

Cyclic performance of monopile foundations in sandy soil: an update on recent R&D in the Netherlands

Federico Pisanò, Assistant Professor, Delft University of Technology

Chaired by: Raffaele Ragni, NGI

The offshore wind energy sector is booming worldwide. The installation of ever larger offshore wind turbines (OWTs) in deeper waters and harsher environments is posing serious engineering challenges, including those regarding foundation design. To date, about 80% of all OWTs installed in Europe are founded on monopiles, tubular steel piles of large diameter. As foundations comprise about 20-30% of the capital expenditure costs, optimising geotechnical analysis and design is a major concern for offshore wind developers, manufacturers and contractors.

The seminar will overview TU Delft research carried out in collaboration with offshore industry partners. Recent findings concerning the cyclic performance of monopiles in sandy soil will be illustrated, focusing on recent numerical modelling developments. In particular, a recent plasticity-based approach to model the cyclic response of sand will be presented, and its use in advanced 3D FE modelling related to SLS checks for tilting monopiles. Finally, research emerging from ongoing JIPs, GDP and MIDAS, will also be introduced, with emphasis on the combination of experimental and numerical activities to conceive new geo-solutions for the offshore wind industry.

About the speaker:

Federico Pisanò is Assistant Professor of Offshore Soil Mechanics at Delft University of Technology (Netherlands). He received his Ph.D. degree from Politecnico di Milano (Italy), and worked as a post-doctoral researcher at University of California at Davis prior to his current appointment at TU Delft in 2014.

Federico has co-authored over 50 scientific publications, co-chaired the CPT'18 symposium, and is currently a member of the ISSMGE Technical Committee TC209 on Offshore Geotechnics. In 2019, he received the ISSMGE Bright Spark Lecture Award for young academics.

Federico's research interests include the constitutive/numerical modelling of geomaterials and soil-structure interaction, with current focus on offshore geotechnics.



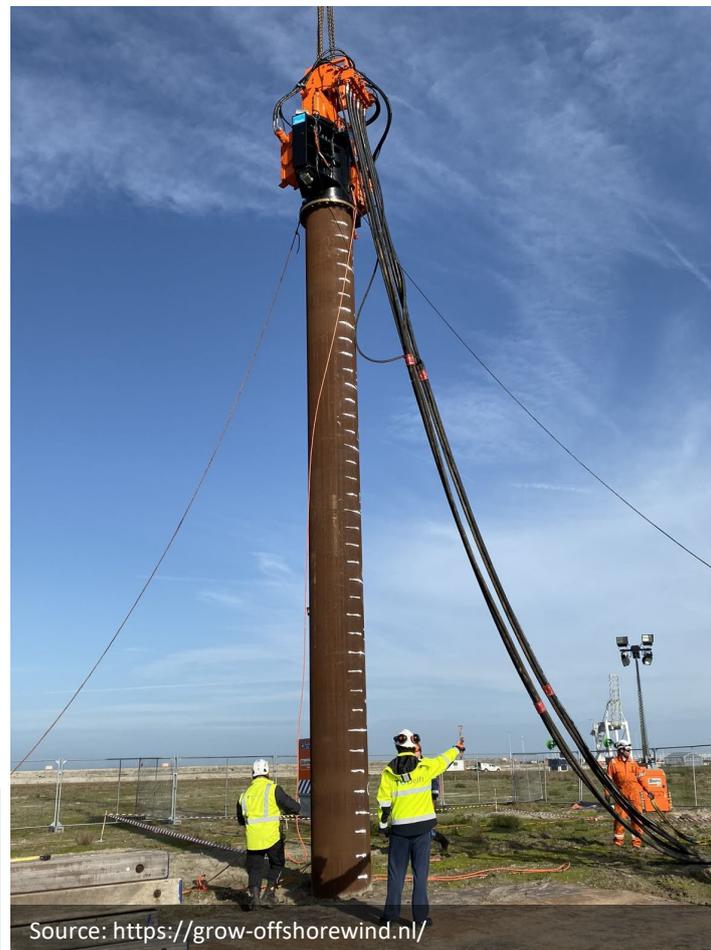
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