Postdoctoral Research Fellowship 2019

Project Title: Condition assessment, modelling and retrofitting strategies for ASR affected concrete dams in South Africa

Scope of Research:
Condition assessment, modelling and retrofitting strategies are to be investigated for South African concrete dams suffering from Alkali-Silica Reaction (ASR). Based on either material investigation, i.e. actual cores taken from affected dam structures, or indirect assessment of material properties from inverse analysis based on relevant measurement data and appropriate ASR characteristics and field data, the stress condition of the dam walls is to be analysed to

- Assess the extent of reaction, and remaining ASR swelling potential
- Determine realistic stress conditions in the dam wall for scenarios of dam water levels, and associated damage and cracking, validated by site inspections and observation data obtained from the dam owners
- Investigate dam stability under excitation expected in the region, including seismicity
- Design and computationally assess the most appropriate retrofitting or repair strategy

The Candidate, together with the Host, must liaise with the owner, typically the Department of Water Affairs and Sanitation (DWAS), for access, materials collection and field data for condition assessment, as well as reporting well-motivated and analysed intervention strategies for repair.

It is expected that the Candidate will establish a good working relation with the DWAS for a sustainable program in dam infrastructure assessment and repair at Stellenbosch University. The Candidate will work together with the Host and other research Master's and PhD students on the topic. At least three scientific papers must be published in international journals of high impact, and two more submitted in 2019 on the topic.

Host: Professor GPAG van Zijl, Structural Engineering, Stellenbosch University

Requirements:

- PhD in computational modelling of structural response, in a field relevant to the topic. The candidate must have graduated within the last five years.
- Previous experience in Computational modelling of Alkali-Silica Reaction in concrete and nonlinear Structural response
- Proven ability to publish in high impact scientific journals.

Commencement of duties: As soon as possible
Duration: One year (12 months)
Closing date for application: 30 November 2018
Application: Send a letter of application, accompanied by a comprehensive curriculum vitae, including list of publications and the names and contact details of at least two referees, to gvanzijl@sun.ac.za. Applicants should request their referees to forward confidential reports by the closing date direct to the same address.