

FINAL PROGRAM



PanAm-UNSAT 2017

Second Pan American Conference on Unsaturated Soils

Dallas, Texas, USA | November 12–15, 2017

Unsaturated Soil Mechanics for Sustainable Geotechnics



PROFESSIONAL
★ EARN UP TO
27
★ DEVELOPMENT HOURS



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Schedule at a Glance

Sunday, November 12

- 7:30 – 8:30 a.m. Continental Breakfast
- 8:00 a.m. – 5:30 p.m. Short Courses and Workshops
- 6:00 – 8:00 p.m. Welcome Reception

Monday, November 13

- 7:30 – 8:30 a.m. Continental Breakfast
- 8:30 – 10:30 a.m. Welcome / Keynote Lectures
- 10:30 – 11:00 a.m. Break
- 11:00 a.m. – 12:30 p.m. Parallel Technical Sessions I
- 12:30 – 2:00 p.m. Lunch / Posters
- 2:00 – 3:30 p.m. Symposium in Honor of Professor Delwyn G. Fredlund, Part I
- 3:30 – 4:00 p.m. Break
- 4:00 – 5:30 p.m. Panel on Dynamics / Parallel Technical Sessions II
- 6:30 – 9:30 p.m. Off-Site Key Social
- 7:00 – 9:30 p.m. TC 106 Committee Meeting

Tuesday, November 14

- 8:00 – 9:00 a.m. Continental Breakfast
- 9:00 – 10:30 a.m. Keynote Lectures
- 10:30 – 11:00 a.m. Break
- 11:00 a.m. – 12:30 p.m. Parallel Technical Sessions III
- 12:30 – 2:00 p.m. Lunch / Posters II
- 2:00 – 3:30 p.m. Symposium in Honor of Professor Delwyn G. Fredlund, Part II
- 3:30 – 4:00 p.m. Break
- 4:00 – 5:30 p.m. Panel on Cracking / Parallel Technical Sessions IV
- 6:30 – 9:30 p.m. First Pan-American Distinguished Lecture & Dinner

Wednesday, November 15

- 8:00 – 9:00 a.m. Continental Breakfast
- 9:00 – 10:30 a.m. State-of-the-Art Lectures
- 10:30 – 11:00 a.m. Break
- 11:00 a.m. – 12:30 p.m. Parallel Technical Sessions V
- 12:30 – 2:00 p.m. Lunch / Posters III
- 2:00 – 3:30 p.m. State-of-the-Practice Lectures
- 3:30 – 4:00 p.m. Break
- 4:00 – 5:30 p.m. Panel on Expansive Soils / Parallel Technical Sessions VI
- 5:45 – 6:30 p.m. Closing Ceremony

Welcome from the Conference Co-Chairs

Welcome to PanAm-UNSAT 2017: The Second Pan-American Conference on Unsaturated Soils, brought to you by the Geo-Institute (GI) of the American Society of Civil Engineers (ASCE), and the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE). PanAm-UNSAT 2017 features the latest research advances and engineering-practice innovations in the area of Unsaturated Geotechnics, with a focus on characterization, modeling, design, construction, and field performance.

The conference builds upon the success of PanAm-UNSAT 2013 (First Pan-American Conference on Unsaturated Soils, Cartagena, Colombia); as well as that of previous conferences on unsaturated soils hosted in the United States, such as UNSAT 2006 (Fourth International Conference on Unsaturated Soils, Carefree, Arizona) and EXPANSIVE'92 (Seventh International Conference on Expansive Soils, Dallas, Texas, 1992).

PanAm-UNSAT 2017 follows this series of successful regional and international conferences on Unsaturated Soils, bringing together researchers, practitioners, students and policy makers from around the world—particularly the Americas—to share the latest advances, engineering applications, and pedagogical approaches in the discipline of unsaturated soil mechanics.

While you're here, make sure you leave time in your schedule to enjoy Dallas. There are so many things to do: from the classics like Reunion Tower and Perot Museum of Nature and Science, to new experiences in must-see spots like Trinity Groves and the Design District. Throughout Dallas, you'll find plenty to explore, from attractions like the Dallas Zoo or the Dallas World Aquarium, to museums and performances, to local and international cuisine, to nightlife and sporting events.

Welcome!

The conference Program Committee would also like to acknowledge the members of the Technical Advisory and the International Technical Committees, who provided guidance and support during the early planning phases of the conference.

Technical Advisory Committee

Sai Vanapalli, University of Ottawa, Canada
Greg Siemens, Royal Military College, Canada
Kanthasamy (Muralee) Muraleetharan, University of Oklahoma, USA
Xiong Zhang, University of Cincinnati, USA
Ning Lu, Colorado School of Mines, USA
Claudia Zapata, Arizona State University, USA
Jorge Zornberg, University of Texas at Austin, USA
Jorge Abraham Diaz-Rodriguez, UNAM, Mexico
Bernardo Caicedo, Universidad de Los Andes, Bogotá, Colombia

Julio E. Colmenares, Universidad Nacional, Bogotá, Colombia
Orencio Villar, University of São Paulo, São Carlos, Brazil
Tacio de Campos, PUC-Rio, Brazil
Fernando Marinho, University of São Paulo, Brazil
Manoel Porfirio Cordão Neto, Universidade de Brasília, Brazil
Diego Manzanal, University of Buenos Aires, Argentina
Alejo Sfriso, University of Buenos Aires, Argentina

International Technical Committee

David Toll, University of Durham, UK
Adrian Russell, University of New South Wales, Australia
Eduardo Alonso, UPC, Barcelona, Spain
Antonio Gens, UPC, Barcelona, Spain
Lyesse Laloui, EFP Lausanne, Switzerland
J. Carlos Santamarina, KAUST, Saudi Arabia
Charles Ng, HKUST, Hong Kong



Laureano R. Hoyos, Ph.D., P.E.



John S. McCartney, Ph.D., P.E.

Program Committee

Conference Chair:

Laureano R. Hoyos, Ph.D., P.E., University of Texas at Arlington

Conference Co-Chair:

John S. McCartney, Ph.D., P.E., M.ASCE, University of California, San Diego

Technical Program Chair:

Sandra L. Houston, Ph.D., D.GE, M.ASCE, Arizona State University

Technical Program Co-Chair:

William J. Likos, Ph.D., M.ASCE, University of Wisconsin, Madison

Local Chair:

Marcelo J. Sanchez, Ph.D., Aff.M.ASCE, Texas A&M University

Local Co-Chair:

Gerald A. Miller, Ph.D., P.E., M.ASCE, University of Oklahoma

Sponsorship & Exhibits Chair:

Anand J. Puppala, Ph.D., P.E., D.GE, F.ASCE, University of Texas at Arlington

SUNDAY, NOVEMBER 12

Begin your PanAm-UNSAT 2017 experience with a short course! Each of the offered courses will allow you to claim four Professional Development Hours (PDHs).

Deformation of Unsaturated Compacted Fills

8:00 a.m. – 12:30 p.m., *Bel-Air I*

The course covers fundamentals of heave, settlement, and lateral expansion of unsaturated compacted fills including: wetting-induced deformation; fundamentals of volume change; tests for one-dimensional swell and collapse; one-dimensional heave-settlement analysis for both design and forensic phases; lateral stretching of compacted expansive fill slopes; and mitigation of heave, settlement, and lateral extension.

Instructors:

Iraj Noorany, Ph.D., P.E., G.E., F.ASCE, Noorany Geotechnical

Christine Detournay, Ph.D., Itasca Consulting Group

4 PDHs

Onsite rate: \$295.00

Continental breakfast for course attendees will be enjoyed in the Bel-Air V-VI Room from 7:30 – 8:30 a.m.

Simple Methods to Characterize and Model Unsaturated Soil Behavior

8:00 a.m. – 12:30 p.m., *Bel-Air II*

Although significant progress has been made in the past six decades, unsaturated soil mechanics is not extensively used in routine engineering projects for several reasons: (1) the equipment needed to characterize unsaturated soils is expensive (\$60-\$150K), (2) the suction-controlled tests are time-consuming (1-3 months/soil, 3-5 years/soil), and (3) the theories for unsaturated soils are complicated to understand and model. This workshop will introduce simple methods to characterize and model unsaturated soils as follows: (1) A Modified State Surface Approach (MSSA) is used to explain unsaturated soil behavior, which can be easily understood by engineers without previous background in constitutive modeling. (2) Conventional testing equipment (single-cell triaxial, oedometer, and unconfined compression test apparatus) for saturated soils is used to rapidly characterize unsaturated soils (4-8 hours/test, 1-2 weeks/soil). (3) Step-by-step procedures are given to analyze these results for constitutive modeling purposes without sacrificing the theoretical accuracy. (4) Examples will also be given to demonstrate how to use the results for numerical simulation of unsaturated soil-related boundary-value problems. The well-known Barcelona Basic Model (BBM) will be used to demonstrate the proposed methods.

