



PROCEEDINGS OF THE 7TH INTERNATIONAL CONFERENCE ON EXPANSIVE SOILS

August 3 - 5, 1992

Dallas, Texas (USA)



Dallas Skyline
(Provided by Dallas Convention and Visitors Bureau)

TABLE OF CONTENTS

Shrink/Heave Prediction

<i>A Model for Predicting Expansive Soil Behavior</i> R. G. McKeen	1
<i>Treatment of Expansive Soils of the Region of Vicosa</i> D. L. Cardoso, B. S. Bueno, and D. C. Lima	7
<i>Evaluation of Soil Suction-Heave Prediction Methods</i> D. R. Snethen and G. Huang	12
<i>Heave Predictions for Northern Virginia Cretaceous Clay</i> M. J. Byle and G. C. Davit	18
<i>A Unified Model for Expansive Soil Behaviour</i> E. E. Alonso, A. Gens, and A. Josa	24
<i>In Situ and Laboratory Measured Suction Parameters for Prediction of Swell</i> O. Erol.....	30
<i>Practical Approach on Heave Prediction</i> F. H. Chen	33
<i>A New Model of Shrink/Heave Prediction</i> Q. Y. Fan and J. Ke	36
<i>Effects of Pre-Test Stress Environments on Swell</i> T. M. Petry, J-S. Sheen, and J. C. Armstrong	39
<i>Expansive Soil Properties in the Queretaro Valley</i> J. A. Z. Garrido, M. L. P. Rea, and J. C. Ochoa	45
<i>Suction-Load-Strain Relations in Expansive Soil</i> H. A. C. Meintjes.....	51

Prediction of Soil Collapse

<i>Soil Collapse Prediction Using an Elastoplastic Model</i> Y. Kohgo, M. Nakano, and T. Miyazaki.....	55
<i>Stress Path Method of Predicting Compacted Soil Collapse</i> J. Maswoswe, J. B. Burland, and P. R. Vaughan	61
<i>On Soil Collapse Prediction</i> S. V. Andrei and S. Manea	67

Determination of Collapse Potential of Soils R. J. Rocca, A. R. Reginatto, and E. R. Redolfi.....	73
-------------------------------------------------------------------------------------------------------------	----

Post-Construction Investigations

Two Computer Models for 3D Raft Slab Back-Analysis D. C. Payne, C. M. Rigg, D. A. Cameron, and K. C. Pile.....	78
--------------------------------------------------------------------------------------------------------------------------	----

Swell Testing as a Predictor of Structural Performance R. W. Thompson.....	84
--------------------------------------------------------------------------------------	----

Slab-on-Grade Deflection: How Much is Too Much? A. S. Koenig	89
------------------------------------------------------------------------------	----

Moisture Flow in the Unsaturated Zone

Frequency Analysis of Expansive Soil Movements W. L. Bratton.....	93
-----------------------------------------------------------------------------	----

Conductivity Through Macropores in Compacted Clay P. W. Jayawickrama and R. L. Lytton.....	99
------------------------------------------------------------------------------------------------------	----

Swelling and Shrinkage of the Pliocene Clays from the Central Poland Z. Frankowski.....	105
---------------------------------------------------------------------------------------------------	-----

Flow Equations in Three Dimensional Finite Strain T. V. Edgar and J. D. Nelson	109
------------------------------------------------------------------------------------------------	-----

Performance of Embankments and Slopes in Expansive Soils

Slopes and Embankments in Eagle Ford Clays B. Bailey and W. R. Stroman	114
----------------------------------------------------------------------------------------	-----

Dewatering Stabilization in Expansive Soil Slope T. J. Tao, Y. P. Xu, and J. C. Liao	120
------------------------------------------------------------------------------------------------------	-----

Remedial Measures and Construction

Helical Piers in Expansive Soils of Dallas, Texas R. L. Hargrave and R. E. Thorsten	125
-----------------------------------------------------------------------------------------------------	-----

