



Newsletter of the New Zealand  
Geotechnical Society Inc.

Issue 69  
ISSN 0111-6851

# NZ Geomechanics News

## June 2005



# NEW ZEALAND GEOMECHANICS NEWS

JUNE 2005, ISSUE 69

## CONTENTS

<b>Chairman's Corner</b> .....	2
<b>Editorial</b>	
Good Reasons to be Good - P Glassey .....	3
<b>Letters to the Editor</b> .....	4
<b>Editorial Policy</b> .....	4
<b>Report from the Secretary</b> .....	6
<b>International Society Reports</b>	
ISSMGE .....	7
IAEG .....	8
ISRM .....	10
ISRM - Rocha Medal .....	11
ISRM - National Group website .....	12
<b>NZGS Branch Activities</b> .....	13
<b>Conference Adverts</b> .....	20
<b>Reviews</b>	
Degrees of Belief .....	23
Mapping in Engineering Geology .....	24
Geotechnical Engineering Education .....	25
<b>Project News</b>	
Banda Aceh - 8 Weeks After Disaster Struck .....	26
Strengthening Ngaio Gorge Road Walls .....	34
Te Apiti Wind Farm: Megawatt-class Machines aided by Geotechnical Expertise .....	37
Geotechnical Investigations and Testing for Wellington Inner City Bypass .....	40
<b>Standards, Law and Industry News</b>	
Why doesn't New Zealand have a Geotechnical Database? .....	42
<b>Breaking News</b>	
18 May rainstorm Damage, Bay of Plenty .....	43
<b>Technical Articles</b>	
Numerical Analysis in Geotechnical Engineering Final Part .....	44
<b>The Bob Wallace Column</b> .....	49
<b>Company Profiles</b>	
Keith Gillepsie Associates .....	50
Boart Longyear Drillwell .....	52
<b>Member Profiles</b>	
Merrick Taylor .....	54
Ann Williams .....	55
<b>Events Diary</b> .....	57
<b>New Zealand Geotechnical Society Inc Information</b> .....	60
<b>New Zealand Geotechnical Society Inc Publications 2005</b> .....	63
<b>Advertising Information</b> .....	64

**Cover photo:** Landslide debris, Tauranga as a result of the 18 May 2005 rainstorm

**Photo Credit:** Mauri McSaveney, GNS

## CHAIRMAN'S CORNER

As I write this edition of Chairman's Corner, the organisers of our upcoming symposium *Earthquakes and Urban Development*, to be held in Nelson over 17 – 18 February 2006, have already received 31 abstracts – an encouraging start given the short time to respond – and by the time you read this column no doubt they will have received many more. A quick scan of these abstracts shows them to be all very interesting and mostly pertinent to the theme.

On behalf of Mark Foley and his committee I want to encourage those of you who haven't yet submitted your abstracts (you know who you are) to put pen to paper and submit one now. The official deadline was 15 May but he will be glad to receive your late entry. It takes little effort to write an abstract and the final papers aren't due until 15 October – plenty of time for further procrastination! To make it even easier there is a simple abstract submittal form on the Society website – check it out.

Nelson in February will be a popular venue and the organising committee is planning some great field trips and social activities. It is sure to be a major highlight of 2006. For younger members, the best way to get your firm to pay for your attendance is to submit a paper – get on to it.

The Society's Annual General Meeting was held this year in Auckland on 5 April after an interesting local field trip to view the excavations for the new Business School at Auckland University and presentation by Dr Toan. The event was marred slightly for Society office holders and stalwarts by the stampede to leave the room when the AGM was announced, fortunately nobody was injured. A bit more consideration would be appreciated by the volunteers who manage the Society and attempt to fulfil the statutory requirements on your behalf!

The meeting confirmed the Management Committee for the year ahead, unchanged from last year except that John Marsh has completed his role as Immediate Past Chairman. Thanks again to John for his service to the Society and for his support to the incoming Chair. Thanks also to

all the continuing committee members, Ann Williams as Treasurer, Phil Glassey as Editor of *Geomechanics News*, Tim McMorrnan (also Christchurch organiser), Michael Laws as Young Geotechnical Professionals Representative, Grant Murray as ISSMGE Australasian Vice President, and John St George as ISRM Australasian Vice President. No election was held this year because the number of nominations for positions on the Committee exactly equalled the number of positions.

Grant will be completing his term as Australasian Vice President of the ISSMGE in September and, by rotation, the next Vice President will be nominated by the AGS. The AGS has nominated John Carter from Sydney University and we have submitted our strong support for his nomination.

The AGS has also nominated Max Ervin for the position of President of ISSMGE, this position to be decided by election at the next meeting of the ISSMGE to be held immediately prior to the next International Conference in Kyoto in September. We have submitted our strong support for Max's nomination.

The Society, with substantial support from The Conference Company and Conventions New Zealand, has submitted a formal bid to host the 2010 International Congress of the International Association of Engineering Geology (IAEG) in Auckland. The Congress will be a major event with some 500 – 700 participants expected. Ann Williams is driving this bid on behalf of the Society and has just returned from Lyon, where she presented our bid to the IAEG Executive Committee and Council. China have offered Beijing in competition to New Zealand, however Ann reports widespread support for New Zealand following her presentation last week. Hosting of the Congress will be a great opportunity for members and the Society and I wish Ann every success.

**Kevin McManus**  
Chairman

## EDITORIAL

### Good reasons to be Good

Hey it's good to have a booming economy, with projects going ahead and a positive outlook, and a new building Act to ensure everything is hunky dory. But I would ask "why has the need for the new building codes arisen?"

