PostDoctoral Position in Experimental Soil Mechanics – Physical modelling

Faculty/department Civil Engineering and Geosciences/ Geoscience and Engineering
Level PhD degree
Maximum employment 36-40 hours per week (1 FTE)
Duration of contract 20 months
Salary scale € 2846 - € 4490 per month gross

Project motivation

Geotechnical structures, like embankments, levees, dams, and landfills, experience a wide range of loads, from extreme short-term loading conditions to long-term climate-associated loading. In the long-term, the effect of these external loads leads to changes within the soil, varying the soil strength and modifying the soil phases (e.g. gas generation, soil cementing, grains breakage). Changes within the soil could lead to excessive deformations or even to failure of vital infrastructure. Physical modelling provides an opportunity for understanding the complex multi-physics of aging geotechnical structures, exploring scenarios of saturated and partially saturated soils subjected to gas generation and exsolution. This position aims at addressing the effects of these processes applied to slope stability and studying the coupled multi-physics of gas-liquid-solid interactions.

Figure 1. Recent failure of a dyke founded on organic soils

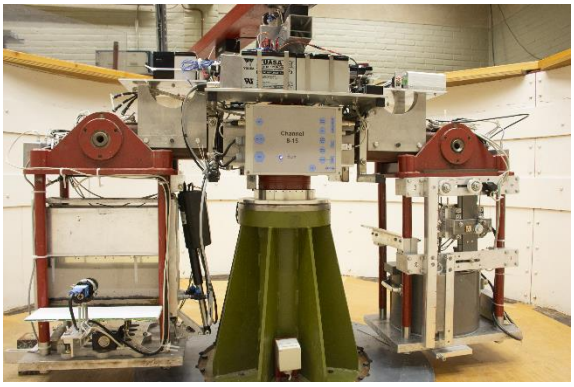

Figure 2. Geotechnical centrifuge of TU Delft

Job description

The postdoctoral project is expected to develop advanced research on:

i) The role of gas and fluid in a simple slope stability model
ii) The scaling principles of fluid and gas within a physical model
iii) The formulation of smart monitoring strategies for aging geotechnical structures

The selected postdoctoral researcher is expected to be involved in the ongoing research activities in experimental soil mechanics at TU Delft, like participating in the development of PhD projects, the elaboration of research projects, and the development of advanced laboratory testing. The postdoctoral researcher will benefit from advanced experimental laboratory facilities including the geotechnical centrifuge, the unsaturated triaxial apparatus, the biaxial plane strain apparatus, and imaging facilities already available in the Faculty of Civil Engineering and Geosciences of TU Delft and partner institutions, and the support of experienced technical staff. The researcher will be involved in the EU funded project GEOLAB: Science for enhancing Europe's Critical Infrastructure (https://project-

geolab.eu/), providing the opportunity to interact in a large research network and participate in the project meetings, workshops, and conferences.

Requirements

Applicants should possess a PhD in Civil Engineering, Geoscience or related disciplines. Experience in physical modelling and experimental soil mechanics is essential, as well as an aptitude for scientific programming and data processing. Communication skills are relevant, and applicants should have a high level of proficiency in written and spoken English. The successful candidate is expected to cooperate with other members of the research team and external partners.

Conditions of employment

TU Delft offers a customisable compensation package, discounts on health insurance and sport memberships, and a monthly work costs contribution. Flexible work schedules can be arranged. For international applicants, we offer the Coming to Delft Service and Partner Career Advice to assist you with your relocation.

Department of Geoscience and Engineering

The Department of Geoscience and Engineering resides within the Faculty of Civil Engineering and Geosciences and encompasses 5 sections: Applied Geology; Applied Petrophysics and Geophysics; Geo-Engineering; Resource Engineering; and Reservoir Engineering. Current collaborations between Geo-Engineering and the wider Faculty include the Section of Offshore Engineering, and the Departments of Structural Engineering, Hydraulic Engineering, and Geoscience and Remote Sensing. The Section of Geo-Engineering has 12 full-time and 6 part-time academic staff, and ~40 PhD and Post-Doctoral researchers. Areas of expertise include soil mechanics, dykes and embankments, foundation engineering, underground space technology, engineering geology, and geo-environmental engineering. There are extensive experimental laboratory facilities, including large-scale soil-structure interaction testing facilities and a geotechnical centrifuge, as well as excellent computing facilities including access to national High-Performance Computing networks.

Additional information

For more information about the position and informal discussion please contact:

- Dr. Stefano Muraro S.Muraro@tudelft.nl
- Prof. Dr. Cristina Jommi C.Jommi@tudelft.nl.

Application procedure

Are you interested in this vacancy? Please apply before **30 July 2022** via the TU Delft website (Job details (tudelft.nl)) and upload:

- a detailed CV
- research statement (1 page maximum)
- a list of three relevant publications
- cover letter (1 page maximum)
- contact details of 2 referees