Exponent®
Engineering & Scientific Consulting

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Professional Profile

Dr. Kermani specializes in project management, infrastructure asset management, forensic evaluations, quality assurance and quality control, and pavement and geotechnical engineering and design. Dr. Kermani has twelve years of experience working on various transportation and infrastructure projects, from consulting to design and research projects for federal, state, and local agencies as well as for the private sector. As a result, he has developed collaborative working relationships within the infrastructure sector. With his project management experience, Dr. Kermani helps his clients resolve complex construction challenges of projects from proposal phase to their completion.

Dr. Kermani is currently involved in construction and utility work, overseeing all stages of projects' lifecycles, including management of electric utility development/upgrade projects throughout all project phases. This involves financial forecasting, budget management, project scheduling, project coordination, decision-making, and project planning.

Before joining Exponent, Dr. Kermani has served at The Transtec Group, Inc. as Project Manager (PM) on various infrastructure projects, which involved pavement and geotechnical evaluations, analysis, and design; material assessments, behavior, and characteristics; construction planning; developing successful Alternative Technical Concepts (ATCs); performing non-destructive testing/evaluation (NDT/NDE) analyses; and business development efforts for Design-Build (DB), Public-Private Partnership (P3), and Design-Bid-Build (DBB) projects across United States and Canada. Dr. Kermani also has extensive experience with advanced laboratory testing and physical modeling of pavement and geotechnical materials under static and dynamic conditions.

Between 2013 to 2018, as a researcher at Penn State University, Dr. Kermani led multiple transportation projects sponsored by Federal Highway Administration (FHWA), Federal Aviation Administration (FAA), Pennsylvania Department of Transportation (PennDOT), National Science Foundation (NSF), and Geosynthetic Institute (GSI). He also instructed the Civil Engineering Material Laboratory, Soil Mechanics, and Pavement Engineering courses during his tenure at Penn State.

Dr. Kermani is a Geosynthetic Institute (GSI) Fellow. He has published numerous peer-reviewed journal articles and conference proceedings and has presented his work in several academic and industry events. Dr. Kermani is currently serving as an Editorial Board Member (EBM) of ASTM Journal of Testing and Evaluation.

Academic Credentials & Professional Honors

Ph.D., Civil Engineering, Penn State University, 2018

M.S., Geotechnical Engineering, Temple University, 2013

B.S., Civil Engineering, Azad University (Sci and Res Branch), Tehran, 2008

2017 Geosynthetic Institute (GSI) Fellowship

2017 International Association of Foundation Drilling (ADSC-IAFD) Scholarship and Travel Grant

2017 Harold F. Martin Outstanding Teaching Award - Penn State University

2017 Glenn E. Singley Memorial Graduate Fellowship in Engineering - Penn State University

2017 First-place poster award at Penn State Graduate Exhibition, The Pennsylvania State University

2017 Best presentation and poster award at Penn State College of Engineering Research Symposium (CERS), The Pennsylvania State University

2017 Iranian American Academics and Professionals (IAAP) Scholarship

2016 Geosynthetic Institute (GSI) Fellowship

2015 Leo P. Russell Graduate Fellowship in Civil Engineering - Penn State University

2014 Deep Foundation Institute (DFI) Best Paper and Presentation Award

Licenses and Certifications

Professional Engineer Civil, Texas, #153267

Academic Appointments

Instructor, Engineering, The Pennsylvania State University, 2013-2018

Prior Experience

Project Manager. The Transtec Group, Inc., 2018-2022

Research Assistant and Instructor, The Pennsylvania State University, 2013-2018

Research and Teaching Assistant, Temple University, 2011-2013

Project Manager, Parket Construction Company, Tehran, Iran, 2008-2011

Project Engineer, Ettehad-Rah Consulting Engineers, Tehran, Iran, 2007-2008

Professional Affiliations

American Society of Civil Engineers (ASCE)

American Society for Testing and Materials (ASTM)

Deep Foundations Institute (DFI)

Languages

Persian (Farsi)

Publications

Kermani, B., Xiao, M., and Stoffels, S. M. (2020). “Implementing An Analytical Framework to Quantify the Magnitude and Rate of Subgrade Pumping in Flexible Pavement.” In Geo-Congress 2020.

Kermani, B., Xiao, M., and Stoffels, S. M. (2020). “Evaluation of The Effectiveness of Geotextile Separation and Filtration in Mitigating Pumping of Subgrade Particles into Overlying Granular Layers in Pavement Systems.” In GeoAmericas 2020.

Ma, Y., Xiao, M., and Kermani, B. (2020). “Experimental investigation of the effects of fluid’s physicochemical characteristics on piping erosion of a sandy soil under turbulent flow.” Geotechnical Testing Journal, 43(2), 436-451.

Kermani, B., Stoffels, S.M., Xiao, M. (2019), “Evaluation of Effectiveness of Geotextile in Reducing Subgrade Migration in Rigid Pavement”, Geosynthetics International. DOI: 10.1680/jgein.19.00052.

