading universities throughout the world.

The Geoprofessional Business Association (GBA) helps members become more successful by creating unique business resources, programs, and services that help members and their clients confront risk and optimize business performance.

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The Industrial Fabrics Association International (IFAI) is a not-for-profit trade association comprised of member companies representing the international specialty fabrics marketplace.

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Geosense is one of Europe’s leading manufacturers and suppliers of instruments to the geotechnical, civil engineering, structural health monitoring, mining and environmental industries.

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Geo-Congress 2019: Case Histories — Capturing the Accomplishments of our Profession

Exhibitors (continued)

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Gilson
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Gilson is a leading manufacturer and distributor of high-quality construction testing equipment and laboratory testing equipment suited to your unique applications. Experienced Customer Service and Technical Support staff work with you to select products that meet even the most rigorous ASTM and AASHTO standards. Our materials testing equipment spans across many industries including construction, laboratory, pharmaceuticals, food services and much more!

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GRL Engineers, Inc.* / Pile Dynamics Inc
www.grlenge.com
www.Pile.com
GRL Engineers, Inc. provides deep foundation testing and analysis services nationwide. Pile Dynamics, Inc. is the world’s leading developer and manufacturer of quality assurance testing systems for the deep foundations industry.

703
HUESKER, INC*
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120
Humboldt Mfg Co
www.humboldtmfg.com
Humboldt Mfg Co., is a leading manufacturer and supplier of construction materials testing equipment for Soil, Concrete and Asphalt. Both Lab and Field Equipment.

401
IDEAL Manufacturing
www.idfgrp.com
IDEAL manufactures the patented STELCOR Drilled Displacement Micropile (DDM), for new foundation support and foundation underpinning, as well as large capacity Helical Pipe Piles. IDEAL is ISO 9001:2015 certified and holds an ICC-ES report (ESR-3750) for our helical pipe piles.

106
IDS Geo Radar
https://idsgeoradar.com
IDS GeoRadar provides products and solutions for geophysical, mining, civil engineering and security applications. Founded in 1980 as part of IDS Ingegneria dei Sistemi in Pisa, Italy, the company was recently acquired by Hexagon.

825
JAFEC USA
www.jafecusa.com
JAFEC USA, Inc. is a geotechnical construction company that provides ground improvement services for liquefaction mitigation, dam and levee stabilization, excavation support and seepage control.

701
Keller
www.kellerfoundations.com

318
Kessler Soils Engineering Products
https://www.kesslerdcp.com
World’s leading manufacturer of Dynamic Cone Penetrometers. Distributors of Zorn Light Weight Deflectometers for compaction control and MIT pavement thickness gauge & dowel bar scanners.

1008
Kordata
www.Kordata.com
Our vision is to be the industry leader in mobile data collection by developing and deploying the most innovative, flexible, scalable, mobile data collection and workflow software available by solving the challenging technical issues and putting simple and elegant solutions in the hands of our valued clients.

Maccamfer*
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Maccamfer is a global leader of civil and geotechnical engineering applications that helps consultants, agencies and contractors with “Engineering a Better Solution.”

1019
Magnum Piering
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Magnum Piering is an industry leader in manufacturing high capacity, high quality steel piling products for deep foundations and foundation repair applications.

418
Malcolm Drilling Company*
www.malcolmmdrilling.com
Malcolm has for 5 decades been an innovator and leader in the industry. Our services include deep foundations, retention systems, ground improvement and dewatering techniques.

518
MARL Technologies
www.marltechnologies.com
MARL Technologies designs and manufactures technology and industry-leading drills for auger, rotary, geotechnical, environmental, sonic, geothermal, water well, CPT, mining and construction. We are also proud to supply the world’s first digital electronic SPT system, the MARL eSPT®.

1020
Max Enterprises
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Max’s New indoor hydraulic sampling units, crews can set up and continuously push Irvin Shelby tube to a depth of 10 feet in less than one hour.

918
McCrossin Foundations
www.mccrossinfoundations.com
Deep foundations and support of excavation contractor, capabilities include large diameter shafts, driven and drilled piling, and small diameter drilling and grouting.

308
Menard Group USA*
www.menardgroupusa.com
Menard USA is one of the leading specialized ground improvement contractors in the U.S., with over 30 years of experience. We are a U.S. affiliate of Menard, a global leader among ground improvement contractors with offices in over 30 countries. Menard USA was formed as a merger between DGI (Drainage & Ground Improvement, Inc.), a leading Vertical Vих Drain installer in the US, and Menard.

421
Meter Group
www.metergroup.com
METER Group delivers real-time, high-resolution data with applications in hydrology and geotechnical engineering. METER instruments measure water and heat transfer in natural and engineered systems.

