



**Australian  
Geomechanics  
Society**

ISSN 0818-9110

# **GEOSYNTHETICS NEW MATERIALS FOR MODERN INFRASTRUCTURE**

**PROCEEDINGS OF THE SYDNEY CHAPTER 2009 SYMPOSIUM**

**HELD AT**

**AUSTRALIAN NATIONAL MARITIME MUSEUM, DARLING HARBOUR, NSW**

**ON**

**21 October 2009**

**Organising Committee : H. G. Buys, B. Ewers and H. Liu**

**Published by  
The Australian Geomechanics Society,  
National Secretariat,  
P.O. Box 955, ST IVES, NSW 2075**

**The AUSTRALIAN GEOMECHANICS SOCIETY is jointly sponsored by:  
Engineers, Australia and  
The Australasian Institute of Mining and Metallurgy**



**Responsibility for the content of this publication rests upon the authors and not on Engineers Australia nor the Australian Geomechanics Society. Data presented and conclusions developed by the authors are for information only and are not intended for use without independent substantiating investigation on the part of the potential user.**

## Australian Geomechanics Society

Geomechanics is the application of engineering principles to the earth sciences to improve continually the accuracy, efficiency, cost-effectiveness and safety of construction projects both above and below ground, including the recovery of the earth's mineral resources. It remains an imprecise discipline due to the infinite variety of conditions in the earth's crust but correspondingly offers a fascinating and rewarding field of research and practice.

The Australian Geomechanics Society was founded in 1970. Its origins lie in the National Committee of Soil Mechanics of the Institution of Engineers, Australia, established in 1953 and the call for a corresponding society in rock mechanics. In 1973 the society was expanded to include the third discipline of engineering geology and has remained substantially unchanged since that date.

The society is affiliated to the International society of Soil Mechanics and Foundation Engineering (ISSMFE), the International Society for Rock mechanics (ISRM) and the International Association for Engineering Geology and the Environment (IAEG).

The AGS is jointly sponsored by the Engineers Australia and the Australian Institute of Mining and Metallurgy.

### CORPORATE MEMBERSHIP OF THE AGS

**\$737.00 and look at what your organisation gets -**

Membership for two nominees who each receive:

- Membership fee (\$176)
- Membership of the three International Societies (\$132)
- IAEG Bulletin (\$44)

An extra copy of *Australian Geomechanics* for company library (\$110)

Acknowledgement in front section of every issue of *Australian Geomechanics*

Total benefit is \$792 All prices include GST.

**Contact Peter Robinson on [secretary@australiangeomechanics.org](mailto:secretary@australiangeomechanics.org) or go to [www.australiangeomechanics.org](http://www.australiangeomechanics.org) for application forms and more information.**

#### (c) Australian Geomechanics Society

All rights reserved. Other than brief extracts, no part of this publication may be produced in any form without the written consent of the publisher. The Society encourages reproduction of its publications and consent is usually looked upon favourably. It is a requirement that full and complete acknowledgement be cited when referencing articles published by AGS.



# Australian Geomechanics Society

Sydney Chapter

## Annual Symposium

Wednesday 21 October 2009

Maritime Museum, Darling Harbour



# Geosynthetics - New materials for modern infrastructure

### Program

8:30	Registration	13:00	Questions
9:00	Opening address	13:15-14:00	Lunch
<b>Innovations</b>		<b>Testing and modelling</b>	
9:15	<b>Failure resistant soils for geotechnical infrastructure</b> Adrian Russell	14:00	<b>Pull out resistance of geosynthetic straps from shale and silty sands</b> David Airey
<b>Geosynthetics used in pavement construction</b>		14:30	<b>Linking design with specification of geotextiles</b> Warren Hornsey
9:45	<b>Subsoil pavement drains – Panel drain vs. round pipe comparison</b> Rod Fyfe	15:00	<b>Modelling fluid flow and contaminant migration through geosynthetics in 2-D and 3-D</b> Abbas El-Zein
<b>Geo-structural applications</b>		15:30	Questions
10:15	<b>Application of high strength woven geotextile in embankment stability control on soft soils</b> Barry Kok	15:30-15:50	Afternoon tea
10:45	Questions	<b>Drainage applications</b>	
10:55-11:15	Morning tea	15:50	<b>Geotextile tube dewatering – Winmalee STP</b> Martin Smith
11:15	<b>Performance of geosynthetic reinforced pile supported embankments over soft ground</b> Samanthika Liyanapathirana	<b>Geosynthetic liners</b>	
11:45	<b>Use of geofabric in Ballina Bypass construction</b> Thevaragavan Muttuvel	16:20	<b>Lake Tewa – Modular Liner system using GCL's</b> Jan Kupec
12:15	<b>Bridge approach treatment works on the Cooperook to Herons Creek section of the Pacific Highway Upgrade</b> Paul Hewitt	16:50	Questions
12:45	<b>Cooperook to Herons Creek Pacific Highway – Geosynthetics over soft ground</b> George Fannelli	17:00	Closing address
		17:10	Close

The papers presented at the symposium will be included in the Proceedings.  
Program may be subject to change.