Kermani, B., Xiao, M., Stoffels, S. M., Qiu, T. (2019). “Measuring the Migration of Subgrade Fine Particles into Subbase Using Scaled Accelerated Flexible Pavement Testing – A Laboratory Study.” International Journal of Road Material and Pavement Design, 20(1), 36-57 DOI: 10.1080/14680629.2017.1374995.

Kermani, B., Stoffels, S. M., Xiao, M. (2019). “Assessment of Geotextile Effectiveness in Decreasing Subgrade Pumping and Increasing Service Life in Rigid Pavements, Using Scaled Model Mobile Load Simulator.” In Geo-Congress.

Kermani, B., Xiao, M., Stoffels, S. M. (2019). “Infiltration of Subgrade Fines into Pavement Subbase and Mitigation Using Geotextile Separation and Filtration.” In Geo-Structural Aspects of Pavements, Airfields, and Railways 2019 (GAP 2019).

Coe, J. T. Kermani, B., and Nyquist, J. E (2019) “Evaluation of Unknown Bridge Foundations Using Borehole-Based Nondestructive Testing Methods: A Case Study in Urban Settings.” Journal of Environmental & Engineering Geophysics (JEEG).

Kermani, B., Xiao, M., Stoffels, S. M., Qiu, T. (2018). “Magnitude and Rate of Migration of Fine Subgrade Soil into Granular Subbase under Scaled Flexible Interstate Pavement.” In International Foundations Congress and Equipment Exposition (IFCEE).

Kermani, B., Xiao, M., Stoffels, S. M., Qiu, T. (2018). “Reduction of Subgrade Fines Migration into Subbase of Flexible Pavement Using Geotextile.” Geotextiles and Geomembranes, 46(4), 377-383.

Kermani, B., Stoffels, S. M., Xiao, M., Qiu, T. (2018). “Experimental Simulation and Quantification of Migration of Subgrade Soil into Subbase under Rigid Pavement Using Model Mobile Load Simulator.” ASCE Journal of Transportation Engineering, Part B: Pavements, 144(4).

Kermani, B., Xiao, M., and Stoffels, S. M. (2018). “Analytical Study on Quantifying the Magnitude and Rate of Subgrade Fines Migration into Subbase under Flexible Pavement.” Transportation Geotechnics, volume 18, 46-56.

Coe, J. T. and Kermani, B. (2016). “Comparison of Borehole Ultrasound and Borehole Radar in Evaluating the Length of Two Unknown Bridge Foundations.” DFI Journal: The Journal of the Deep Foundations Institute, 10(1), 8-24 (2014 DFI Paper and Presentation Award).

Kermani, B., Xiao, M., Stoffels, S. M., Qiu, T. (2016). “Evaluation of Geotextile Separation to Prevent

Migration of Subgrade Fines into Subbase." Report No. FHWA-PA-2016-007-PSU WO#009C, October 2016, Pennsylvania Department of Transportation, Harrisburg, PA. pp 383.

Kermani, B., Coe, J. T., Nyquist, J. E., Sybrandy, L., Berg, P. H., & McInnes, S. E. (2014). "Application of electrical resistivity imaging to evaluate the geometry of unknown bridge foundations." In 27th Annual Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP) (pp. cp-400).

Coe, J. T., Kermani, B., Nyquist, J. E., Berg, P. H., McInnes, S. E., and Sybrandy, L. (2014). "Use of P-wave Reflection Imaging and Other Nondestructive Testing Techniques to Evaluate Unknown Bridge Foundations." Proceedings ASCE Geo-Congress, Atlanta, GA.

Coe, J. T., Sybrandy, L., and Kermani, B. (2014). "Laboratory Development of a Borehole Ultrasound Nondestructive Testing Method to Evaluate Bridge Foundations." Proceedings American Society of Nondestructive Testing (ASNT) Structural Materials Technology for Highways and Bridges Conference, Washington, D.C.

Stoffels, S., Lopez, M., Yeh, L., Jeong, Y., Barzegari, S., and Kermani, B. (2014). "Fracture Characterization and SEM Examination of NAPTF CC6 Concrete Mixes." In 2014 FAA Worldwide Airport Technology Transfer Conference, (No. P10097).

Coe, J. T., Nyquist, J. E., Kermani, B., and Sybrandy L. (2013). "Application of Non-Destructive Testing to Evaluate Unknown Foundations for Pennsylvania Bridges." Report No. FHWA-PA-2013-003-TEM 002, Pennsylvania Department of Transportation, Harrisburg, PA. pp 288.

Presentations

Kermani, B. Assessment of Geotextile Effectiveness in Decreasing Subgrade Pumping and Increasing Service Life in Rigid Pavements, Using Scaled Model Mobile Load Simulator, in Geo-Congress 2019, Philadelphia, PA, 2019.

Kermani, B. Geosynthetics and their Applications in Civil Engineering Practice, Invited Speaker, Bucknell University, Lewisburg, PA, 2018.

