Lectures on Geosynthetic Applications
(1) Barrier Systems for Waste Management
(Geotechnical & Geo-environmental Aspects)
and
(2) Reinforced Earth Practice in Australia

Organised by: Centre for Infrastructure Engineering and Management
and School of Engineering
Griffith University Gold Coast campus
Date: 12 October 2005
Speakers: Professor Kerry Rowe
Professor Robert Lo
Venue: Building G16 (Clinical Science Building) Room 1.12
Griffith University Gold Coast Campus

Introduction

Following the successful lectures by Prof. Harry Poulos on Pile and Piled Raft Foundations, lectures and workshops were arranged on Pavement Engineering and Civil Engineering Aspects Mining.

This was followed by lectures on ground improvement with the use of prefabricated wick-drains and surcharge and/or vacuum techniques. Also covered in this series on ground improvement is the use of reinforcing columns similar to stone columns and deep mixing lime/cement piles.

The current lectures are on Geosynthetics aimed to provide up-to-date information on Design of Barrier Systems in Waste Management and Reinforced Earth Practice in Australia. Notable speakers include Prof. Kerry Rowe, a Rankine Lecturer and Prof. Robert Lo.

Who Should Attend?

The course will be beneficial to post-graduate students, engineers and those who are in the design and analysis side of Geotechnical Engineering and Practice.

Contents of the Lectures

(1)Professor Kerry Rowe - Long-Term Performance of Contaminant Barrier Systems

Barrier systems for waste containment facilities typically include both permeable drainage and low permeability liner components and are constructed using a combination of natural and geosynthetic materials. This lecture describes the latest findings with respect to the long-term performance of these systems based on theoretical developments, laboratory studies and observed field behaviour.

Consideration is given to the effectiveness of modern liners in controlling long-term contaminant transport under normal operating conditions. The lecture will then discuss techniques for estimating the service life of these systems. Field data relating to the clogging of leachate collections systems is examined and the latest techniques for predicting performance are highlighted. The impact of clogging on both contaminant migration and the service life of the liner system are discussed. The long term performance of geomembrane liners is then investigated. Finally consideration is given to the long term performance of clay liners, with particular emphasis on the potential for desiccation of the liners due to heat generated in landfills.

(2)Prof. Lo's Lectures on Reinforced Earth -- Professor Robert Lo will present case studies of major reinforced soil projects in Australia. Following this a comprehensive coverage of reinforced soil wall design in Australia will be presented. He will also emphasize the special considerations on the use of select fill with large quantity of fines. A systematic study done in the laboratory as relevant to engineering practice on the pull out resistance of geosynthetic reinforcement will also be part of the lecture material. In this study he has used innovative

instrumentation techniques for measuring large strains/deformations occurring in geosynthetic reinforcement and they are widely used in engineering practice for monitoring the performance of geosynthetic reinforced embankments.

Road embankments constructed on soft soils undergo large settlements and lateral movements resulting in different types of instability problems. A recently developed cost-effective solution to overcome this problem is to use geosynthetic reinforcement within the fill near the ground surface. Robert has also investigated this problem in a systematic manner and has used numerical modelling techniques for the analysis and design of unreinforced and geosynthetic reinforced embankments on soft, compressible and rate sensitive soils using fully coupled large strain finite element formulations.

About the Speakers

Professor Kerry Rowe
Vice Principal (Research)
Queen's University, Kingston, ON, Canada

Professor Kerry Rowe FRSC, FCAE - Kerry was a University of Sydney man who was fortunate to be in the staple of the late Prof. Ted Davis, who also was the Guru of Prof. Harry Poulos and the late Prof. John Booker. He received his PhD from the University of Sydney for work on soil-structure interaction. Kerry moved to University of Western Ontario in Canada in 1978 and became a full Professor in that University in 1986(within an eight year period) and was the Head of Civil & Environmental Engineering from 1992 to year 2000. Currently, as the Vice Principal (Research) at Queen's University in Kingston (2000-present) Kerry is responsible for the administration of all research conducted at Queen's (from health sciences to the humanities) as well as for the commercialization of research in his capacity as chairman of the Board of the very successful commercialization arm, PARTEQ Innovations Inc. He has been a consultant on over 40 landfills, is the lead author of the book "Barrier systems for waste disposal facilities" (Spon, 2004), and a co-author of the computer programs POLLUTE and MIGRATE which are extensively used in landfill design.

Kerry is internationally recognized as a leading geotechnical and geoenvironmental engineer and researcher. His research has focussed on developing advanced analysis and then taking it into engineering practice... Kerry has made lasting and outstanding contributions to at least three major areas of geotechnical and geoenvironmental engineering. First, his early work on the elasto-plastic finite element analysis of soil stability found immediate application to a variety of geotechnical problems. Examples include the design of soil anchors, 'rock socketed' piles, and tunnels in soft ground. Second, he has provided a theoretical, experimental and practical underpinning to the application of 'geosynthetics', thus promoting

the successful use of these materials as part of the barrier systems for landfills and in ground improvement applications such as reinforced embankments on soft ground. Third, he has made seminal contributions to the understanding of the migration of leachates and contaminants through the liner systems used in landfills and in the development of design methodologies for landfills. The advanced modelling techniques he has developed are now being used extensively around the world. .

