GeomeEast 2019
International Congress and Exhibition on Sustainable Civil Infrastructures

3rd

Beyond The Horizon

10th-14th November 2019
Cairo Marriott Hotel, Egypt
Index

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Welcome Message

We are delighted to welcome you to the 3rd GeoMEast International Conference in November 2019. This is the third in this series of such conferences to be held in Middle East’s great cities. It is being held in Cairo located in the heart of the Middle East.

Our conference theme, Sustainable Civil Infrastructure: Beyond The Horizon, is broad and inclusive. We believe that this presents a multitude of opportunities for all parts of the industry (including consultants, contractors and materials and equipment manufacturers, as well as academics) and at all career stages to attend and to present papers.

A series of 30 keynote lectures, technical sessions, workshops, short courses, technical meetings and social visits, will be available to make this event the most interactive in the Middle East, if not the most interactive in the world.

The proceedings of GeoMEast 2019 have been published in 12 Edited volumes by Springer-DE, which will be indexed in EI and submitted for inclusion in ISI “Thomson Reuters”. In addition, some journal special issues will be published in some prestigious journals from selected best papers of the conference, however, authors need to expand and include materials that are at least 75% different than the accepted papers in the proceedings.

GeoMEast 2019 will provide some awards; such as: best paper awards, best presenter awards, best student presenter awards, industrial project, and others.

We do hope that you will enjoy your times here in Cairo!

Chairmen of the Organizer Community

Dr. Hany Farouk Shehata  
CEO & Founder of SSIGE

Prof. Khalid M. ElZahaby  
President of HBRC
Invitation

GeoMEast 2020
International Congress and Exhibition on Sustainable Civil Infrastructures

8th-12th November 2020
Sheraton Cairo Hotel

Abstract submission is NOW OPEN!
Exhibition booking is NOW OPEN!

Deadlines

- November 1, 2019: Open for Abstract submission
- Submit on: http://www.editorialmanager.com/suci
- February 15, 2020: Deadline for Abstract submission
- March 1, 2020: Notify authors of accepted Abstracts
- May 30, 2020: Deadline for Full Paper submission
- June 30, 2020: Notify authors of Accepted Papers
- July 30, 2020: Final Camera-Ready Papers
- November 8-12, 2020: Conference Days

www.geomeast.org
Important Complicated Question:
Some Geotechnical works and infrastructures were constructed without taking into consideration several factors; such as the soil-structure interaction and impact of earthquakes and others, and some of them were constructed without respect to any standards, however, these projects are still alive and didn’t fall. So why is the study of these effects? Why is the need of the standards?

Simple Answer:
Same reason people get sick .. and not all patients die!
Such structures are considered sick .. and not all sick structures fall!
We design all structures to be Healthy Non-Patients, so we must take all the considerations during the design of any structure.
People’s lives are not a game in order to put them at risk!

• A very warm welcome is given to all the attendees of the GeoMEast2019, the Official International Congress of the SSIGE!

SSIGE Mission:
To aid the Middle East’s overall growth through focused Geotechnical and infrastructure research, education and policies.

SSIGE Vision:
1- To provide a unique group within M.E for the interchange of ideas among Geotechnical and infrastructure researchers, educators, managers, and policymakers from the M.E and all over the world, with the intention of covering all modes and sectors, and having a special intention to cover all the soil-structure interaction topics.
2- To serve as a research and development group to guide and focus Geotechnical and infrastructure research, education, and policies in the M.E towards satisfying the countries’ needs and to assist in their overall growth.

• Doctrines of the Group:
• SSIGE works to provide a unique group within the Middle East for the interchange of ideas among Geotechnical and Infrastructure Researchers, Educators, Managers and Policy Makers from the Middle East and all over the world.
• We believe that, the design of any structure is considered a soil-structure interaction problem. So, civil engineers of the different disciplines should work together in analyzing and designing the different structures. The study of soil-structure interaction is not only a problem for Geotechnical engineers, but also for Geoscience, Geological, Structural, Transportation, and all Civil Engineers.
• Our belief is that the global climate-change studies and its effects on the infrastructures are now very important and will be critical in the near future. “The world is now experiencing unprecedented challenges ... Climate change is fast happening, much, much faster than one would have expected ... Climate and ecosystems are under growing strain.” – Ban Ki-Moon, Associated Press interview prior to the World Economic Forum, Jan. 2013 ,21.
• We also believe that the sustainable design of all structures is a must in the 21th century, which requires the cooperation between the different engineering disciplines; such as: Architecture, Geological, Civil, Urban planning, Energy and Chemical Engineering. The built environment assists as a dynamic interface through which the human society and the ecosystem interrelate and influence each other. Understanding this interdependence is a key to understanding sustainability.

There is a rising consensus that delivers a sustainably built environment starts with integrating sustainability throughout the planning, design and construction stages of a project.

www.ssige.org
The Housing and Building National Research Center «HBRC»
Belongs to the Ministry of Housing, Utilities and Urban Communities
Responsible for issuing the different Egyptian and Arabian Codes of Practice and Standards.

**History:**
On 21 June, 1954, a cooperation agreement on the establishment of the Institute for building researches in cooperation with the Department of Foreign Affairs of the United States of America’s Government was signed. Act No. 495 was issued on 23 September 1954 to establish the Institute for building researches in Egypt as an independent organization.

At the end of the year 1956, The U.S. government suspended its contribution to support the Institute yet the Egyptian government kept presenting it.
In 1964 the Institute was considered a qualitative institute for Building Research subjected to the Financial and management Regulations of the National Research Center. Several organizational amendments were made and remained affiliated with the Ministry of Scientific Research.

In 1971, decision number 1871 was issued from the Prime Minister stating the affiliation of the Institute to the Ministry of Housing, Utilities and Urban Development.

In 1977, presidential decree number 46 for the year was issued to establish the general organization of the Housing, Building, and Urban Planning Center and its headquarter in Cairo affiliated to the Minister of Housing and subjected to Act No. 46 for the year 1973.

On 16 February 2005, two presidential decrees No. 63 and No. 64 for the year were issued to reorganize the Housing and Building Center and its name become Housing and Building National Research Center affiliated to the Minister of Housing, Utilities and Urban Development. Besides, its headquarter in Cairo and the Chairman of HBRC has the right to establish other branches in governorates and new cities.

It consists of 11 institutes for different engineering disciplines, which include the Geotechnical Engineering Laboratory (GEL).

**Objectives:**
HBRC aims at developing a policy and general plan of research, studies and their implementation in the field of construction within the framework of the priorities that respond to community needs with particular attention to the national problems in HBRC work fields, HBRC considers what it needs for putting standards and criteria as well as for design and terms of construction and building works implementation regarding the building materials specifications. Moreover, HBRC assists the Engineering Sector with scientific systems which achieves better performance, low cost, more safety measures and environment protection.

[www.hbrc.edu.eg](http://www.hbrc.edu.eg)
Recent rapid construction in the Middle East has provided great opportunities for bridge, pavement, geotechnical, geological, tunnel all engineers to use their knowledge and talents to solve many challenging problems involving highways, bridge structures, pavements, materials, ground improvements, slopes, excavations, dams, canals and tunnels with innovative solutions and cutting-edge technologies. That will provide a showcase for recent developments and advancements in design, construction, and safety inspections of transportation infrastructures and offer a forum to discuss and debate future 21st century. Conference topics cover a broad array of contemporary issues for professionals directions for the pavement, Geomechanics, geo-environmental, geotechnical, geosciences, geophysics, tunnel, water structures, railway and emerging techniques for safety inspections.

**GeoMEast 2017**

GeoMEast 2017 in Sharm El-Sheikh, Egypt is marked with a Great Success in all aspects. It was an outstanding event with more than 600 attendees from 48 Countries.

**GeoMEast 2018**

GeoMEast 2018 in Marriott House Hotel, Egypt is marked with a Great Success in all aspects. It was an outstanding event with more than 1300 attendees from 65 Countries.
Announcement

Sustainable Civil Infrastructures
Editor-in-chief: H.F. Shehata

Sustainable infrastructure impacts our well-being and day-to-day lives. The infrastructures we are building today will shape our lives tomorrow. The complex and diverse nature of the impacts due to weather extremes on transportation and civil infrastructures can be seen in our roadways, bridges, and buildings. Extreme summer temperatures, droughts, flash floods, and rising numbers of freeze-thaw cycles pose challenges for civil infrastructure and can endanger public safety. We constantly hear how civil infrastructures need constant attention, preservation, and upgrading. Such improvements and developments would obviously benefit from our desired book series that provide sustainable engineering materials and designs. The economic impact is huge and much research has been conducted worldwide. The future holds many opportunities, not only for researchers in a given country, but also for the worldwide field engineers who apply and implement these technologies. We believe that no approach can succeed if it does not unite the efforts of various engineering disciplines from all over the world under one umbrella to offer a beacon of modern solutions to the global infrastructure. Experts from the various engineering disciplines around the globe will participate in this series, including: Geotechnical, Geological, Geoscience, Petroleum, Structural, Transportation, Bridge, Infrastructure, Energy, Architectural, Chemical and Materials, and other related Engineering disciplines.