Instructors: Xiong Zhang, Ph.D., P.E., A.M.ASCE, University of Cincinnati; **Laureano R. Hoyos, Ph.D., P.E.**, University of Texas at Arlington; **Marcelo J. Sanchez, Ph.D., Aff.M.ASCE**, Texas A&M University

4 PDHs

Onsite rate: \$295.00



SUNDAY, NOVEMBER 12

Welcome Reception in Exhibit Area

6:00 – 8:00 p.m., *Garden Court I-II*

Be among the first to see innovations in the industry by attending the Welcome Reception. Join colleagues and friends in the exhibit area for this opportunity to network and make valuable future contacts. Visit the exhibits and discuss solutions to the challenges facing you in your daily life.

MONDAY, NOVEMBER 13

Continental Breakfast

7:30 – 8:30 a.m., *Garden Court I-II*

Opening Plenary Session: Welcome & Keynotes

8:30 – 10:30 a.m., *Malachite Showroom*

1 PDH

Following a brief introduction to the conference, this opening plenary session features two keynote presentations from Professor Delwyn G. Fredlund and Professor Ning Lu.

Opening Remarks:

Laureano R. Hoyos, Ph.D., P.E., University of Texas, Arlington

John S. McCartney, Ph.D., P.E., M.ASCE, University of California, San Diego

David Toll, Ph.D., University of Durham; Chair, TCI06 Committee, ISSMGE

Moderator: John S. McCartney, Ph.D., P.E., M.ASCE, University of California, San Diego

KEYNOTE SPEAKERS

Effect of Initial Conditions on the Interpretation of Soil-Water Characteristic Curves (SWCCs) in Geotechnical Engineering

Speaker: Delwyn G. Fredlund, O.C., Ph.D., F.E.I.C., P.Eng., D.GE, L.M.ASCE, Golder Associates Ltd.

Professor Delwyn (Del) Fredlund has spent more than 40 years conducting research into the behavior of unsaturated and expansive soils. Del presently heads the Golder Unsaturated Soils Group which is involved in the implementation of unsaturated soil mechanics into geotechnical engineering practice. Del has undertaken international programs of collaboration with countries such as China, Africa, and Vietnam. Del Fredlund obtained his Ph.D. in 1973 and has spent 34 years teaching and conducting research at the University of Saskatchewan, Saskatoon. Del's research studies have focused on unsaturated soil mechanics and numerical modeling. He is the author, along with Dr. Harianto Rahardjo, of the book *Soil Mechanics for Unsaturated Soils* (1993). In 2012, he authored a second book on unsaturated soil mechanics titled *Unsaturated Soil Mechanics in Engineering Practice*, along with Dr. H. Rahardjo and M.D. Fredlund. Del has been the recipient of numerous awards, amongst them the; Legett Award, 1999, the Terzaghi Award, 2005, and the Quigley Award, 2009. He is also a recipient of the Order of Canada and is a member of the Canadian Academy of Engineering.

Generalized Elastic Modulus Equation for Unsaturated Soil

Speaker: Ning Lu, Ph.D., F.E.M.I, F.ASCE, Colorado School of Mines, Golden

Professor Ning Lu is well known internationally for his work on stresses in variably saturated porous media. His primary research interest is to seek common threads among basic soil physical phenomena including fluid flow, chemical transport, heat transfer, stress, and deformation. He pursues understanding of these phenomena at fundamental levels, including unifying atomic-scale potentials, inter-particle forces, and engineering-scale stresses in soils. He has been working on challenging engineering problems in chemical transport in clayey soil, underground nuclear waste isolation, residential house foundation damage by expansive clays, and, most recently, precipitation-induced shallow landslides. He teaches regularly on mechanics and hydrology of variably saturated porous media with the textbook *Unsaturated Soil Mechanics* (John Wiley and Sons, 2004). He also teaches vadose zone hydrology and landslides with the textbook *Hillslope Hydrology and Stability* (N. Lu and J.W. Godt, Cambridge University Press, 2012).

Break

10:30 – 11:00 a.m., *Garden Court I-II*

Exhibitors and coffee will help inspire you and fuel your brain as you tackle the first block of technical programming.

Concurrent Technical Session I

11:00 a.m. – 12:30 p.m. **1.5 PDHs**

See page 8 for sessions and locations.

Lunch

12:30 – 2:00 p.m., *Garden Court I-II*

Plenary Session: Fredlund Symposium I

2:00 – 3:30 p.m., *Malachite Showroom*

1.5 PDHs

This session (Part I) honors the research contributions of Delwyn G. Fredlund to the field of Unsaturated Soil Mechanics. All three of the session speakers have interacted with Professor Fredlund and have been influenced by his work.

Moderator: Sandra L. Houston, Ph.D., D.GE, M.ASCE, Arizona State University

Symposium Speakers:

Numerical Analyses for Assessment of Geobarrier System Performance

Hariato Rahardjo, Ph.D., P.Eng, Nanyang Technological University

Empirical Approach for the Use of Unsaturated Soil Mechanics in Pavement Design

Claudia E. Zapata, Ph.D., A.M.ASCE, Arizona State University

The Soil Characteristic Curve

Robert L. Lytton, Ph.D., P.E., D.GE, F.ASCE, Texas A&M University

Break

3:30 – 4:00 p.m., *Garden Court I-II*

Need a little pick-me-up? Lively conversations with friends and exhibitors, as well as a nice beverage, should do the trick!

Concurrent Technical Session II

4:00 – 5:30 p.m. **1.5 PDHs**

See page 9 for sessions and locations.

TC 106 Committee Meeting

7:00 – 9:30 p.m., *Bel-Air IV*

TUESDAY, NOVEMBER 14

Continental Breakfast

8:00 – 9:00 a.m., *Garden Court I-II*

Plenary Session: Keynotes

9:00 – 10:30 a.m., *Malachite Showroom*

1.5 PDHs

This plenary session features two keynote presentations from Professor Bernardo Caicedo from Colombia and Professor Tacio De Campos from

Moderator: Laureano R. Hoyos, Ph.D., P.E., University of Texas at Arlington Brazil.

KEYNOTE SPEAKERS

A Mechanical Framework for Soil Compaction

Bernardo Caicedo, Ph.D., Universidad de los Andes

Bernardo Caicedo is a graduate in Civil Engineering at the Cauca University in Colombia (1986), a DEA in geotechnics and structures from the Ecole Centrale de Paris (1987), and a Ph.D. in Geotechnics and Structures from the Ecole Centrale de Paris (1991). He has been a Professor at Los Andes University (Unianandes) since 1991. He is a member of the editorial boards of Geotechnique Letters, Acta Geotechnica and the Journal of Transportation Geotechnics, and is a referee for several international journals. Supervisor of 95 master thesis, 12 doctoral thesis at Unianandes. Leader of more than 65 research projects in pavements and geotechnics at Unianandes. He is the editor of one book and the author of 80 conference papers and 36 journal papers.

Failure Mechanisms of Unsaturated Soil Slopes under Rainstorms in Rio De Janeiro, Brazil: An Overview

Tacio M. P. De Campos, Ph.D., Pontifícia Universidade Católica do Rio de Janeiro

Professor Tacio De Campos is a graduate of the University of Brasilia (1971), and obtained his Masters of Science (1980) and Doctorate in Soil Mechanics from Imperial College in London, England. He is currently the director of the Department of Civil and Environmental Engineering at PUC Rio. He is an expert on unsaturated soil mechanics and slope stability analysis. He is a member of technical committees TC101 and TC106 of ISSMGE and is a founding member of the committee on unsaturated soils of ABMS in Brazil.

Break

10:30 – 11:00 a.m., *Garden Court I-II*

Day two! Time to share a beverage with those exhibitors you didn't get to meet yesterday; they probably have just the thing you need.

Concurrent Technical Session III

11:00 a.m. – 12:30 p.m. **1.5 PDHs**

See page 9 for sessions and locations.

Lunch

12:30 – 2:00 p.m., *Garden Court I-II*

Plenary Session: Fredlund Symposium II

2:00 – 3:30 p.m., *Malachite Showroom*

1.5 PDHs

This session (Part II) is in honor of the research contributions of Delwyn G. Fredlund to the field of Unsaturated Soil Mechanics. Four speakers will give lectures during this session who have interacted with and have been influenced by the work of Professor Fredlund.