Kermani, B. Magnitude and Rate of Migration of Fine Subgrade Soil into Granular Subbase under Flexible Pavement Due to Cyclic Traffic Loading, in International Foundations Congress and Equipment Exposition (IFCEE) 2018, Orlando, FL, 2018.

Kermani, B. Experimental and Numerical Study of Subgrade Soil Migration into Pavement Subbase and Mitigation Using Geotextile, The Graduate Exhibition 2018, The Pennsylvania State University, University Park, PA, 2018.

Kermani, B. Experimental and Numerical Study of Subgrade Soil Migration into Pavement Subbase and Mitigation Using Geotextile, College of Engineering Research Symposium (CERS) 2018, The Pennsylvania State University, University Park, PA, 2018.

Kermani, B. Measuring the Magnitude and Rate of Migration of Subgrade Fine Particles into Subbase Using Laboratory Scaled Accelerated Pavement Testing and Prevention Using Geotextile." College of Engineering Research Symposium (CERS) 2017, The Pennsylvania State University, University Park, PA, 2017.

Kermani, B. Magnitude and Rate of Migration of Subgrade Soil Particles into Subbase Due to Cyclic Traffic Loading and Its Prevention Using Geotextile. College of Engineering Research Symposium (CERS) 2016, The Pennsylvania State University, University Park, PA, 2016.

Project Experience

Exponent – Manager

Utility Electric Transmission Program – Project Manager and Project Control Analyst

Managed several electric transmission interconnection, relocation, and replacement projects from planning to execution and developed financial forecasting, project resource-loaded schedules, and project status reports. Provided project and program control services, monitored monthly project level status updates, project risk mitigation plan, contract spend, and KPI reports. Coordinated with third-party customers and project team members and produced project status reporting. Analyzed budget and schedule variances and communicated and escalated risks to clients and management.

The Transtec Group, Inc. – Project Manager

Managed and provided design, consulting, and research services for federal, state, and local agencies, which included geotechnical and pavement evaluations, analysis, and design, material assessments, behavior and characteristics, construction guides, and non-destructive testing/evaluation (NDT/NDE) analyses services, for DB, P3, and DBB/PEPs projects.

Completed multiphase projects, from information and contract to plan development, costs, schedules, and quality.

Analyzed and evaluated geotechnical data for different infrastructure projects.

Provided pavement engineering services, pavement evaluation, design and analyses, pavement construction guides, material behavior assessments, and pavement management for highway and airport projects.

Conducted and analyzed NDT/NDE testing such as FWD and GPR.

Developed design alternatives, Alternative Technical Concepts (ATCs), and maintenance strategies for DB, P3, and DBB/PEPS projects.

Performed asset management to deliver strategies improving infrastructure performance throughout its service life.

Developed new and innovative design ideas for use on transportation projects to advance the state of the art.

Performed Life Cycle Cost Analyses for DB and P3 projects.

Researched material behavior and pavement surface characteristics, design, and construction.

The Pennsylvania State University – Principal Researcher and Instructor

Led multiple transportation projects sponsored by Federal Highway Administration (FHWA), Federal Aviation Administration (FAA), Pennsylvania Department of Transportation (PennDOT), National Science Foundation (NSF), and Geosynthetic Institute (GSI).

Instructed Civil Engineering Material and Soil Mechanics Laboratory, Soil Mechanics, and Pavement Engineering courses.

Temple University – Researcher and Teaching Assistant

Led a transportation project sponsored by Federal Highway Administration (FHWA) and Pennsylvania Department of Transportation (PennDOT).

Assisted instructing Civil Engineering Material and Soil Mechanics Laboratory and Construction Estimating courses.

Parket Construction Company, Tehran, Iran – Project Manager

Managed/led multiple construction and consulting transportation projects, which included design and analysis, project management and scheduling, bid preparation, etc.

Ettehad-Rah Consulting Engineers, Tehran, Iran – Project Engineer

Served as an engineer on multiple consulting transportation projects, which included road and pavement design and analysis, surveying, costing, and contract.

Editorships & Editorial Review Boards

ASTM Journal of Testing and Evaluation, Editorial Board Member, 2019-present

Research Grants

Geosynthetic Institute (GSI) Grant: “Evaluation of Effectiveness of Geotextile Separation in Preventing Migration of Fine Particles from Subgrade to Overlying Layers in Pavement Due to Cyclic Traffic Loading.”

Geosynthetic Institute (GSI) Grant: “Numerical Investigation on the Effectiveness and Durability of Geotextiles Against Migration of Subgrade Soil to Overlying Granular Layers in Pavement Systems.”

Peer Reviews

ASCE Journal of Geotechnical and Geoenvironmental Engineering

ASTM Journal of Testing and Evaluation

ASCE Journal of Cold Regions Engineering

International Journal of Pavement Engineering

ASCE Journal of Transportation Engineering, Part B: Pavements

Transportation Geotechnics Journal

Road Materials and Pavement Design Journal

Transportation Research Board (TRB)

Transportation Research Record (TRR)

Geo-Congress

International Foundation Congress & Equipment Expo (IFCEE)

Geo-Shanghai