100
Morris Shea
www.morrisshea.com
Morris Shea is a heavy civil contractor specializing in design/build of deep foundations. Services include DeWaal® Piles, CFA piles, drilled shafts and earth retention.

118
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NHAZCA S.r.l., Spin-off Company of “Sapienza” University of Rome, is a services and consultancy company with great expertise in the following fields: natural hazards, geotechnics, hydrogeology, civil and environmental engineering. Oil & Gas and mining. Thanks to a constant effort in the innovation and optimization, NHAZCA provides cutting-edge solutions for the management of complex projects in complex environments making use of the most advanced remote sensing technologies, such as: Satellite SAR Interferometry, Terrestrial SAR Interferometry, PhotoMonitoringTM and UAV Surveys.

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Nicholson Construction Company*
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Nicholson is a leader and an innovator in the geotechnical construction industry with expertise in deep foundations, earth retention systems and ground treatment solutions.

109
Nucor Skyline
www.nucorskyline.com

224
Parratt-Wolf Inc.
www.pwmic.com
Parratt-Wolf Inc. is an employee-owned full-service drilling firm that ensures every site investigation meets or exceeds our clients’ expectations.

824
PDCA
www.piledrivers.org
A pile driving contractors organization, including engineers and associates who advocate the significant benefits of using driven piles for deep foundations and earth retention systems.

113
Pennoni Associates
www.pennoni.com
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Medical Emergencies – Loews Philadelphia Hotel
ASCE hopes that your visit to GeoCongress 2019 will be free from illness or injury, but in case you or a family member needs medical attention during your time at the event, contact the front desk. The closest hospital is Thomas Jefferson University Hospital
Thomas Jefferson University Hospital
111 South 11th Street, Philadelphia, PA 19107, |215| 955-6000

Medical Emergencies – Pennsylvania Convention Center
If there is an injured person or someone who needs medical attention, identify yourself to the individual if possible and obtain as much information as possible from him/her. Contact the Command Station, via the beige house phone at ext. 4911. Relay information to the Command Station. The Command Station will either contact the show EMS or the Philadelphia Fire Department Rescue Unit. It is important that you know where you are so medical attention may be rendered as quickly as possible. Do Not Call 911.

No Smoking Policy
Smoking is not allowed at any ASCE event or in the Convention Center or hotel.

Meeting Room Overcrowding
ASCE will make every effort to schedule popular events in rooms large enough to accommodate anticipated attendance. Since many events are extremely popular, it is wise to select alternative events as you plan your conference schedule. ASCE and the Pennsylvania Convention Center are REQUIRED to follow local fire regulations and may ask participants in rooms filled to capacity to choose another event.

Program and Session Cancellation
ASCE reserves the right to cancel programs and/or sessions. In the unlikely event of a cancellation, all registrants will be notified. Programs and sessions are subject to change, and ASCE reserves the right to substitute a program, session, and/or speaker of equal caliber to fulfill the educational requirements.

Pennsylvania Convention Center – Emergency Procedures
Evacuation Plan | Familiarize yourself with your surroundings. Note all emergency exits in your area. The key to a successful evacuation is for everyone to remain calm. In the event that evacuation is necessary, you will be informed via a voice-recorded message advising you to proceed to the nearest exit. If you are assisting in the evacuation of your show attendees and exhibitors, make sure they are instructed to leave by way of the nearest exit in a calm and orderly fashion. Physically challenged guests should be escorted to the nearest fire exit and the command station must be notified via house phone at ext. 4911 or nearest security personnel with the exact location of the individual so that the Fire Department is notified for retrieval of the individual.

Fire – Code Red | If a fire is suspected, contact the Command Station at 215-418-4911 or via the beige house phones at ext. 4911. Give the location and extent of the suspected fire. The Command Station will dispatch Security and Engineering and will call the Fire Department. The Command Station will also notify the Emergency Response Leaders, who will be in touch with Show Management. If evacuation is necessary, see evacuation plan above.

Bomb Threat – Code Black | When a call is received, try to keep the caller on the line as long as possible in order to obtain as much information as possible. Try to be calm when speaking to the caller. After a threat has been made and the call has been terminated, call the Command Station at 215-418-4911. Do Not Use your Radio at this point since the frequency of a two-way radio could trigger the device. Pages as well as cell phones should also be turned off. Command Station will call the police and notify the Emergency Response Team. The Emergency Response Team will be in touch with Show Management. If evacuation is necessary, see evacuation plan above.

Civil Disturbances | If you see protestors or witness a civil disturbance, notify the PCCA Command Station via the beige colored house phone at ext. 4911. The Command Station will also notify the Philadelphia Police Department, Security Services, and will meet with appropriate Show Management and advise them of the situation.

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Photographs and Video of the event may be taken by ASCE, its agents, contractors, or representatives, and such photographs and video may be used for any purpose at ASCE discretion.

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