Editorial Note – Issue 1 2020

Dear DFI Journal readers,

We are excited to present this first of two issues in 2020, and hope you enjoy its mix of research and case study papers. 2020 is an exciting year for the DFI Journal as we expanded our editorial board with a set of highly qualified editors with various expertise in deep foundation engineering, ground improvement, slope stabilization, QA/QC of pile elements, load testing, seismic foundation design, and innovative foundation construction technologies. We invited qualified professionals from Academia, Government, Engineering Consulting, and Contracting with the primary objective to provide technical rigor and personal interest and commitment to advancing the foundation engineering practice. Our editorial structure now consists of three teams, including two Editor’s in Chief, a Journal Ombudsman, and a set of highly qualified Journal Editors. Each board member committed to serving a three-year term for the Journal. This structure allows for rotation and/or renewal upon the Editor’s availability and interest after completing the 3-year term on the DFI editorial board. Each editor is devoted to serve as an advocate for the Journal, as a technical resource for our members (in the context of publications) and has declared their willingness to elevate the Journal to a new level. This includes a continued publication of transformative and practice-oriented research as well as state of the art case studies (lessons learned) and novel techniques (engineered and built) that set benchmarks in engineering practice. We are certain that the new structure of the DFI Journal’s editorial board better reflects the broad membership diversity and expertise in the Deep Foundations Institute and are confident that you will find the right editor to work with for your future submissions. A full list of our team can be found on DFI’s Journal website.

Our current issue begins the 2019 DFI Student Paper Award winning team, Abigail Bateman and Jamie Crispin, from the University of Bristol, in the UK. In their paper “Theoretical “t-z” Curves for Piles in Radially Inhomogeneous Soil” Bateman and Crispin propose theoretical “t-z” curves that can be derived by substituting an attenuation function describing the variation of shear stress with distance from the pile, into a soil constitutive model relating shear strain to shear stress, then integrating with respect to distance to get the settlement at the pile circumference due to an applied shear stress. The authors also introduce a radial inhomogeneity correction factor that can be applied to a “t-z” curve to account for pile installation effects.

Victor Aguilar, Andrzej Nowak, J. Michael Stallings, and J. Brian Anderson present a set of safety factors for Drilled Shaft Foundations Subjected to Wind-Induced Torsion in cohesive, cohesionless, and layered soils. The factors of safety are presented as a function of the target reliability index, as well as the type of in-situ test performed to obtain the soil strength properties. Three alternatives were considered: standard penetration test, cone penetration test, and vane shear test. The procedure described can be used by practitioners to select appropriate factors of safety based on local conditions when statistical parameters from a particular site investigation are available.

The third paper, led by the Oregon State research team, and co-authored by Milad Souri, Arash Khosravifar, Scott Schlechter, Nason McCullough, and Stephen, E. Dickenson presents the results of five centrifuge models used to evaluate the response of pile-supported wharves subjected to inertial and liquefaction-induced lateral spreading loads. “p-y” curves were back-calculated for both dynamic and static loading from centrifuge data and were compared...
against commonly used American Petroleum Institute “p-y” relationships. The authors found that liquefaction in loose sand resulted in a significant reduction in ultimate soil resistance and that incorporating p-multipliers that are proportional to the pore water pressure ratio in granular materials is adequate for estimating pile demands in pseudo-static analysis.

Bengt Fellenius and Tony Ruban present the analysis of strain-gage records from a static loading test on a 610-mm diameter, 10 m long CFA pile installed through 3 m of clay and sand and into a thick deposit of lacustrine clay. The loading procedure included prolonged load-holding and an unloading-reloading event, which adversely affected the interpretations of the strain records and demonstrated the inadvisability of not performing a test with equal load-increments and equal load-holding durations and avoiding all unloading-reloading sequences. The strain records enabled the determination of the pile axial stiffness and the load distributions to simulate the static pile-head load-movement curve. The knowledge of the pile load-movement response with depth makes the results of the test applicable to other (slightly different) piles at the project site; more so than if the test had been used to assess a capacity from the pile-head load-movement curve and deciding on a working load from applying a factor of safety to the capacity value.

Our issue closes with a sensitivity analysis of soft clay parameters on an existing quay wall at the East Port in Port Said, Egypt. The author team Ehab R. Tolba, Sherif Abd Ellah, Elsayed M. Galal, Ezzat Ahmed Sallam, and Mohammad Ahmad Kamal studied the influence of soft clay layer parameters on the results of FEM analyses on an existing quay wall. All soil profiles under consideration for east Port Said Port have a thick deposit of soft clay which extended from about 20 m to 60 m below ground level. The numerical analysis suggested the quay wall’s structural internal forces to reduce with increasing the soft soil stiffness values. A variety of soil stratigraphies and material stiffnesses are considered and its effect on the overall vertical settlement behavior as well as internal structural forces is evaluated.

We hope you enjoy the mix of research and case studies that this Issue has to offer and welcome any feedback and discussion.

Sincerely, the DFI Journal Co-Editors in Chief
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