I recently visited Banda Aceh in Indonesia, devastated by the Boxing Day earthquake and tsunami (see Project News this issue), and here some of the answers to that question became apparent. Despite having building codes (based on NZ codes), they are outdated, there was in general a lack of enforcement of the code, a lack of understanding of why building standards needed to be adhered to and cutting of corners at every opportunity. This had tragic consequences for the people of Banda Aceh, where recently completed buildings, of modern construction and design (supposedly), failed catastrophically as a result of the earthquake shaking. I heard a rumour that for one building that collapsed, the budget left to the contractor after everyone else had had their slice was about 60% of the original tender. I don't know how true this story is.

So, another question might be "has this type of corruption become endemic in NZ building practices, where the fast dollar, or 'cheap', is paramount over quality workmanship and craftsmanship?" I would like to hope not, but fear that it might have to a small degree. Perhaps a good earthquake, flood, or just time will tell.

This is a sidetrack to another issue that I really wanted to raise. Quality comes out of research - studying and understanding the things that work and those that don't. Research should not be restricted to Universities, Crown Research Institutes, BRANZ or the newly formed Department of Building and Housing. Theoretically, industry should be indulging also. From such research often come better and cheaper design solutions, innovation and a competitive difference.

Research involves experimentation, observation, monitoring and documentation. Some of these are second nature, others we struggle with as an industry. I know by some cursory observations I've made of what is going on in the geotechnical industry that there are innovative solutions being applied to projects. However, documentation of these innovative solutions, by my observations, especially of the diminishing number of Project News and Technical Articles in this magazine, appears to be poor. Perhaps it is the same malaise that crept into the building industry that required legislation. Or is it that we are all "just too busy", thanks to the booming economy.

**Phil Glassey**  
Editor

### The Editorial Team

#### Phil Glassey

Geological & Nuclear Sciences  
Private Bag 1930  
Dunedin  
p.glassey@gns.cri.nz

#### Imrana Azimullah

Assistant Editor  
Advertising Manager

#### Karryn Muschamp

Design and typesetting

#### Beverley Elliott

Word Processing

### NZ Geotechnical Society Contact Details

PO Box 12-241  
Wellington  
**Web: [www.nzgeotechsoc.org.nz](http://www.nzgeotechsoc.org.nz)**

#### Management Secretary:

Imrana Azimullah  
Email: [nzgs@paradise.net.nz](mailto:nzgs@paradise.net.nz)

## LETTERS TO THE EDITOR

Dear Phil

### **Important Reference material – free to a good home**

I am in process of clearing the debris from a lifetime in geomechanics. Amongst the debris is a set of the 3 volumes of papers presented to the 10th ICSMFE, Stockholm 1981, and a few other regional conference proceedings. Rather than just discarding, as with the bulk of the debris, I wonder whether any of our members would like to give these volumes a new home - perhaps to fill a gap in their library. Would it be possible to put a short note in NZ Geomechanics News to this effect?

**Regards**

**Roy Northey**

**Dr R D Northey**

127 Knights Rd

Lower Hutt

roygretn@globe.net.nz

## EDITORIAL POLICY

*NZ Geomechanics News* is a biannual newsletter issued to members of the NZ Geotechnical Society Inc. It is designed to keep members in touch with matters of interest within the Geo-Professions both locally and internationally. The statements made or opinions expressed do not necessarily reflect the views of the New Zealand Geotechnical Society Inc. The editorial team is happy to receive submissions of any sort for future editions of *NZ Geomechanics News*. The following comments are offered to assist potential contributors. Technical contributions can include any of the following:

- Technical papers which may, but need not necessarily be, of a standard which would be required by international journals and conferences.
- technical notes
- comments on papers published in *NZ Geomechanics News*
- descriptions of geotechnical projects of special interest.

### **General articles for publication may include:**

- letters to the NZ Geotechnical Society
- letters to the Editor
- articles and news of personalities
- news of current projects
- industry news.

Submission of text material in camera-ready format is not necessary. However, typed copy in Microsoft Word is encouraged, particularly via email to the Editor or on floppy disk or CD. We can receive and handle file types of almost any format. Contact us if you have a query about format or content.

Diagrams and tables should be of a size and quality appropriate for direct reproduction. Photographs should be good contrast, black and white gloss prints or high resolution digital images. Diagrams and photos should be supplied with the article, but also saved separately as 300 dpi JPGs. Articles need to be set up so that they can be reproduced in black and white, as colour is limited.

*NZ Geomechanics News* is a newsletter for Society members and articles and papers are not necessarily refereed. Authors and other contributors must be responsible for the integrity of their material and for permission to publish. Letters to the Editor about articles and papers submitted by members will be forwarded to the contributing member for a right of reply.

Persons interested in applying for membership of the Society are invited to complete the application form in the back of the newsletter. Members of the Society are required to affiliate to at least one International Society and the rates are included with the membership information details.