ENGINEERS  
AUSTRALIA  
Sydney Division



**Australian Geomechanics Society**  
Sydney Chapter  
**ANNUAL SYMPOSIUM**



**Wednesday 21 October 2009**  
**Maritime Museum, Darling Harbour**

# Geosynthetics - New materials for modern infrastructure

*The following papers will also be included in the Proceedings.*

Comparing performance of Geocomposite filter-drains and granular filters under irrigation canal lining - **Hasaan Rahimi, Ali A Khosravi**

Effects of Fibres on Development of Cracks in Clay - **Hossein Taiebat, Hassan Rahimi, Sankara N Mishra**

**Platinum sponsor**



**Gold sponsor**



**Silver sponsors**



**AUSTRALIAN GEOMECHANICS SOCIETY, ABN 89 615 696 393 [WWW.AUSTRALIANGEOMECHANICS.ORG](http://WWW.AUSTRALIANGEOMECHANICS.ORG)**  
Venue: ANZ Theatre, Australian National Maritime Museum, 2 Murray Street, Darling Harbour, Sydney NSW 2000.  
(02) 9298 3625  
AGS Committee reserves the right to change the program and / or the identity of the presenters at any time without notice.

## SYMPOSIUM – WEDNESDAY 21 OCTOBER 2009

# GEOSYNTHETICS NEW MATERIALS FOR MODERN INFRASTRUCTURE

### PREFACE

This document contains the papers for the 13<sup>th</sup> annual symposium organised by the Sydney Chapter of the Australian Geomechanics Society. It is hoped the symposium will keep practising geotechnical engineers, engineering geologists and other engineering professionals informed of recent developments in this field. It also recognises the need to gather together the experience of those practising throughout Australia and to allow transfer of knowledge and sharing of their experiences.

These symposia continue to be one of the best forums for bringing together the key stakeholders of the Australian geotechnical community. The objectives of the symposium held in Sydney on 21 October 2009 have been to advance the knowledge of geosynthetics in engineering.

The symposium includes a number of themes including innovations, testing and modelling, case histories drainage applications and construction. Contributors include academics, designers, suppliers and contractors. The papers present geosynthetics project challenges and solutions from throughout Australia and overseas.

This symposium is the cooperative effort of many authors. The Editors and organising committee wish to thank the authors, who have so generously contributed their time to prepare the various papers, and the employers of the authors, who have assisted with time, secretarial, drafting and photocopying facilities. Appreciation is also extended to our sponsors for their support. Without them, the AGS Symposium would not be one of the best ongoing forums for the Australian geomechanics community.

**Henk Buys, Brook Ewers, Hana Liu**

On behalf of the Australian Geomechanics Society, Sydney Chapter and  
Sydney Chapter Symposium Organising Committee

### Annual Seminars of AGS Sydney Chapter

No.	Date	Topic	Chairman & Organising Team
1	9 April 1997	Pavement Design Beyond 2000	Andrew Leventhal
2	1998	Recent Developments in Piling Practice in Sydney	Peter Andrews
3	11 August/1999	Flexible Retaining Walls: Design to Prevent Failure	Peter Andrews/Paul Hewitt
4	9 August 2000	Computer Methods	Paul Hewitt/John Carter
5	8 August 2001	Excavation Retention	T. Walker/P. Hewitt
6	2002	Landslide Risk Management	B Walker/T Walker
7	13 August 2003	Geotechnical Instrumentation and Construction works Compliance Testing	G Scholey/T Walker
8	12 October 2004	The Engineering Geology of the Sydney Region – Revisited	G Scholey/M Parmar /G Young/G McNally
9	12 October 2005	Geotechnical Aspects of Tunnelling	H Buys/T Gourlay
10	11 October 2006	Soft Ground Engineering	H Buys/P Hewitt/R. Moyle
11	10 October 2007	Engineering Advances in Earthworks	R Moyle/H Liu/R Lindbeck
12	15 October 2008	Foundations: Innovation and Experience	R Moyle/R Lamont/B Ewers
13	21 October 2009	Geosynthetics: New Materials For Modern Infrastructure	H Buys/B Ewers/H Liu