



Research Engineer
(if known)

Will be advertised

**Sponsoring
Company**

UK Chapter,
International
Geosynthetics Society

Contacts

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IGS

Research Period

Oct 2010 - Sept 2014

PROJECT TITLE

**REDUCING ENVIRONMENTAL IMPACT OF CONSTRUCTION
THROUGH USE OF GEOSYNTHETICS**

Context/Background

Geosynthetics can offer significant benefits to the client, both financially and with respect to reduced cradle through life environmental impact of a construction. In recent years the carbon footprint of structures has been widely researched and can be defined in numerous ways. This research will allow development and refinement of the most appropriate comparison techniques to assess the technical and sustainability advantages of geosynthetic based solutions.

Aims and Objectives

The general scope of the project is to assess the environmental credentials of geosynthetic materials used in a variety of geoenvironmental and construction related applications. The aim is to produce a framework for comparison of geosynthetic based solutions to conventional construction techniques. Objectives of the project are:

- Review of approaches for life cycle assessment, carbon footprinting and environmental impact indicators and their relevance for assessment of geosynthetic applications.
- Define best practice nationally and internationally for geosynthetic applications in construction.
- Develop, refine and test a commercially applicable methodology for life cycle analysis and cradle through life carbon footprinting of geosynthetic solutions.
- Assess environmental impact of geosynthetic solutions compared to conventional construction techniques for a broad range of applications.
- Establish current industry awareness of geosynthetic solutions, including benefits, and develop an education and dissemination strategy for the developed methodology.

Methods

Research in this area was commenced in 2009 through a research and development project funded by WRAP. This short term project carried out by Symonds consulting engineers resulted in production of a report 'Geosystems in Civil Engineering Applications'. This detailed a potential methodology for assessing the benefits of using geosynthetics in construction in relation to CO² emissions and cost.

Production of the report was supported by the geosynthetics industry in the UK who provided information for the case studies incorporated in the report. The proposed project will build on this preliminary work. It will also critically review research in parallel areas and recent international work on geosynthetic applications (e.g. Germany). A key resource is access to the UK IGS membership for information on current practice (e.g. design methods and in house carbon calculators) and case study information. In addition, the project will have access to international expertise and practice through the IGS Council Technical Committee, of which Prof. Dixon is currently Vice Chairman.

To ensure relevance of the study and to maximise dissemination of outputs to industry it is proposed to form a steering committee. This will comprise 3 members: John Barritt (WRAP), a consultant and a contractor. This will meet at the start of the project and then annually. The student will be based at Loughborough University but will spend periods working with UK geosynthetic companies investigating current practice, obtaining data for case studies and, in the latter part of the project, disseminating project outputs.

Benefits/Expected Outcomes

This project offers a unique opportunity for the Department of Civil and Building Engineering to work with the UK Chapter of the International Geosynthetics Society (IGS). The IGS is a global organisation with over 2000 members bringing together individuals, academic and corporate bodies from all parts of the world, who are involved in the design, manufacture, sale, use or testing of geotextiles, geomembranes, related products and/or associated technologies, or who teach or conduct research about such products. Collaboration with the IGS will grant the researcher unrivalled access to some of the world's leading academics and practitioners. This project is timely as it follows on from the WRAP Sustainable Geosystems in Civil Engineering Applications Report published in December 2009. This report highlights the benefits both in terms of CO² reduction and cost savings of using geosynthetics in construction. However the report is not exhaustive in its coverage of the calculation methods or of potential construction applications. This project will develop rigorous assessment methods and will broaden applications. It is expected that the project will have an impact on UK construction practice and will lead international research in this area.

Any informal enquiries can be addressed to Professor Neil Dixon, Tel: 01509 228542, email: n.dixon@lboro.ac.uk or Ian Fraser, Tel: 07733 001825, email: ifraser@tensar.co.uk **Closing date for applications 14th May 2010.**