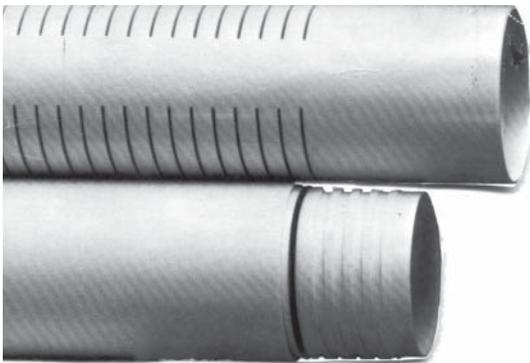
# ***strata screens & fabrication ltd***

P.O Box 5315 Hamilton New Zealand 12 Wickham Street

Phone 07 846 7239 Fax 07 846 7240

Email: [strata.screens@xtra.co.nz](mailto:strata.screens@xtra.co.nz)

## **Manufacturers of slotted PVC & HDPE pipe**



### **AVAILABLE WITH THREADED OR SOLVENT JOINTS FOR:**

- Environmental monitoring
- Piezometers
- Well screens
- Horizontal drains
- Subsoil (TNZ-F.2)
- Landfill leachate drains

### **ON SITE PLASTIC PIPELINE WELDING**

Extrusion Welding Systems



Butt Fusion Welding Systems



### **ALSO AVAILABLE**

- Electrofusion welding
- PVC & PE fabrication

### **FOR FURTHER INFORMATION CONTACT:**

**Bruce 0274 975 873 or Paul 0274 746 791**

## REPORT FROM THE SECRETARY

It has nearly been a year since I was appointed. I am thoroughly enjoying the role as it includes a wide range of activities. I and have even learnt a good deal of geotechnical jargon.

I have communicated with many of you via email and phone, and it was great to put faces to names at my first AGM. I look forward to meeting many more of you at the 2006 NZGS Symposium in beautiful Nelson. Remember to diarise for February 2006.

### Branch Events are for You

Did you know that you have a great opportunity to network with fellow members at your local branch events? Look out for the email flyers.

### Membership Clears the 500 Mark

502 – that is how many members we now have! It is a pleasure to welcome 33 new members into the Society since the last issue of NZ Geomechanics News.



### Subscriptions

You would have received your subscription invoices for 2004/2005. Please do not file them in the pay sometime later file. PLEASE PAY YOUR SUBSCRIPTIONS PROMPTLY. Thank you.

Please do contact me for any assistance you might require or any queries you might have.

### Imrana Azimullah

Management Secretary  
nzgs@paradise.net.nz

## INTERNATIONAL SOCIETY REPORTS

### ISSMGE Australasia VP Report

#### Board Meetings

The penultimate Board Meeting was held in Austin, Texas in January. This Board's term of office will end at the Osaka Council Meeting and the issues that it would like to resolve at that time are:-

- The ISSMGE constitution on voting procedures.
- The Member Society subscriptions.
- ISSMGE Membership Cards
- ISSMGE Newsletter
- ISSMGE Policy Documents

#### Voting and Fee Structure

Alternate options for resolution of these issues have been discussed over the last three and half years. Progress has been made and the Board has developed a fee proposal that shall be presented to Council in August 2005. At the moment it will involve:

- Abolishing the existing Society Fee.
- Link the fee to PPP Index
- Introduce a sliding scale for individual fee per registered member based on Member Society size.
- Introduce a minimum and maximum fee payable for individual members.

The overall objective of revising the fee structure is to ensure that the poorer less affluent member societies are not discouraged from membership of the ISSMGE by being forced to pass on disproportionately high fees to their individual members. Similar, simplified approaches that incorporate these features were presented to the Board by the VP for Africa and Australasia. These have been accepted by the Board and will be presented to the Council in September. Unfortunately, if adopted, this proposal will result in a significant increase to the member society fees for NZ.

With regard to voting policy, the Board remains of the view that each Member Society should have an equal voice at Council. The Board recognises that historical voting trends have skewed the selection of venue for IC's and Council Meetings. The Board will present a proposal to amend the society bye-laws so that these events are rotated around the regions.

#### Policy Documents

The Board of the ISSMGE initiated the drafting and publication of a series of Policy Documents. The second and third have now been prepared and will be circulated to Member Societies and published on the ISSMGE website.

#### Membership Card

The Board has determined that the members may benefit by having a unique ISSMGE Membership Card with identification number similar to those provided by ASCE, ICE and other professional societies. A proposal was circulated to Member Societies at the end of last year and the Board is seeking feedback on the scheme and is hopeful that it will come into effect before the end of this term.

#### Newsletter

The Board recognises the need and demand for a regular newsletter. It is proposed that the new Newsletter will be published electronically and circulated to Member Society's twice a year. The newsletter will be posted on the ISSMGE website. Member Societies will be encouraged to distribute it in any manner they think is appropriate for their particular situation.

#### OSAKA Council Meeting and Conferences

At the Osaka Council Meeting, Max Ervin will be nominated for President of the ISSMGE from 2005-9 and the 2007 ANZ conference in Brisbane will be nominated to host the Mid-Term Council Meeting. If we are successful in both ballots it is my opinion that it would be just recognition of the contribution that this Region has made to the International Geotechnical Community over many years.

This will be my last report to the Geomechanics News as the VP for Australasia. John Carter will be taking over from me in September and I wish him the very best of luck. It has been a pleasure and an honour to act as the Australasian VP over the last four years. I would like to sincerely thank the NZGS for their support throughout that time.