Moderator: William N. Houston, P.E., L.S., M.ASCE, Arizona State University

Symposium Speakers:

Spatial Resolution of Degree of Saturation Measurements in Unsaturated Transparent Soil Experiments

Gregory A. Siemens, Ph.D., P.Eng., A.M.ASCE, Royal Military College of Canada

Microstructure and Shear Strength of Widely Graded Soils during Desaturation

Limin Zhang, Ph.D., F.ASCE, Hong Kong University of Science and Technology

Fundamentals of Soil Shrinkage

Fernando A. M. Marinho, Ph.D., University of São Paulo

Break

3:30 – 4:00 p.m., *Garden Court I-II*

One more round of exchanges and snacks before the day's last technical sessions.

Concurrent Technical Session IV

4:00 – 5:30 p.m. **1.5 PDHs**

See page 10 for sessions and locations.

Plenary Session and Conference Dinner

6:30 – 9:30 p.m.

1.5 PDHs

Following the conference dinner, this plenary session will include the delivery of the first Pan-American Distinguished Lecture on Unsaturated Soils by Professor Sandra Houston. This regional distinguished lecture is given under the endorsement of Technical Committee (TC) 106 on Unsaturated Soils of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE). Professor Jean-Louis Briaud will provide an introduction to the distinguished lecture, putting it into perspective in the history of the field of unsaturated soil mechanics, ISSMGE, and TC 106.

Moderator: Jean-Louis Briaud, Ph.D., P.E., D.GE, Dist.M.ASCE, Texas A & M University

Speaker:

Suction-Oedometer Method and Net Partial Wetting Factors for Computation of Heave and Remaining Heave

Distinguished Lecturer: Sandra L. Houston, Ph.D., P.E., D.GE, M.ASCE, Arizona State University

WEDNESDAY, NOVEMBER 15

G-I Unsaturated Soils Committee Meeting

7:30 - 8:45 a.m., *Bell-Air IV*

Continental Breakfast

8:00 – 9:00 a.m., *Garden Court I-II*

Plenary Session: State-of-the-Art (SOA)

9:00 – 10:30 a.m., *Malachite Showroom*

1.5 PDHs

This plenary session will include three lectures on the state of the art in unsaturated soil mechanics, including experimental and numerical advances. Future research frontiers will be discussed, including the role of unsaturated soil mechanics at the bio-geo interface.

Moderator: Adrian Russell, Ph.D., University of New South Wales, Sydney

SOA Speakers:

Desaturation via Biogenic Gas Formation as a Ground Improvement Technique

Edward Kavazanjian, Jr., Ph.D., P.E., D.GE, NAE, F.ASCE, Arizona State University; **Leon A. Van Paassen, Ph.D., Aff.M.ASCE**, Arizona State University

Unsaturated Soil Mechanics in Mining

Luciano Oldecop, Ph.D., Universidad Nacional de San Juan

Soil-Atmosphere Interaction in Unsaturated Soils Problem Solving

Gilson Gitiriana, Ph.D., UFG Universidade Federal de Goias

Break

10:30 – 11:00 a.m., *Garden Court I-II*

Your exhibitors, comrades and collaborators are still here, and the chances for coffee-fueled conversation are still copious!

Concurrent Technical Session V

11:00 a.m. – 12:30 p.m. **1.5 PDHs**

See page 10 for sessions and locations.

Lunch

12:30 – 2:00 p.m., *Garden Court I-II*

Plenary Session: State-of-the-Practice (SOP)

2:00 – 3:30 p.m., *Malachite Showroom*

1.5 PDHs

This plenary session will feature four lectures on how unsaturated soil mechanics has been successfully implemented into practice. It will include lectures on unsaturated soil mechanics in landfill cover systems, foundation engineering and site investigation, and transportation engineering.

Moderator: Anand J. Puppala, Ph.D., P.E., D.GE, F.ASCE, University of Texas at Arlington

SOP Speakers:

Using Principles of Unsaturated Soil Behavior to Design Water Balance Covers for Waste Containment: Case Study

Craig H. Benson, Ph.D., P.E., D.GE, NAE, F.ASCE, University of Virginia

Compaction and Volume Change Behavior of Compacted Soil in Embankments

Gerald A. Miller, Ph.D., P.E., M.ASCE, University of Oklahoma

Models to Predict Resilient Modulus at Optimum Conditions and Its Variation Due to Soil Suction

John A. Siekmeier, P.E., M.ASCE, Minnesota Department of Transportation; **Paul Garnica, Ph.D.**, Director Laboratorios Infraestructura, Instituto Mexicano del Transporte, Mexico City

Break

3:30 – 4:00 p.m., *Garden Court I-II*

Finish the last afternoon of vital technical knowledge with a beverage and the support of your friends and colleagues.

Concurrent Technical Session VI

4:00 – 5:30 p.m. **1.5 PDHs**

See page 11 for sessions and locations.

Closing Ceremony

5:45 – 6:15 p.m., *Malachite Showroom*.

This session will provide an overview of the conference, including a recap of the keynote lectures, panel sessions, state-of-the-art (SOA), and state-of-the-practice (SOP) sessions.



Sunday, November 12

8:00 a.m. – 12:30 p.m.		Short Courses	
	Bell-Air I		Bell-Air II
	SHORT COURSE 1: Deformation of Unsaturated Compacted Fills Instructor: Iraj Noorany, Ph.D., P.E., G.E., F.ASCE, Noorany Geotechnical; <i>Christine Detourmay, Ph.D., Itasca Consulting Group</i>		SHORT COURSE 2: Simple Methods to Characterize and Model Unsaturated Soil Behavior Instructors: Xiong Zhang, Ph.D., P.E., A.M.ASCE, University of Cincinnati; <i>Laureano R. Hoyos, Ph.D., P.E., University of Texas at Arlington; Marcelo J. Sanchez, Ph.D., Aff.M.ASCE, Texas A&M University</i>

