THE BIG 5 HEAVY 2019 CPD WORKSHOPS

25th – 28th November 2019
Dubai World Trade Centre

25th NOVEMBER 2019 – GEOTECHNICAL AND ENGINEERING SUMMIT BY DFI

11:20 – 11:30 WELCOME AND OPENING REMARKS

Speakers: **Eng. Emad Sharif,** Director, **GTC**

Dr. Salah Al Dilimi, Vice President, **DFI – Helical Piles Committee**

11:30 – 12:00 Challenges of finite element modelling and correlation with site monitoring

- Finite element
- Soil structure interaction
- Monitoring

Speaker: **Ahmed Ali Ghareeb,** Chief Engineer, **RTA**

12:00 – 12:20 Geology risk assessment for tunneling

Speaker: Karim Khalaf, Regional Business Line Manager - Consulting, **Furgo**

12:20 – 12:40 Thermal integrity testing of deep foundations

Speaker: **Hazem Sarhan,** General Manager, **ADEC Engineering Consultancy**

12:40 – 13:00 Foundation strengthening and remediation of differential settlement of a commercial building in Dubai

Speaker: Yasir Husain, Sales Engineer, **Ischebeck Titan Middle East**

13:00 – 15:00 BREAK AND VISIT TO THE EXHIBITION

15:00 – 15:30 Latest developments in diaphragm wall technology - focus on Middle East projects

- Technological innovations to protect hydraulic systems from mud contamination
- Design solutions to reduce downtimes in the job site
- Machine design to reduce maintenance costs

Speaker: Andrea Di Eugenio, Product Line Manager, **Soilmec**

15:30 – 15:50 A forensic study of a puzzling ground subsidence case: Interesting findings

Speaker: Dr. Hesham Elsazly, Professor of Geotechnical Engineering and Soil Dynamics, **ADM**

15:50 – 16:10 Innovation for below ground construction

- Innovation
- Sustainability
- Waterproofing

Speaker: Nick Chettinden, Regional Manager Underground Construction – Middle East and Africa, **BASF**

16:10 – 16:30 Petrographic analysis of weak rock of the ghayathi formation

Speaker: Luke Bernhard Brouwers, Engineering Geologist, **Fugro Middle East**

16:30 – 17:00 Introduction to helical piles and helical anchors

- Helical Piles and Anchors defined
- Helical development
- Theory, design and applications

Speaker: Dr. Salah Al Dilimi, Vice President, **DFI – Helical Piles Committee**

17:00 – 17:10 CLOSING REMARKS AND END OF THE SUMMIT

Speakers: Eng. Emad Sharif, Director, **GTC**

Dr. Salah Al Dilimi, Vice President, **DFI – Helical Piles Committee**

TOPIC & SPEAKER DETAILS

SESSION TIME	TOPIC DETAILS	SPEAKER DETAILS	SPEAKER PHOTO
11:20 – 11:30	**Welcome and Opening Remarks**	**Eng. Emad Sharif,** Director, **GTC** **Dr. Salah Al Dilimi,** Vice President, **DFI – Helical Piles Committee**	 **Salah Al Dilimi**
11:30 – 12:00	**Challenges of finite element modelling and correlation with site monitoring** **Abstract:** • Finite element • Soil structure interaction • Monitoring	**Ahmed Ali Ghareeb,** Chief Engineer, **RTA** **Bio:** Dr. Ahmed Ghareeb is a Structural Engineer with more than 15 years of experience in design of Mega projects including underground metro stations, rail projects, and water and wastewater plants in Egypt and Gulf region. Ahmed gained great experience in soil structure interaction modelling of underground structures. Ahmed gained great experience in the analysis and design of RC structures practicing various worldwide building codes including the BS Codes of Practice, ACI and Eurocode. He is also participate in preparing and reviewing of many geo-risk assessments and monitoring plans of development projects beside metro tunnels and infrastructures. He participated in development and updating of "Railway Protection Code of Practice for Dubai Emirate". Dr. Ahmed is a Teaching Staff Member in Shoubra Faculty of Engineering, Banha University, where he is a lecturer in Civil Engineering department. Currently Ahmed is holding position of Chief Engineer in Rail Agency – Road and Transport Authority (Dubai).	 **Ahmed Ali Ghareeb**