#### Prepared by

J Grant Murray  
VP Australasia Region

## IAEG Australasia VP Report

### Introduction

This report is submitted by Dr Fred Baynes, Regional IAEG Vice President for Australasia. Contact details:

Baynes Geologic, 10/272 Hay Street,  
 Subiaco, WA 6008, Australia  
 Tel: +61 89 381 9498  
 Fax: +61 89 382 1564  
 Email: fredb@iinet.net.au

### Australasian Group

In the Australasian region a proportion of members of the Australian Geomechanics Society (AGS) and New Zealand Geotechnical Society (NZGS) elect to also be members of IAEG. The Australasian group officials consists of:

<p><b>New Zealand Geotechnical Society</b></p>	<p><b>Secretary:</b> Imrana Azimullah                  NZ Geotechnical Society Inc., PO Box 12 241, Wellington, New Zealand                  Tel &amp; Fax +64 9 817 4786 Mob +64 21 211 0048                  Email: nzgs@paradise.net.nz</p> <p><b>IAEG Representative:</b> Anne Williams                  Beca Carter Hollings &amp; Ferner Ltd., PO Box 6345, Wellesley St,                  Auckland, New Zealand                  Tel +64-9-300 9172, Fax +64 9 300 9300 Email: <a href="mailto:awilliams@beca.co.nz">awilliams@beca.co.nz</a></p>
<p><b>Australian Geomechanics Society</b></p>	<p><b>Secretary:</b> Val Lee                  Engineers Australia, 11 National Circuit, BARTON, ACT 2600, Australia                  Tel +61 2 6270 6558 Fax +61 2 6273 2358 Email: <a href="mailto:valerie_lee@ieaust.org.au">valerie_lee@ieaust.org.au</a></p> <p><b>IAEG Representative:</b> Fred Baynes                  Baynes Geologic, 10/272 Hay Street, Subiaco, WA 6008, Australia                  Tel: +61 89 381 9498, Fax: +61 89 382 1564, Email: <a href="mailto:fredb@iinet.net.au">fredb@iinet.net.au</a></p>

### Australasian Group Membership Details

	June 2003	June 2004	May 2005	% change
AGS IAEG members without Bulletin	160	56	59	+3
AGS IAEG members with Bulletin	125	101	100	-1
<b>AGS Total</b>	286	157	159	+2
NZGS IAEG members without Bulletin	66	67	65	-2
NZGS IAEG members with Bulletin	90	95	96	+1
<b>NZGS Total</b>	158	162	161	-1
<b>TOTAL FOR REGION</b>	441	319	320	0

## Activities

### Australia:

- Technical meetings dealing with ground engineering held at seven state centers around the country with typically eight to ten meetings per center per year.
- The database of practising engineering geologists in the Australasian region has been updated.

### New Zealand:

- Technical meetings dealing with ground engineering held at 5 branches around the country.
- A proposal to host the 11th IAEG Congress in Auckland in 2010 has been prepared and submitted by the NZGS.

## IAEG Objectives

### Bulletin

No papers were published from the Australasian region to the Bulletin during this period. Springers were found to be making unauthorised changes to an accepted paper and to be rather inefficient in their dealings with the author.

## Technical Commissions

A review of Core Values and Technical Commissions by a Task Force chaired by Fred Baynes was completed at and soon after the Meeting in Florence and letters were sent to all Commission chairs. I have been asked to organise and chair a review session of Core Values at the Nottingham Congress in 2006. Arrangements are progressing.

## Professional Practice

In the Australasian region engineering geologists remain concerned about professional registration but there has been no further work on this.

## Relationships to other Societies

IAEG continues to form a fully integrated part of AGS and NZGS.

## Meetings and Communication

I attended the IAEG Executive and Council Meeting in Florence in August 2004 as Regional V-P.

## Net based activities

The Australasian region is currently using an email list of both practitioners and IAEG members to distribute information. An AGS website exists ([www.australiangeomechanics.org](http://www.australiangeomechanics.org)) and includes an employment opportunity section.

## Awards/Nominations

There were no nominations for any IAEG awards from the Australasian region.

## Education

A ten day geology for engineers training course in Adelaide is planned for 2006

## Fred Baynes

VP Australasian Region

## ISRM Australasia VP Report

---

### Website

The main item of news is the establishment of the website which was launched this month. The website will be the main forum for presenting and discussing items of interest to the Society. The site holds all the necessary information for the Society to function and in addition has a virtual library, micro-sites for the commissions, areas for discussion, working space for the Board and services available only to ISRM members.

### Rocha Medal

There have been three nominations for the Rocha Medal:

#### Elena Pasternak

Generalised Homogenisation Procedures for Granular and Layered Materials.  
School of Civil and Resource Engineering,  
The University of Western Australia.

#### Sedat Esen

A non-ideal detonation model for commercial explosives.  
Julius Kruttschnitt Mineral Research Centre,  
The University of Queensland.

#### Mark Tingay

In Situ Stress and Overpressures of Brunei Darussalam, at the University of Adelaide.

From these, our panel will have to select two to go forward to the final judging which will take place at the ISRM meeting to be held in early 2006.

### Commissions

The recently re-activated Commission on the Education has no members from our region. Since this is an important Commission there should be some involvement from the region. Suggestions of suitable people who would be willing to participate on the Commission would be welcome.

### Müller Award

There will be call for nominations for the Müller Award. This is a very prestigious award made once every four years at the ISRM Congress, in recognition of distinguished contributions to the profession of rock mechanics and rock engineering.

### Council and Board Meeting

The next ISRM Council and Board meetings are scheduled to take place next month at Brno in the Czech Republic. Two important decisions will be taken in Brno. The election of the next ISRM President for the term 2007-2011 from three nominations

- Dr Claus Erichson (Germany) – nominated by the ISRM National Group of Germany
- Prof John Hudson (UK) – nominated by ISRM National Groups China, UK and USA
- Prof Luis Ribeiro E Sousa (Portugal) – nominated by ISRM National Group of Portugal

Secondly the selection of venue for the 2011 Congress between Beijing – NG China and NG Singapore and Seoul – NG Korea.

