

2 PhDs in Bio-mediated Ground Improvement

Engels -- Faculty/department Civil Engineering and Geosciences
Level Master degree
Maximum employment 38 hours per week (1 FTE)
Duration of contract 4 years
Salary scale €2042 to €2612 per month gross

Civil Engineering and Geosciences

The Faculty of Civil Engineering and Geosciences provides leading, international research and education in road and water engineering, earth sciences, traffic and transport control, and delta technology. Innovation and sustainability are central themes. The research addresses global social issues and is closely interwoven with education as well as with the work carried out by a broad spectrum of knowledge institutions. The faculty consists of 17 sections distributed among the Departments of Design & Construction, Hydraulic Engineering, Transport & Planning, Water Management and Geotechnology.

The Geo-engineering Section of the Department of Geotechnology of Delft University of Technology investigates the behaviour of soils and rocks and the interactions between earth-processes, engineered structures and human activities in order to achieve a sustainable use of the subsurface. The group has 15 academic staff members, including Hans Bruining (section leader, fluid flow and transport in porous media), Frits van Tol (geotechnical engineering, foundation engineering), Timo Heimovaara (geo- environmental engineering), Leon van Paassen (engineering geology, biocementation), Michael Hicks (soil mechanics, numerical modelling), and Dominique Ngan-Tillard (rock mechanics and shallow geophysics), as well as 25 PhD students and six technicians.

The Environmental Biotechnology group of the Biotechnology Department of Delft University of Technology aims at developing and improving mixed culture bioprocesses for waste treatment and product formation. For this purpose, microbial ecosystems are studied at all levels ranging from molecule to full-scale bioprocesses. The group is has 6 staff members, including Mark van Loosdrecht (group leader, biofilm systems, process modeling), Cristian Picioreanu (Biofilms, numerical modeling, porous media), Gerard Muyzer (Systems biology of microbial communities) and Robbert Kleerebezem (Microbial community engineering for the production chemicals and bioenergy), 13 PhD students and 3 technicians.

Job description

We are looking for a PhD researchers for the project "Biofix: Bio-mediated ground improvement to mitigate liquefaction and piping of granular sediments." This project is a collaboration of the departments of Biotechnology and Geotechnology of Delft University of Technology and Research Institute Deltares, and is part of the STW Perspective Programme BioGeoCivil.

The project's main objective is to quantify the effectiveness of bio-cementation in improving the performance of ground constructions and reducing the risks associated

with liquefaction and piping. The research involves (probabilistic) numerical modelling supported by detailed experimental studies and will be performed by two PhD students and a post-doc in close collaboration with industrial partners.

The first PhD student will work at Environmental Biotechnology and will focus on the biological aspects, identifying which microbial population is involved and what are the rate limiting factors in the biological process. The second PhD student will work at Geo-Engineering and will try to define the requirements of biocement to mitigate liquefaction and piping. This research will result in an optimised process for biological ground improvement using waste as a substrate for cementation, enabling process prediction and defining the targets to mitigate liquefaction and piping of loose sands.

Requirements

As a PhD researcher you are an ambitious, creative and enthusiastic scientist who is internationally oriented and a team player, devoted to helping develop a sustainable and climate-neutral environment.

You have:

- an MSc in Mining, Civil or Environmental Engineering, Biotechnology or other related science
- scientific research skill
- excellent communication skills and a teamwork attitude.

Knowledge of and expertise in biogeochemistry, soil science and geomechanics is preferred.

Conditions of employment

This is a temporary position for a period of 1.5 years with extension of 2.5 years after a successful evaluation. Gross salary per month € 2042 in the first year increasing to € 2612 per month in the fourth year. TU Delft offers an attractive benefits package, including a flexible work week, free high-speed Internet access from home, and the option of assembling a customised compensation and benefits package (the 'IKA'). Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities.

Information and application

For more information about this position, please contact Leon van Paassen, phone: +31 (0)15-2787473, e-mail: l.a.vanpaassen@tudelft.nl. To apply, please e-mail a detailed CV and a letter of application by 1 May 2011 to Willy Maertens, Recruitment-CiTG@tudelft.nl.

When applying for this position, make sure to mention vacancy number CITG11-14.