Monday, November 13

11:00 a.m. – 12:30 p.m.					Concurrent Technical Session I				
Track A: Malachite Showroom		Track B: Bel-Air I-II		Track C: Bel-Air V-VI		Track D: Mayfair		Track E: Le Gala	
10/ Shear Strength Behavior		03/ Expansive Soils and Volume Change, Part I		11/ Innovations in Testing, Part I		06/ Pore Fluid Retention Behavior, Part I		08/ Hydraulic Behavior, Part I	
Moderator: Ali Khosravi, Ph.D., Aff.M.ASCE, Sharif University of Technology		Moderator: Rifat Bulut, Ph.D., M.ASCE, Oklahoma State University		Moderator: Xin Kang, Ph.D., ACI, ASTM, A.M.ASCE, Hunan University		Moderators: William J. Likos, Ph.D., M.ASCE, University of Wisconsin, Madison; Idil Deniz Akin, Ph.D., A.M.ASCE, Washington State University		Moderator: Leonardo D. Rivera, METER Group	
Formula of Shear Strength of Unsaturated Soil and Its Verification, Longtan Shao, Guofeng Zheng, Xiaoxia Guo, Yalong Qin, Xiang Sun A VET-Based Direct Shear Box for Testing Unsaturated Soils at High Suctions, Hamed Sadeghi, Fardin Jafarzadeh, Charles Wang Wai Ng Influence of Matrix Suction on the Shear Strength of a Cohesive Soil-Geosynthetic Strap Interface, Patricia D. G. Orlando, Fernando A. M. Marinho Evaluation of Liquefaction Resistance in Silty Sand via Suction Controlled Cyclic Triaxial Tests, Ujwalkumar D. Patil, Anitra Banerjee, Anand J. Puppala, Laureano R. Hoyos Influence of Fluid Pressures on Shear Strength of Unsaturated-Saturated Bentonite-Sand Mixture, Tomoyoshi Nishimura, Paul Habasimbi Strength and Stiffness Parameters of an Unsaturated Tropical Soil, Breno Rocha, Jefferson Fernandes, Roger Rodrigues, Heraldo Giacheti Effects of Atmospheric Drying and Consolidation of Flocculated Fluid Fine Tailings and Centrifuged Cake on Near-Surface Shear Strength, Ward G. Wilson, Nicholas A. Boeier, J. Don Scott, Louis K. Kabwe Shear Strength Properties and Collapse Response of a Sandy Silt under Generalized Stress States, Enrique Romero, Octavio E. Cardenas, Antonio Lloret, Rodrigo C. Weber		Evaluation of the Soil-Water Retention Curves of Different Unsaturated Silt-Sand Mixtures, Kátia V. Bicalho, Fernanda V. Gonçalves, and Leidimara S. Favero Effect of Fabric on the Swelling Characteristics of Highly Plastic Clays, Christian P. Armstrong, Jorge G. Zornberg Understanding the Shrink/Swell(Iss) Test for Quantifying Ground Movements in Reactive/Expansive Clays Due to Soil Moisture Variations, Bruce Hargreaves Cyclic Swell-Shrink Behavior of a Low Plastic Expansive Soil, Shu-feng Chen, Ling-wei Kong New Conditioned Soil Index Test and Characteristic Ground Movement Calculation Model, Dominic Lopes		Development of an Alternative Total Volume Change Measuring System for Samples in Unsaturated Conditions in Triaxial Tests, Taíse Monique de Oliveira Carvalho, Tácio de Campos, Mariana Ferreira Benessuti Motta Saturation and Resaturation of High Capacity Tensiometers Build with 1.5MPa HAEV Ceramic Filters, Joao Mendes, Domenico Gallipoli, Alessandro Tarantino, David G. Toll Large-Strain Consolidation Column with Applied Negative Water Pressure, Bereket Fisseha, Ward G. Wilson, Delwyn G. Fredlund Design and Calibration of a Miniature Cone for Testing in Unsaturated Soils, Majid Ghayoomi, Pegah Jarast, Majid Ghayoomi Classifying Unsaturated Soils via Cone Penetration Testing, Gerald A. Miller, Rodney Collins		Air-Water and Air-LNAPL Retention Curves in Soil with Bimodal Distribution of Pores, Miguel Alfaro Soto, Chang Hung Kiang, Eduardo dos Santos Effects of Suction Path on Water Retention and Volumetric Behavior of Loess at High Suctions, SK Belal Hossen, Hamed Sadeghi, Charles Wang Wai. Ng Accuracy Assessment of Predictive SWCC Models for Estimating the van Genuchten Model Parameters, Ghada Ellithy, Farshid Vahedifard, Xavier Rivera-Hernandez Observation and Use of Soil Suction, 20 Years of Experience, Ronald Reed Soil-Gasoline Retention Curve for a Uniform Sand, Fernando A. M. Marinho, Bruna Pivoli, Alexandre Maximiano Comparing In Situ Soil Water Characteristic Curves to Those Generated in the Lab, Colin Campbell, Gaylon Campbell, Neil Hanson, Bryan Hopkins, Douglas Cobos, Alton Campbell, Emily Campbell		Hydraulic Properties for Bulyanhulu Tailings during Drying, Feixia Zhang, Delwyn G. Fredlund, Ward G. Wilson Upward Wetting Behavior of Unsaturated Xanthan Gum-Treated Sand, Ilhan Chang, An T.P. Tran, Jooyoung Im, Gye-Chun Cho Microstructural Study of Hydromechanical Behavior of Brasilia Soil, Letícia Morais, Camilla R. Borges, Manoel Porfirio Cordão Neto, Bernardo Caicedo In-Depth Characterization of the Hydro-Mechanical Behaviour of a Mixture Composed of Pellets/Powder mx80 Bentonite, Agustin Molinero Guerra, Nadia Mokni, Yujun Cui, Anh Minh Tang, Pierre Delage, Patrick Amedieu, Frédéric Bernier, Michel Bornert Evaluation of the Soil-Water Retention Curves of Different Unsaturated Silt-Sand Soil Mixtures, Katia Bicalho, Fernanda Gonçalves, Leidimara Favero	

Monday, November 13 *(continued)*

4:00 – 5:30 p.m. Concurrent Technical Session II				
Track A: Malachite Showroom	Track B: Bel-Air I-II	Track C: Bel-Air V-VI	Track D: Mayfair	Track E: Le Gala
PANEL: Dynamic Characterization and Seismic Response of Unsaturated Soils	20/ Foundations on Expansive Soils	12/ Innovations in Testing, Part II	07/ Pore Fluid Retention Behavior, Part II	09/ Hydraulic Behavior, Part II
Moderator: Majid Ghayoomi, Ph.D., A.M.ASCE, <i>University of New Hampshire</i>	Moderator: Xiong Zhang, Ph.D., P.E. A.M.ASCE, <i>Missouri University of Science and Technology</i>	Moderator: Morteza Khorshidi, Ph.D., Aff.M.ASCE, <i>Geosyntec Consultants</i>	Moderator: Corrie Walton-Macaulay, Ph.D., P.E., M.ASCE, <i>Bucknell University</i>	Moderator: Leonardo D. Rivera, <i>METER Group</i>
<ul style="list-style-type: none"> Majid Ghayoomi, Ph.D., A.M.ASCE, <i>University of New Hampshire</i> Kanthasamy K. Muralaetharan, Ph.D., P.E., F.ASCE, <i>University of Oklahoma</i> Jonathan P. Stewart, Ph.D., P.E., F.ASCE, <i>University of California - Los Angeles</i> Ryosuke Uzuoka, Ph.D., <i>Kyoto University, Kyoto</i> 	<p>Effects of Hydraulic Hysteresis and Drainage Conditions on Bearing Capacity of Unsaturated Soil Shallow Foundations, Adrian Russell, Yi Tang, Hossein Taiebat</p> <p>Drag Load on Piles in Partially Saturated Collapsible Soils, Ibrahim Mashhour, Adel Hanna</p> <p>Numerical Study of Undrained 1-D Compression for Unsaturated Soil, Kaitlin Hall, Patrick Fox, Ning Lu</p> <p>Design of Retaining Wall and Single Pile in Expansive Soils Using Unsaturated Soil Mechanics as a Tool, Yunlong Liu, Sai Vanapalli</p> <p>A Coupled Geotechnical-Hydrological Model for Computing Bearing Capacity and Settlement of Shallow Foundation, Nadarajah Ravichandran, Vahidreza Mahmoudabadi</p>	<p>Evaluation of Different Procedures for the Installation of Sensors of Indirect Suction Measurement, Gabriel Nunes, Orlando Oliveira, Rafael Higashi</p> <p>Measurement of Suction Stress in Adsorption Regime, Yi Dong, Ning Lu</p> <p>Compacted Unsaturated Soil Behavior in a Large Scale Laboratory Test, Corrie Walton-Macaulay, Sebastian. L. Bryson, Jason Curt</p> <p>Influence of Chemical Properties of Soaking Liquid in the Collapsing Behavior of Tropical Soils, Ana Carina Collares, Orencio Vilar</p> <p>Investigations on Pile-Soil Interaction Using Image Analysis, Sreelakshmi Gopalakrishnan, Asha M. Nair, Divya Viswanath</p>	<p>Testing Method and Fabric Effects on the SWCC of a Poorly Graded Sand, Lucas Walshire, Oliver-Denzil S. Taylor, Woodman Berry</p> <p>Extraction/Infusion Rate Effects on Continuous Soil-Water Characteristics Curves for Clayey Sand, Muwafaq Awad, Inthum Sasanakul, Richard Ray</p> <p>Comparative Analysis of Water Retention Curves of Residual Soils of Gneiss, Granite and Diabase, Compacted under Optimum Moisture Conditions, Orlando Oliveira, Luana Pecapedra, Rafael Higashi, Fernando A. M. Marinho</p> <p>Experimental Study of Suction Stress Characteristic Framework for Granular Materials Using Conventional Direct Shear Test, Emad Maleksaedi, Mathieu Nuth, Sagol Sarlati, Mohamed Chekired</p> <p>The Soil Water Characteristic Curve for 3D Printed Soil Samples, Nairman Mahabadi, Dirk BeGell, Xianglei Zheng, Jaewon Jang, Leon van Paarsen</p>	<p>Effects of Relative Humidity Cycling on the Tensile Strength of a Claystone, Jubert Andres Pineda, Enrique Romero, Eduardo Alonso</p> <p>Rainfall Infiltration and Runoff Characteristics of an Unsaturated Volcanic Soil under Grass Cover, Thanh Binh Nguyen, Tatsuya Ishikawa, Srikrishnan Siva Subramanian</p> <p>Prediction of Soil-Water Characteristic Curve Using Artificial Neural Network Approach, Sajib Saha, Fan Gu, Xue Luo, Robert L. Lytton</p> <p>Influence of Confining Pressure on Air Permeability of Unsaturated Soil Barrier, Suman Roy, Rajesh Sathiyamoorthy</p> <p>Determination of Spatial Variation of Unsaturated Vertical Permeability, Mohammad Sadik Khan, Md Sahadat Hossain, Asif Ahmed</p>

