Auckpath Sawangsuriya

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Education

Ph.D. Civil Engineering [Geotechnical Engineering] May 2006
University of Wisconsin – Madison, U.S.A.
Dissertation: *Stiffness-Suction-Moisture Relationship for Compacted Soils*
Advisor: Professors Tuncer B. Edil and Peter J. Bosscher

M.S. Civil Engineering [Geotechnical Engineering] August 2001
University of Wisconsin – Madison, U.S.A.
Dissertation: *Evaluation of the Soil Stiffness Gauge*
Advisor: Professors Tuncer B. Edil and Peter J. Bosscher

B.Eng. Civil Engineering (Honors) May 1999
Sirindhorn International Institute of Technology, Thammasat University, Thailand

Areas of Expertise

Characterization of Mechanical Properties of Pavement Materials
Earthwork Quality Control and Performance Assessment
Non-destructive Evaluation of Pavement System
Unsaturated Geo-technology
Geotechnical Instrumentation for Field Testing and Performance Monitoring

Research and Employment Experience

Research Associate May 2006-Present
Research Assistant September 2005-May 2006
University of Wisconsin – Madison
Research Title: *Resilient Behavior of Unsaturated Subgrade Soils*, subcontract to the University of Minnesota sponsored by the Minnesota Department of Transportation (Mn-DOT)

- Characterizing the unsaturated resilient properties of four typical subgrade soils from Minnesota at different soil suctions in the range of 0 to 500 kPa.
- Developing test methods and procedures for assessing the resilient modulus of unsaturated soils.
- Determining the relationship between the resilient modulus and matric suction.
- Providing a basis to formalize the relationship of resilient modulus to matric suction.
- Preparing a state-of-the-art paper on pavement design procedure using resilient modulus extending the principles of unsaturated soil mechanics.
- Preparing the progress report to Mn-DOT.

- Providing a final report of the findings and assisting the University of Minnesota in developing unsaturated resistance factors for use in "mechanistic-empirical" pavement design software.

Project Assistant January 2004-January 2005
University of Wisconsin – Madison
Research Title: *Alternative Cover Assessment Program (ACAP),* funded by the US Environmental Protection Agency through the Superfund Innovative Technologies Evaluation Program

- Conducted saturated hydraulic conductivity and soil water characteristic curve tests on undisturbed samples of the cover soils collected from the ACAP test sites.
- Performed index properties and compaction tests on disturbed samples of the cover soils.
- Compared the hydraulic properties of the ACAP cover soils measured at the time of construction and those measured 2 to 4 years after construction.
- Evaluated how hydraulic properties of water balance cover soils change in response to pedogenesis (e.g. change in soil structure caused by weathering and biota instrusion).
- Prepared the geotechnical laboratory report describing results of laboratory tests conducted to characterize the hydraulic properties of soils being considered for final cover for a landfill.
- Prepared technical papers for the journal of geotechnical and geoenvironmental engineering.

Teaching Assistant Fall 2003
University of Wisconsin – Madison
Course Title: *Field Methods in Geological Engineering*

- Taught methods of site investigations for the rational design of foundation.
- Taught field reconnaissance and subsurface exploration (e.g. soil boring and sampling, augering, and standard penetration testing).
- Taught field instrumentation and data acquisition for monitoring meteorological conditions and time-domain reflectometry measurements
- Taught in situ methods (e.g. borehole permeability test, geophysical methods such as seismics and magnetics survey, dilatometer test, inclinometers and sondex etc.).
- Prepared lectures, graded homework and lab reports, and held office hours.

Research Assistant Summer 2000-Fall 2003
University of Wisconsin – Madison
Research Title: *Investigation of the SSG and DCP as Alternative Methods to Determine Subgrade Stability,* sponsored by the Wisconsin Department of Transportation

- Evaluated the soil stiffness gauge (SSG) and dynamic cone penetrometer (DCP) for structural design property development and earthwork quality control.
- Utilized the SSG and DCP in companion with traditional moisture-density methods such as nuclear test and sand cone test for direct and rapid in situ stiffness and strength measurements of natural earthen materials, industrial by-products,

chemically stabilized soils, and other materials from thirteen construction sites around the state of Wisconsin.
- Conducted laboratory tests including pulse transmission, bender elements, resonant column, resilient modulus, triaxial compression, unconfined compression, and California bearing ratio.
- Analyzed and correlated the data obtained from the SSG, the DCP, and traditional moisture-density methods as well as compared the stiffness and strength of subbase and subgrade obtained from different laboratory tests and in situ measurements.
- Prepared the progress report to the Technical Oversight Committee of the Wisconsin Highway Research Program.

