ICE UAE Committee

In-Person Learned Event

“Design Practices and Research Advancement in the Design of Deep Foundation in Dubai Sedimentary Rock”

Dr. Marwan Alzaylaie - Senior Manager - Geotechnical Engineering at Dubai Development Authority

Thursday, 9 February 2023, 6:00 PM – 8:00 PM (UAE Time)

Venue: Heriot-Watt University Dubai

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E: middle.east@ice.org.uk

Established in 1818 in London, the Institution of Civil Engineers (ICE) is the first professional engineering body in the world. Since obtaining its Royal Charter in 1828, it has expanded considerably and now has more than 95,000 members across the world.

Speaker's Biography

Dr. Marwan Alzaylaie, Senior Manager – Geotechnical Engineering - Dubai Development Authority

Dr.-Ing. Marwan Alzaylaie has been working at Dubai Development Authority (DDA), as Senior Manager-Geotechnical Engineering since 2006. His responsibilities include the review of geotechnical works design such as geotechnical investigation reports, shoring design, piling/deep foundation design, soil stability for open excavation, groundwater control and ground improvement design. Moreover, he supervises and monitors the geotechnical constructions sites within DDA jurisdictions. Also, he worked for Sharjah Municipality from 2002 to 2006 as a Civil Engineer.

Since 2015 Dr. Alzaylaie started teaching as part-time lecturer at Heriot-Watt University Dubai. He is involved in teaching geotechnical engineering courses and supervising the post and undergraduate students' research. In 2021 he started teaching in Abu Dhabi University College of Engineering, Civil Engineering Department as Adjunct Faculty.

Dr. Alzaylaie obtained his PhD in civil/geotechnical engineering from Technische Universität Darmstadt in Germany (TU Darmstadt). His PhD thesis was titled "Stiffness and Strength of Dubai Sedimentary Rock", also he obtained his B.Sc. & M.Sc. in civil engineering from University of Sharjah (UoS), UAE.

Dr. Alzaylaie has published several papers in addition to serving as member of organizing committees for numerous international conferences. Furthermore, he is a Member for ISSMGE Technical Committee TC 217 (Land Reclamation) and the Secretary & Treasurer of Deep Foundation Institute Middle East (DFI Middle East).

Topic Overview

Safety, optimization and sustainability are the most important aspects for the design of any foundation system. An optimized and safe design of foundation systems for high-rise buildings in difficult soil and groundwater conditions is based on a reduction of construction material used, construction time spent, energy consumed and the adequate consideration of the soil-foundation interaction. This is also important for the high-rise structures like skyscrapers and bridge piers in Dubai, UAE. Due to the large loads, most of these structures are found in the Dubai sedimentary rock.

Up to now the rock mechanical parameters for these rock layers have been defined on the very conservative side which led to over-dimensioned foundations in many cases. In a large research programme, the bearing behaviour of Dubai sedimentary rock has been investigated by field and laboratory tests, by in-situ pile load tests and the numerical back-analysis using the Finite-Element-Method (FEM). Comprehensive research investigations show that the stiffness of Dubai sedimentary rock is higher as it is assumed up to now.