Tuesday, November 14

11:00 a.m. – 12:30 p.m. Concurrent Technical Session III				
Track A: Malachite Showroom	Track B: Bel-Air I-II	Track C: Bel-Air V-VI	Track D: Mayfair	Track E: Le Gala
24/ Modeling of Cracked Soils and Effects of Cracking	04/ Expansive Soils and Volume Change, Part II	13/ Innovations in Testing, Part III	23/ Pipeline and Transportation Structures in Unsaturated Soils	01/ Dynamic Behavior of Unsaturated Soils, Part I
Moderator: Marcelo J. Sanchez, Ph.D., Aff.M.ASCE, <i>Texas A&M University</i>	Moderator: Jairo E. Yepes, Ph.D., Aff.M.ASCE, <i>University of Texas at Arlington</i>	Moderator: Morteza Khorshidi, Ph.D., Aff.M.ASCE, <i>Geosyntec Consultants</i>	Moderators: Claudia E. Zapata, Ph.D., A.M.ASCE, <i>Arizona State University</i> ; Mohammad Sadik Khan, Ph.D., P.E., M.ASCE, <i>Jackson State University</i>	Moderator: Majid Ghayoomi, Ph.D., A.M.ASCE, <i>University of New Hampshire</i>
<p>Numerical Modelling of Desiccation Cracking of Clayey Soil by Using Cohesive Fracture Model, Thi Dong Vo, Amade Pouya, Sahar Hemmati, Anh Minh Tang</p> <p>Some Studies on Desiccation Cracking of Fiber-Reinforced Expansive Clay Subjected to Drying and Wetting Cycles, Uma Chaduvula, Indupriya Manogaran, B. V. S. Viswanadham, Jayantha Kodikara</p> <p>Hydro-Mechanical Analysis of Crack Initiation in Expansive Soils, Hussein Al-Dakheeli, Rifat Bulut, Christopher Clarke, James B. Nevels</p> <p>Cracking Characteristics of Cemented Fiber Reinforced Fine-Grained Soils, Naresh Mali, Venkata Uday Kala</p> <p>Modeling the 3D Crack Network Observed in Desiccated Soils, Michael A. Moedo, Marcelo Sánchez, Osvaldo Manzoli, Leonardo Guimarães</p>	<p>Measurement of Soil Shrinkage Curve Using Photogrammetry, Eng Choon Leong, Kripa Upreti</p> <p>Automated Station for Monitoring Seasonal Ground Movements in Expansive Clay, Ivo Rosa Montenegro, Andrew J. Whittle, John T. Germaine</p> <p>Bench-Scale Study of Desiccation Crack Development in Clayey Soil, Gerald A. Miller, Arash Hassanikhah</p> <p>Repairing a Damaged House by Watering Foundations: The MACH Project, David Mathon</p>	<p>Response of Unsaturated Silty Soil under Constant Loading States during Water Infiltration, Gabriel Nunes, Orlando Oliveira, Rafael Higashi</p> <p>Study of the Coefficient of At-Rest Earth Pressure for Unsaturated Residual Soils with Different Weathering Degrees, Regina Delcourt, Marília Soares, Thaiana Silva, Ana Carolina Viana, Tácio de Campos</p> <p>Relationship between Electrical Resistivity and Matrix Suction of Compacted Granite Residual Soil, Yi Dong, Ning Lu</p> <p>Anisotropic Thermal Conductivity of Unsaturated Compacted Gmz Bentonite-Sand Mixture, Corrie Walton-Macaulay, Sebastian. L. Bryson, Jason Curt</p> <p>Resilient Modulus and Permanent Strain Behavior of a Compacted Red Clay, Ana Carina Collares, Orencio Vilar</p>	<p>Uplift Resistance and Mobilization of Buried Pipelines in Unsaturated Sands, Dilan Robert, Indrasenan Thusyanthan</p> <p>Behaviour of Unsealed Stabilized Road Pavements Using Non-Linear Strength Model, Dilan Robert, Sujeeva Setunge, Brian O'Donnell</p> <p>Application of Euler-Bernoulli Beam on Winkler Foundation for Highway Pavement on Expansive Soils, Md A. Khan, Jay X. Wang</p> <p>Air-Coupled Acoustic Testing of Pavement System, Hiba Al-Adhami, Nenad Gućunski</p> <p>Study of a Natural Unsaturated Clay and Its Effect on Railroads, Dong Wang, Marcelo Sánchez, Esteban Sáez, Carlos Ovalle, Jean-Louis Briaud</p>	<p>Resonant Column Behavior of Unsaturated Near-Surface Sands, Katherine Winters, Oliver-Denzil S. Taylor</p> <p>Influence of Degree of Saturation on the Small Strain Shear Modulus of a Silty Clay, Shu-feng Chen, Ling-wei Kong, Ai-guo Guo, Cheng Chen</p> <p>Impact of Grain Size Distribution Curve on the Small Strain Shear Modulus of Unsaturated Clean Sand, Ali Khosravi, Parisa Shahbazan, Pouya Toomani, Ali Pak, Mehrzad Rahimi</p> <p>Dynamic Behavior of Naturally Overconsolidated Clays via Resonant Column Testing at Constant Water Content, Jorge A. Pineda-Jaimes, José A. Cruz, Pamela Y. Avila Pedraza</p>

Tuesday, November 14 *(continued)*

4:00 - 5:30 p.m.

Concurrent Technical Session IV

Track A: Malachite Showroom	Track B: Bel-Air I-II	Track C: Bel-Air V-VI	Track D: Mayfair	Track E: Le Gala
PANEL: Modeling and Analysis of Cracking in Unsaturated Soils	05/ Expansive Soils and Volume Change, Part III	25/ Constitutive Modeling: Micro to Macro	19/ Numerical Modeling: Coupled Processes	02/ Dynamic Behavior of Unsaturated Soils, Part II
Moderators: Gerald A. Miller, Ph.D., P.E., M.ASCE, <i>University of Oklahoma</i>	Moderator: Iraj Noorany, Ph.D., P.E., G.E., F.ASCE, <i>Noorany Geotechnical</i>	Moderator: Kalehiwot N. Manahiloh, Ph.D., P.E., M.ASCE, <i>University of Delaware</i>	Moderator: Giuseppe Buscamera, Ph.D., Aff.M.ASCE, <i>Northwestern University</i>	Moderators: Nadarajah Ravichandran, Ph.D., M.ASCE, <i>Clemson University</i> ; Laureano R. Hoyos, Ph.D., P.E., M.G.I., <i>University of Texas at Arlington</i>
<ul style="list-style-type: none"> Rifat Bulut, Ph.D., M.ASCE, <i>Oklahoma State University</i> Bernardo Caicedo, Ph.D., <i>Universidad de los Andes</i> Marcelo J. Sanchez, Ph.D., Aff.M.ASCE, <i>Texas A&M University</i> Frank Wuttke, Ph.D., <i>Christian-Albrechts-Universität zu Kiel</i> 	<p>Effects of Density and Initial Degree of Saturation of Barrier Material on the Contaminant Transport through Natural Soil, Mandeeep Raj Pandey, G.L. Sivakumar Babu</p> <p>Effect of Suction on the Poisson's Ratio of Claystones, Jairo Martin Espitia Lopez, Bernardo Caicedo, Luis Vallejo</p> <p>Swelling-Shrinkage Properties of Expansive Moreland Clay, Md A. Khan, Jay X. Wang, William B. Patterson</p> <p>Soil Tests for Prediction of One-Dimensional Heave and Settlement of Compacted Fills, Iraj Noorany</p> <p>Laboratory Evaluation of a Liquid Ionic Stabilizer for an Expansive Soil in North Texas, Esmat Tavakoli, Shi He, Xinbao Yu, Laureano Hoyos, Anand Puppala</p>	<p>Soils with Bimodal Soil-Water Characteristic Curve, Eng Choon Leong, Lei Zou</p> <p>Shear Strength Prediction of Compacted Silty Sand at Peak / Critical State Failure over Wider Suction Range, Anitra Banerjee, Ujwalkumar D. Patil, Anand J. Puppala, Laureano R. Hoyos</p> <p>Material Microstructure Effects in Thermo-Hydro-Mechanical Modelling of Bentonite, Ayman Abed, Wojciech Solowski</p> <p>Effect of Grain Crushing and Grain Size on the Evolution of Water Retention Curves, Yida Zhang, Joon Soo Park, Giuseppe Buscamera, Shenjun Gao, Andrew Sorita, Brett Hoin</p>	<p>A Chemical-Mechanical Coupling Constitutive Model of Unsaturated Soils, Tianfan Ma, Changfu Wei, Chuangqin Yao, Pan Chen, Chuangqin Yao, Pan Chen</p> <p>Normal Compression Planar Surfaces for Specific Volume and Degree of Saturation, Marti Lloret-Cabot, Simon J. Wheeler, Marcelo Sánchez</p> <p>Calibration and Validation of Plasticity-Based Safety Factors for Rainfall-Induced Landslides, Giuseppe Buscamera, Jose J. Lizarraga</p> <p>Thermo-Hydro-Mechanical Modeling of a Shallow Foundation under Atmospheric Actions, Sergio Samat</p> <p>THM Evolution of Bentonite in China-Mock-Up Test for High Level Radioactive Waste Disposal in China, Yuemiao Liu, Shengfei Cao</p>	<p>Dynamic Properties of Residual Soil over a Wide Range of Strain, Eng Choon Leong, Kripa Upreti</p> <p>Influence of the Confining Stress on the Small Strain Stiffness of a Residual Soil under K_0 Conditions, Carlos E. Torres Romero, Julio E. Colmenares</p> <p>Modeling the Dynamic Response of a Level Ground Unsaturated Sand Deposit Using a Fully Coupled Finite Element Analysis Procedure, Bo Zhang, Kanthasamy Muralaetharan</p> <p>Modeling the Seismic Compression of Unsaturated Sands, Wenyong Rong, Yewei Zheng, Patrick Fox, John S. McCartney</p> <p>Assessment of Cary and Zapata Suction Based Model for Prediction of Resilient Modulus of Fine Grained Subgrade Soils, Pugazhivel Thirthar Palarivelu, Claudia Zapata</p>

