

# International Geosynthetics Society

## United Kingdom Chapter



IGS/MGS  
JOINT MEETING  
**Monday 7th December 2016**  
Haworth lecture theatre,  
Dept of Mechanical and Civil Engineering,  
University of Birmingham

6.15pm for 7.00pm

### Reducing the Environmental Impact of Construction through use of Geosynthetics

**Jamil Raja, Loughborough University, IGS UK Chapter, Network Rail**

The changing climate and damaging effects of CO<sub>2</sub> on the environment, has led to awareness throughout the construction industry of the need to deliver more sustainable solutions. The use of geosynthetics as a sustainable construction solution was demonstrated by Waste and Action Resources Programme (WRAP) in a report entitled 'Geosystems in Civil Engineering Applications' (WRAP, 2010). The WRAP report presented a series of case studies in which geosynthetic solutions provided both cost and CO<sub>2</sub> savings in comparison to non-geosynthetic solutions. However, in what is a huge field the report concentrated on specific areas relative to the calculation methods or on the potential construction applications.

An EngD research project was carried out, to build on the work by WRAP and aimed to establish a rigorous framework for comparison of CO<sub>2</sub> emissions between geosynthetic and non-geosynthetic solutions. The research reviewed CO<sub>2</sub> calculation methodologies and techniques to produce a rigorous framework that could be adopted in comparative CO<sub>2</sub> studies between geosynthetic and non-geosynthetic solutions. The development of the case studies and framework highlighted the need for accurate embodied carbon data. There was an absence of geosynthetic specific embodied carbon values in the commonly employed databases. The EngD research sought to address this and through some experimental work in collaboration with geosynthetic manufacturers calculated embodied carbon values for four types of geosynthetics.

This presentation will provide an overview of the research project. It will demonstrate the comparative framework employed and present some of the key findings from the case studies and geosynthetic specific embodied carbon values.

#### Biography:

Jamil Raja is currently a civil engineer for Network Rail, working on the management of geotechnical and drainage assets. He graduated in July 2010 with a first class BEng (Hons) in Civil Engineering which also included an industrial placement year at Keller UK Ltd. He has since been carrying out an Engineering Doctorate research project sponsored by the IGS UK in collaboration with Loughborough University and ESPRC. As a result of the research Jamil has produced a number of conference and journal papers and was also selected to present in a special Young IGS session at the 10th ICG conference in Berlin. His most notable work includes publication of papers in Geosynthetics International and ICE journals.

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