

19.12.2014

Job Offer

Chemistry and material technology determine life and working environment of our society. The mission of the BAM Federal Institute of Materials Research and Testing is to deploy technology in a safe and environmentally friendly way. We test substances, materials and components as well as natural and fabricated systems; we check their reliability, develop test methodologies and essential test procedures and standards. We offer a unique research and learning environment with a long tradition in analysis and assessment of manageability and use of technical progress. Approximately 1700 employees (including permanent and temporary staff, apprentices and trainees) conduct research at BAM in the fields of technology and chemistry, assessing and limiting risk. BAM is a technical and scientific superior authority of the Federal Ministry of Economics and Energy (BMWi).

BAM's Division 7.2 "Buildings & Structures" in Berlin-Lichterfelde, Germany invites applications for a

PhD position

Pay grade 13 TVöD
Fixed term contract for 18 months
with an optional extension for another 18 months
starting date: as early as possible

Job Description:

This project is concerned with the development of a novel simulation tool for the **long-term prediction of plastic strains in cyclically loaded foundations** using an explicit accumulation technique. This will be pursued by replacing the time variable by a suitable measure of the applied load cycles. Implementing the inelastic behavior's dependency on the number of cycles into the constitutive model will permit the simulation of long-term loading events with large numbers of cycles, which is not possible with the classical numerical approaches.

The general simulation tool will be developed for the case of cyclically axially loaded piles considering the interactions between the foundation, the soil and their interface. Such foundations may suffer cyclic degradation of their shaft capacity and "friction fatigue", which can lead to sudden failure after a certain number of load cycles. The problem has a high relevance in current design of offshore wind turbines and can be based on a good amount of experimental data for verification. Based on an existing FE code for geomechanics the following aspects should be investigated:

- development of a theoretical framework for the explicit accumulation model.
- implementation of a subroutine for high-cycle loading of an interface element at piles
- validation with experimental data

Profile requirements:

- successfully completed scientific studies at university level in either civil engineering, mechanical engineering, material science, physics, mathematics or similar fields
- advanced knowledge in continuum mechanics and eventually soil mechanics, Finite Element Methods or related mathematical models
- ability to solve complex problems and related programming experience (e.g. Fortran, MATLAB)
- above-average commitment, own initiative and the capability to independently carry out scientific work and good communication skills
- very good knowledge of either English or German

For research-related questions please contact Dr. Matthias Baeßler via email (matthias.baessler@bam.de) or telephone (+49 30 8104 1724).

BAM is trying to increase the percentage of women in academic positions and thus encourages suitably qualified women to apply. Suitably qualified seriously handicapped candidates will be given preference; they need only to meet minimum physical requirements.

Please submit your application (including CV, a statement of interest, Master and PhD certificates and references), quoting reference number 228/14 – 7.2., at latest until January 16th 2015, by post to the following address:

BAM Federal Institute for Materials Research and Testing, Division Z.3, reference number 228/14-7.2., Unter den Eichen 87, 12205 Berlin, Germany