



IRF
GLOBAL

Geotechnical Engineering for Resilient Road Construction

Dubai, UAE
May 20-23, 2024



Workshop



Geotechnical Engineering for Resilient Road Construction

May 20-23, 2024

Dubai, UAE

Background

This workshop is designed to provide a comprehensive knowledge of fundamental geotechnical concepts and principles used in the design and construction of resilient highways. Participants will be introduced to different soil properties and relevant ASTM testing techniques for soil properties identification. The workshop will introduce hydraulic concepts as pertinent to underground water table and its effect on soil properties and surface discharge (floods) and how to mitigate its impact on highway longevity through flood control measures. Different types of soils will be discussed including problematic soils. Different soil anomalies will be presented and different ground improvement techniques and methodologies will be explained to reduce potential damage on highway networks.

Learning Objectives

- ✓ To define and discuss geotechnical fundamental concepts to design and construct resilient roads
- ✓ Understand soil properties and their relevance to highway design
- ✓ Understand soil stresses, lateral earth pressure, and the role of underground water table
- ✓ Develop sufficient understanding of earth improvement techniques
- ✓ Introduce advanced subsurface exploration techniques and how to detect soil anomalies
- ✓ Introduce hydraulics concepts, and proper techniques to mitigate flood damage

Target Audience

- ✓ Road Authorities & Operators
- ✓ Road Design Consultants
- ✓ Road Contractors
- ✓ Asset Managers
- ✓ Infrastructure Engineers
- ✓ Maintenance Personnel
- ✓ Geotechnical and Pavement Engineers

Lead Instructor



Amin K. Akhnoukh, Ph.D., P.E.
Associate Professor
East Carolina University
Greenville, NC, USA

Dr. Amin K. Akhnoukh is an Associate Professor in the Construction Management Department at East Carolina University (ECU). Prior to joining ECU in August 2017, Dr. Akhnoukh worked as an Assistant and Associate Professor at the Construction Management & Civil and Construction Engineering at the University of Arkansas at Little Rock, a Senior Design Engineer at Dar El-Handasa, and an Engineer at Orascom Engineering, Cairo, Egypt. Dr. Akhnoukh's main research interests are in the fields of construction materials, with an emphasis on concrete and asphalt. Dr. Akhnoukh has an extensive teaching portfolio with more than 14 undergraduate and graduate level courses, including Structure Analysis, Mechanics of Materials, Soil Mechanics and Foundations, Reinforced and Prestressed Concrete, Flexible and Rigid Pavement Design, Sustainability in Construction, and Construction Quality. Dr. Akhnoukh is a registered Professional Engineer in the States of Arkansas and North Carolina and a registered Associate Constructor by the American Institute of Constructors, Virginia, USA. Dr. Akhnoukh has more than 75 refereed publications in prestigious journals and local and international conferences. Dr. Akhnoukh received research funding in excess of \$3.0 million as PI and Co. PI. His research is funded by the Arkansas Department of Transportation, the Arkansas Science and Technology Association, the Arkansas Space Grant Consortium, the North Carolina Department of Transportation, the National Science Foundation, and NASA. Dr. Akhnoukh supervised and graduated more than 20 Doctorate and Master students. Dr. Akhnoukh is a member of the American Society of Civil Engineers, American Concrete Institute, and Precast/Prestressed Concrete Institute. Dr. Akhnoukh is a Fellow of the International Road Federation (IRF) and the National Aeronautics and Space Administration (NASA).

Registration

- **2,000 USD IRF Members / Groups of 3 or more**
- **2,500 USD Non-IRF Members**



Seminar Hotel:

Jumeriah Creekside Hotel Al Garhoud, next to The Irish Village , PO Box 78377, Dubai, UAE
Al Garhoud, next to The Irish Village , PO Box 78377, Dubai, UAE

Website: <https://www.jumeirah.com/en/stay/dubai/jumeirah-creekside-hotel>

Registration: <https://www.irf.global/event/geo24-ws-dubai>

For any support, please contact: asmirnou@irf.global

For any question, please contact: melabyad@irf.global

Learning Modules

(Mon. – Thu. 9:00 AM – 4:00 PM)

May 20 : Soil Properties and ASTM Soil Testing Procedures

- Soil composition
- Soil properties
- ASTM standards and QC testing of soils

May 21: Soil Improvement Techniques

- Poor soil and problematic soils
- Role of underground water table
- Soil improvement techniques
- Compaction, partial replacement, full replacement of site soils

May 22: Soil Drainage, Lateral Support, and Soil Stresses

- Intro to hydraulics and drainage principles (flood control)
- Soil stresses, stress calculation, and lateral soil pressure
- Lateral soil support
- Case studies

May 23: Soil anomalies, subsurface investigation and impact on road design

- Soil anomalies
- Subsurface investigation (lightweight deflectometer, dynamic cone penetrometer, and ground penetrating radar)
- Types of roadway and pavement problems
- Soil and pavement remedies

GLOBAL

KNOWLEDGE • ADVOCACY • EDUCATION
BEST PRACTICES • BUSINESS OPPORTUNITIES

Better Roads. Better World.



IRF[®]
— GLOBAL —

International Road Federation

GLOBAL HEADQUARTERS & SECRETARIAT

Madison Place

500 Montgomery Street, Fifth Floor

Alexandria, VA 22314 USA

Telephone: +1 703 535 1001 Facsimile: +1 703 535 1007

REGIONAL OPERATIONS

Accra, Ghana | Nairobi, Kenya | Kuala Lumpur, Malaysia

TRAINING INSTITUTES

Alexandria, VA USA | Dubai, UAE | Zagreb, Croatia

www.IRF.global