

## **Position for PhD Researcher**

**Department of Structural Engineering and Building Materials, Ghent University**

The Department of Structural Engineering and Building Materials of the Faculty of Engineering and Architecture, at Ghent University currently is looking for a PhD Researcher on the following granted project:

### **Demonstration of Dune-Dike hybrid blue-grey Nature-based Solutions – Dunefront**

#### **SUMMARY OF THE PROJECT**

Within the European project DuneFront, the PhD researcher affiliated with the Department of Structural Engineering and Building Materials will develop a framework for "blue infrastructure" rating, based (among others) on the model of LEED, building on life cycle assessment (LCA) and life cycle cost (LCC) analysis, to quantify the environmental impacts and the costs of different alternatives for coastal protection systems. The researcher will also apply and validate this novel rating system on selected demonstrators. He/she will define Key Model Performance Indicators for Dune-Dike Nature Based Solutions (DD-hybrid NbS) representing biodiversity, flood safety, environmental, economic and societal effects to assess the performance of the DD-hybrid NbS under different climate change scenarios.

Furthermore, the researcher will develop cementitious materials and production techniques to realize complex shapes, to realize improved bio-receptivity of dikes and to promote biodiversity. He/she will aid in the preparation for implementation of an eco-dike along the Belgian Coast to provide a solution for coastal safety issues while reinforcing ecological values and providing opportunities for recreation.

In general, the different partners of the EC project DuneFront will demonstrate blue-grey coastal and marine infrastructure as a new generation of sustainable, inclusive, and aesthetic solution to ensure coastal safety under climate change. The project has the ambition to co-create hybrid Dune-Dike Nature Based Solutions (DD-hybrid NbS) that can efficiently integrate static hard infrastructure with adaptive, dynamic aeolian and vegetated sediments. Mainstreaming biodiversity into marine and coastal DD-hybrid NbS is essential to jointly safeguard human assets, blue economy activities and biodiversity gain and restoration. DuneFront will achieve this challenge by identifying key biological, physical,

and socio-economic boundary conditions, and by translating evidence on biodiversity, morphodynamics and safety from 12 Demonstrators along vulnerable European coasts into new roadmaps for DD-hybrid NbS design and installation. The integration of this multidisciplinary knowledge into physical and digital twins will pilot the development of a Decision-Support-System, coastal and marine infrastructure Blueprints, and the installation of new prototypes along one of the most recreated coasts. DuneFront will provide a wide range of stakeholders with design, installation and market-ripe business plans for DD-hybrid NbS. Translation of new research and innovations into the DuneFront targeted actions will occur within a full co-creation-procedure.

More information can be obtained by contacting Prof. Kim Van Tittelboom or Prof. Nele De Belie.

## **ABOUT THE RESEARCH GROUP**

The Magnel-Vandepitte Laboratory at the Department of Structural Engineering and Building Materials of Ghent University is the largest Belgian research center in the field of concrete technology and concrete structures and has a vast and widely-spread international recognition. The research areas focus on different aspects of concrete structures, going from fundamental material research on microscopic and sub-microscopic scale to structural behaviour and structural reliability of concrete structures on large scale. The Magnel-Vandepitte Laboratory disposes of extensive experimental testing facilities and infrastructures, among which the large strong floor for executing load tests on large-scale elements is a unique instrument.

## **VACANCY**

The Dunefront project is funded by The European Commission (HORIZON Europe). The project will be performed in collaboration with companies, agencies and universities inside and outside Belgium.

The Dunefront project will start on 1 January 2024 and will last for 48 months.

The candidate is offered an appointment for 4 (1 + 3) years in a high-level international research team at Ghent University. The candidate will have the possibility to attend international conferences, follow specialized courses and to develop a national and international scientific and industrial network.

## **APPLICANTS**

Applicants should have a MSc in Structural or Civil Engineering (or another MSc leading to sufficient knowledge on the topics of relevance), an independent and well-organized working style, well-developed social skills directed towards working in an interdisciplinary team, strong motivation to succeed in scientific research, excellent presentation and scientific writing skills and excellent English language skills (verbally and written). Experience with Life Cycle Analysis or 3D printing of concrete is an added value.

## **INTERESTED?**

Applications must contain the following documents:

- a personal (motivation) letter and curriculum vitae,
- a copy of degree certificates and associated certificates,
- a transcript of records of the bachelor and master curriculum,
- a copy of degree projects and any previous publications,
- a proof of English language skills,
- two recommendation letters (or the names and email addresses of two references).

The documents should be sent to [kim.vantittelboom@ugent.be](mailto:kim.vantittelboom@ugent.be) and [nele.debelie@ugent.be](mailto:nele.debelie@ugent.be) with in the title of the mail a clear reference to this vacancy.

As Ghent University maintains an equal opportunities and diversity policy, everyone is encouraged to apply for this position.

## **MORE INFORMATION**

For more information about this vacancy, please contact Prof. Kim Van Tittelboom ([kim.vantittelboom@ugent.be](mailto:kim.vantittelboom@ugent.be), +32(0)9/264 55 40) or Prof. Nele De Belie ([nele.debelie@ugent.be](mailto:nele.debelie@ugent.be)).