

## **Special Issue on GeoEngineering in Face of Energy and Sustainability Challenges**

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This special issue is prepared based on selected papers presented at the 17<sup>th</sup> Great Lakes Geotechnical and Geoenvironmental Conference, which took place on May 24, 2012 at the campus of Case Western Reserve University, Cleveland, Ohio. The theme of the conference is *GeoEngineering in Face of Energy and Sustainability Challenges*. This proceeding contains 6 technical papers that cover a variety of topics related to the sustainable geotechnical and pavement engineering practice.

- In the paper 'Advancements in Drilled Shaft Construction, Design, and Quality Assurance: The Value of Research', Prof. Gray Mullins of University of Florida, USA describes a number of recent advancements in technologies that ensure the construction of durable drilled shafts. The paper was presented as a keynote talk during the conference.
- In the paper 'Advanced Ultrasonic Technology for Freezing Damage Prevention of Concrete Pavement', Professor Xiong (Bill) Yu of Case Western Reserve University, USA and his team describes the development of advanced ultrasonic technologies that measure the pore space characteristics and use it to mitigate the damages of concrete due to internal crystallization processes.
- In the paper 'Computer-Aided Design of Thermal Energy Harvesting System across Pavement Structure' describes the computer analyzes to optimize the design of a thermal energy harvesting system that utilize the heat on the road to produce the electricity.
- In the paper 'Incorporation of Subgrade Modulus Spatial Variability in Performance Prediction of Flexible Pavements', Prof. Abbas of the University of Akron, USA, describes the performance based pavement design method that considers the spatial variations in the subgrade modulus.
- In the paper 'Influence of Axial Loads on the Lateral Capacity of Instrumented Steel Model Piles', Dr. Lee of NHTB Corporation, USA and coauthors studied the influence of axial loads on the lateral capacity of pile from model scale experiments.
- In the paper 'Innovative Chromogenic Materials for Pavement Life Extension: Modeling Study of Surface Temperature of Sustainable Asphalt Pavement', Prof. Xiong (Bill) Yu of Case Western Reserve University, USA and his team describes the feasibility analyses using computer model on the use of chromogenic materials to control the surface temperature of pavement to ensure their longevity.

These papers present a balanced selection of efforts that contribute to the sustainability practice in geotechnical and pavement engineering. Special emphasis was placed upon innovative solutions for sustainable engineering practice.