

PhD: Reversing Subsidence in Low-Lying Polders

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 Department of Geotechnology investigates the sustainable exploration, exploitation and use of the Earth's resources and the subsurface space, including: characterising the natural subsurface and the processes taking place within it, and developing quantitative methods that lead to predictive models; developing innovative and economically and ecologically sound methods of exploitation and construction; and investigating anthropogenic influence on the Earth. The Geo-engineering Section 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.

Job description

The "Lift Up Lowlands" project aims to develop several strategies to reverse subsidence in low-lying polder areas by improving the suitability of dredged material for surface elevation and minimising oxidation of peaty soils, including accelerating peat formation in constructed wetlands, mixing ripened sediment with stable organic matter and other additives or strengthening dredged sediment for civil engineering purposes.

The PhD student will collaborate closely with a PhD student in Wageningen, particularly on developing design criteria for subsidence reversal strategies at field scale. The work will include:

- Literature survey on ripening and consolidation theory of soft sediments and strategies for accelerated dewatering.
- Designing an experimental set-up for low stress, long-term dewatering experiments.
- Characterisation of different types of organic (peat) soils, mixtures of dredged sediments, organic matter and other additives.
- Integration of the laboratory results in a numerical model describing the sedimentation, consolidation, ripening and oxidation behaviour.
- Subsidence forecasts for the different strategies, to be validated by field data.

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 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

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. Selection will be made in collaboration with the Department of Bioprocess Engineering of Wageningen University and Research Centre.

When applying for this position, make sure to mention vacancy number CITG11-13.