<i>Preheaving of Expansive Soils by Flooding - Failures and Successes</i> G. E. Blight, K. Schwartz, H. Weber, and B. L. Wiid.....	131
<i>Some Observations on the Performance of Railway Lines Over Expansive Clays</i> B. E. Hall.....	137
<i>Restoration of Tree-Affected Building Foundations</i> A. P. Nunn, J. C. Holden, M. Ma, and A. Dimos.....	143
<i>Treatment of Collapsible Soils Using a Vibratory Technique</i> S. Jafroudi.....	149
<i>Damage to Road Beds and Remedial Measures</i> X. M. Wu, D. X. Wei, and J. H. Chen.....	153

Classical Soil Mechanics for Unsaturated Soils

<i>Generalized Nonlinear Constitutive Theory of Unsaturated Soils</i> D. Yang and Z. J. Shen.....	158
<i>Strength Properties of Soils by Plate Uplift Test</i> T. Shogaki.....	163
<i>Critical State Concepts for Unsaturated Soil</i> S. J. Wheeler and V. Sivakumar.....	167
<i>Behavior of an Expansive Clay Related to Suction</i> J. M. Fleureau, R. Soemitro, and S. Taibi.....	173
<i>Osmotic Suction as a Valid Stress State Variable in Unsaturated Soils</i> D. J. Miller and J. D. Nelson.....	179
<i>Study on Generalized Consolidation Theory of Unsaturated Soils</i> D. Yang and Z. J. Shen.....	185
<i>An Effective Stress Model for Swelling of Soils</i> S. Frydman.....	191
<i>On Strength and Deformation of an Unsaturated Compacted Clay</i> D. Yang and Z. J. Shen.....	196

<i>Crack and Block Models for Expansive Clay Soils; Theoretical Analysis</i>	
K. B. Wallace and R. L. Lytton.....	201
<i>Suction Controlled Testing of Non Saturated Soils with an Osmotic Consolidometer</i>	
P. Delage, G. P. R. Suraj de Silva, and T. Vicol.....	206
<i>Bearing Capacity and Settlement of a Cold Storage Foundation on Chengdu Expansive Clay</i>	
L. Zhang, G. Yang, and T. Hu.....	212

Vertical and Lateral Swelling Pressures

<i>Swelling Characteristics of Compacted Bentonite</i>	
H. Komine and N. Ogata.....	216
<i>One Dimensional Swell Behavior of Unsaturated Soil</i>	
S. A. Habib, T. Kato, and D. Karube.....	222
<i>Lateral Swelling Pressures</i>	
T. B. Edil and A. S. Alanazy.....	227
<i>A New Method for Calculating Lateral Swelling Pressure in Expansive Soil</i>	
J. Z. Xin and Q. X. Ling.....	233
<i>Experimental Study of the Swelling Behaviour of Heavily Overconsolidated Flandres Clays</i>	
S. Khaddaj, L. Lancelot, and I. Shahrour.....	239
<i>Lateral Pressures and Swelling in a Cracked Expansive Clay Profile</i>	
K. B. Wallace and R. L. Lytton.....	245
<i>Anisotropic Swelling and Shrinkage of Miocene Carpathian Foredeep Clays</i>	
R. Kaczynski.....	251

Collapsing Soils

<i>Foundations on Hydrocollapsible Soils</i>	
M. Karakouzian, P. L. Roullier, and A. N. Stille.....	256
<i>Collapsible Deformation of Loess Foundation</i>	
M. Zhu, S. Xie, and H. J. Qian.....	262

Settlement Evolution of a Hotel Building Founded on Collapsible Soil I. P. Antonescu	268
Deformation Properties of Collapsing Loess Soils D. Milovic and H. Bogdanovic	274
Identification and Characterization of Coarse-Grained Collapsible Soils K. M. Rollins, R. L. Rollins, T. D. Smith, and G. H. Beckwith	280
Soil Collapse and Matric Suction Change R. Tadepalli, D. G. Fredlund, H. Rahardjo	286
The Strength Behaviour of Remolded Loess G. X. Zeng, M. H. Yu, and Y. M. Li	292
A Micromechanical Structural Analysis on Collapsing Deformation of Loess Soils W. Jianguo	296
Partial-Wetting Collapse Predictions S. L. Houston	302

