GSP 303

PanAm Unsaturated Soils 2017

Swell-Shrink and Tropical Soils

Papers from Sessions of the
Second Pan-American Conference
on Unsaturated Soils

Dallas, Texas
November 12–15, 2017

Edited by

Laureano R. Hoyos, Ph.D., P.E.
John S. McCartney, Ph.D., P.E.
Sandra L. Houston, Ph.D., D.GE
William J. Likos, Ph.D.

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SELECTED PAPERS FROM SESSIONS OF THE SECOND PAN-AMERICAN CONFERENCE ON UNSATURATED SOILS

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Preface

The Second Pan-American Conference on Unsaturated Soils (PanAm-UNSAT 2017) was held in Dallas, Texas, November 12-15, 2017, featuring the latest research advances and engineering-practice innovations in the area of Unsaturated Geotechnics, with a focus on characterization, modeling, design, construction, field performance and sustainability.

PanAm-UNSAT 2017 follows a now well-established series of regional and international conferences on Unsaturated Soils, bringing together researchers, practitioners, students and policy makers from around the world, particularly the Americas. The conference built 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, including UNSAT 2006 (Fourth International Conference on Unsaturated Soils, Carefree, Arizona) and EXPANSIVE'92 (Seventh International Conference on Expansive Soils, Dallas, Texas, 1992).

Proceedings of PanAm-UNSAT 2017 have been documented in four Geotechnical Special Publications (GSP) of ASCE including Volume 1: Plenary Session Papers; Volume 2: Fundamentals; Volume 3: Applications; and Volume 4: Swell-Shrink and Tropical Soils.

Current Volume 4 (Swell-Shrink and Tropical Soils) consists of five sections:

Section I, Expansive Soils: Volume Change, includes 12 papers dealing with the measurement of the volume change of expansive soils during both shrinkage and swelling. This includes evaluations of different testing approaches, as well as the characterization of expansive soils under different conditions.

Section II, Expansive Soils: Mitigation and Modeling, includes 14 papers dealing with different strategies to treat expansive soils, using new and established additives and methodologies. Further, several papers on the modeling of expansive soils are included that focus on climate interaction and volume change progression over time.

Section III, Foundations on Expansive Soils, includes 5 papers dealing with foundations on unsaturated soils, including both shallow footings and deep foundations. The papers focus on field observations, design approaches, and finite element simulations to consider the impact of unsaturated conditions on the deformation and bearing capacity of the foundations.

Section IV, Modeling of Cracked Soils, includes 6 papers dealing with the observation and theoretical modeling of cracking in unsaturated soils. Two papers

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focus on the role of fiber reinforcements in resisting cracking, and one focuses on cracking effects on soil-structure interaction.

Section V, Tropical Soil Behavior, includes 8 papers dealing with the shear strength, volume change, dynamic properties, and hydraulic properties of tropical soils. Papers include innovative testing approaches to consider the behavior of these unique soils. Papers focus on the chemistry and microstructure encountered in dealing with tropical soils.

Each paper was subject to rigorous technical review during a three-phase submission process and received a minimum of two positive peer reviews before final acceptance by the corresponding session chair(s).

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The conference Program Committee would also like to acknowledge the officers of the TC106 Committee on Unsaturated Soils (ISSMGE), and all members of the Technical Advisory and International Technical Committees, who provided guidance and support during the early planning phases of the conference.

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The conference Program Committee would also like to acknowledge the conference Session Chairs, who guided authors and reviewers through the draft and final phases of paper submission and review. In most cases, these chairs also served as on-site moderators during the conference itself.

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14/ Field Applications of Unsaturated Soils
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