#### John St George

ISRM - VP Australasia  
Department of Civil and Environmental Engineering  
University of Auckland  
Private Bag 92019  
Auckland, New Zealand  
Email: j.stgeorge@auckland.ac.nz



## ROCHA MEDAL 2007

Since 1982 a bronze medal and a cash prize have been awarded annually by the ISRM for an outstanding doctoral thesis in rock mechanics or rock engineering, to honour the memory of Past President Manuel Rocha while stimulating young researchers.

An invitation is now extended to the rock mechanics community, and especially to Faculty members, for nominations for the Rocha Medal 2007.

Full details of the Rocha Medal can be found in ISRM By-law No. 7.

will run as  
 a B&W

FOR ROCK MECHANICS

### Applic:

To be c  
 be nomin  
 official de  
 Nomin  
 nominee's  
 or organiz  
 Nomin  
 Vice Pres  
 ▪ a one  
 ▪ a thes  
 of the  
 5,000  
 detailed  
 thesis  
 figures;  
 recomn  
 level of  
 ▪ one c  
 the doc  
 ▪ a lett  
 to copy  
 selectio

### Applic:

The nomination must reach the ISRM Vice President concerned, by registered mail, not later than December 31, 2005.

All relevant information, namely By-law No. 7 and addresses of Vice Presidents can be obtained from the ISRM website, at <http://www.isrm.net>.

ORTUGAL  
 REECE  
 RANCE  
 USTRALIA  
 USTRIA  
 JK  
 RANCE  
 ERMANY  
 OUTH AFRICA  
 USTRALIA  
 NDIA  
 HILIPPINES  
 APAN  
 ANADA  
 USA  
 ERMANY  
 USTRALIA  
 OUTH AFRICA  
 RANCE  
 OUTH AFRICA  
 ANADA  
 OUTH AFRICA  
 ITALY  
 JK



Secretary General

1 April 2005

# will run as a B&W

Dear Pres

I am pleased  
to address:

A number  
of the Sc  
corporate  
others th  
a virtual I

This web  
support it

As conce  
responsib  
of interes  
and pass

As regard  
directly re  
existing in  
encourag  
inform us  
to keep a

Thanking  
give, and

Dr Luís Lamas

y, at the same

ive information  
ussion, a list of  
ral Groups, and  
mented, namely

vity. With your

access by the  
ere information  
your username

re possibility to  
n the addresses  
his is why I am  
nd immediately  
the Secretariat

im sure you will

## NZGS BRANCH ACTIVITIES

### Auckland Branch Activity Report

Towards the end of last year, we called a branch meeting with a view to setting a regular meetings programme for 2005. The end result of this was that myself, Yan Chan and Steve Crawford 'volunteered' to work up the programme. We are now well into the 2005 year and our programme of meetings is more or less holding up.

The programme actually started in November last year, when we held a drinks party at Old Government House. The setting at OGH is superb, with the function room looking out over the terrace and lawns beyond. All going well, we will repeat it again towards the end of the year.

This year it is our aim to hold meetings regularly on the last Tuesday of the month in order to establish a routine. This should make it easier for us all to organise our mental diaries. Interspersed with the regular meetings will be 'specials' organised around visiting speakers.

This year our programme kicked off with a 'special' when Prof Dov Leshchinsky of the University of Delaware gave us a presentation on Large Scale Shaking Table Tests on Segmental Walls, His approach was refreshingly pragmatic and appreciated by all present.

Our main meetings programme has so far included:-

- University of Auckland Business School – A Geotechnical Perspective by Dr DV Toan & Wayne Gunn of Beca Infrastructure Ltd. This meeting was preceded by a site visit to see first hand the scale of the excavation and the anchored retaining wall supporting it. The meeting was followed by the NZGS AGM.
- New Building Act 2004 by Malcolm Maclean of Glaister Ennor (solicitors). This meeting was one of the few given by someone from outside of our profession, which made it all the more interesting. The large amount of feedback from the floor both during and following Malcolm's presentation highlighted the concern and uncertainty felt by us all over this piece of legislation.

The programme for the rest of the year covers a wide range of subjects, practical to academic and engineering to geological and will provide something for everyone.



**Rodney Hutchison**

Auckland Branch Coordinator

Phone (09) 478 6655

Rhutchison@kga.co.nz

Rodney Hutchinson is Principal with Keith Gillespie and Associates Ltd – a small specialist geotechnical practice on Auckland's North Shore. They act as a "house builder's and small developer's friend". He is a geotechnical engineer who studied in London and then worked in Honk Kong and the UK before returning to NZ.

## Canterbury Branch Activity Report

During February, Geovert hosted a branch meeting where Hannes Salzmann, Principal Geotechnical Engineer from Geobruigg in Switzerland gave a talk on Rockfall and Debris Flow Protection Systems. The talk was held at Rydges in Christchurch and Geovert kindly provided drinks and nibbles.

During April Mark Yetton gave a very interesting talk entitled Earthquake Tree-Ring impacts in the Middle and Upper Buller River catchment. This talk summarised the findings of a recent EQC funded study conducted by Mark and Andrew Wells. His talk demonstrated the record of the 1929 Buller and 1968 Inangahua earthquakes held in growth rings of forest trees and suggests that the method could also be used to identify prehistoric earthquakes. Maccaferri kindly provided drinks and nibbles.

In May, Kevin McManus, Chairman of the NZGS Management Committee will give a talk on a topic of his choice. A flier outlining the topic, time and venue will be sent out shortly.

In June, URS will give a presentation on a recent seismic safety evaluation of a large dam.



**Tim McMorran**

Canterbury Branch Coordinator

URS New Zealand Ltd

Work: 03 374 8506

Email: tim\_mcmorran@urscorp.com

Tim McMorran was elected onto the NZGS management committee in 2003, and was offered the position of Canterbury Branch Facilitator in 2004.

