6th Annual Web Conferences 2020
Technical Committees

Live Streaming Daily – Technical Case Studies

December 6 – 10, 2021

The Geo-Institute Deep Foundations Technical Committee will live-stream on Tuesday, December 7 at 2 PM EST. The topics include:

"Geotechnical Design and Construction on Design Build Projects", **Ravi Vedantham**, P.E., M.ASCE

Design Build is an emerging deliverable methodology for construction projects in recent times in United States and across the globe. The presentation encompass of discussion on a typical design build project process, key stake holders and their involvement during procurement, design and execution phases. The presentation will talk about the advantages, disadvantages and challenges that could encounter and possibly be avoided from a specialized contractor prospective. Importance of performance requirements, specifications, quality control and quality assurance will be discussed. A partnering effort between all the important stake holders such as Owner, General Contractor, specialized subcontractor, Engineer of Record is a key element to success on any design build project and an example project on a deep foundation design/build project and lessons learnt will be discussed.

"*The Incremental Rigidity Method – More-Direct Conversion of Strains to Internal Forces in a Static Loading Test*", **Van E. Komurka**, P.E., D.GE., F.ASCE

The Incremental Rigidity method determines the relationships between measured strain and a deep foundation's axial rigidity (the product EA) at individual strain-gauge levels, permitting calculation of internal forces in a static loading test without knowledge of either elastic modulus or cross-sectional area. The presentation will describe the Incremental Rigidity method, and illustrate a number of the method's advantages over more-conventional approaches to converting strain to internal force using data from a case history.

"*The NYU Criterion for Interpreting the Capacity of Piles and Drilled Foundations*", **Antonio (Tony) Kodsy**, S.M.ASCE and **Magued Iskander**, Ph.D., C.Eng., P.E., F.ASCE

The interpretation of field load tests on piles has many important practical considerations especially with respect to identifying the capacity of a pile. A dozen or more interpretation criteria have been used in the past. Despite the increasing use of large-diameter open-ended piles (LDOEPs) and drilled shafts for support of infrastructure projects, few of the currently available criteria have been originally designed for them. Therefore, it is important to ascertain that an interpretation criterion is suitable for them. Fourteen to Sixteen of the most commonly used interpretation criteria, were investigated for use with LDOEPs and Drilled, in an effort to determine the best criterion to be used. Their performance was assessed using a database of 68 load test conducted on LDOEPs and 194 load tests conducted on drilled shafts. The performance of various criteria was evaluated in terms of: (1) applicability; (2) correlation among each other; and (3) the effect of diameter, length, and predominant soil type. The capacities corresponding to several serviceability limit states were also investigated. It was concluded that none of these methods was significantly better than the others, and that their performance was somewhat correlated. However, many of the criteria could not be objectively applied to large diameter foundations or to cases involving strain softening. In addition, the capacity in some cases corresponded to excessive settlement. Therefore, a new criterion is proposed, where capacity is defined as the load corresponding to the smallest of (1) a settlement corresponding to the elastic compression of a free-standing column plus 0.75 inches (20mm); (2) the capacity at plunging or strain-softening; or (3) settlement corresponding to 5% of the pile diameter, unless modified by the structural engineer of record. The proposed method is objective and showed good correlation with several established criteria, while including a built-in serviceability safeguard against excessive settlement.

"A Recent Development on Driven Piles in Intermediate Geomaterials", **Kam Ng**, Ph.D., P.E., M.ASCE

Pile foundations are often driven in soft rocks to attain higher resistances in order to meet the increasing load demand, satisfy Load and Resistance Factor Design (LRFD) specifications, improve design efficiency, and reduce construction challenges. Intermediate geomaterials (IGMs) are transitional geomaterials that possess a high natural variability. However, these geomaterials are not well defined and characterized in the design and construction of driven piles. Furthermore, methods to estimate the resistances of

piles in soft rocks have yet been developed. This presentation will highlight the recent research development using over 150 pile load test data collected from Departments of Transportation to comprehensively address current challenges with pile foundations in IGMs. A methodology is present to classify soil- and rock-based IGMs with the intention to reduce pile design and construction uncertainties. New static analysis methods are developed and validated to improve the estimation of shaft resistance and end bearing of piles in IGMs. New procedures to model pile driving in IGMs using wave equation analysis program are proposed to improve the construction control efficiency. LRFD resistance factors are calibrated using probability-based methods to achieve a target design reliability.