12:00 – 12:20	**Geology risk assessment for tunneling** **Abstract:** Many of tunnel construction projects face underperformance due to unexpected geological conditions encountered during excavation phase. However, many of these geo-risks can be identified by adequate site investigations and consultancy support during the planning phase and the tunnel design can be made to mitigate from these foreseen risks. Engineering geological investigations for tunnel projects should include three main steps, 1- Preparation of geological model and evaluation of geo-risks, 2- Development of geo-mechanical model, 3- Preparation of input parameters for design. Preparation of geological model starts with evaluations of regional and local geological and hydrogeological conditions along the proposed tunnel corridor. Main geohazards and risks in this corridor should be identified in this stage and possible effects during the construction and operation stages should be evaluated carefully. According to the geological map and the preliminary geological model of tunnel alignment, site investigation, in-situ and laboratory testing program should be prepared for the planned tunnel alignment. In case of high geo-risks encountered on the planned alignment, alternative tunnel alignments or tunnel portal location optimizations can be considered in this stage. Typical geohazards for tunnel alignment can be; active or inactive faults, landslide, squeezing and	**Karim Khalaf,** Regional Business Line Manager - Consulting, **Furgo** **Bio:** Since 1994, extensive experience in geotechnical engineering and soil investigation best practice and excellence. Worked as project manager on special foundation works as contractor. Involved in grouting, piling and micro-piling and anchoring works. Leading design and execution of retaining structures in urban environment, piling and underpinning of existing buildings for basement clearance. Managing large scale soil investigations and geotechnical engineering studies for Rail roads, harbor facilities and coastal developments. Developed extensive experience in soil investigation technique, in laboratory testing, insitu testing geophysics, observational methods, geotechnical concept designs, foundation design, damage diagnostic and remedial solutions.	 **Karim Khalaf**

	swelling ground, karst, rock bursting, confined high pressurised water, gas etc. Pre-geological model of the tunnel alignment, which was already prepared after detailed geological mapping, should be revised based on the sub-surface site investigation (boring, in-situ tests and geophysical survey) and laboratory tests. Geo-mechanical zonation should be for each geotechnical unit encountered on the tunnel alignment. Groundwater conditions at tunnel elevation is highly important for excavation and support design of the tunnel and to account mitigation measures. Geo mechanical design parameters for numerical analyses should be assigned for each zone considering all site investigation results.		
12:20 – 12:40	**Thermal integrity testing of deep foundations** **Abstract:** The quality of cast-in-place deep foundations has been assessed by well-established non-destructive techniques including the Cross Hole Sonic testing [CSL], pulse echo [low strain] integrity testing and gamma-gamma testing. A new method called the Thermal Integrity Profiler (TIP) uses the heat generated by curing cement (hydration energy) to assess the quality of drilled shafts, bored piles, augered cast in place, continuous flight auger or drilled displacement piles. It can also be used for quality control and shape evaluation of jet grouting, slurry walls, and diaphragm walls. The average temperature within a concrete shaft is dependent on its diameter, the concrete mix design and on the time of measurement relative to concrete casting. Measured	**Hazem Sarhan,** General Manager, **ADEC Engineering Consultancy** **Bio:** Hazem Sarhan, Ph.D., P.E. is the General Manager of ADEC Engineering Consultancy with 25 years' experience in maritime, oil and gas, power generation, industrial and LNG projects. Dr. Sarhan graduated with honors from Cairo University and earned his Ph.D. in Geotechnical and Civil Engineering from the University of Houston, Texas. Dr. Sarhan worked in Bechtel Oil and Gas in Houston between 2001 - 2007 on several challenging engineering and construction assignments in North America, West Africa, Egypt and Trinidad & Tobago. Dr. Sarhan was Projects Director with ARTELIA between 2007 - 2018, working and managing projects in maritime, ports, and oil and gas in the Middle East. Dr. Sarhan combines strong technical skills 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.	 **Hazem Sarhan**