Tim is an Engineering Geologist who leads the geotechnical group of the URS Christchurch office. He graduated from University of Canterbury in 1991 with an MSc in Engineering Geology and has worked in consulting since then. After graduating Tim lived in Sydney and worked for DJ Douglas and Partners, and has worked for URS (formerly Woodward-Clyde), based in Christchurch since 1995.

The Canterbury Branch of NZGS typically has 30 to 40 attendees at meetings, and has a large local geotechnical community to draw speakers from, both in engineering practice and at local universities. In 2005 Tim has commitment from many local practitioners to give talks at our monthly meetings.

## Check it out – we are online!

- Regularly updated
- Has a comprehensive list of what is on
- Includes the Shear Vane Guidelines
- Employment Opportunities Listing



[www.nzgeotechsoc.org.nz](http://www.nzgeotechsoc.org.nz)

---

## Nelson Branch Activity Report

---

No Activity in this period from Nelson Branch



### Tim Coote

Nelson Branch Coordinator  
 Tonkin and Taylor Ltd  
 Work: 07 839 9863  
 Email: tcoote@tonkin.co.nz

Tim Coote is a senior engineering geologist with Tonkin & Taylor Ltd in their Nelson office. Tim recently spent four years living in Colorado (1999 to 2003) working with SRK Consulting Ltd on mining development projects throughout South and Central America. Tim's project experience also includes two multi-million dollar landslide investigation and remediation programs at Cromwell (The Clyde Power Project) and Waihi (The Golden Cross Project).

---

## Otago Branch Activity Report

---

No activity so far. Phil Glassey will give a talk on his visit to Banda Aceh at some stage. No other activity is planned just at present and your ideas and assistance in putting together a programme would be appreciated



### Phil Glassey

Otago Branch Coordinator  
 Geological & Nuclear Sciences  
 Work: 03 479 9684  
 Email: p.glassey@gns.cri.nz

Phil Glassey is currently the Manager of the Mapping section at the Institute of Geological & Nuclear Sciences Ltd. He is also on the GSNZ management committee and the current editor of Geomechanics News

Phil is an engineering geologist with a MSc in Engineering Geology from Canterbury University. He worked for 5 years for an engineering consultant firm in Tauranga prior to joining the Institute of Geological & Nuclear Sciences in 1991. He has been involved in wide range of engineering geological investigations mostly involving slope stability, foundation conditions and groundwater studies. Phil was the reporting geologist for investigations into Hydroelectric power schemes in New Zealand, notably the proposed Lower Clutha Power Development and the landslide stabilisation, monitoring and groundwater studies associated with Clyde Power project.

More recently, Phil's specialist research interest has become landslide hazard mapping and zonation methodologies, GIS applications and database management. Between 1993 and 1996, he was part of a team that developed a GIS-based Hazard Information System for part of Southwest Dunedin. During this time he also gained a Diploma for Graduates, specialising in Spatial Information Systems.

---

## Wellington Branch Activity Report

---

The Wellington Branch has got off to a slow start to the year with no meetings undertaken yet. Plans are under way for four meetings this year.

### Grant Dellow

Wellington Branch Coordinator  
Geological & Nuclear Sciences  
PO Box 30-368, Lower Hutt  
Email: g.dellow@gns.dri.nz

Grant Dellow is an engineering geologist employed by the Institute of Geological and Nuclear Sciences Ltd (GNS). He has been primarily involved in three areas of work. The first of these is foundation investigations and repairs for hydropower structures and includes major work at Matahina, Arapuni, Whakamaru, Clyde, Waitaki, Aviemore, Benmore and Ohau C. A second area of work has been in the earthquake hazards, producing susceptibility models for ground shaking amplification, liquefaction and slope stability. The third area of work and now the most time consuming has been the study of landslides. This work started with the systematic compilation of an inventory of large landslides in New Zealand for GNS and is still ongoing. Since 1996 landslides have been catalogued for GNS using news media accounts and response missions. The landslide catalogue has allowed a more accurate quantification of the hazard and associated risk New Zealanders are exposed to from landslides.

---

## Waitako Branch Activity Report

---

This winter season we have four forthcoming presentations related to both current projects within the Waikato and long standing geotechnical personalities!! A programme of events is expected in June 2005 (boy its hard to get these guys to sign up for presentations). Do remember that the Branch activities will only succeed if you at least attend the events organised, or better still offer to contribute and share your experiences!!