Wednesday, November 15

11:00 a.m. - 12:30 p.m.

Concurrent Technical Session V

Track A: Malachite Showroom	Track B: Bel-Air I-II	Track C: Bel-Air V-VI	Track D: Mayfair	Track E: Le Gala
21/ Expansive Soils: Mitigation	15/ Stability of Unsaturated Slopes, Part I	17/ Numerical Modeling: Flow and Deformation, Part I	22/ Expansive Soils: Modeling	14/ Field Applications of Unsaturated Soils
Moderator: Bhaskar C.S. Chittoori, Ph.D., P.E., M.ASCE, <i>Boise State University</i>	Moderator: Navid H. Jafari, Ph.D., A.M.ASCE, <i>Louisiana State University</i>	Moderator: Zhen Liu, Ph.D., P.E., M.ASCE, <i>Michigan Technological University</i>	Moderator: Xinbao Yu, Ph.D., P.E., M.ASCE, <i>University of Texas-Arlington</i>	Moderator: Gerald A. Miller, Ph.D., P.E., M.ASCE, <i>University of Oklahoma</i>
<p>Stabilization of High Sulfate Soils with Nontraditional Additives, Gökhan Saygili, Yetkin Yildirim, Hakan Sahin</p> <p>Characterization of a Northeast Brazilian Swelling Soil in the Natural Condition and Treated with Lime, Joanderson James Oliveira Morais, Sergio Carvalho de Paiva, Rafael Bazilio Silva, Silvio Romero de Melo Ferreira</p> <p>Remediation Solutions for Buildings Affected by Shrinkage or Swelling of Unsaturated Clays, Roy Doumet, Billy Fisher</p> <p>An Elastoplastic Framework for Expansive Soils Based on Effective Stresses, Eduardo Rojas, María L. Pérez-Rea, Christian Eduardo Hernández Mendoza</p> <p>The Mixed Success of Australian Standard 2870 in the Past 30 Years, Dominic Lopes</p>	<p>Seasonal Variation of the Safety Factor and Stability of a Diabase Slope Located in Florianopolis, Brazil, Orlando Oliveira, Gabriel Nunes, Narayana Massocco, Rafael Higashi, Lucas Campos, Fernando A. M. Marinho</p> <p>A Probabilistic Approach to the Stability of a Dam under Rapid Drawdown Conditions, Ana Rios, Manoel Porfirio Cardão Neto, André Assis</p> <p>Slope Failure and Landslide Triggered by an Intense Rainfall Event: Forensic Investigations and Remedial Design, Charbel Khoury, Kafi B. Acheompong, Kwabena Ofori-Awuah</p> <p>Analysis and Performance Monitoring of a Temporary Excavation in Highly Plastic Clay and Comparison of Predicted and In-Situ Soil Strength Due to Unsaturated Soils, Yonghoon Lee, Noel W. Janacek</p> <p>Rainfall Induced Shallow Slope Failure over Yazoo Clay in Mississippi, Mohammad Sadik Khan, Farshad Amiri, John Ivake, Masoud Nabahar</p>	<p>Assessing the Influence of Errors in SWCC Prediction Methods on Transient Seepage Analyses, Lucas Walshire, Bryant Robbins, Oliver-Denzil S. Taylor</p> <p>Evaluation of Point Pede-Transfer Functions for the Soil-Water Characteristic Curve, Eng Choon Leong, Lei Zou</p> <p>Estimation of Water Level in Road Embankment by Transient Unsaturated Seepage Analysis, Hirohiko Kusaka, Akihito Takahashi</p> <p>Effects of Unsaturated Hydraulic Properties of Municipal Solid Waste on Moisture Distribution and Settlement in Bioreactor Landfills, Girish Kumar, Krishna Reddy</p> <p>Numerical Implementation of a Critical State Model for Soft Rocks, Marti Lloret-Cabot, Jubert Andres Pineda, Daichao Sheng</p>	<p>Alternative Explanation of "Lime-Induced Heave", Ronald Reed</p> <p>An Update of the H_s Values for the State of Queensland (Australia), Bruce Hargreaves, Linda Osman-Schlegel</p> <p>Numerical Simulation and Validation of Long-Term Moisture Fluctuations in Expansive Pavement Subgrades, Berjees A. Ikra, Jay X. Wang</p> <p>The Active Zone: Unsaturated Soil Volume Change Due to Normal Cycles and Anomalies at Depth, John T. Bryant, Hayden Fischer, Jeong Cheon, Kabir Hossain</p> <p>Data Based Real Time Moisture Modeling in Unsaturated Expansive Subgrade, Asif Ahmed, Md Sahadat Hossain, Mohammad Sadik Khan, Aya Shishani</p> <p>Evaluating the Ability of Swell Prediction Models to Predict the Swelling Behavior of Excessively High Plastic Soils, Bhaskar Chittoori, Debakanta Mishra, Mir Mohammad Tamim, Amit Gajurel</p>	<p>Relating Moisture Content, Suction and Shear Strength of an Ore, Adrian Russell, Thanh Vo, Hongwei Yang</p> <p>Behavior of the Air Phase within Embankment Due to Rainfall, Katsuyuki Kawai, Daichi Hazama, Ryunosuke Nose</p> <p>Integration of Laboratory and Field Investigation on the Slope Aside of the Highway in a Brazilian Coastal Hillside, Andressa de Fátima da Rocha Pontes, Marina Naim B. Trevizoli, Larissa B. Passini, Liamara Sestrem, Alessandro C. M. Kormann, Fernando A. M. Marinho, Andressa de Fátima da Rocha Pontes</p> <p>Monitoring Suction Stress and Effective Stress in a Silty Sand Levee under Seasonal and Tidal Changes, Xavier Rivera-Hernandez, Ghada Ellithy, Farshid Vahedifard</p> <p>Experimental Investigation on At-Rest Earth Pressure Acting on Walls Retaining Collapsible Soil Subjected to Inundation, Nhut H. P. Nguyen, Adel Hanna</p> <p>Effect of Temperature on Field Water Content Measurements Using Water Content Reflectometers, Duraisamy S. Saravananthiban, Milind Khire</p> <p>Comparison of Percolation of Flat and Slope Section Vegetated Lysimeters Using Field Soil Water Characteristic Curve, Md Jobair Bin Alam, Asif Ahmed, Mohammad Sadik Khan, Md Sahadat Hossain</p> <p>Creep Behavior of Soil Nails in High Plasticity Clay under Various Load Level, Mohsen Mahdavi Kharanaghi, Marcelo Sanchez, Jean-Louis Briaud, Gang Bi</p>