	temperatures at the reinforcement cage vary with the distance to the center of the shaft and with the concrete cover. The data is obtained through embedded Thermal Wire® cables with thermal sensors that are attached to the reinforcing cage. TIP has the ability to assess the entire cross-section and the full length of the foundation with no depth limitations. Results are available shortly after the shaft installation is concluded. TIP reveals necks or soil inclusions which are reflected in regions that are colder than average, bulges as regions that are warmer than average, variations in concrete cover, the shape of the shaft and cage alignment. The testing method is standardized in ASTM D7949-14, Standard Test Methods for Thermal Integrity Profiling of Concrete Deep Foundations.		
12:40 – 13:00	**Foundation strengthening and remediation of differential settlement of a commercial building in Dubai** **Abstract:** A commercial building purposed as "Hotel Apartments" experienced differential settlement which required repair & strengthening of the entire structure. Micropiles in combination with jet grout columns were proposed as a remediation & strengthening solution. Some further details are presented on the execution of these scopes in an existing structure with challenging constraints	**Yasir Husain**, Sales Engineer, **Ischebeck Titan Middle East** **Bio:** Mr. Husain is a Sales Engineer for Ischebeck TITAN Ground Engineering Division working with the contractors and consultants for ground engineering projects in the Middle East. His previous experience consists of working as a design & estimation engineer for a local ground engineering contractor. Mr. Husain is qualified as a Civil Engineer from the University of Texas at Austin with Bachelors and Masters degrees.	 **Yasir Husain**

15:00 – 15:30	**Latest developments in diaphragm wall technology - focus on Middle East projects** **Abstract:** • Technological innovations to protect hydraulic systems from mud contamination • Design solutions to reduce downtimes in the job site • Machine design to reduce maintenance costs	**Andrea Di Eugenio,** Product Line Manager, **Soilmec** **Bio:** Andrea Di Eugenio is the Director of the Crane & Hydromill Division in Soilmec, which develops duty cycle crawler cranes and related technologies, as diaphragm walls, ground improvement, piles excavation, pile driving, soil digging. He joined the company in 2009 and prior to his current role, he held positions of increasing levels of responsibility in areas within the new business development, leading the growth of the crawler cranes business in Soilmec. Before Soilmec, Andrea had a ten years experience in the high-speed rail sector, working for the world leader company in the integrated transport systems. Today he can rely on an extensive expertise in project management, product development and product marketing strategy. Andrea Di Eugenio holds a M.Sc. in Electrical Engineering from Bologna University and a Master in Business Administration from Bologna Business School.	 **Andrea Di Eugenio**
15:30 – 15:50	**A forensic study of a puzzling ground subsidence case: Interesting findings** **Abstract:** Mysterious subsidence that affected roads, utilities and villas in a residential area has been observed while evolving to assume large magnitudes. Its extent was limited to a particular sector but was still spread over significant area. The damage distribution was random in space and magnitude. The cause of such was, therefore, puzzling and was not immediately known, nor was it clearly understood. The city, traditionally, has a	**Dr. Hesham Elsazly,** Professor of Geotechnical Engineering and Soil Dynamics, **ADM** **Bio:** Dr. Elshazly has 30 years of combined practical, research and academic experience in geotechnical engineering. He is currently the Geotechnical Expert for Abu Dhabi Municipality. He has worked for a number of international consultancies, including Parsons, Dar Alhandasah and Mouchel. His strengths include soil dynamics, earthquake engineering, dam engineering, river (irrigation) structures, maritime geotechnics, soil-structure interaction, structural dynamics, infrastructure geotechnics, shoring systems, tunnels and TBM micro-tunnels, HDDs, bridges, pavement design, reinforced earth foundations and MSE walls,	 **Dr. Hesham Elsazly**

