Teixeira Duarte Engenharia e Construções, SA (TD), Oeiras, Portugal

Lagoa ParK, Edifício 2, 2740-265, Oeiras, Portugal
Marie Skłodowska-Curie Actions, Doctoral Candidate
Deadline for applications: June 4th, 2023
Expected starting date: November 1st, 2023

Job description:
The job is a full-time position for Doctoral Candidate (DC) in the field of **BIM workflow for green high-performance building: design to construction (GREEN-BIM).** The goals are the research in the green-infrastructure and building design with BIM technology, aimed at decarbonizing, and improving the quality of the urban environment, while increasing the efficiency of the design-construction-maintenance chain. The expected results are focus on the elaboration of a multi-objective approach, that covering all the relevant aspects of a green high-performance building, including Life Cycle Assessment, Life Cycle Costing, eco-friendly materials, energy and water efficiency and carbon footprint all with support on a BIM platform.

Job duration: 36 months

Main research field: BIM and Green Buildings and Systems

Research subfield: Life Cycle Assessment of eco-friendly materials.

Institution description:
Teixeira Duarte – Engenharia e Construções, S.A., the Teixeira Duarte Group´s benchmark company in the construction sector, is a Portuguese company whose origins date back to 1921, 100 years from the current date, and it's a global organisation active in all areas of construction. TD comprises more than 175 entities operating in 22 countries with the commitment and dedication of 9600 employees. TD carries out its activity in different business areas of the construction sector that all share production resources and are essential for management staff training and career monitoring. In 2019, a prospective study was conducted and gives support to the definition of a Strategic Innovation Plan for the 2019-2020 two year period. This study identified speed of construction and modular construction as strategic guidelines. TD also runs the Teixeira Duarte Academy that is a program designed to integrate Trainees in the activities of the companies of the TD Group. In 2018 TD has started a process to adopt the UN SGDs as a global framework to shape, drive and report the Sustainable Development actions of its subsidiaries, as it identified great affinities between its corporate vision of Sustainability and these Goals. The Group identified at a local level a number of SDGs that are most relevant. Thus, despite contributing to all SDGs, TD took on 5 as priorities: SDG 3, SDG 4, SDG 8, SDG 9 and SDG 12. On December 31, 2020, the Group had employees of 38 different nationalities. The different cultures, habits, and ways of working contribute to creating greater openness and growth in companies that seek to ensure a working environment where mutual respect and equal opportunities prevail. Teixeira Duarte Concrete Laboratory was created in 1994 with the aim of supporting the manufacture and control of concrete. In 1996, the Laboratory applied for Accreditation by the IPQ, under the NP EN ISO/IEC 17025 Standard and has 7 tests Accredited by the IPAC.

Working place
The project will take place at the head quarter of Teixeira Duarte in the Lagoa ParK, Edifício 2, 2740-265, Oeiras, Portugal.

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The DC will have access to all the lab facilities and services as well to the software for BIM design and development of buildings and infrastructures on the local department offices. A few secondments take place in the IST (Instituto Superior Técnico) with Prof. F. Poggi and M. Amado, and in the AUA (Agricultural University of Athens, Greece) with Prof. T. Bartzanas. The DC will understand the framework for promoting green buildings as drivers for the improvement of urban quality and environmental health in future low carbon societies; The BIM workflow for designing green high-performance buildings, as a basis for standardization of repeatable, consistent and intuitive processes and the guidelines to new job requirements and future platforms to accelerate BIM development.

Project description

The main objective of the project is to provide new solutions to conceive an integrated system of built-up and open spaces that, powered by green technologies and NBS/GBI, allows both the design and the regeneration of resilient, safe and health-promoting environments for everyone, while addressing climate change and post-pandemics challenges. Despite the growing interest in studying the ability of such green systems to reduce GHG emissions, adapt to climate change, improve air quality and reduce the heat island effect,

most studies evaluate their benefits and performance only during the use phase. GreeNexUS will assess the overall environmental performance of green infrastructure and systems, in a life cycle perspective, combining modelling and simulation and Life-Cycle Thinking. By providing quantitative data on the benefits of these green systems, the project will help planners, designers and policy makers in evidence-based decision making and in targeting interventions in a more cost-effective and sustainable way. Increased sea level and frequency in flooding events related to climate change is usually addressed as an environmental problem to be faced through technological and management solutions. The project will approach such topical challenge as an opportunity to rethink urban environments, combining safety requirements with strategic urban regeneration interventions improving accessibility to high quality open spaces, integrated in the urban fabric. Providing guidelines and best practices will support local agents' decisions about how, when and where green regeneration of waterfronts should be prioritized, as well as enhance public participation, also through digital interactive platforms and geo-design tools simulating different scenarios for more resilient, green and healthy waterfronts. The construction sector is increasingly adopting low-carbon buildings and infrastructure, also integrating NBS/GBI. The project will contribute to boosting the application of green systems in the building sector by applying the innovation potential of the BIM approach to green infrastructure.

Benefitting of the complementary expertise of academic institutions and a leading construction company, the win-win scenario will allow the construction sector to become greener and more competitive and efficient, and public administrations to plan urban developments and regeneration based on more standardized expected impacts on urban quality.