Engineering Intern May 1999
Department of Civil Engineering, Sirindhorn International Institute of Technology, Thammasat University, Pathumthani, Thailand
Project Title: *Parametric Study on Finite-Element Modeling of Composite Steel-Concrete Flyover Bridge*
- Performed the finite-element computer program called MARC.
- Simulated three-dimensional (3D) finite-element modeling of the renovated Thai-Belgian bridge.
- Compared the finite-element analysis with the measured results.

Project Title: *Truck Loading Test on Ramkamhaeng-Rama 9 Bridge*
- Recorded the field measurement data.
- Coordinated the measurement procedure.
- Checked loading position.

Student Intern March - May 1998
Ceda Company Limited, Bangkok, Thailand
- Reviewed geotechnical laboratory report.
- Verified and analyzed the soil bearing capacity and bracing system.
- Visited the construction site.

Italian-Thai Development Public Company Limited (Elevated Toll-way Construction Site), Pathumthani, Thailand
- Reviewed structural design plans, cost estimation, technical works, and project scheduling.
- Designed the pier footing and construction formwork.
- Verified the position of driven pile foundation.
- Visited the construction site.

Selected Coursework

Engineering Properties of Soils
Foundations
Retaining Structures
Seepage and Slopes
Soil Dynamics
Advanced Highway Design
Field Methods in Geological Engineering

Unsaturated Soil Geoengineering
Introduction to Applied Geophysics
Vibration and Wave Propagation

Publications

Refereed Journal Publications

Sawangsuriya, A., Edil, T. B., and Bosscher, P. J., "Stiffness-suction-moisture relationship for soils at as-compacted state," To be submitted to *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE

Sawangsuriya, A., Edil, T. B., and Bosscher, P. J., "Stiffness-suction-moisture relationship for compacted soils: post-compaction state," To be submitted to *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE

Sawangsuriya, A., Edil, T. B., Bosscher, P. J., and Fratta, D., "On investigation of fabric anisotropy of compacted soils using bender elements," To be submitted to *Geotechnical Testing Journal*, ASTM

Benson, C. H., **Sawangsuriya, A.**, Trzebiatowski, B., and Albright, W. H. (2006), "Pedogenic effects on the hydraulic properties of cover soils," *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE (under review)

Sawangsuriya, A. and Fratta, D. (2006), "Discussion on 'correlations between P-wave velocity and atterberg limits of cohesive soils' by M. Fener, S. Kahraman, Y. Bay, and O. Gunaydin," *Canadian Geotechnical Journal* (accepted for publication)

Sawangsuriya, A. (2006), "Stiffness-suction-moisture relationship of compacted soils," *Geotechnical News* (thesis abstract accepted for publication)

Sawangsuriya, A., Bosscher, P. J., and Edil, T. B. (2006), "Application of soil stiffness gauge in assessing small-strain stiffness of sand with different fabrics and densities," *Geotechnical Testing Journal*, ASTM, Vol. 29, No. 3, pp. 207-216.

Sawangsuriya, A., and Edil, T. B. (2005), "Evaluating stiffness and strength of pavement materials," *Proceedings of the Institution of Civil Engineers-Geotechnical Engineering*, Vol. 158, No. 4, pp. 217-230.

Sawangsuriya, A., Edil, T. B., and Bosscher, P. J. (2003), "Relationship between soil stiffness gauge modulus and other test moduli for granular soils," *Transportation Research Record 1849*, TRB, National Research Council, Washington, D.C., pp. 3-10.

Sawangsuriya, A., Bosscher, P. J., and Edil T. B. (2002), "Laboratory evaluation of the soil stiffness gauge," *Transportation Research Record 1808*, TRB, National Research Council, Washington, D.C., pp. 30-37.

Chaisomphob, T., **Sawangsuriya, A.**, Denpongpan, T., and Lertsima, C. (2001), "Parametric study on finite element modeling of composite steel-concrete multi-girder bridges," *Songklanakarin Journal of Science and Technology*, Vol. 23, No. 1, pp. 89-101.

Refereed and Non-refereed Conference Papers

Biringen, E., **Sawangsuriya, A.**, and Fratta, D., "Soil modulus evaluation by bender elements and MEMS accelerometer-based measurements," *Geo-Denver Conference*, 2007, Denver, CO (abstract submitted)

Sawangsuriya, A., Edil, T. B., Bosscher, P. J., and Fratta, D., "Velocity-stress power relationship: fabric and contact behavior of sand," *Geo-Denver Conference*, 2007, Denver, CO (abstract submitted)

Sawangsuriya, A., Edil, T. B., and Benson, C. H., "Advanced characterisation of unsaturated subgrade soils," *Internal Conference: Advanced Characterisation of Pavement and Soil Engineering Materials*, 2007, Athens, Greece (abstract submitted)

Sawangsuriya, A., Benson, C. H., and Edil, T. B., "Resilient modulus of unsaturated compacted soils," *The 2nd International Conference: Mechanics of Unsaturated Soils*, 2007, Germany (abstract submitted)

Sawangsuriya, A., Edil, T. B., Benson, C. H. and Wang, X., "A simple setup for inducing matric suction," *Third Asian Conference on Unsaturated Soils*, 2007, Nanjing, China (abstract submitted)

Sawangsuriya, A., Edil, T. B., Bosscher, P. J., and Wang, X. (2006), "Small-strain stiffness behavior of unsaturated compacted soils," *Proceedings of the Fourth International Conference on Unsaturated Soils, Unsaturated Soils 2006*, ASCE, Geotechnical Special Publication, No. 147, Carefree, AZ, pp. 1121-1132.