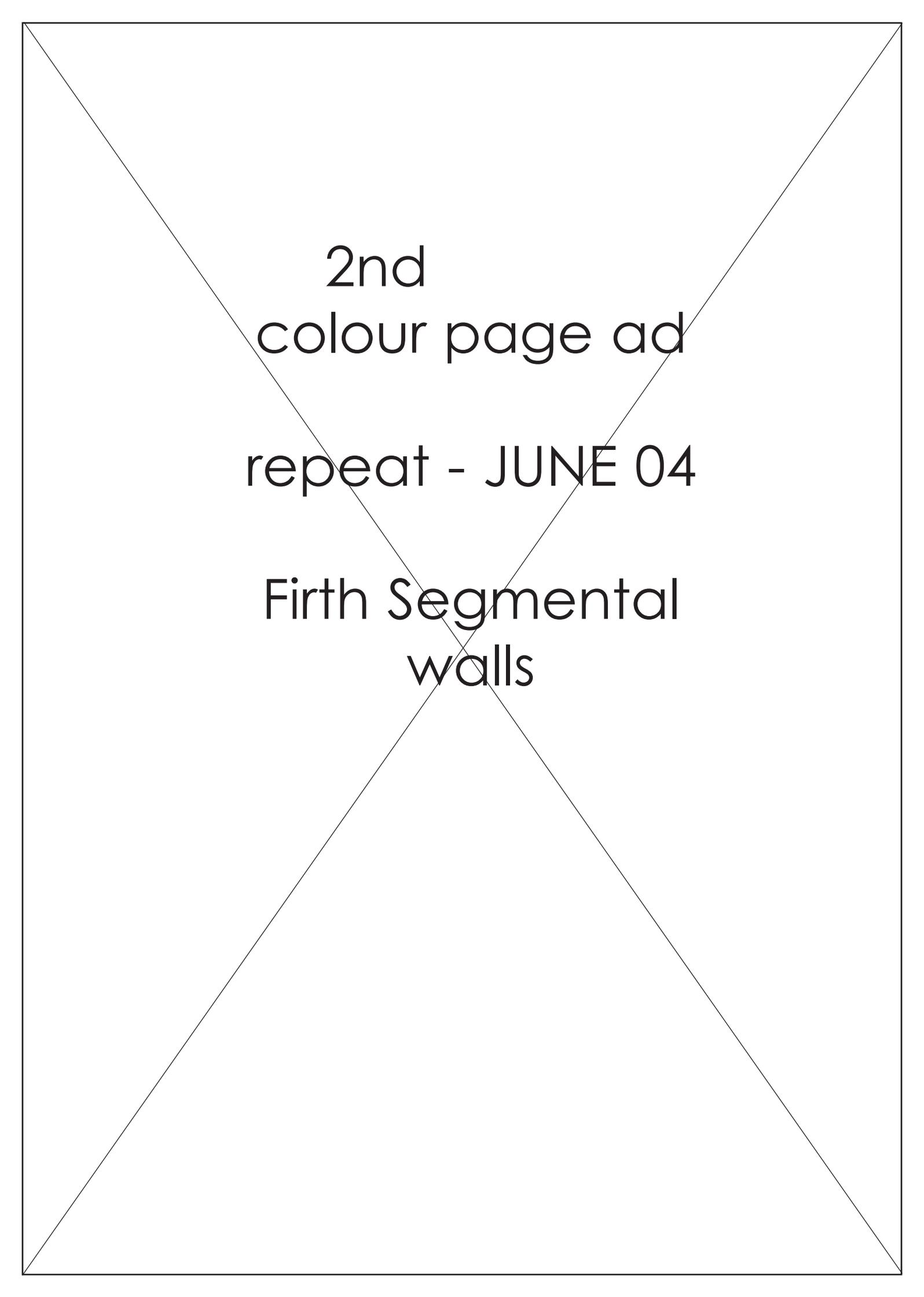
There are some major and diverse projects on-going in the Waikato which someone must be working on!

### Stuart Finlan

Waikato Branch Coordinator  
MWH New Zealand  
Work: 07 839 9863, Fax: 07 839 4234  
Mobile: 027 291 1914  
Email:  
stuart.finlan@NZ.mwhglobal.com

1st colour page  
ad

repeat  
Drillwell Services  
from  
december 2004



2nd  
colour page ad  
repeat - JUNE 04  
Firth Segmental  
walls



# Geotechnical New Zealand

*Beca Geotechnical: Specialist and multidisciplinary, teamwork, challenging projects, knowledge sharing, progression opportunities.*

If variety is what you are seeking, these roles have the potential to provide you with challenge and merit-based promotions. Seize the opportunity to join us and prosper! If you have the right attributes, we can offer you:

- Recognition for performance** the potential to develop your career with Beca's support so you can make your highest level of contribution. In addition, the opportunity to become part of an award-winning team and receive a competitive salary package
- Long-term prospects** the potential to become a shareholder in the largest New Zealand employee-owned professional services firm
- Reputation** the opportunity to work alongside some of the most talented and experienced New Zealand and international experts in a wide range of disciplines, providing our clients with leading-edge expertise and global experience
- Excellence** working on diverse projects combining proven systems with the opportunity to innovate, with a focus on exceeding clients expectations and delivering award winning projects

Join our geotechnical business and become part of a team that has developed an international reputation for versatility and creativity. Assist us to keep delivering practical yet innovative solutions on the project work we undertake throughout New Zealand, Australia, the Pacific Islands, Asia and Indonesia.

## Senior Geotechnical Engineers – Wellington and Tauranga (Ref: 320-12)

The opportunity to create new business with a strong focus on building relationships with our client excites you? But you would also like to keep your hands on aspect of managing and delivering projects and technical problem solving? This position is tailor-made for you.

## Senior Geotechnical Engineers – Auckland (Ref: 320-13)

As an experienced senior engineer, you will have the responsibility for project management on a large range of interesting projects and act as a mentor for the engineering staff. This role will give you the opportunity to share your knowledge and commitment.

## Geotechnical Engineers – Auckland (Ref: 320-14)

We are looking for motivated individuals keen to further develop their career in geotechnical engineering. It's a great opportunity to upskill with involvement in general geotechnical work and detailed analysis, on our wide range of projects.

If you're interested in embarking on a rewarding career within a diverse engineering environment, call Kylee Craig on 09 300 9000 or email your resume to [humanresources@beca.co.nz](mailto:humanresources@beca.co.nz), quoting the appropriate reference number. Alternatively you can apply online at [www.beca.com](http://www.beca.com)



## *Geologically Active* 11th IAEG Congress

Auckland, New Zealand 2010



The New Zealand Geotechnical Society invites you to support our bid to host the 11<sup>th</sup> IAEG Congress in Auckland, Aotearoa, New Zealand, September 2010.