Recently published:
M. Badr, A. Lotfy (Eds.)
Sustainable Tunneling and Underground Use
Proceedings of the 2nd GeoMEast International Congress and Exhibition on Sustainable Civil Infrastructures, Egypt 2018 – The Official International Congress of the Soil-Structure Interaction Group in Egypt (SSIGE)

S. El-Badawy, R. Abd El-Makim (Eds.)
Recent Developments in Pavement Design, Modeling and Performance
Proceedings of the 2nd GeoMEast International Congress and Exhibition on Sustainable Civil Infrastructures, Egypt 2018 – The Official International Congress of the Soil-Structure Interaction Group in Egypt (SSIGE)

M. Shehata, F. Rodrigues (Eds.)
Project Management and BIM for Sustainable Modern Cities
Proceedings of the 2nd GeoMEast International Congress and Exhibition on Sustainable Civil Infrastructures, Egypt 2018 – The Official International Congress of the Soil-Structure Interaction Group in Egypt (SSIGE)

Upcoming Volumes:
J. Wasowski, T. Dijkstra (Eds.)
Recent Research on Engineering Geology and Geological Engineering
Proceedings of the 2nd GeoMEast International Congress and Exhibition on Sustainable Civil Infrastructures, Egypt 2018 – The Official International Congress of the Soil-Structure Interaction Group in Egypt (SSIGE)

Submission information at the series homepage and springer.com/authors
Order online at springer.com or for the Americas call toll-free 1-800-SPRINGER or email us at customerservice@springer.com. For outside the Americas call +49 (0) 6221-345-4101 or email us at customerservice@springer.com.
Announcement

Editors-in-Chief:
D.H. Chen; K.M. ElZahaby

Manager & Executive Editor:
Hany Farouk Shehata

Innovative Infrastructure Solutions

• Presents studies exploring the disciplines of geotechnical engineering and sustainable civil infrastructure

• Helps to develop existing and new infrastructure which mitigates and adapt to climate change

• The official journal of the Soil-Structure Interaction Group in Egypt (SSIGE)

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Nick Barton: President of NB&A, Oslo, Norway
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Piergiorgio Grasso: President, GEODATA Engineering S.p.A., Italy
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Tamer M. Sorour: Ain-Shams University, Egypt
Tarek Abdoun: RPI, USA
Wissem Frikha: ENIT, Tunisia
-Registration:
  1st Day @ VERDI & THEBES
  2nd, 3rd & 4th Day @ SAKKARA

-Coffee Breaks (C.B) @ The Bridges
-Handling the certificates @SAKKARA from the 3rd day
Norma Jean Mattei, Ph.D., P.E. is professor and past chair at the University of New Orleans’ (UNO) Department of Civil and Environmental Engineering. She has been active in ASCE for more than 20 years in local, regional and national leadership roles and was elected by the Society’s membership as the 2017 ASCE President.

President Mattei sits on the executive committee of ASCE’s New Orleans Branch SEI/Structures Committee. The former Region 5 director has served on ASCE’s Committee on Diversity and Women in Civil Engineering and the Committee on Licensure and Ethics. ASCE has drawn on her expertise for a number of media relations activities, including an interview with National Public Radio’s “Morning Edition” on post-Hurricane Katrina conditions. Recently, she was spokeswoman for “Raised Floor Living,” a commercial that aired in the New Orleans’ region promoting elevation of residential structures above the flood plain.

In 2012, President Obama named Mattei one of three civilian members of the Mississippi River Commission, which researches and provides policy and work recommendations covering flood control, navigation and environmental projects. In that capacity, she helped oversee a drainage basin that covers 41 percent of the nation. The governor of Louisiana appointed her to the state’s licensing board for professional engineers -- LAPELS. She also serves on the board of directors for both the Louisiana Transportation Research Center Foundation and the Louisiana Technology Council.

Mattei has been a member of the UNO faculty since 1995. Her technical research interests include large watershed management, material and structural testing, sustainable reuse of spent construction and fabrication materials, and residual stress measurement. She is also interested in diversity, licensure and ethics issues.

Mattei earned a bachelor’s degree in civil engineering in 1982 and a doctorate in 1994, both from Tulane University.
Sunday
10 November 2019

Registration
- New & Pre-registration @ THEBES Hall @ VERDI Hall
- Invites
07:30 AM : 05:00 PM

Opening Ceremony (in Arabic) @ Aida Ballroom
09:00 AM : 11:00 AM
*Translation available; ask about the headset at the hall

Opening Exhibition @ Aida Foyer
11:00 AM : 11:30 AM

Kancheepuram N. Gunalan @ Aida Ballroom
11:30 AM : 12:10 PM
[ASCE Official lecture] to be delivered by ASCE Elected President 2020 called Future World Vision: Infrastructure Reimagined.
Chairs: N.J Mattei, Khaled El-Zahaby, Charles W.W. Ng

Fernando Branco @ Aida Ballroom
12:10 PM : 12:50 PM
[IABSE Official lecture] to be delivered by the president of the International Association for Bridge and Structural Engineering (IABSE).
Chairs: N.J Mattei, Khaled El-Zahaby, K. N. Gunalan

Charles W.W. Ng @ Aida Ballroom
12:50 PM : 01:30 PM
Chairs: N.J Mattei, Khaled El-Zahaby, K. N. Gunalan

Industry Talks @ Aida Ballroom
01:30 PM : 02:00 PM
GeoTech Egypt - TechFab India
Chairs: N.J Mattei, Khaled El-Zahaby, Mohamed Farouk

Lunch @ ALMAZ Restaurant
02:00 PM : 03:10 PM

Richard J. Bathurst @ Aida Ballroom
03:10 PM : 03:50 PM
Developments in MSE Wall Research and Design.
Chairs: N.J Mattei, Charles W.W. Ng, R. Kerry Rowe,

R. Kerry Rowe @ Aida Ballroom
03:50 PM : 04:30 PM
Chairs: N.J Mattei, Charles W.W. Ng, Dallas Little

Coffee Break @ Aida Foyer
04:30 PM : 05:00 PM

George E. Leventis @ Aida Ballroom
05:00 PM : 05:30 PM
From Super Tall, to Mega Tall, to?
Chairs: N.J Mattei, K. N. Gunalan, R. J. Bathurst

George Anastasopoulos @ Aida Ballroom
05:30 PM : 06:00 PM
Chairs: N.J Mattei, Dallas Little, Fernando Branco

Suzanne van Eekelen @ Aida Ballroom
06:00 PM : 06:30 PM
State of the art of geosynthetic-reinforced pile supported embankments.
Chairs: N.J Mattei, Dallas Little, R. Kerry Rowe

Gala Dinner "Ask about your Tickets"
@ ALMAZ Restaurant
07:30 PM
Monday
11 November 2019

Registration @ SAKKARA Hall 07:30 AM : 05:00 PM
Workshops @ VERDI Hall 11:30 AM : 01:30 PM
Geosynthetics Engineering @ THEBES Hall 09:00 AM : 06:30 PM
Workshops @ MEMPHIS Hall 09:00 AM : 01:00 PM
Introduction to Tunnel Engineering (Day One of Two) Courses @ Aida Foyer 02:30 PM : 06:30 PM
Courses @ MEMPHIS Hall 03:00 PM : 06:00 PM
Artificial Intelligence (AI) in Geotechnical Engineering Heinz Brandl @ Aida Ballroom 09:00 AM : 09:40 AM
Courses @ Aida Ballroom Long-term settlement (creeping) of soft soils, and ground improvement.
Chairs : N.J Mattei, Yuli Rigby, A.P.S. Selvadurai

Chaido Doulala-Rigby (Yuli) @ Aida Ballroom 09:40 AM : 10:20 AM
[Robert M. Koerner Honor lecture] A historic review from the mid-60’s original concept to today’s design and GOOD construction practice using site-won and other non-‘standard’ reinforced soil fills.
Chairs : N.J Mattei, A.P.S. Selvadurai, F. Tatsuoka

Fumio Tatsuoka @ Aida Ballroom 10:20 AM : 11:00 AM
Geosynthetic-reinforced soil structures for railways and roads (developments from walls towards bridges).
Chairs : N.J Mattei, Heinz Brandl, A.P.S. Selvadurai

Refresment @ Aida Foyer 11:00 AM : 11:30 AM
Pedro Simão Pinto @ Aida Ballroom 11:30 AM : 12:10 PM
Chairs : N.J Mattei, Yuli Rigby, Heinz Brandl

Louay Mohammad @ Aida Ballroom 12:10 PM : 12:50 PM
Durable Flexible Pavements: Emerging technologies and Trends.
Chairs : N.J Mattei, Sherif ElBadawy, P.Simão Pinto

A.P.S. Selvadurai @ Aida Ballroom 12:50 PM : 01:30 PM
Thermo-Hydro-Mechanical Processes in Complex Rocks: The Role of Multi-Phasic Approaches.
Chairs : N.J Mattei, P.Simão Pinto, Yuli Rigby

Kancheepuram N. Gunalan @ Aida Ballroom 01:30 PM : 02:00 PM
Understanding and Developing Geotechnical Performance Criteria
Chairs : N.J Mattei, P.Simão Pinto, A.P.S. Selvadurai

Lunch @ ALMAZ Restaurant 02:00 PM : 03:00 PM
1st parallel sessions @ Aida Ballrooms 03:00 PM : 04:30 PM
Coffee Break @ Aida Foyer 04:30 PM : 05:00 PM
2nd parallel sessions @ Aida Ballrooms 05:00 PM : 06:30 PM
Tuesday
12 November 2019

Registration

Workshops
Introduction to Tunnel Engineering (Day Two of Two)

Workshops
QA/QC Methods for Deep Foundations

Courses
Sustainability of Flexible Pavement in terms of Micro Crack Healing Concept.