Edil, T. B., and **Sawangsuriya, A.** (2006), "Use of stiffness and strength for earthwork quality evaluation," *ASCE Geotechnical Special Publication (GSP): Site and Geomaterial Characterization*, GeoShanghai Conference, Shanghai, China (accepted for publication).

Sawangsuriya, A., Biringen, E., Fratta, D., Bosscher, P. J., and Edil, T. B. (2006), "Dimensionless limits for the collection and interpretation of wave propagation data in soils," *ASCE Geotechnical Special Publication (GSP): Site and Geomaterial Characterization*, GeoShanghai Conference, Shanghai, China (accepted for publication).

Edil, T. B., and **Sawangsuriya, A.** (2005), "Earthwork quality control using soil stiffness," *Proceedings of the 16th International Conference on Soil Mechanics and Geotechnical Engineering*, Osaka, Japan, pp. 1689-1692.

Sawangsuriya, A., Bosscher, P. J., and Edil, T. B. (2005), "Alternative testing techniques for modulus of pavement bases and subgrades," *Proceedings of the 13th Annual Great Lakes Geotechnical and Geoenvironmental Engineering Conference, Geotechnical Applications for*

Transportation Infrastructure, ASCE, Geotechnical Practice Publication, No. 3, Milwaukee, WI, pp. 108-121.

Sawangsuriya, A., Edil, T. B., and Bosscher, P. J. (2005), "Stiffness behavior of an unsaturated pavement subgrade soil," *Proceedings of International Conference on Problematic Soils*, Famagusta, N. Cypus, pp. 209-217.

Sawangsuriya, A., Edil, T. B., and Bosscher, P. J. (2004), "Assessing small-strain stiffness of soils using the soil stiffness gauge," *Proceedings of the 15th Southeast Asian Geotechnical Conference*, Bangkok, Thailand, pp. 101-106.

Sawangsuriya, A., and Edil, T. B. (2004), "The soil stiffness gauge and dynamic cone penetrometer for earthwork evaluation," *The 83rd Annual Meeting of the Transportation Research Board (in CD-ROM)*, Washington, D.C.

Sawangsuriya, A., Edil, T. B., and Bosscher, P. J. (2002), "Comparison of moduli obtained from the soil stiffness gauge and moduli from other test," *The 81st Annual Meeting of the Transportation Research Board (in CD-ROM)*, Washington, D.C.

Technical Reports and Theses

Sawangsuriya, A. (2006), *Stiffness-suction-moisture relationship for compacted soils*, Ph.D. Thesis, The University of Wisconsin-Madison, Madison, WI.

Edil T. B., and **Sawangsuriya, A.** (2005), *Investigation of the DCP and SSG as alternative methods to determine subgrade stability*, Report No. 0092-01-05, Wisconsin Department of Transportation, WI.

Sawangsuriya, A. (2001), *Evaluation of the soil stiffness gauge*, M.S. Thesis, The University of Wisconsin-Madison, Madison, WI.

Honors and Awards

University of Wisconsin Thailand Alumni Association Scholarship, 2006
Second Place, The 2006 Geo-Congress Conference Student Competition, Information Mining and Geotechnical Site Characterization Design, Atlanta, 2006
Norman H. Severson Geotechnical Engineering Award, University of Wisconsin-Madison, 2005
Vilas Fellowship Travel Award, University of Wisconsin-Madison, 2004
Royal Thai Government Scholarship, 1999-2005
Second Class Honors, B.Eng., Sirindhorn International Institute of Technology, Thammasat University, 1999

Memberships

American Society of Civil Engineers (ASCE)
American Society for Testing and Materials (ASTM)
International Geosynthetics Society (IGS)
Transportation Research Board (TRB)

Thai Student Association (TSA), University of Wisconsin-Madison
Saint Paul's University Catholic Center

Continuing Education

Completed the short course, "Foundation Design" by the Department of Engineering Professional Development, College of Engineering, University of Wisconsin – Madison, March 2002

Completed the short course, "Understanding and Using Geophysical Methods for Characterizing Engineering and Environmental Sites" by the Department of Engineering Professional Development, College of Engineering, University of Wisconsin – Madison, May 2003