

# International Geosynthetics Society

## United Kingdom Chapter



IGS/ICE Bath  
JOINT MEETING  
**Tuesday 15th November 2016**  
Chancellors Building, Room 3.5, The University of Bath  
Claverton Down, Bath BA2 7AY  
6.00pm for 6.30pm

### Physical modelling of Geosynthetic-Reinforced soils spanning voids

**Talia Da Silva, University of Cambridge**

#### Synopsis:

Geosynthetic-reinforced soils are used in the design of road and railway infrastructure over geotechnically challenging areas where the potential for void formation exists such as sinkholes or the collapse of mineshafts. The reinforcement is used as a preventative measure to create a load transfer platform in order to limit soil deformation and surface deflection over the void, and protect the infrastructure from catastrophic collapse.

Current design methods for the geosynthetic-reinforcement in these load transfer platforms include British (BS 8006:2010), German (EBGEO) and French (RAFAEL) design standards and guidelines. These rely on a decoupled approach of applying arching in the soil and tensioned membrane theory for the geosynthetics over the void, and have different assumptions related to the failure mechanism, soil arching, expansion in the soil, and surface subsidence. The assumed shape of the deflected geosynthetic and tension developed in it is also varied.

Physical model tests of the behaviour of unreinforced and basally-reinforced granular fills over voids were conducted in a geotechnical centrifuge using a trapdoor model where soil arching and mechanisms of deformation were investigated. In this seminar, a comparison of the reinforced and unreinforced soil behaviour based on observations from the tests conducted will be presented. The observed behaviour will be compared to the various design assumptions made, with indications as to where potential improvements to these design methods could be made.

#### Biography:

Talia da Silva is a geotechnical engineer from South Africa and did her undergraduate and honours degrees at the University of Pretoria. She has four years of work experience in South Africa as a civil engineer specialising in design of hazardous and general waste disposal facilities and associated infrastructure and site rehabilitation, and is a Registered Professional Engineer under the Engineering Council of South Africa.

Talia is currently completing her PhD at the University of Cambridge at the Schofield Centre under the supervision of Dr. Mohammed Elshafie with the receipt of a Gates Cambridge Trust scholarship. Her research investigates the centrifuge modelling of arching in granular soils and behaviour of geosynthetic-reinforced soils over voids.

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