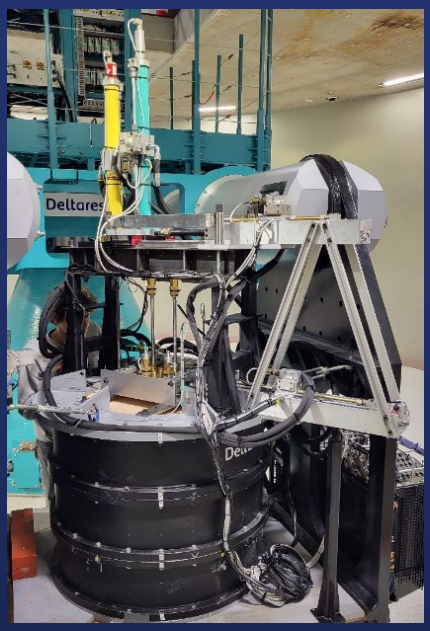
GEOLAB's Transnational Access User Project

InstaLatPile: Influence of installation effects on the performance of laterally loaded pile groups

Deltares
Delft, The Netherlands



Deltares Geo-Centrifuge

Plug-in system: open system before pile installation

ABOUT THE INFRASTRUCTURE

The Geo-Centrifuge is used for testing physical scale models of geotechnical engineering systems. By increasing earth gravity, real stresses can be scaled down to models and for natural processes in soil time can be accelerated and brought back from decades to hours. The Geo-Centrifuge can be used for scientific research in the energy, urban, water and transport infrastructure sector and in validating applied models.

SPECIFICATIONS:

- C72-3 beam type centrifuge manufactured by Actidyn
- 260 g-tonne capacity - a platform radius of 5.0 m
- The platform can house test set-ups with dimensions up to 1.2 m x 1.2 m x 1.8 m (length x width x height).

WHAT IS TRANSNATIONAL ACCESS

Transnational Access (TA) is the back bone of GEOLAB that will lead to ground-breaking research and innovative solutions to address the challenges faced by Critical Infrastructure owner. The aim of TA is to equip high level researchers from across Europe with world class research facilities that can only be found in few European institutions. This is achieved through TA activities, in which access to eleven installations will be provided to eligible User Groups to perform ground breaking research and innovation using the beyond state-of-the-art advances of the GEOLAB capabilities.

WHAT IS InstaLatPile?

InstaLatPile investigates the impact of installation effects on the lateral load bearing capacity of different pile types placed as a pile group and tested in a geotechnical centrifuge at 50g

INNOVATIVE ASPECTS

Besides the already mentioned aspects of improving the understanding of the performance of laterally loaded pile groups, the way of performing this kind of pile group tests in a centrifuge is highly challenging. To model driven, fixed-headed piles in a centrifuge without stopping means that the piles have to be driven, rigidly fixed and loaded laterally in flight, without stopping the centrifuge in between. If the centrifuge has to be stopped for further installations, this could cause significant changes of the stress state in the soil as well as for the soil-structure interaction. Due to the relaxation, the behaviour of the soil-structure interaction will fundamentally change. The results of the created output would be hardly definable. Outcomes could range from resembling driven piles to, in worst case, behaving like a bored pile group due to relaxation. Therefore, no installation effects would be figured out in the end. That's why maybe former research couldn't picture significant differences, affected by the method of pile installation.

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WEBSITE: HTTPS://PROJECT-GEOLAB.EU/

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