CURRICULUM VITAE

Michael P. Navin, P.E.

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EDUCATION

Doctor of Philosophy in Geotechnical Engineering (August 2001 - August 2005)
Virginia Tech, Blacksburg, VA.

Master of Science in Civil Engineering (August 1998 - May 1999)
Virginia Tech, Blacksburg, VA.

Bachelor of Science in Civil Engineering (August 1989 - December 1993)
University of Missouri, Columbia, MO.

PROFESSIONAL EXPERIENCE

Civil Engineer (January 1994 - August 2001)
U.S. Army Corps of Engineers, Geotechnical Branch, St. Louis, Missouri

CO-OP (May 1991 - December 1993)
U.S. Army Corps of Engineers, Geotechnical Branch, St. Louis, Missouri

Professional Engineer in the State of Missouri (1998 – present)

COURSES TAUGHT

Earth Pressures and Foundations – CEE 4534, Fall 2004.

PUBLICATIONS

Navin, M. P. and Filz, G. M. (2005) "Stability of embankments founded on ground improved with deep mixed columns," Center for Geotechnical Practice and Research, Blacksburg, VA.

Filz, G. M. and Navin, M. P. (2005) "Stability of column supported embankments," Report prepared for the Virginia Transportation Research Council, 48 p.

PUBLICATIONS (continued)

Navin, M.P., and Filz, G.M. (2005) "Statistical Analysis of Strength Data from Ground Improved with DMM Columns," Proceedings of the International Conference on Deep Mixing 2005, Stockholm, May 2005, 10 p.

Navin, M.P., Kim, M., and Filz, G.M. (2005) "Stability of embankments founded on Deep-Mixing-Method columns: three-dimensional considerations," accepted as part of the proceedings of the 16th International Conference on Soil Mechanics and Geotechnical Engineering, Osaka, September 2005.

Stewart, M.E., Navin, M.P., and Filz, G.M. (2004) "Analysis of a Column-Supported Test Embankment at the I-95/Route 1 Interchange," Proceedings of GeoTrans 2004, Los Angeles, ASCE, pp. 1337-1346.

Duncan, J.M., Navin, M.P., and Wolff, T.F. (2003) Discussion of "Probabilistic slope stability analysis for practice," Canadian Geotechnical Journal, Vol. 40, No. 4, pp. 851-855.

Duncan, J.M., Navin, M.P., and Patterson, K.L. (1999) "Manual for Geotechnical Engineering Reliability Calculations," Report of a Study Sponsored by the Virginia Tech Center for Geotechnical Practice and Research, 74 p.

AWARD & HONORS

Via Doctoral Fellowship at Virginia Tech, August 2001
U.S.A.C.E., Performance Award, $1000, January 2001
U.S.A.C.E., Performance Award, $1000, January 2000
Selected for the Corps of Engineers' Mission Related, Long Term Training Program, 1998-1999.
U.S.A.C.E., Official Commendation for Excellent Teamwork, February 1998, $250 Award.
U.S.A.C.E., Performance Award, $500, September 1995
U.S.A.C.E., Team of the Quarter Award, February 1993, $250.

WORK EXPERIENCE WITH USACE

• Designed sheet pile cells, a lock sub-floor drainage system, pile foundations for innovative float-in structures, a pile load test and other geotechnical items necessary for lock replacements or extensions as part of the Upper Mississippi River - Inland Waterway (UMR-IWW) study.

• Performed reliability calculations for geotechnical components of navigation structures and flood control structures along the Mississippi River.

WORK EXPERIENCE WITH USACE (continued)

• Designed pile foundations by analyzing pile stresses, axial loads, and lateral displacements. Determined appropriate pile hammers using wave equation analysis.

• Performed slope stability, underseepage, bearing capacity, and settlement analyses.

• Prepared plans and specifications, cost estimates, and drilling requests.

• Worked as an inspector for explorations programs classifying soil types and testing soils.

• Performed emergency flood fighting duties in the summer of 1993 to insure fifty-year flood protection measures in rural areas of southern Illinois could withstand what was later determined to be a two-hundred-year flood event on the Mississippi River.

RESEARCH AND DISSERTATION

My research was sponsored by Virginia Department of Transportation, VDOT, to evaluate edge stability of roadway embankments founded on soft soils that have been improved with columnar inclusions. The types of columns investigated included lime and/or cement mixed in-situ with soil, stone columns, and driven piles. Current design methods for these forms of ground improvement near the edge of embankments are based on simplified, limit equilibrium slope stability analyses, which only account for shear failure and not the other failure modes, such as column bending and tilting, that have occurred in model tests and full-scale installations. VDOT has constructed a heavily instrumented test embankment on soft organic soils that were improved with dry mix, lime-cement columns as part of the I-95/Route 1 interchange reconstruction in Alexandria, VA. Numerical analyses were verified against field measurements from this test embankment, as well as centrifuge model tests found in the literature. Two- and three-dimensional analyses were used to evaluate the potential for isolated columns to fail by mechanisms other than shear failure. The final product of this research is to provide VDOT with recommendations for designing these ground improvement technologies to maintain stability near the edge of roadway embankments. A key finding is that numerical analyses combined with reliability analyses are necessary to fully describe the behavior of these complex systems.