Wednesday, November 15 *(continued)*

4:00 – 5:30 pm Concurrent Technical Session VI				
Track A: Malachite Showroom	Track B: Bel-Air I-II	Track C: Bel-Air V-VI	Track D: Mayfair	Track E: Le Gala
PANEL: Current Practices in Expansive Soil Engineering	16/ Stability of Unsaturated Slopes, Part II	18/ Numerical Modeling: Flow and Deformation, Part II	26/ Climate Effects and Permafrost	27/ Energy Geotechnics, Bio-Geo, and Sustainability
Moderator: Sandra L. Houston, Ph.D., D.GE, M.ASCE, Arizona State University	Moderator: Soankie Nam, Ph.D., EIT, A.M.ASCE, Georgia Southern University	Moderator: Xiaoyu Song, Ph.D., A.M.ASCE, University of Florida	Moderator: Farshid Vahedifard, Ph.D., P.E., M.ASCE, Mississippi State University	Moderator: John S. McCartney, Ph.D., P.E., M.ASCE, University of California, San Diego
<ul style="list-style-type: none"> ■ A. Wayne Clifton, B.E., M.Eng., P.Eng., M.ASCE, Clifton Associates Ltd. ■ Ronald M. McOmber, Chairman and Chief Executive Officer, CTL Thompson, Inc. ■ Siva P. Pathivada, P.E., M.ASCE, Terracon Consultants, Inc ■ Dominic Lopes, Geotechnical Consultant, USL Group Pty Ltd., ■ Iraj Noorany, Ph.D., P.E., G.E., F.ASCE, Noorany Geotechnical 	<p>Understanding Shallow Slope Failures on Expansive Soil Embankments in North Texas Using Unsaturated Soil Property Framework, Anu Muthumala George, Sayantan Chakraborty, Jasaswee T. Das, Aravind Pedarla, Anand J. Puppala</p> <p>Quantifying Landslide Risk, Bruce Hargreaves</p> <p>Stability Analysis of Unsaturated Infinite Slopes - A Reliability Perspective, Munwar Basha B, Raghuram Ammavajjala</p> <p>The Failure Characteristics and Evolution Mechanism of the Expansive Soil Trench Slope, Zhangjun Dai, Shanxiang Chen, Jian Li</p> <p>Moving from 2D to a 3D Unsaturated Slope Stability Analysis, Delwyn G. Fredlund, Murray Fredlund, Lulu Zhang</p>	<p>Physical and Numerical Modeling of an Earthen Three-Layer Landfill Cover System under One-Dimensional Infiltration, Jason L. Coe, Zac Pui San So, Charles Wang Wai Ng</p> <p>Fully Coupled Finite Element Analysis for Consolidation of Unsaturated Soils Due to Hydraulic and Mechanical Loads, Yue Zhang, Annan Zhou</p> <p>Klinkenberg-Corrected Gas Permeability of an Unsaturated Bentonite, Bing Qin, Zhen-Dong Fang, Fa-Zhong Zhang, Zheng-Han Chen</p> <p>Examination of Capillary Regime in the Soil Water Retention Curve Using Multi-Phase Lattice Boltzmann Method, Jonathan Fili, Farshid Vahedifard, Bohumir Jelinek, John Peters, Jody Priddy</p> <p>Moisture Distribution in Unsaturated Subgrade through Field Instrumentation and Numerical Modeling, Asif Ahmed, Md Sahadat Hossain, Mohammad Sadik Khan, Md Jobair Bin Alam</p> <p>Unsaturated Hydraulic Properties of Biochar and Biochar-Amended Soils for Landfill Covers, Girish Kumar, Jairo E. Yepes, Laureano R. Hoyos, Krishna Reddy</p>	<p>The Influence of Maximum Water Storage on Thornthwaite Moisture Index, Lizhou Chen, Rifat Bulut, Christopher Clarke, James B. Nevels</p> <p>Cryosuction: A Model to Describe the Mechanism during Ground Freezing, Ludmilla Derk, Florian Unold</p> <p>Numerical Analysis of Climate Effect on Slope Stability, Lynda Djerbal, Merat Saumia, Ramdane Bahar</p> <p>Characterization of Mine Waste Materials after 50 Years of Climate Interaction, Germán Rodari, Lucas Garino, Luciano A. Oldecop</p> <p>Mechanical Behavior of Soil Subjected to Freezing-Thawing Cycles, Bohan Zhou, Marcelo Sánchez, Ajay Shastri, Juyoung Lee</p> <p>Comparison and Applications of the Thornthwaite Moisture Index Using GIS, Sandra Houston, Sai Singhar, Jeffrey Vann, Austin Olaiiz</p>	<p>Bioremediation of Unsaturated Saline Soil, M. Moqsood, Kiyoshi Omine, N Yasufuku</p> <p>Evaluation of Ground Coupled Heat Pump Systems in a Hot and Semi-Arid Climate, Edward Kavazanjian, Vaibhavi Tambe, T. Agami Reddy</p> <p>The Economic Viability of Ground Coupled Heat Pump Systems in a Hot and Semi-Arid Climate, Edward Kavazanjian, Vaibhavi Tambe, T. Agami Reddy</p> <p>Evaluation of Coupled Thermal and Hydraulic Relationships Used in Simulation of Thermally-Induced Water Flow in Unsaturated Soils, John S. McCartney, Tugce Baser, Yi Dong, Ning Lu</p> <p>Effect of Biogenic Gas on Skempton's Pore Pressure Parameter Bw, Saswati Ghatak, Debasis Roy, Suman Roy</p> <p>Analysis of the Hydration of an Unsaturated Seal, Antonio Gens, Daniel F. Ruiz, Miguel A. Mánica, Jean Vaunat</p> <p>Field Measurements on Geothermal Foundations, Mohammedreza Keshavarz, Jean-Louis Briaud, Marcelo Sánchez, Ghassan Akrouh</p> <p>Characterization of Hydro-Mechanical Behavior of Compressed Air Energy System, Ajay Shastri, Marcelo Sánchez, Le Thi Minh Hue</p>



Registration & Exhibit Schedule

Registration Hours

Bel-Air Foyer

Sunday, November 12

7:30 a.m. – 6:30 p.m.

Registration Open *(break from 1:30 – 2:30 p.m.)*

Monday, November 13

7:00 a.m. – 4:30 p.m.

Registration Open *(break from 1:00 – 2:00 p.m.)*

Tuesday, November 14

7:30 a.m. – 7:00 p.m.

Registration Open *(break from 1:00 – 2:00 p.m.)*

Wednesday, November 15

7:30 a.m. – 4:00 p.m.

Registration Open *(break from 1:00 – 2:00 p.m.)*

Speaker Ready Room

Bel-Air Room III

Monday, November 13 –

Wednesday, November 15

8:00 a.m. – 8:00 p.m.

Exhibits

Garden Court I-II

Sunday, November 12

Decorator Move-in

Exhibitors Move-in

Show Hours

Welcome Reception

Monday, November 13

Show Hours

Breakfast

Networking Break

Lunch

Networking Break

Tuesday, November 14

Show Hours

Breakfast

Networking Break

Lunch

Networking Break

Wednesday, November 15

Show Hours

Breakfast

Networking Break

Lunch

Networking Break

Exhibitors/Decorator Move-out

7:00 a.m. – 12:00 p.m.

12:00 – 4:00 p.m.

6:00 – 8:00 p.m.

6:00 – 8:00 p.m.

7:30 a.m. – 4:00 p.m.

7:30 – 8:30 a.m.

10:30 – 11:00 a.m.

12:30 – 2:00 p.m.

3:30 – 4:00 p.m.

8:00 a.m. – 4:00 p.m.

8:00 – 9:00 a.m.

10:30 – 11:00 a.m.

12:30 – 2:00 p.m.

3:30 – 4:00 p.m.

8:00 a.m. – 4:00 p.m.

8:00 – 9:00 a.m.

10:30 – 11:00 a.m.

12:30 – 2:00 p.m.

3:30 – 4:00 p.m.

4:00 – 8:00 p.m.

Exhibitors



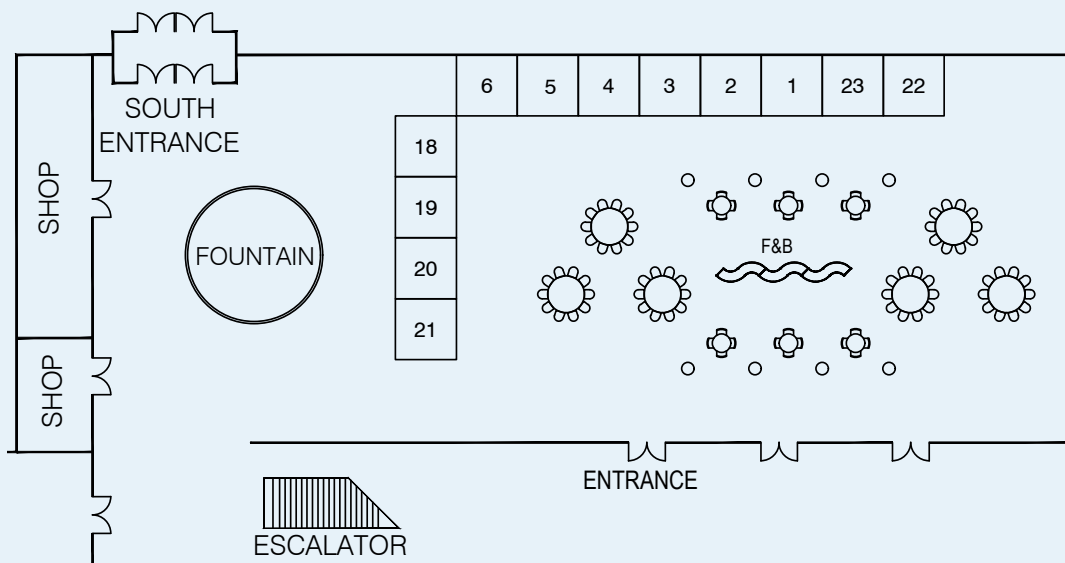
METER



Exhibit Booths

Booth 2	GDS Instruments
Booth 21	GCTS Testing systems
Booth 3	METER Group, Inc. USA
Booth 1	Group Delta Consultants, Inc.
Booth 4	Soilvision Systems Ltd.