Courses
The Design and Construction of Mechanically-Stabilized Earth Retaining Walls and Slopes Using Geosynthetic Reinforcement.

Adam Bezuijen
Slurry and foam to stabilize the front face during TBM tunnelling
Mechanisms in saturated sand.

Mario Manassero

Mourad Zeghal

Refreshment

Laureano Hoyos
Suction Stress Characteristic Curves of Cohesive-frictional Soils from Multiple Suction-controlled Testing Methods.

Alberto M. Scuero
A geomembrane liner to stop water seepage in an 8 km long embankment: the Bill Young reservoir case history.

Mounir Bouassida
Ground Improvement - Tunisian case histories.

Ragaa Abdelhakim
[Bright Spark Lecture] Laboratory and field investigation of moisture susceptibility of hot and warm asphalt mixes

Lunch

3rd parallel sessions

Coffee Break

4th parallel sessions
Wednesday
13 November 2019

Registration @ SAKKARA Hall 07:30 AM - 05:00 PM

Workshops
Pavement Workshop @ VERDI Hall 09:00 AM - 02:00 PM

Workshops
DFI Workshop @ THEBES Hall 09:00 AM - 02:00 PM

Courses
Geosynthetic-Reinforced Pile-Supported Embankments @ SALON VERT 09:00 AM - 05:00 PM

Courses
Design of Prestressed Concrete Bridges According to AASHTO LRFD Bridge Design Specifications @ MEMPHIS Hall 09:00 AM - 05:30 PM

Kent P. von Maubeuge @ Aida Ballroom 09:00 AM - 09:40 AM
Regulated groundwater protection in roads with geosynthetic barriers.
Chairs: N.J Mattei, Yasser Elmossallamy, Shehab Wissa, Yuli Rigby

Yasser Elmossallamy @ Aida Ballroom 09:40 AM - 10:20 AM
Limitations and Future Use of Soil Improvement in Soft Soil.
Chairs: N.J Mattei, K. P. V. Maubeuge, Hany El-Naggar, Walter Wittke

Shehab Wissa Agaiby @ Aida Ballroom 10:20 AM - 11:00 AM
[ Sherif Wissa Honor lecture] Mega Projects, Mega Geotechnical Challenges
Chairs: N.J Mattei, Yasser Elmossallamy, Sayed ElAraby, Ayman Fayed

Refreshment @ Aida Foyer 11:00 AM - 11:30 AM

Walter Wittke @ Aida Ballroom 11:30 AM - 12:10 PM
Tunnel and Dam Design accounting for the interaction of ground and structure.
Chairs: N.J Mattei, Chang-Yu Ou, Hany El-Naggar, M. Jamiolkowski

Hany El-Naggar @ Aida Ballroom 12:10 PM - 12:50 PM
Seismic Design of Soil-Metal Arch Bridges.
Chairs: N.J Mattei, Chang-Yu Ou, G. Russo, M. Jamiolkowski

Chang-Yu Ou @ Aida Ballroom 12:50 PM - 01:30 PM
Control of movement induced by deep excavation.
Chairs: N.J Mattei, M. Jamiolkowski, Walter Wittke, G. Russo

Exhibition Show @ Aida Ballroom 01:30 PM - 02:00 PM

Lunch @ ALMAZ Restaurant 02:00 PM - 03:00 PM

Gianpiero Russo @ Aida Ballroom 03:00 PM - 03:40 PM
Excavations in Napoli for the construction of new under ground lines: Effects on the surrounding civil structures including historical buildings
Chairs: N.J Mattei, M. Jamiolkowski, Walter Wittke, Hany El-Naggar

Samer Dessouky @ Aida Ballroom 03:40 PM - 04:20 PM
Sustainable and Safer Roadways through Innovative Energy Harvesting Solutions.
Chairs: N.J Mattei, Louay Mohammad, Sherif Elbadawy, Ragaa Abd El-Hakim

Michele Jamiolkowski @ Aida Ballroom 04:20 PM - 05:00 PM
Role of in-hole geophysical tests in geotechnical site characterization.

Coffee Break @ Aida Foyer 05:00 PM - 05:30 PM

Geosynthetic discussion panel and Exhibition closing @ Aida Ballroom 05:30 PM - 06:30 PM
Thursday
14 November 2019

One Full Day Cairo Social Tour ....
*Included in the registration fee*

**Great pyramids**
08:00 AM - 10:30 AM

**Mosque of Amr ibn al-As**
02:30 PM - 03:30 PM

**Ben Ezra Synagogue**
11:30 AM - 12:30 PM

**Khan el-Khalili**
04:30 PM - 06:30 PM

**The Hanging Church**
01:00 PM - 02:00 PM

**Returning Point**
- Back to Hotel Reception
08:00 PM

- Cairo Marriott Hotel shall prepare breakfast boxes for the attendees who are guests at hotel.
- The Tour includes lunch box for each attendee.
Parallel Sessions

**1st Parallel Sessions**

**Innovative Solutions for Deep Foundations**

Patrick Hannigan
- Use and Comparison of New QA/QC Technologies in a Test Shaft

Naveen Kumar Meena
- Finite Element Modeling of Soil Arching in Pile Supported Embankment: 2D Approach

Fady Safwat
- Development of Earth-Based Mortars for Usage in Earth Construction

Ivan Puig
- Assessment of earth retaining wall sustainability

**Advancements in Unsaturated Soil Mechanics**

Mohamed Abubakr
- Effect of fines and matric suction on the collapsibility of sandy soils

Alassal
- Stabilization of expansive soil reinforced with polypropylene and glass fiber in cement and alkali activated binder

Anasua GuhaRay
- On the consequences of microstructural evolution on macroscopic behavior for unsaturated soils

Hiram Arroyo
- Effects of Reynolds number and aspect ratio on the turbulence characteristics in developing and fully developed flow over a rough bed

**2nd Parallel Sessions**

**Innovative Solutions for Soil Structure Interaction**

Graziella Sebaaly
- Assessment of Liquefaction Potential Index Using Deterministic and Probabilistic Approaches—A Case Study

Abdallah Elgendy
- Effect of Low-Plastic Fines Content on the Properties of Clean Sand

Wen-Chieh Cheng
- Factors affecting lubrication of pipejacking in soft alluvial deposits

Arindam Dey
- Bearing capacity of square footing: a comparative study

**Advancements in Pavement Engineering**

Ndakhona Bashingi
- ICT for travel in Southern African Cities

Iñaki Prieto
- Novel approach for designing the deployment of urban wifi based on an urban 3d model and a web tool

Mostafa Radwan
- ANN-based Fatigue and Rutting Prediction Models versus Regression-based Models for Flexible Pavements

T.S. Rambabu
- Treatment of expansive soils using grouted columns

**Monday 11 November 2019**

**Chairs:**
- Hany El Naggar & Pedro Pinto
- Laureano Hoyos & A.P.S. Selvadurai
- Adam Bezuijen & Wen-Chieh Cheng
- Sherif Elbadawy & Ragaa Abd El-Hakim
Tuesday  
12 November 2019

3rd Parallel Sessions

Recent Research in Sustainable Structures  
@ Aida Ballroom 1  
03:00 PM : 04:30 PM

- **Aisha Jaber**  
  Non Linear Finite Element Modelling for R.C Arched Beams with opening strenghted with CFRP

- **Mohamed Darwish**  
  Development and Performance of Manual Technique used in Production of Compressed Earth Blocks

- **Omkar Powar**  
  Localized Effects due to Aerodynamic Modifications in Buildings: A State-of-Art Review

- **Radwa Mahmoud Mourad**  
  Exploration of Early Civilization through restoring structural stability of DJOZER Step Pyramid (Part II)

Recent Thoughts in Geoenvironmental Engineering  
@ Aida Ballroom 1  
03:00 PM : 04:30 PM

- **Akkouri Nacer**  
  The Impact of Recycled Plastic Waste in Morocco on Bitumen Physical and Rheological Properties

- **Reem Alqaisi**  
  Applications of Recycled Sustainable Materials and By-Products in Soil Stabilization