Field Measurements

Evaluation of Soil Suction Instruments H. C. Lee and W. K. Wray	307
Seasonal Ground and Water Movement Observations from an Expansive Clay Site in the UK M. S. Crilly, R. M. C. Driscoll, and R. J. Chandler	313
Field Instrumentation to Monitor Cellular Rafts J. P. Pellissier	319
In situ Suction Measurements Using Thermal Sensors D. G. Fredlund, P. J. Sattler, J. K-M. Gan	325
Comparison of Predicted Heave to Field Measurements W. K. Wray	331
Laboratory and Field Tests on an Expansive Soil in Brazil J. F. T. Juca, J. A. G. Filho, and J. M. Justino Da Silva	337

Physico-Chemical Topics

Acceptance Criteria for Lime Slurry Injection T. D. Baker.....	343
Soil Stabilization Using Cement Kiln Dust M. Zaman, A. Sayah, and J. G. Laguros	347
Physical and Mineralogical Characterization of a Swelling Claystone M. Picornell and R. L. Lytton.....	352
The Role of Hydroxy - Aluminium on Expansive Clays T. S. R. Ayyar, N. Balasubramanian, V. Raman, M. S. Krishna, and S. Esakku.....	358
Heave and Settlement of Soils Due to Acid Attack B. P. Wrench and S. J. J. Geldenhuis	364
Active Clay Stabilized by Admixtures of Fine and Coarse Sands P. T. Leelani, P. V. Compton, and S. Abdul-Baki.....	370
Wave Analysis of Foundations on Swelling Soils L. D. Johnson.....	375

Case Studies

Light Buildings on Expansive Clays - Case Studies K. Muthukrishnaiah	381
Standard-of-Care for Expansive Soil Design P. O. Shires and H. Mack	387
Controlling Expansive Soils: Twenty Texas Highway Projects M. L. Steinberg	392
Characterization of Sensitive Soils in Arriyadh A. El-Nimr, M. M. Tabba, and F. T. Touma	398
Desiccation, Some Examples Measured in London Clay L. N. Parry.....	404
Expansion of Lime-Treated Clays Containing Sulfates L. L. Perrin	409
Expansive Clay Practices in Dallas and Fort Worth B. Bailey.....	415

Raft Performance Versus Soil Moisture Variation J. H. Strydom and J. P. Pellissier	420
Expansive Soils in Eastern Province of Saudi Arabia S. N. Abduljawwad, R. A. Hameed, G. J. Al-Sulaimani, I. A. Basunbul, and M. M. Safar	426
The Distribution of Expansive Soils in Oman A. Al-Rawas and L. K. R. Woodrow	432
Performance of Foundations on Steeply Dipping Claystone R. W. Thompson	438
Structural Distress of Tlamoha Technical College H. A. C. Meintjes	443

Shallow Foundations Constructed in Expansive or Collapsing Soils

A Deformation Analysis of Expansive Soil Grounds in Underpinning a Building Y. Q. Zou	447
The Performance of the Cellular Raft Foundation A. A. B. Williams and J. P. Pellissier	453
HUD Concerns: Post-Tensioned Foundations in Texas R. J. Sazinski	459
The Behaviour of Low Cost Roads on Deep, Cracking, Expansive Clay Subgrades F. Bullen and K. B. Wallace	465
Shallow Footings on Expansive Soils E. Retamal and P. Ortigosa	471

Deep Foundations Constructed in Expansive or Collapsing Soils

Analysis of Uncertainties Related to the Response of Piers in Expansive Soils C. Ferregut, M. Picornell, and J. A. Pendones	477
A Model of Pile Interface in Collapsible Soils E. R. Redolfi and C. O. Mazo	483

Pile Foundations in Expansive Soils E. A. Sorochan and V. Y. Shishkin	489
An Expert System for Foundations on Expansive Soil G. Wiseman, J. G. Zeitlen, and A. Komornik	495
Appendix: Author Index	500