In addition to his contribution to academic administration, Kerry has served as Vice-President and then President of the Canadian Geotechnical Society. It is a very significant measure of his international recognition that he was the first Canadian elected President of the International Geosynthetics Society. He has presented over 250 invited lectures in 23 countries. This includes 44 keynote lectures at conferences held in 14 different countries.

Kerry received the Canada's highest engineeering award, the Killam Prize in Engineering, for 2004.

(2) Professor Robert Lo - ADFA

The University of New South Wales

Prof. Robert Lo has a strong track record in collaborating with international specialist contractors. He has developed innovative reinforced soil systems, notably the Terramesh reinforced soil system and the Tied back-to-back Freyssisol reinforced soil system. These works were cited and presented in the State-of-the-Art Report of two consecutive International Conferences in Soil Mechanics and Foundation Engineering, 1994 and 1997. Robert was also actively involved with the development of the Road and Traffic Authority Design Specification for Reinforced Soil Wall, R57 (2002), in addition to having his research work on pullout resistance of strap type reinforcement (Lo 1998) integrated with R57.

Robert has one of the finest Geotechnical Laboratory in ADFA at Canberra and has carried out sophisticated laboratory and field tests for many of the major projects.

Robert has contributed significantly to the transfer of research findings to industry via the delivery of seminars to universities and engineering organizations in Australia, Canada, China, Hong Kong, Singapore, and Japan. These seminars include special “technology transfer” short courses or training workshops to Buildings Department, Hong Kong, Road and Traffic Authorities, NSW, and QDMR. Robert has contributed to the research community by serving as discussion leader, panelist or chairperson of sessions in major international conferences. He also serves as reviewer to prestigious journals such as the Canadian Geotechnical Journal, the Geotechnical Testing Journal and Geotechnique. CI-Lo is currently serving as a member of TC-9, the Technical Committee of the Intl Society of Soil Mechanics and Geotechnical Engineering on reinforced soil.

Over the past 10 years, Robert has successfully supervised many PhD students and a number of Masters Students in geotechnical and pavement engineering. All his research student has a very successful career in engineering. Robert has contributed extensively in prestigious journals and conferences and also has written chapters in books on recent development in geotechnics

TENTATIVE PROGRAMME

		Day	**October 12, 2005**
09:30	**–**	**09:45 am**	**Registration**
09:45	**–**	**10:00 am**	**Opening**
10:00	**–**	**12:00 am**	**Long-Term Performance of Contaminant Barrier Systems**
12:00	**–**	**01:00 pm**	**Lunch**
01:00	**–**	**04:00 pm**	**Reinforced Earth Practice in Australia**
04:00	**–**	**04:30 pm**	**Afternoon Tea**

Venue: Building G16 Room 1.12, Griffith University Gold Coast Campus

Registration Fee $100 AUD (includes 10% GST)
(a minimum nominal charge is adopted to cover only the expenses).

For additional information please contact

Prof. A. S. Balasubramaniam
Ph: 07-55528590
Fax: 07-55528065
Email: a.bala@griffith.edu.au
School of Engineering,
Griffith University Gold Coast Campus,
PMB 50, Gold Coast Mail Centre,
Queensland 9726, Australia.

Mr. Erwin Oh
Ph: 07-55528564
Fax: 07-55528065
Mob: 0409-497746
Email: y.oh@griffith.edu.au
School of Engineering,
Griffith University Gold Coast Campus,
PMB 50, Gold Coast Mail Centre,
Queensland 9726, Australia.

Registration Form

Geo-Environment Technical Workshop

Given Name:			
Last Name:			
Position:		Title:	
Organisation:			
Department:			
Address:			
State:		Postcode:	
Telephone:		Facsimile:	
Mobile:			
Email:			

Please inform us of any special dietary requirements.
The registration fee includes light refreshment, light lunch and handouts during the program.

Enclosed is my registration fee of:

□ **AUD$100.** (*GST included*).

□ For students, **Free**.

Cheque Payments:

Cheques or money order to be made payable in Australian Dollars to "**Griffith University**". In Australia, the ABN, required to be used for GST purposes, is **78106094461**.

Credit Card Payments:

☐ Bankcard ☐ Visa ☐ MasterCard

Card Number:

Expiry Date: _____

Name of Card holder: _____

Card Holder's signature: _____

Amount to be charged: _____

Please fax or mail the completed form (by 10 October 2005) to
Prof. A. S. Balasubramaniam, School of Engineering,
Griffith University Gold Coast Campus, QLD 4215, AUSTRALIA.
Fax: +61 7 55528065