- **Ahmed Nasr**  
  Site Characterization of Al-Burrullus Clay Formations

- **Sana Simou**  
  Mechanical characterization of the adobe material: Case of the Chellah archaeological site

Sustainable Civil Infrastructures  
@ Aida Ballroom 3  
03:00 PM : 04:30 PM

- **Nora El-Gohary**  
  A Machine-Learning Approach for Semantic Matching of Building Codes and Building Information Models (BIMs) for Supporting Automated Code Checking

- **Ahmad Mousa**  
  Efficacy of Treatments on Coal Bottom Ash as a Cement Replacement

- **Mohamed Noureldin**  
  Seismic Fragility Evaluation of Retrofitted Low-Rise RC Structures

- **Han-Yong Jeon**  
  Review of Process Control and Assurance for Optimized Seaming Condition Optimization of Woven Geotextiles to Improve Stability in Soft Soil Structure

Various topics Geo-Engineering (1)  
@ Salon Vert  
03:00 PM : 04:30 PM

- **Arindam Dey**  
  Bearing capacity of square footing: a comparative study

- **Ahmed Mahmoud Hasan**  
  Characterization of Shear Strength and Compressibility of Diesel Contaminated Sand

- **Kennedy Onyelowe**  
  Oxides of Carbon Entrapment for Environmental Friendly Geomaterials Ash Derivation
4th Parallel Sessions

Innovative Solutions using Geosynthetics

- Swaraj Chowdhury: Effect of Strain Rate on Cyclic Behavior of Pond Ash Reinforced with Geocell
- Jose Miguel Muñoz: Geomembrane stress cracking resistance depending On the polymer used
- Peter Huang: Giant Geotextile Tube Applied to the Temporary Cofferdam Reclamation Construction for a New-Build Container Base at Harbor in Taiwan
- Ruiyu Zhang: A density-dependent constitutive model of rockfill as well as a dynamic contact technique for simulation of dynamic compaction with MPM

Latest Advancements in Underground Structures

- Abdelkareem Alzo'ubi: Effect of Joint Persistency on Large Rock Slope Behavior
- Hachay Olga: Defining the contours of combined elastic, anomaly dense and anomaly stressed hierarchical inclusions located into a block layered medium
- Safwan Chahal: Experimental investigations of two-way hinges in reinforced concrete members

Contemporary Issues In Geotechnical Engineering

- Venkata Gullapalli: Effect of soil structure interaction on free vibration characteristics of antenna structure
- Ragaa Abd El-Hakim: Quantifying Effects of Urban Heat Islands State of the Art
- Ahmad Mousa: Hydraulic response of an internally stable gap-graded soil under variable hydraulic loading: A coupled DEM-Monte Carlo
- Fayez Abdulla: Groundwater Numerical Modelling of Amman-Zarqa Basin-Jordan

Various topics Geo-Engineering (2)

- Jnanendra Mandal: Feasibility Study of Bagasse ash as a filling material
- Vinod Kumar Mauriya: Application of Bottom Ash as filter material in construction of Dyke embankment for Sustainable Infrastructure
- Saad Sarsam: Impact of Aeration and Curing Periods on Shear Strength of Asphalt Stabilized Soil
- Muhammad Hamzah: A Case Study on Buckling Stability of Piles in Liquefiable Ground for a Coal-Fired Power Station in Indonesia
Kancheepuram N. Gunalan
Ph.D., P.E., D.GE, F.ASCE
ASCE President-Elect 2020

Guna graduated from Texas Tech University with a Ph.D. in Civil Engineering (Major: Geotechnical/Structures, Minor: Geosciences/Soil Science). Guna started his consulting career in Lubbock, Texas with Terra Testing, Inc. and for the next 12 years developed his technical and management skills while also becoming actively engaged with ASCE. He eventually served as the President of the High Plains Branch of the Texas Section. He took the opportunity to serve as the Chair of the Geotechnical Group of the Utah Section and was fortunate enough to get involved in some major projects. Guna served as the Technical Support Manager on the $1.529 billion I-15 Reconstruction Project that received an ASCE OPAL award. He served as Utah Section President during the 150th anniversary of ASCE and volunteered for the 2002 Winter Olympics. Guna rose to serve ASCE at both the regional and national levels, and chaired the 2014 Global Engineering Conference in Panama City, Panama during the 100th anniversary of the opening of the Panama Canal that was held in conjunction with the Engineers Without Borders Conference.

IABSE
(International Association for Bridge and Structural Engineering)

Professor Fernando Branco, assumed office on November 1, 2016, as president of the International Association for Bridge and Structural Engineering (IABSE), for the period 2016-2019. Fernando Branco is a full-time professor and former president of the Civil Engineering Dept. IST - University Lisbon. He left recently the Presidency of the European Council of Civil Engineers (ECCE) and he is currently a partner of GATEWIT - Construction Information Technologies and of SACIV, Ld.- Civil Engineering Services. His fields of expertise are bridge design, maintenance and rehabilitation, and new materials, and has been a consultant for major Public Works such as the S. João Bridge, Vasco da Gama Bridge in Portugal and the Macau-Taipa Bridge, China. Being simultaneously an academic and a bridge consultant, he joined IABSE in the late 1980’s because of the quality of IABSE’s journal Structural Engineering International (SEI) and the very interesting conferences, where he felt and as he feels today, to be updated with the recent innovations in structural engineering.
Honorable Professor

Harry G. Poulos
AM FAA FTSE Hon FIEAust Dist M ASCE

Professor Harry Poulos’ pioneering work in pile foundation analysis and design has enabled the world’s geotechnical specialists to have a greater understanding of the way structures interact with the ground. His research has enabled a more reliable approach to be adopted for pile design, replacing procedures which previously relied purely on experience and empiricism. Professor Poulos has applied his research to a wide range of major projects, both in Australia and overseas, including buildings, bridges, tunnels, freeways, mines, airports offshore structures (e.g. oil rigs) and earthquake-related problems. Professor Poulos’ work includes the Emirates Twin Towers in Dubai.

Speakers of Honor lecture

Charles W.W. Ng
(2017-2021) President of the International Society for Soil Mechanics and Geotechnical Engineering

Energy Pile Foundations
Demand is evidently increasing for energy, clean energy in particular, to support population growth and economic development worldwide. According to many studies, the world reserves of fossil fuels are likely to be exhausted within the next century. It is therefore imperative to seek alternative renewable resources, or at least reduce our current consumption of natural resources while alternative energy is being sought. One way to reduce global energy consumption is to make greater use of energy pile foundations. According to Brandl (2006), energy piles can reduce energy consumption for thermal comfort in buildings by up to 75% in some countries.

Robert M. Koerner
Emeritus Professor of Civil Engineering at Drexel University

Dr. Robert M. Koerner’s interest in geosynthetics spans thirty-five years of teaching, research, writing and consulting. He holds his Ph.D. in Geotechnical Engineering from Duke University. He is a registered Professional Engineer, a Distinguished Member of ASCE, a Geotechnical Engineering Diplomate, and an Honorary Member of the International Geosynthetics Society and a member of the U.S. National Academy of Engineering.

Chaido Doulala-Rigby (Yuli)
Chartered Engineer (CEng) and a Fellow of the Institution of Civil Engineers (FICE)

Celebrating Reinforced Soil Structures: A historic review from the mid-60’s original concept to today’s design and GOOD construction practice using site-won and other non-‘standard’ reinforced soil fills. This lecture will give a historic insight on how HDPE geogrid RSRW Systems have evolved in the past 40 years through presenting 10 different case studies, showcasing different types of non-standard reinforced fills including both site-won and purpose made reinforced fill, the challenges they presented and the lessons learned.
Honor lectures

Professor Braja Das is the Dean Emeritus of the College of Engineering and Computer Science, California State University, USA. He is a geotechnical engineering by profession and received his Ph.D. degree in 1972 from the University of Wisconsin, Madison, USA. For more than three decades, Professor Das has worked as a faculty member and in academic administration in several universities. He is a Fellow and Life Member of the American Society of Civil Engineers; Life Member of the American Society for Engineering Education; and Emeritus Member of TRB’s AFS-80 Committee on Stabilization of Geomaterials and Stabilized Materials.

Design Through Case Histories of New Tagus Bridge and Leziria Bridge

In this lecture, pile foundation design and soil-structure interaction are referred. The ultimate limit states and serviceability limit states are introduced. The potentially liquefiable soils and remedial measures are addressed. Two case studies related with pile design of New Tagus bridge based in pile load tests and the pile design and liquefaction potential evaluation of Leziria bridge foundations are presented. Some conclusions are drawn.

Dr. Giroud, Chevalier in the Order of the Légion d’Honneur and a former professor of geotechnical engineering, is a consulting engineer, member of the US National Academy of Engineering, Doctor Honoris Causa of the Technical University of Bucharest, Past President of the International Geosynthetics Society (IGS), Chairman Emeritus and founder of Geosyntec Consultants, and Chairman of the Editorial Board of Geosynthetics International. Dr. Giroud has authored over 400 publications. He coined the terms “geotextile” and “geomembrane” in 1977.