The research of the candidate follows the Objectives: Developing a life-cycle based BIM workflow combining sustainable design principles and integration of green systems in the building envelope. Integration of research in the green-infrastructure and building design with BIM technology, aimed at decarbonizing and improving the quality of the urban environment, while increasing the efficiency of the design-construction-maintenance chain. The project tasks are: Task 1: review of literature on sustainable construction, green systems, and BIM, including BIM evolution on Green buildings;

Task 2: collect and review benchmarks and good practices of green building projects, analysing the different stages of the design and construction process, and characteristics and performance concerning design and construction phases; Task 3: elaborate a multi-objective approach, covering all the relevant aspects of a green high-performance building, including Life Cycle Assessment, Life Cycle Costing, eco-friendly materials, energy and water efficiency, carbon footprint, regulation capacity.

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Marie Skłodowska-Curie Doctoral Network GreeNexUS

In our increasingly anthropised planet, many cities are facing multiple societal and environmental challenges and the link between the characteristics of the urban green contexts and people's health and safety represents an emerging topic and of urgent importance. Air pollution and urban climate, reduced contact with nature, limited access to quality green spaces, and urban fabrics and infrastructure that discourage sustainable&safe mobility and active lifestyles, are threatening the mental and physical well-being of an aging society and increasing its social disparities. The GreeNexUS project proposes a novel and multidisciplinary approach to promote urban greening, territorial regeneration and safety/accessibility/walkability of urban infrastructures, as key strategies to face those challenges, while addressing climate change and preventing pandemics from exacerbating inequalities in disadvantaged/vulnerable groups. The GreeNexUS participants (20 institutions from 9 European countries) are joining forces to offer a collaborative Training-through-Research programme involving universities, research centres, companies, NGOs, and local authorities that share this new vision of fostering greener, healthier and safer urban realms of Europe's cities and towns. This will drive the GreeNexUS process to train specialists, whose cutting-edge and intersectoral expertise will be developed and managed through a challenging general programme of training that combines and integrates the various fields of innovative knowledge of the GreeNexUS' participants, and also includes career planning, entrepreneurship and soft skills training. In terms of research, 10 specific and multidisciplinary topics will be addressed by 10 Doctoral Candidates, who are envisaged to spread the GreeNexUS approach beyond the project's scope and duration, under the guidance of a supervisory group of academic and non-academic experts.

Candidate profile

The candidate is required to have a master's degree in Civil Engineering or Architecture or Environmental Engineering giving access to the PhD school and NOT to hold any PhD degree. Previous research experience, (which must be no longer than 4 years), although appreciated, is not mandatory. It is mandatory a good knowledge in programing languages, preference C# (other languages like python, java will be also validated), BIM Software's and BIM interoperability. Good oral communication skills in English are compulsory. Willingness to travel internationally for the purpose of research, training and dissemination is mandatory.

Eligibility requirements

DC appointments are full-time fixed term for 36 months. Candidates matching the required profile will be evaluated until a successful candidate is appointed. There are strict eligibility rules associated with the recruitment of Doctoral Candidates in MSCA Doctoral Networks.

Career: At the time of recruitment, the DC must hold a master's degree or equivalent degree giving access to PhD and not more than 4 years of previous research activity. A PhD degree in any field is not compatible with this DC position.

Mobility: Transnational mobility is an essential requirement of Marie Skłodowska-Curie Doctoral Networks. At the time of recruitment, the DC must not have resided in Portugal for more than 12 months in the 3 years immediately prior to the recruitment date and not have carried out in Portugal his/her main activity (work, studies, etc.). Applicants must be prepared for a secondment for a total of 3 months at IST (PT), and another secondment for at least 2 months at AUA in Greece.

Language: A good knowledge of spoken and written English is required and will be evaluated during the selection process.

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How to apply
Applicant shall provide the documentation listed in the corresponding Application Form. The Application process can be completed at the following webpage https://jobpage.cvwarehouse.com/GreeNexUS. A confirmation message will be sent upon submission.

Evaluation and interview
The selection process will consist of CVs, motivation and records evaluation and an interview (additional interviews could be required). The interview to assert the skills, the motivation, and the fluency in English, will take place at the host institution or, for those candidates who are not able to travel to Lisbon (Portugal), by internet connection. The candidates will be ranked according to both their records and the interview. The candidate at the highest-ranking position will be offered the position. If, for any reason, the selected candidate will decline the offer or will fail to comply with the requirements for enrolment in the position, the one following in the list will be selected. More details on the selection process could be found on https://greenexus.unibo.it/ and on https://euraxess.ec.europa.eu/.

Rights and responsibilities of researchers participating in Marie Skłodowska-Curie Actions
The European Charter for Researchers is a set of general principles and requirements, which specify the roles, responsibilities and entitlements of both researchers and the employers and/or funders of researchers. The aim of the Charter is to ensure that the nature of the relationship between researchers and employers or funders is conducive to successful performance in generating, transferring, sharing and disseminating knowledge and technological development and to the career development of the researchers. It is obligatory for applicants to read and understand the detailed information regarding the rights and responsibilities of researchers engaged in a Marie Skłodowska-Curie Doctoral Network. The European Charter for researchers can be accessed at: https://euraxess.ec.europa.eu/jobs/charter/european-charter

Employment contract and remuneration
The selected candidate will be appointed under a 36-months full-time employment contract with full social security and fiscal coverage, as foreseen by the Portuguese national legislation. The remuneration will be compliant with the rules of the MSCA-DN, as by the Marie Skłodowska-Curie Actions Work Programme 2021-22, 'European Union Contribution and Applicable Rates'. The gross amount per year of the allowances includes the salary (34'394.4 €), the mobility allowance (7'200€) and a family allowance, if eligible (7'920€). These gross amounts include all compulsory deductions under national applicable legislation (taxes depend on the country of the host institution).

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