

# Stellenausschreibung

Chemistry and material technology determine life and working environment of our society. The mission of the Federal Institute of Materials Research and Testing (BAM) 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 concerns the design for cyclically loaded offshore foundations which may suffer degradation of their capacity. Special attention is focused on the shaft resistance of cyclically axially loaded piles and buckets where after a certain number of load cycles large plastic displacements and failure might occur.

A novel simulation scheme for considering the interactions between the foundation, the soil and their interface has to be developed and implemented in an existing Geomechanical Code. The aim is to have a long-term prediction of the plastic strains caused by cyclic loads on foundations using an explicit accumulation technique, where the time variable will be replaced by a suitable measure of the applied load cycles. Moreover, 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 problem can be based on a good amount of experimental data for verification and the principal aspects that will be investigated are:

- development of a theoretical framework for the explicit accumulation model
- implementation of a subroutine for high-cycle loading of an interface element at piles and buckets
- 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](mailto: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 234/15 – 7.2., at latest until September 4<sup>th</sup> 2015, by post to the following address:**

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