From the Design of Bottom Landfill Liner Systems to the Impact Assessment of Contaminants on Underlying Aquifers: A long-lasting research activity has been developed at the Politecnico di Torino since the 90’s in order to set up an advanced & comprehensive design approach for the definition & optimization of the bottom lining system profiles for solid waste landfills, with particular reference to the mineral barriers. Recently, particular attention has been devoted to the characterization of the Geosynthetic Clay Liners (GCLs) in terms of their hydraulic, diffusive and osmotic properties versus the containment & self-healing performances assessed through the coupled flows theory (Mitchell, 1990).
Abdel-Ghaffar graduated in 1970 from Cairo University with a B.S. degree in civil engineering. After working for two years as an instructor in structural engineering, he attended the California Institute of Technology, where he earned a master’s degree in civil engineering in 1973 and a Ph.D. with an emphasis on structural dynamics and earthquake engineering in 1976. Abdel-Ghaffar’s pioneering research at Caltech as a doctoral student under Prof. George Housner brought him international recognition in the then-emerging field of sensor-based monitoring of long span flexible bridges.

Hydro Micromechanical Modeling and Simulation of Saturated Granular Soils Under Extreme Conditions

This lecture presents a hydro-micromechanical (continuum-discrete) approach to modeling saturated granular soils. The fluid phase is idealized using volume-averaged Navier-Stokes (VANS) equations. The numerical solution of these equations is tackled using the Lattice Boltzmann Method (LBM). This method employs fine lattice meshes and is highly effective in accommodating complex boundary conditions. The LBM is modified and adapted to solve the VANS equations.

Mourad Zeghal
Professor, Civil and Environmental Engineering

Dr. Agaiby culminated his High School education with the highest honours, achieving the highest overall grades for his year in Bahrain. He continued to excel and graduated with highest honours from Cairo University, Egypt, earning his BSc and MSc degrees in Civil Engineering in 1983 and 1987, respectively. He subsequently moved to Cornell University, Ithaca, New York, to study for a Ph.D., which he was awarded in 1991. After a brief but valiant fight with cancer, He passed away gracefully in London on the 20th of August 2019.

Mega Projects, Mega Geotechnical Challenges

Over the past decades, the number of mega projects increased all over the world with an expectancy to exponentially increase in the near future. Mega projects are significantly more complex if compared to normal developments as they may involve many stakeholders, large and extended sites, substantial investment costs and time. One of the main sources of uncertainties in these projects is the high probability of unforeseen geotechnical conditions which may increase their relatively huge costs and/or delay their successful completion.
Keynote lectures

(Alphabetizing by First Name)

Adam Bezuijen
Chairman TC 204
ISSMGE
Ghent University-
Deltareas

Alberto M. Scuero
Chairman & Executive
President, CARPI TECH,
Switzerland

A.P.S. Selvadurai
Professor in the
Department of Civil En-
gineering and Applied
Mechanics, McGill Uni-
versity, Montréal,
Canada

Chang-Yu Ou
President of Chinese
Taipei Geotechnical
Society

Adam Bezuijen is professor in soil mechanics and geo-
technics at Ghent University in Belgium and part-time
senior specialist at Deltases, Delft, the Netherlands. He
worked fulltime at Deltases before becoming a professor.
At Deltases he was involved in research on revetments,
dredging, tunnelling, geotextiles and model testing and
was the scientific coordinator of the geotechnical cen-
trifuge of Deltases. He is chair of the ISSMGE technical
committee TC204 “Underground construction in Soft
ground” and member of TC104 “Physical Model Testing”.

A.Scuero graduated in Hydraulic Civil Engineering at Tu-
rin Polytechnic in Italy. After working for major civil en-
gineering construction companies in Italy and Africa, in
1986 he joined CARPI, a private Dutch group that works
in the field of waterproofing with geosynthetics. He has
been involved in research on geomembrane technolo-
gies, for which he invented and holds several patents, in
design and application of waterproofing geomembrane
systems to all types of hydraulic structures, including
120 large dams

A.P.S. Selvadurai obtained his PhD degree in Theo-
retical Mechanics from the University of Nottingham,
under the tutelage of the world-renowned continu-
um mechanicist, the late A.J.M. Spencer. In 1986 the
University of Nottingham awarded him its first ever
research DSc in Theoretical Mechanics. He was Profes-
sor and Chair of the Department of Civil Engineering at
Carleton University, Ottawa, 1982 to 1991, and from
1993 to 1997, the Chair the Department of Civil En-
gineering and Applied Mechanics at McGill University.

Chang-Yu Ou is Professor of Construction Engineering
at the National Taiwan University of Science and Tech-
nology in Taipei. Professor Ou’s focus of research is on
studies of soil behaviour and excavation problems and
he has published many journal and conference papers
on these subjects. In parallel to his academic career, he
has worked closely with industrial builders, taking part
in many large-scale excavation projects, gaining valua-
ble practical experience in analysis and design.
He received the degree of PhD in Geotechnical Engineering, University of Tokyo 1973 & is Prof. Emeritus of University of Tokyo and Tokyo University of Science. He was Vice President, ISSMGE (2001-2005); President, Japanese Geotechnical Society (2007-2008); Vice President, Japanese Society for Civil Engineers (2005-2006); and Vice President and President, International Geosynthetic Society (2002-2006; 2006-2010) specialized in the deformation, strength characteristics of geomaterials, ground improvement & geosynthetic-reinforced soil.

Prof Russo born in Pompei in 1967, graduated in Civil Engineering in Naples in 1992 with the highest honors cum laude. In 1992, resulted first in the competition for admission with a scholarship to the PhD course in Geotechnical Engineering – Univ. Roma-La Sapienza and Napoli Federico II. In 1996 he obtained the title of Doctor of Philosophy, and in 1997 he was awarded with a scholarship for a post-doctoral research topic jointly with the University of Ghent (Belgium) on the experimental behavior of piled foundations.

He is a Mechanical Engineer with an MSc and a PhD in Applied Mechanics from Northwestern University. He is member of ISO TC176 and CASCO committees who developed the new ISO 9001 and ISO/IEC 17025. He is awarded with the EOQ Presidential Georges Borel Award for international achievements in quality. He participated in consulting and research projects in USA, European Union and many other countries worldwide.

George Leventis serves on the Board & Executive Committee of Langan, a 1,000+ consulting engineering firm & is Managing Principal of the firm’s New York office. Also, as Managing Director of Langan International, he spearheaded opening offices in the Middle East & London. Between 1998 and 2001, George served as Director General of the Organizing Committee for the Athens 2004 Olympic Games. He holds a BS in Civil Engineering from National Technical University of Athens & an MS in Geotechnical Engineering from UIUC.
Dr. Hany El Naggar is an Associate Professor of Geotechnical Engineering at Dalhousie University with more than 24 years of experience in civil construction, geotechnical and structural engineering and research in Canada and overseas. He has participated in several geotechnical and structural investigations and is experienced in analysis and design of foundations and soil-structure interaction of buried infrastructure.

Prof. H. Brandl has been Full Professor for Soil and Rock Mechanics and Foundation Engineering (including Tunnelling) since 1977, chairing until 2009 the prestigious Institute for Soil Mechanics and Geotechnical Engineering, which was founded by Prof. Karl Terzaghi in 1928 at the Vienna University of Technology. Since 2008 he is Prof. Emeritus. Professor Brandl authored about 580 scientific publications (including 21 books), partly published in 18 languages.

Kent von Maubeuge studied civil engineering and also obtained his Master of Science degree. For more than 25 years, he has been an active member of various associations, such as DIN, CEN and ISO. He is also a member of ASTM International and is especially involved as chairman (D35.04) in standards for GCLs. He also serves as Chairman for CEN TC189/WG6 Barriers and the Technical Committee IGS Barrier Systems. He has chaired both ASTM past workshops on GCLs.

Kent von Maubeuge studied civil engineering and also obtained his Master of Science degree. For more than 25 years, he has been an active member of various associations, such as DIN, CEN and ISO. He is also a member of ASTM International and is especially involved as chairman (D35.04) in standards for GCLs. He also serves as Chairman for CEN TC189/WG6 Barriers and the Technical Committee IGS Barrier Systems. He has chaired both ASTM past workshops on GCLs.
Louay Mohammad
Professor at Louisiana State University, USA
Dr. Mohammad has been recognized with the 2013 Best Paper Award of the 8th International Conference on Road and Airfield Pavement Technology, 2010 Distinguished Research Paper of the Journal of Engineering Research, the 2009, 2012, and 2015 Asphalt Rubber Ambassador Award, and the 2002 Association of Asphalt Paving Technologists Board of Directors Award of Recognition.

Michele Jamiolkowski
Professor Emeritus, Technical University of Torino
-Academic Records:
-1971-1979 Associate Professor,
-1980-2007 Full Professor of Geotechnical Engineering, Technical University of Torino.
-Since 2008 Emeritus Professor of C.E. Technical University of Torino.
-Founder and Chairman of the Engineering Consultant Company, Studio Geotecno Italiano.