Booth 23	VJ Tech Limited
Booth 22	Hayward Baker
Booth 19	VerTek/ARA
Booth 20	Plaxis Americas
Booth 5	IFCEE 2018



Booth 2
GDS Instruments
www.gdsinstruments.com
 GDS Instruments designs, develops and manufactures materials testing machines and software used for the computer-controlled testing of soils and rocks.

Booth 21
GCTS Testing Systems
www.gcts.com
 GCTS Testing Systems designs and delivers productive and precise solutions for the advanced material characterization of soils, rocks, and pavements.

Booth 3
METER Group, Inc. USA
www.metergroup.com
 METER Group delivers revolutionary products and services by connecting science, engineering and design to deliver precisely what the customers need

Booth 4
SoilVision Systems Ltd.
www.soilvision.com
 SoilVision Systems Ltd. is a rapidly growing company and their next generation geotechnical and hydrogeological software is seeing widespread adoption on a global scale.

Booth 23
VJ Tech Limited
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 VJ Tech has designed, manufactured and delivered fully automated high-quality Unsaturated Triaxial and Shear systems to the civil engineering industry and academic community since 1991.

Booth 22
Hayward Baker
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 Hayward Baker, North America's leader in geotechnical solutions, offers solutions for ground improvement, earth retention & shoring, foundation repair & underpinning, liquefaction mitigation, deep foundations, and groundwater control.

Booth 1
Group Delta Consultants, Inc
www.groupdelta.com
 Group Delta Consultants, Inc., a geotechnical engineering, materials testing and inspection firm, has offices located in Irvine, Torrance, Ontario, San Diego, the Bay Area, and Victorville.

Booth 20
Plaxis Americas
www.plaxis.com
 User-friendly, versatile and sophisticated PLAXIS software is a leader in modeling stability and deformation of soil, rock and structures; with dynamics, flow and thermal tools.

Booth 19
VerTek/ARA
www.vertekcpt.com
 VerTek delivers a million feet of experience combined with 30 years as a world leader in the development and manufacturing of advanced CPT equipment and technologies.

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Geotechnical Earthquake Engineering and Soil Dynamics V (GEESD V) 2018

Austin, Texas | June 10-13

5th Geotechnical Earthquake Engineering and Soil Dynamics Conference



GEESD V will provide you with new insights through case histories and practice-oriented papers, recent research findings, innovative technologies, and the emerging arts from across the many disciplines involved in earthquake engineering and soil dynamics.

Topics for 2018

- Induced Seismicity
- Ground Motions and Site Response
- Seismic Hazard Assessment
- Recent Advances in In Situ Site Characterization
- Liquefaction: Triggering, Consequences, and Mitigation
- Regional Scale Assessment of GeoHazards
- Applications of Remote Sensing
- Recent Advances in Numerical Modeling
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- Laboratory Testing
- Seismic Slope Stability and Landslides

www.geesdconference.org

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GEO-CONGRESS 2019

Philadelphia, Pennsylvania | March 24-27

www.geocongress.org



Hotel, General, & Registration Information

Hotel Rates and Reservations

Intercontinental Dallas

15201 Dallas Parkway, Addison, Texas 75001
(972) 386-6000

Single/Double - \$189

Government per diem rate – Contact hotel for current rate.

All room rates are subject to applicable tax, which is currently 13% per room, per night, and is subject to change without notice.

Online Reservations:

Visit www.unsatsoilsconference.org and click on the Lodging and Transportation tab.

Transportation

Dallas Love Field Airport

Located 13 miles from hotel
Supershuttle: \$16; Taxi: \$30

DFW Airport

Located 23 miles from hotel
Supershuttle: \$18; Taxi: \$50

ADA Compliance

The Intercontinental Dallas is fully accessible to the disabled. While ASCE will make every effort to meet the needs of the disabled, accommodations cannot be guaranteed without prior notification.

Attire

The dress code for the conference is business casual (i.e. slacks, casual dresses) to business attire (i.e. neckties, business suits). Meeting room temperatures will vary, so wear layered clothing to ensure your personal comfort. We also recommend attendees wear comfortable shoes. Please note that certain events may have specific details on attire, and you should refer to the description of that event for more information.

Badge Policy and Ribbons

Your name badge is your admission to the conference. Please wear your badge at all times while in the Intercontinental Dallas. Tickets are required for the pre-conference short courses, meals, and special events. Where tickets are required, please be sure to bring your tickets with you to each event as you will not be admitted without a ticket. Ribbons will be available at the Registration desk. ASCE recommends you remove your badge when leaving the conference hotel.

Conference Proceedings

The formal Proceedings of the PanAm-UNSAT 2017 conference will be provided to all registrants as multiple volumes of e-books from the ASCE Library. After the conference, information about how to download those volumes will be sent to all eligible registrants.

During the conference, we are making special arrangements to have final versions of all papers available online. You will be able to download a final copy of any paper in which you are interested—so that you can have them handy during presentations. Instructions on how to download these papers will be available at the registration desk.

Professional Development Hours (PDHs)

You may earn PDHs, which are nationally recognized units of record, by attending pre-conference short courses, general sessions, and concurrent technical sessions. 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.

Instructions:

- Check off each session you attended and write in the number of PDH credits earned each day
- Add up PDHs and give the total on page 2

Within 30 days of the end of the conference, the session information will be uploaded into the MyLearning system. You will receive an email from the conference registration system with a link and detailed instructions on how to access MyLearning and to update your session attendance. By accessing the MyLearning system for this conference, you automatically agree and certify you attended the selected sessions.

The system will remain open for 30 days from the receipt of the registration email to allow you time to make any adjustments and print your certificate and transcript. After that 30-day mark, you will need to contact ASCE Customer Service at registrations@asce.org or (800) 548-2723 to modify your conference attendance information.



Recording of Sessions

Video or audio recording of any educational session is strictly prohibited without prior written permission from both ASCE and the session presenter(s).

Release/Waiver/Special Assistance

Photograph Release: By submitting the Registration form, I hereby release any photographs that may be incidentally taken of me during these events by ASCE to be used for any purpose.

Liability Waiver: I agree and acknowledge that I am undertaking participation in ASCE events and activities at my own free and intentional act, and I am fully aware that possible physical injury might occur to me as a result of my participation. I give this acknowledgement freely and knowingly that I am, as a result, able to participate in ASCE events, and I do hereby assume responsibility for my own well-being. I also agree not to allow any other individual to participate in my place.

Registration Information

ON-SITE REGISTRATION (ONS)

Please do not mail registration forms through the U.S. Postal Service AFTER **October 4, 2017** in order to ensure your registration is processed by the Wednesday, **October 18, 2017** deadline. After this date, registrations must be secured with a credit card. If you are paying by credit card, please register online or download the PDF registration form and submit it onsite along with your full credit card payment.

CANCELLATIONS/REFUNDS

Cancellations must be received by ASCE in writing. A refund will be issued, minus a \$75 processing fee, if the cancellation notice is received by ASCE by Wednesday, **October 18, 2017**. No refunds will be made for cancellations received after Wednesday, **October 18, 2017**. Send cancellations to registrations@asce.org or fax to **(866) 902-5593**.

Emergency Medical Facilities

Nearest 24-Hour Pharmacy:

Walgreens Pharmacy

5201 Beltline Rd/Monfort Dr. | (972) 385-1036
Less than 1 mile east of the hotel; Open 24 Hours

Nearest Hospital:

Plano Presbyterian Hospital

6200 W Parker Rd | (972) 981-8000
3 miles north of hotel; Open 24 Hours

Nearest Trauma Center:

Plano Presbyterian Hospital

6200 W Parker Rd. | (972) 981-8000
3 miles north of hotel; Open 24 Hours



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Second Pan American Conference on Unsaturated Soils

Dallas, Texas, USA | November 12-15, 2017

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