	reputation of karst features but the subsided zone was not classified as having any karst anomalies. There was, however, narrations of earlier substantial filling works to have taken place in the damaged domain. Intensive field examination for all the affected elements, as well as for possible potential causes, was first performed. A comprehensive field and laboratory program of geotechnical testing was then scoped and implemented. Pieces of information were put together and all material, geometrical and loading aspects as well as damage patterns were integrally studied to capture the true cause of the perplexing problem.	observational construction and back analysis as well as geophysical methods and interpretations. Hesham was granted his academic degree from Kyoto University, Japan in 1997, and has ever since been a Professor of Geotechnical Engineering and Soil Dynamics at the NWRC. He taught at several universities, including the UAE University, AlHosn University and the American University in Dubai, AUD.	
15:50 – 16:10	**Innovation for below ground construction** **Abstract:** • Innovation • Sustainability • Waterproofing	**Nick Chettinden,** Regional Manager Underground Construction – Middle East and Africa, **BASF** **Bio:** Nick is an engineer with over 25 years' experience in the international tunnelling market. He qualified as a Mining Engineer from Cardiff University before taking an MBA and then an MSc in Tunnelling at the Polytechnico Torino. He is a specialist in the rock support technologies of sprayed concrete, injection and waterproofing. He is a member of the ITATech committee on sprayed concrete and WG 12 in ITA as well as an EFNARC Nozzleman Assessor. He is currently employed by BASF in Dubai as the Regional Manager for Underground Construction in the Middle East, Egypt, East Africa and Iran where he has been based for over 9 years. Previous to this, Nick's global tunnelling experience covered projects in Taiwan, Canada, Egypt, China, South Africa and Iceland. He has presented at numerous conferences and events around the world including the World Tunnelling Congress in Singapore, the Arabian Tunnelling Conference in the UAE, the International Road Federation World Forum in Riyadh and the South African Institute of Mining and Metallurgy. He has also given lectures for the American University of Dubai, the International Tunnelling Association's Foundation for Continuing Education and Training,	 **Nick Chettinden**

		and the Young Engineers Forum of the Arabian Tunnelling Conferences. He is BASF's representative within the International Tunnelling Association (ITA), on the ITA prime sponsors steering board and a committee member for the DFI Middle East Chapter.	
16:10 – 16:30	**Petrographic analysis of weak rock of the ghayathi formation** **Abstract:** An imminent challenge currently being faced in Dubai is the occurrence of soft rock underlying the quaternary Aeolian sand deposits. One such offender encountered, is the thinly laminated calcareous sandstone of the Ghayathi Formation, which may occur as alternating beds of very dense sand and extremely weak sandstone. The current accepted method for differentiating between soil and rock is dependent on a UCS strength occurring below 0.6 MPa. Laboratory experiments performed on samples retrieved from the Ghayathi Formation exhibit an average UCS, Point Load Index and E-modulus of 0.71 MPa, 0.11MPa and 1128 MPa respectively. However, Strength and deformation is controlled by inherent physical properties of the material such as mineral composition, density, structure, fabric and porosity. Petrographic analysis of representative samples from the Ghayathi Formation shows the sandstone comprises of highly porous fine-grains with sporadic bands of coarser material cemented together by a thin uniform crust around depositional grains with some degree of compaction. Overall the mineralogical composition by volume comprises of: calcite (80%) as a cementing agent and bioclasts, quartz (16%), rare feldspars (2%), trace amounts of pyrite (1%) and igneous rock	**Luke Bernhard Brouwers,** Engineering Geologist, **Fugro Middle East** **Bio:** Engineering geologist with experience throughout South Africa and Middle East. Experienced in site investigations techniques for foundations and construction material. Educated in processing and interpreting in-situ and laboratory testing results. Co-author in peer reviewed journal articles and presenter in international engineering geology and hydrogeology conferences	 **Luke Bernhard Brouwers**

	fragments (<1%). Primary pore spaces remain unfilled and result in a high inter-particle porosity of 27.69%, which is inversely proportional to the bulk and dry densities exhibiting average values of 1968 Kg/m^3 and 1660 Kg/m^3 respectively. The high inter-particle porosity resulted in the degree of saturation predominantly ranging between 40 - 80% but the inherent water content had minimal influence on the strength of the samples. This petrographic analysis comparison to laboratory results highlights some of the complexities currently being faced in soft rocks research and further supports that improved sampling techniques, laboratory testing methods and understanding of soft rock characteristics is required for improved classification.		
16:30 – 17:00	**Introduction to helical piles and helical anchors** **Abstract:** • Helical Piles and Anchors defined • Helical development • Theory, design and applications	**Dr. Salah Al Dilimi,** Vice President, **DFI – Helical Piles Committee**	 **Dr. Salah Al Dilimi**

17:00 – 17:10	**Closing Remarks and End of the Summit**	**Eng. Emad Sharif,** Director, **GTC** **Dr. Salah Al Dilimi,** Vice President, **DFI – Helical Piles Committee**	 **Dr. Salah Al Dilimi**