Mounir Bouassida
Appointed Board Member, ISSMGE
Bouassida is a professor of civil engineering at the National Engineering School of Tunis (ENIT) of the University of Tunis El Manar where he earned his B.S., M.S., Ph.D., and doctorate of sciences diplomas, all in civil engineering. He is the director of the Research Laboratory in Geotechnical Engineering and Georisk. Dr M. Bouassida has supervised 20 Ph.D. and 30 master of science graduates. His research focuses on soil improvement techniques and behavior of soft clays.

R. Kerry Rowe
Canada Research Chair in Geotechnical and Geoenvironmental Engineering at Queen’s University in Kingston Canada.
Rowe has published extensively, including two books and has 40 years research and consulting experience in embankments of soft soil, soft ground tunnelling, geosynthetics, waste management, and geoenvironmental engineering. He is a past president of the International Geosynthetics Society, a foreign member of the US National Academy of Engineering, and a Fellow of The Royal Society of London. Rowe worked as a geotechnical engineer with the Australian Government Department of Construction prior to emigrating to Canada in 1978.
Keynote lectures

Richard J. Bathurst
Professor of Civil Engineering at the Royal Military College of Canada

Samer Dessouky
Prof, University of Texas at San Antonio, USA

Suzanne van Eekelen
Expert in geotechnical engineering and geo-synthetic reinforcement and piled embankments at Deltares

Walter Wittke
Global Expert of Rock Mechanics and Tunnel Engineering

Dr. Bathurst (BSc., MSc., Ph.D. 1986 Queen’s) is Professor of Civil Engineering at the Royal Military College of Canada where he has taught since 1980. He also holds a cross-appointment with the Civil Engineering Department at Queen’s University. He has been an Adjunct Professor of Civil Engineering at the University of Waterloo and Ryerson University (Canada) and Edith Cowan University in Australia. He was visiting Distinguished Scientist at King Abdulaziz University, Jeddah, Saudi Arabia in 2013-14.

Dr. Samer Dessouky is a professor of Civil and Environmental Engineering at University of Texas at San Antonio. He has more than 18 years of research experience in highway construction materials, sustainability and traffic safety. His research is sponsored by the City of San Antonio, Texas DOT, U.S. DOT, Federal Highway Administration, CPS energy and others. He is the author of more than 100 refereed publications on pavement management, energy harvesting and motorists safety.

Dr. Suzanne van Eekelen received her MSc and PhD degrees in Geotechnical Engineering from the Delft University of Technology, Netherlands. She is a researcher in geotechnical engineering and an expert in the field of ground improvement, geosynthetic reinforcement and geosynthetic-reinforced pile-supported embankments. She is chairing the Dutch working groups ‘Design Guideline Geosynthetic-reinforced Piled Embankments’ and ‘Design Guideline Retaining walls and abutments of reinforced soil’.

Walter Wittke is a visionary and a devoted engineer. The Professor Emeritus and founder of the engineering company WBI lives for his family and for his profession. Educated as structural engineer, he dedicated his professional life to geotechnical and rock mechanical engineering. As one of the pioneers in rock mechanics, back in the 1970ies, he started to develop models for the realistic description of the behavior of jointed rock masses under consideration of discontinuity characteristics, and implemented these in numerical codes.
Prof. Yasser has been a researcher and consultant since 32 years. His work includes among others the application of numerical modeling and analyses in geotechnical projects. He has a wide experience by the design and construction of raft and piled raft foundations of high-rise buildings and bridge foundation. He has shared a lot of mega projects in different countries especially in Germany, China, Turkey, Egypt, Saudi Arabia, Kuwait UAE and Jordanian.

Dr. Abdelhakim professor at Tanta University, Egypt. She received a BSc degree with honor in Civil Engineering (Structural Engineering) from Tanta University, Egypt. Dr. Abdelhakim pursued her MSc and PhD Degrees at Tanta University in Civil Engineering (Public Works Engineering). She worked as an assistant Professor in civil Engineering Department, Faculty of Engineering, Delta University for Science and Technology from June 2010 until January 2014. She started working in Tanta University since 2014, and she was a Fulbright visiting scholar at Texas A&M University in the Academic year 2017/2018.
1-Introduction to Tunnel Engineering

**Day 1 - 11 November 2019 (09:00 AM - 06:30 PM)**

- **09:00-09:15** Philosophy of Tunnelling
- **09:15-09:30** Hard Ground Vs Soft Ground Tunnelling
- **09:30-11:00** Introduction to Fundamentals of Rock Mechanics related to Tunnelling
- **11:00-11:30** Tea break
- **11:30-13:00** Tunnel Construction Techniques
  - An Overview of Tunnel Construction Techniques
  - Tunnel Construction Techniques in Soft Ground
  - Cut-&-Cover Method
- **13:00-13:30** Drill & Blast Method (to be continued after lunch)
- **13:30-14:30** Lunch break
- **13:30-14:15** Drill-&-Blast Method (contd.)
- **14:15-15:15** TBM Tunnelling
- **15:15-16:30** Approaches for Tunnelling
  - New Austrian Tunnelling Method (NATM)
- **16:30-17:00** Tea break
- **17:00-18:30** Tunnel Support Design
  - Rock Mass Classification
  - Convergence-Confinement Method
  - Tutorials (RocSupport)
- **13:30-14:30** Lunch break
  - Numerical Methods of Analysis & Design of Tunnels using various software from Rocscience
- **14:30-14:45** Introduction to FEM
- **14:45-15:30** Design of Tunnel Supports - RS2 tutorials
- **15:30-16:00** Design for gravity driven failure(structurally controlled failure) - Unwedge Tutorials
- **16:00-16:30** Tea break

**Day 2 - 12 November 2019 (11:30 AM to 06:00 PM)**

- **11:30-12:15** Tunnel Support Design
  - Rock Mass Classification
- **12:15-12:45** Convergence-Confinement Method
- **12:45-13:30** Tutorials (RocSupport)
- **13:30-14:30** Lunch break
  - Numerical Methods of Analysis & Design of Tunnels using various software from Rocscience
- **14:30-14:45** Introduction to FEM
- **14:45-15:30** Design of Tunnel Supports - RS2 tutorials
- **15:30-16:00** Design for gravity driven failure(structurally controlled failure) - Unwedge Tutorials

**Miscellaneous Topics**

- **16:30-18:00** Two or three topics will be presented out of the following list, based on availability of time and preference of the participants:
  - Shotcrete Technology
  - Challenges of Urban Tunnelling
  - Tunnel Instrumentation
  - Tunnel Grouting
  - Tunnelling through Squeezing Ground Condition
  - Tunnel Soft Eye
  - In situ Stress

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**Manoj Verma**


is a specialist in tunnelling and rock engineering with over 35 years of extensive experience with infrastructure projects in India and overseas. With international recognition and proven track record in his core areas of rock engineering and underground structures, he is currently an independent consultant focussing on these areas. He is a dynamic leader who effectively combines his passion and strong technical skills to deliver engineering services of high quality to time and budget. His international positions include Vice President on global Board of ISRM (2011-2015) and President, International Commission on Hard Rock Excavation (2011-2019).
2-Geosynthetics Engineering

Fumio Tatsuoka
11:30 AM to 12:00 PM
Research and construction of GRS bridge abutments and GRS integral bridge


Adam Bezuijen
12:00 PM to 12:30 PM
Impact of stones on geotextiles, experiments and failure mechanism

As a professor in Ghent, professor Adam guides PhD and Post-doc research on tunnelling, piled embankments, geotextile reinforcement, polymer treated bentonite and backward erosion piping. He is chair of the ISSMGE technical committee TC204 “Underground construction in Soft ground” and member of TC104 “Physical Model Testing”.

Han-Yong Jeon
12:30 PM to 1:00 PM
Sustainable Geosynthetics with Environmental Adaptive and Eco-Friendly Concepts to consider Field Application and Functions

Dr. Han-Yong Jeon is a Prof. of Inha University, Incheon, Korea(Rep.), and a geosynthetics/technical organic materials researcher. He was the 32nd President of Korean Fiber Society (2014~2015) and the 6th President of Korean Geosynthetics Society (2011~2013). He has published more than 890 proceedings and abstracts in domestic and international conferences. His research is focused on the Manufacturing, Application and Evaluation of Technical Organic Materials/ Manufacturing, Evaluation, Standardization & Regulation of Geosynthetics/Environmental and Structural Polymeric Composites etc. He wrote 21 texts including ‘GEOSYNTHETICS’ and also published 149 papers in domestic & international journals.

