‘Green Water Hubs’: Develop sustainable solutions for urban water management!

**Job description**

Would you like to extend your knowledge, practical work experience and get a Professional Doctorate in Engineering degree (PDEng) in the water sector in a condensed time of two years?  The faculty of Civil Engineering and Geosciences of Delft University of Technology (TU Delft), in close collaboration with the faculty of Architecture and the Built Environment, offers you a program where you will find a solution for a practical, integrated and complex problem in cooperation with companies. You study, on average, two days per week at the TU Delft, following dedicated courses, and apply your learnings three days per week on the project in practice.

We offer a 2-year PDEng position, financed by the Topsector Water & Maritiem to research and design a rainwater harvesting system that offers an alternative for drinking water and avoids flooding of the streets by heavy rainfall in the urban environment. Both the botanical garden De Hortus and the zoo Artis, both in Amsterdam, use a lot of drinking water for watering/irrigation of the gardens and for basins for the animals. An alternative for drinking water may be rainwater, collected on different roofs and other possible catchment areas. However, De Hortus and Artis require specific water compositions that may not be met with the locally collected rainwater, so treatment of the harvested rainwater is necessary. Microbial contamination and presence of specific components will require dedicated treatment of the rainwater before it can be used by De Hortus and Artis. In addition, storage of rainwater is required to match the supply (rainwater events) with the demand of De Hortus and Artis, in particular also to overcome expected more frequent and longer periods of drought. This storage has to be integrated in a complex urban environment with many functions. Also, De Hortus and Artis want to show the solution to the public as an innovative, sustainable water management system, so it has also an educational function and it should be attractive for the public.

In this PDEng project you will combine research and design on water quality aspects with water quantity aspects. The water quality aspects concern the analysis of the expected quality of the locally harvested rainwater and the water quality that is required by De Hortus and Artis and their different purposes. To close the gap between these qualities, you will have to design a treatment scheme and analyse it on costs, sustainability, robustness and ease of operation. The water quantity aspects concern the available rainwater, the water demand of De Hortus and Artis, and solutions how to match the supply (rainwater) and demand by a storage system that can be integrated in the urban environment. For that you will (1) analyse the water demand of De Hortus and Artis, both quantity and quality; (2) design a water treatment system to meet the required quality; (3) design the rainwater harvesting system in terms of water collection system and surfaces, water storage system and water distribution system; (4) incorporate educational aspects in the design to make the whole system attractive for the public.

You will be part of a consortium including its core partners Delft University of Technology (Faculty of Civil Engineering and Geosciences CEG, Department Water Management; Faculty of Architecture and the Built Environment ABE, Department of Urbanism), Artis, De Hortus and Amsterdam Institute for Advanced Metropolitan Solutions (AMS Institute).

You will be supervised by Prof.dr.ir. Jan Peter van der Hoek and Dr.ir. Edo Abraham of CEG and Prof.dr.ir. Arjan van Timmeren and Dipl.-Ing. Ulf Hackauf of ABE and will work in close cooperation with De Hortus and Artis.

**Requirements**

Need-to-haves:

* MSc in Water Management, Environmental Enginering or MSc related to Water Treatment/Management
* Strong background and interest in water quality and water treatment technologies (relevant course work/-work experience)
* Knowledge of water storage and water transport systems
* Independent, self-motivated, curiosity-driven mind, open to communicate and collaborate with peers and partners as proven by previous experience
* A scientific attitude and analytical skills combined with a hands-on mentality
* Excellent spoken and written English

Nice-to-haves:

* Experiences with cost calculations and sustainability analyses
* Dutch language skills

Doing a PDEng at TU Delft requires English proficiency at a certain level to ensure that the candidate is able to communicate and interact well, participate in English-taught Doctoral Education courses, and write scientific articles and a final thesis. For more details, please check the [Graduate Schools Admission Requirements](https://www.tudelft.nl/onderwijs/opleidingen/phd/admission).

**Conditions of employment**

Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities. Compulsory and elective courses for the project will be provided as well as a proper guidance for the project. We offer a stimulating working environment both at TU Delft and at Hortus and Artis.

The 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.

**TU Delft (Delft University of Technology)**

Delft University of Technology is built on strong foundations. As creators of the world-famous Dutch waterworks and pioneers in biotech, TU Delft is a top international university combining science, engineering and design. It delivers world class results in education, research and innovation to address challenges in the areas of energy, climate, mobility, health and digital society. For generations, our engineers have proven to be entrepreneurial problem-solvers, both in business and in a social context. At TU Delft we embrace diversity and aim to be as inclusive as possible (see our [Code of Conduct](https://www.tudelft.nl/en/about-tu-delft/strategy/integrity-policy/tu-delft-code-of-conduct/)). Together, we imagine, invent and create solutions using technology to have a positive impact on a global scale.

Challenge. Change. Impact!

**Faculty Civil Engineering & Geosciences**

The Faculty of Civil Engineering & Geosciences (CEG) is committed to outstanding international research and education in the field of civil engineering, applied earth sciences, traffic and transport, water technology, and delta technology. Our research feeds into our educational programmes and covers societal challenges such as climate change, energy transition, resource depletion, urbanisation and the availability of clean water, conducted  in close cooperation with a wide range of research institutions. CEG is convinced that Open Science helps to achieve our goals and supports its scientists in integrating Open Science in their research practice. The Faculty of CEG comprises 28 research groups in the following seven departments: Materials Mechanics Management & Design, Engineering Structures, Geoscience and Engineering, Geoscience and Remote Sensing, Transport & Planning, Hydraulic Engineering and Water Management.

Click [here](https://www.tudelft.nl/en/ceg/) to go to the website of the Faculty of Civil Engineering & Geosciences.

**Department of Water Management**

In the [Department of Water Management](https://www.tudelft.nl/citg/over-faculteit/afdelingen/watermanagement), about 35 full time staff members, 120 PhD candidates, 10 PDEng trainees and 20 post-docs, teach and perform research on the full breadth of water management ranging from meteorology, groundwater and surface water hydrology, urban water infrastructure, to water treatment and re-use. Our quality of research, viability, and societal relevance are rated as ‘excellent’, meaning internationally leading in its field of expertise. Researchers in the Water Management department like to take the “path less travelled” in research and education to produce path-breaking and original advances in understanding and solving complex water engineering challenges.

**Additional information**

For more information about this vacancy, please contact Prof.dr.ir. Jan Peter van der Hoek, email J.P.vanderHoek@tudelft.nl or dr.ir. Edo Abraham, e-mail E.Abraham@tudelft.nl.

**Application procedure**

Are you interested in this vacancy? Please apply before 15 July 2022 by mailing your motivation and CV to j.p.vanderhoek@tudelft.nl.

Interviews are expected to take place between 18 and 29 July.

* A pre-Employment screening can be part of the selection procedure.
* Acquisition in response to this vacancy is not appreciated.