Kent P. von Maubeuge
01:00 PM to 01:30 PM
Why geosynthetic barriers are so important and what to consider

Kent has published and presented many international papers on geosynthetics and has contributed to numerous conferences as chairman throughout the world. For a German geosynthetics manufacturer (NAUE) he is senior Director of Product Marketing/Management and is also involved with international concerns. Further involvement in the geosynthetic industry includes: Task group leader ISO 221 WG6/PG9 Designing with Barriers, BoA Geosynthetic Institute, IGS Council member and member of the Technical Advisory Committee Geosynthetics (IFAI).
3-QA/QC Methods for Deep Foundations
Quality Assurance and Quality Control (QA/QC) Methods for Deep Foundations

Dynamic pile testing (high strain dynamic testing) and interpretation techniques
- Capacity estimation
- Hammer system performance
- Pile driving stresses
- Structural integrity
- CAPWAP method
- References in codes
- Dynamic and static load tests correlations
- Special considerations for pile capacity estimation
- Case Histories

Thermal integrity profiling
- Thermal Integrity Profiling (TIP) Background
- TIP testing configurations
- TIP testing advantages
- Case histories

- Low strain pile integrity testing
  - Test description
  - Advantages and limitations
  - Sample results – good vs. defective piles
  - Case histories and correlation of PIT vs PIR

- Cross-hole sonic logging testing
  - Testing technique
  - Typical results for uniform and defective piles
  - Defect resolution – SSL vs. CSL
  - Case histories

- Shaft quantitative inspection device [SQUID]
  - Quantitative assessment of bored pile’s base
  - Applications goal and use
  - Data collection, typical results and interpretation
  - Case histories

Dr. Hazem Sarhan

Dr. Hazem Sarhan, is a Projects Director with 20 years’ experience in projects in maritime, oil and gas, power generation, petrochemicals, industrial and liquefied natural gas plants. Dr. Sarhan graduated with Honors from Cairo University, earned his MSc. in Civil Engineering and commenced his career in the same University. He earned his Ph.D. in Geotechnical Engineering from the University of Houston, Texas. He worked in Bechtel Oil and Gas hub in Houston has exposed him to multitude of engineering and construction challenging assignments in North America, West Africa, Egypt and Trinidad & Tobago. Dr. Sarhan joined Artelia in 2007, where his experience has expanded in the maritime, ports, and oil and gas industries in the GCC countries managing projects in UAE, Oman, Bahrain and Kuwait. Dr. Sarhan combines strong technical aptitude with a seasoned experience in design, construction and management of large, multidisciplinary and complex projects. He has a proven record of coordinating and motivating the efforts of diverse engineering teams to deliver solutions for challenging assignments.
4-Pavement workshop  ☕ Refreshment  11:00 AM to 11:30 AM

Louay Mohammad

09:00 AM to 10:00 AM
Durable Flexible Pavements: Emerging technologies and Trends

Dr. Mohammad currently serves as the Flexible Pavement Section Editor of ASCE Journal of Materials in Civil Engineering, Associate Editor of the Journal of Engineering Research & International Journal of Pavement Research & Technology. He has been recognized with the 2013 Best Paper Award of the 8th International Conference on Road & Airfield Pavement Technology.

Samer Dessouky

10:00 AM to 11:00 AM
Innovative Energy Harvesting Technologies for Smart Roadways Applications

Dr. Samer Dessouky research is sponsored by the City of San Antonio, Texas DOT, U.S. DOT, Federal Highway Administration, CPS energy and others. He is the author of more than 100 refereed publications on pavement management, energy harvesting and motorists safety. Along with his students he received several national awards such as the best green engineering technology award by ASCE in 2016 and 2017.

Sherif El-Badawy

11:30 AM to 12:30 PM
Polymer Modified Asphalt

Sherif El-Badawy is associate professor at Mansoura University, Egypt. He serves as the director of Highway and Airport Engineering Laboratory, Director of the Center of Scientific, Experimental, and Technical Services, Mansoura University. He received a BSc degree with honor in Civil Engineering and MSc from Mansoura University, Egypt.

Wen-Chieh Cheng

12:30 AM to 01:30 PM
Cutting-Edge Jet-Grouting Technology.

-2012-2013, Adjunct Professor, Department of Civil Engineering, National Taipei University of Technology
-2013-2017, Tunnel Engineer, Geotechnics, Ove Arup & Partners HK Ltd
-2016-2017, Visiting Scholar, Department of Civil Engineering, Shanghai Jiao Tong University
2017-Present, Professor, School of Civil Engineering, Xi’an University of Architecture and Technology

Emad Sharif

01:30 AM to 02:00 PM
The new application of dynamic plate loading test in pavement works for fast quality control

Born in 1958 in Palestine. Obtained B.Sc. Degree in Civil Engineering from Alexandria University in Egypt in 1982 and obtained Master’s Degree in Geotechnical Engineering from Stanford University, California, U.S.A in 1984. Emad became a lecturer in Birzeit University, Ramallah - West Bank in the Civil Engineering Department for 10 years from 1984 to 1994.
Workshops

5-DFI workshop

Patrick Hannigan
PDI - USA
New Innovations and Improvements in Bored Pile QA/QC Methods

Ahmed Abdullah
Sr. Project Manager, BAUER International FZE
Deep Tunnel Storm Water System Terminal Pumping Station & Sea Outfall

MAN BUITAN
GTC – Lab - Dubai
Advanced Geotechnical Laboratory Testing and Applications

Salah Al Dilimi
DFI Helical Piles Committee
Helical Piles and Anchors, history, theory, design and practical applications

Sean Beirne-Lewis
Dywidag - DSI (Germany)
Topic on Micro piles - Soil Nails- ground anchors

Marcel Bielefeld
Allmanics / Verbeek Management Services (USA)
Rapid Load Testing - the latest developments.

Marwan M. Alzaylaie
Dubai Development Authority (DDA) Dubai
Modulus of Deformation of soft rock of Dubai -back analysis of pile load tests for rock modulus-
1-Artificial Intelligence (AI) in Geotechnical Engineering

Course Outline

Methodologies of Different AI models:
- Artificial Neural Network
- Support Vector Machine
- Relevance Vector Machine
- Least Square Support Vector Machine
- Adaptive Neuro Fuzzy Inference System
- Genetic Programming
- Emotional Neural Network
- Functional Network
- Extreme Learning Machine
- Multivariate Adaptive Regression Spline
- Minimax Probability Machine Regression
- Gaussian Process Regression
- Deep Learning

Application:
- Determination of bearing capacity and settlement of pile foundation and shallow foundation
- Prediction of seismic liquefaction potential of soil
- Determination of stability of soil slope and rock slope
- Estimation of pullout capacity of ground anchor
- Rock engineering
- Geoenvironmental
- Determination of reliability index of geostructure
- Site characterization
- Earth retaining structure
- Uplift capacity of suction caisson
- Prediction of different soil properties such as OCR, compression index, undrained shear strength, etc.

Pijush Samui

Working as an associate professor in civil engineering department at NIT Patna, India. He has been selected as an adjunct professor at Ton Duc Thang University (Ho Chi Minh City, Vietnam). He has been Visiting Professor at Far East Federal University (Russia). He has published more than 100 journal papers. He has also written several books.
2-Geosynthetic Engineering

2.1-Introduction to Geosynthetic Engineering

Geosynthetics have been widely applied to various ground and underground structures such as road, tunnel, soil retaining wall, dam, railroad, waste landfill etc. Although this course is very specialized compared to the too large scale of geosynthetics and geotechnical engineering, it will play a role of a touchstone for civil engineers due to the faithfully composed presentation with title of this course. Finally, it will be expected the contents of this course will be able to create a new paradigm through the geosynthetics applications and to help solve the difficulties of field applications for those involved in the geosynthetics fields.

2.2-Latest insights into the performance of barrier systems

This two hour short course examines latest findings related to the performance area systems landfill other containment applications. Consideration is given to leakage through the liner and how that is affected by choices made with respect to other components of the various system, design considerations, construction, construction quality assurance, and operations. The effect of any overlying drainage layer, protection layer, any compacted or geosynthetic Clay liner, and the subgrade are all touched upon. Special emphasis is placed on how construction can greatly affect the short and long-term performance of the systems.

Program:

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>02:30PM ~ 03:10 PM</td>
<td>Types and Functions of Geosynthetics for Their Serviceability in Field Application</td>
<td>Han-Yong Jeon</td>
</tr>
<tr>
<td>03:10PM ~ 03:50 PM</td>
<td>Analysis of Geosynthetics Required Performances as a General Guidelines for Geosynthetic Installation</td>
<td>Han-Yong Jeon</td>
</tr>
<tr>
<td>03:50PM ~ 04:00 PM</td>
<td>Q&amp;A</td>
<td>@Aida Foyer</td>
</tr>
<tr>
<td>04:00PM ~ 04:30 PM</td>
<td>Coffee Break</td>
<td>Kerry Rowe</td>
</tr>
<tr>
<td>04:30PM ~ 06:30 PM</td>
<td>Latest insights into the performance of barrier systems</td>
<td>Kerry Rowe</td>
</tr>
</tbody>
</table>
3-Geology in Dam Engineering (An evolving contribution of Engineering Geology uncertainties for safety and efficient operation)

Outline Course:

1. Stability of the dam site and selection of type of dam
   1.1 Types of dams and Geology
   1.2 Causes of failure
   1.3 Variability of same rock types
   1.4 Influence of structure
   1.5 Unstable conditions and landslides at dam site

2. Big scale stability in reservoir area

3. Water tightness
   3.1 Dam site
   3.2 Reservoir area
   3.3 Special reference to karstic rocks

---

Paul G. Marinos

4-Sustainability of Flexible Pavement in terms of Micro Crack Healing Concept

Course Topics:

09:00 AM to 10:00 AM
- Assessment of cracking in flexible pavement

09:00 AM to 10:00 AM
- Crack healing potential of asphalt

10:00 AM to 11:00 AM
- Refreshment

11:00 AM to 12:30 PM
- Modes of crack healing

12:30 PM to 01:30 PM
- Testing to predict the effectiveness of crack healing

Saad Issa Sarsam

Prof. Sarsam was born in Baghdad (1955), got his BSc. in Civil Engineering (1977), Post graduate diploma in Transportation Engineering (1978); MSc in Transportation Engineering (1980). Worked as senior material Engineer for NCCL (1982-1988); Served as Director of NCCL- Mosul, Iraq (National center for construction laboratories; Ministry of Housing and construction) (1988-1993). Joined the academic staff at University of Mosul (1992-2005) and got the Assistant Professor degree at (2002); Joined the academic staff at University of Baghdad (2005 until now) and got the Professor degree at (2007). Served as Head of the Department of Civil Engineering, university of Baghdad (2016-2018). Published four books and 217 research papers in national and international scientific journals. Member of editorial board of nine international scientific journals, and reviewer of another five journals. Supervised 41 MSc Thesis. Participated in 50 national and international scientific conferences. Worked for Ministry of Industry and Military manufacturing, Faw General Directory, (1989-1990). Worked as Consultant road Engineer for Municipality of Mosul on urban road resurfacing and construction (2001-2002). Worked for Training program at Iraqi Engineers Union for junior and senior engineers (2001-2004). Worked as Consultant Engineer for [Sumer Contracting Company (2004); AFM Group-Switzerland (2014); Ministry of Transport (2011-2017) and National center for construction laboratories and research (2011-2015)].
5-The Design and Construction of Mechanically-Stabilized Earth Retaining Walls and Slopes Using Geosynthetic Reinforcement

Outline of Instruction:

- Applications of Mechanically-Stabilized Earth (MSE) Retaining Walls and Slopes, Terminology and Construction Materials
- External Stability Analyses of MSE Walls
- Internal Stability Analyses of MSE Walls
- Stability Analyses of MSE Slopes
- Use of Slope Stability Methods to Analyze Internal Stability of MSE Walls
- Construction Drawings, Details and Specifications for MSE Structures
- Forensic Investigations of Failed MSE Structures

Agenda:

09:00-11:00  Materials for MSE Structures
11:00-11:30  Break
11:30-12:30  Internal Stability of MSE Retaining Walls
12:30-13:30  External Stability of MSE Retaining Walls
13:30-14:30  Lunch
14:30-15:30  Limit State Analyses of MSE Structures
15:30-16:30  Slope Stability Analyses
16:30-17:30  Design Details and Construction

R. J. Valentine

Mr. Valentine has studied geosynthetics and their use in mechanically-stabilized earth (MSE) structures since he performed his graduate school research at Virginia Tech. Since that time he has worked for geotechnical engineering consultants, a geosynthetic manufacturer, a block manufacturer, and as chief engineer for a MSE wall design/build contractor. During the last 21 years he has specialized in the design, research and forensic investigation of earth retention structures as an independent consulting geotechnical engineer. During this period he has performed the following:

- Instructor for National Highway Institute training courses Inspection of Mechanically Stabilized Earth Walls and Reinforced Soils Slopes and Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes.
- Lead consultant for the design of the protocol for the US Federal Highway Administration’s IDEA Program for the evaluation of MSE retention systems.
- Corporate consultant to Lowe’s Companies, Inc. for retaining wall designs, reviews, and investigations since 2000.
- Investigator of more than 50 failed walls and slopes.
## 6- Geosynthetic-Reinforced Pile-Supported Embankments

### Course Outline

<table>
<thead>
<tr>
<th>Time</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00</td>
<td>Welcome (Dr. Suzanne van Eekelen and Arjan Venmans, MSc)</td>
</tr>
<tr>
<td>09:05</td>
<td>Introduction (Dr. Suzanne van Eekelen)</td>
</tr>
<tr>
<td>09:25</td>
<td>Geosynthetic-reinforced pile-supported embankments: Research and new developments; basic principles, load distribution (Dr. Suzanne van Eekelen)</td>
</tr>
<tr>
<td>10:25</td>
<td>Requirements and initial details of the reinforced embankment; part I (Dr. Suzanne van Eekelen)</td>
</tr>
<tr>
<td>11:00</td>
<td>Refreshment</td>
</tr>
<tr>
<td>11:30</td>
<td>Requirements and initial details of the reinforced embankment, part II (Dr. Suzanne van Eekelen)</td>
</tr>
<tr>
<td>11:55</td>
<td>Fill materials (Arjan Venmans, MSc)</td>
</tr>
<tr>
<td>12:00</td>
<td>Exercise: design and optimization in practice, develop your engineering judgement, part I (Dr. Suzanne van Eekelen and Arjan Venmans, MSc)</td>
</tr>
<tr>
<td>12:50</td>
<td>Cost Benefit Analysis (CBA) of construction on soft soil, comparing piled embankments with other construction types (Arjan Venmans, MSc)</td>
</tr>
<tr>
<td>13:30</td>
<td>Lunch</td>
</tr>
<tr>
<td>14:30</td>
<td>Design of the geosynthetic reinforcement: analytical and numerical methods (Dr. Suzanne van Eekelen)</td>
</tr>
<tr>
<td>15:40</td>
<td>Exercise: design and optimization in practice, develop your engineering judgement, part II (Dr. Suzanne van Eekelen and Arjan Venmans, MSc)</td>
</tr>
<tr>
<td>16:40</td>
<td>Discussion, evaluation and closure (Dr. Suzanne van Eekelen and Arjan Venmans, MSc)</td>
</tr>
<tr>
<td>17:00</td>
<td>End of program</td>
</tr>
</tbody>
</table>

### Course material:
- Design Guideline Basal Reinforced Piled Embankments.
- The book will be available for free for the first 40 participants of the course.

### Who should attend?
- Senior undergraduate and postgraduate students
- Research candidates
- Practising engineers
- Specialised contractors
- Project managers
- Land developers

---

**Suzanne van Eekelen**

Received the IGS Award of the International Geosynthetics Society for her research on geosynthetic-reinforced piled embankments in 2014, the Award for the best paper in Geotextiles and Geomembranes in 2012.

**Arjan Venmans**

He is member of the CEN Technical Committee 396 on Earthworks and registered evaluator for the European Commission Research Programs. He published over 40 scientific publications.
7-Design of Prestressed Concrete Girder Bridges According to AASHTO LRFD Bridge Design Specifications

Course Outline

Design Philosophy and Loadings (AASHTO 1.3, 3.4, 3.5, and 3.6):
- Service, Strength, Fatigue, and Extreme Event Limit States
- Load Factors and Combinations
- Permanent and Live Loads Structural Analysis (AASHTO 4.2)
- Equivalent Strip Method for Deck
- Distribution Factors for Girders Material Properties (AASHTO 5.4 and 5.5)
- Mechanical and Time-Dependent Properties of Concrete
- Properties of Reinforcing Steel, Welded Wire Reinforcement, and Prestressed Steel Design for Flexure and Axial Load Effects-B Regions (AASHTO 6)
- Design Assumptions
- Design of Flexural Members
- Design of Compression Members
- Deformations
- Crack Control

Design for Shear and Torsion- B-Regions (AASHTO 5.7):
- Design Procedures and Requirements
- Sectional Design Model
- Combined Shear and Torsion
- Interface Shear Transfer – Shear Friction
- Design for D-Regions (AASHTO 8)
- Strut-and-Tie Method
- General Zone of Post-Tensioning Anchorage
- Prestressed Concrete (AASHTO 9)
- Girder Production, Handling, and Transportation
- Types of Cracks and Stress Limits
- Prestress Losses (Approximate and Refined Methods)
- Primary and Secondary Moments

George Morcous

Dr. George Morcous is a Professor at Durham School of Architectural Engineering and Construction at the University of Nebraska-Lincoln since January 2005. He has a B.S. and M.S. degrees in Civil Engineering from Cairo University-Egypt. He earned his doctorate degree from Concordia University – Canada in 2000. He is currently a registered professional engineer in the State of Nebraska. His research and teaching interests include design and construction of precast prestressed concrete structures and bridge engineering. He has two patents and over 150 publications.
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- **Workshop:**
  QA/QC Methods for Deep Foundations (9a-1p, Tuesday, Nov 12, 2019)
- **DFI Workshop:**
  Pile QC Testing & Innovations (Thebes Hall, Wednesday, Nov 13, 2019)

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Contact Us

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