We have identified a theme, *Geologically Active*, that will encompass the full range of engineering geological practice, encourage participation from, and provide value to, practitioners from around the world. Engineering geology and geotechnical engineering go hand-in-hand in Australasia, and we plan to celebrate this intrinsic inter-relationship, while maintaining a core engineering geological flavour.

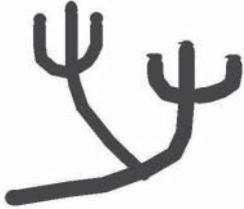
Located astride the leading edge of the Australian Plate, New Zealand is *Geologically Active*, presenting a range of particular challenges to engineering geological and geotechnical practitioners in meeting the needs of communities and infrastructure:

- Active volcanic terrain; and
- Sensitive soils deposited by volcanism, that do not behave conventionally when worked or loaded;
- Seismically active terrain; and
- The stability of slopes in tectonically deformed and uplifted weak rocks.

Immerse yourself in collapsing cones, sensitive soils, slippery slopes, mylonite and melange, rock slide avalanches, boiling mud and geysers, pumice, ignimbrite, tephra and weak rock of many kinds.

Aotearoa, New Zealand, is the country.  
Akarana, Auckland is the city.  
*Geologically Active* is the theme.

***Geologically Active* Auckland, Aotearoa New Zealand.**  
**Give us your support, and be here in 2010**



3-iYGEC Osaka

## **Re: Final invitation to 3rd Young Geotechnical Engineer Conference in Osaka, JAPAN**

Dear member societies of the International Society of Soil Mechanics and Geotechnical Engineering

On behalf of the International Society (ISSMGE), the Japanese Geotechnical Society (JGS) is going to host the 3<sup>rd</sup> International Young Geotechnical Conference (3iYGEC) in Osaka during the International Conference on Soil Mechanics and Geotechnical Engineering (ICSMGE) in Osaka as well. With the original idea proposed by ISSMGE, 3iYGEC takes place in the same week as ICSMGE in the same city and is intended to give a good opportunity to promising young people of member societies to attend ICSMGE at a very low cost as well as to get acquainted with other by means of working together. For more information, the following website can be referred to:

<http://www.jiban.or.jp/e/events/3iygec.html>

Since the initial invitation was sent to member societies in Fall of 2004, so far 58 delegates have been nominated. The organizing committee of 3iYGEC, however, has decided to make the last effort to invite more people to the said conference. In case your society has already decided your delegates, please forget this correspondence. The member societies which have not decided their delegates or have decided only one delegate are encouraged to choose in total two delegates each.

For more details, please refer to the previous invitation letter which is attached here. Although the due date of application was at the end of January, the last application shall be accepted until the middle of May. In case there is a special situation where the nomination is made later, please contact [towhata@geot.t.u-tokyo.ac.jp](mailto:towhata@geot.t.u-tokyo.ac.jp).

Last but not least, the organizing committee is planning to invite young students from nations who are currently studying in Japan and whose member societies cannot send delegates to Japan. The selection will take place after May. It is requested to member societies to accept this idea.

Yours sincerely,

I. Towhata  
Organizer of 3iYGEC  
Professor of Geotechnical Engineering  
University of Tokyo  
E-mail : [towhata@geot.t.u-tokyo.ac.jp](mailto:towhata@geot.t.u-tokyo.ac.jp)  
Fax. +81-3-5841-8504

# CALL FOR PAPERS

## EARTHQUAKES AND URBAN DEVELOPMENT

A Symposium by the New Zealand  
Geotechnical Society

17-18 FEBRUARY 2006, Rutherford Hotel, NELSON

This symposium is intended to provide a forum for practitioners to meet and exchange ideas on a wide range of geotechnical engineering and engineering geological issues related to the effects of earthquakes on urban development and infrastructure.

The symposium will extend over two days at the Rutherford Hotel, with an option for undertaking a field trip on Sunday 19th February 2006.

### Topics will include:

- Seismic design standards: The Building Act; Building owner requirements; Building insurance implications; Public expectations
- Earthquake hazard and risk assessment
- Engineering geology of seismic induced landslides
- Developments in Paleoseismic research
- Site specific seismic spectra and attenuation models, subsoil categories and loading codes
- Seismic lateral earth pressures on retaining walls
- Liquefaction and lateral spreading
- Ground improvement
- Seismic slope stability analysis and inundation prediction
- Faulting and building set-back lines and near fault effects
- Preparedness and response to a seismic event
- Alignment of structural and geotechnical seismic design models
- Seismic induced ground deformations
- Geotechnical database development

### Call for Papers

The Convenor invites interested parties to submit an abstract for consideration to be included in the programme. All accepted papers will be published in the Symposium Proceedings which will be available to attendees upon arrival at the Symposium.

### For on-line submission

The preferred method for abstract submission is on-line and should be made through the link below  
Link to electronic abstract submission

### For email submission

Alternatively, you may send via email attachment. An Abstract Return Form must be completed for each abstract if sending by email. Save your abstract (maximum one page) as  
GEOTECH\_(presenting author's name).doc

Email your abstract as a Word attachment together with the Abstract Return Form to: [geotech2006@cont.canterbury.ac.nz](mailto:geotech2006@cont.canterbury.ac.nz)

### On the subject line please indicate:

GEOTECH (presenting author's name) –Abstract

### Abstract Layout (for email submission only)

Abstracts should be 100 - 200 words. Each abstract must contain a brief title, the author(s) name(s) and their affiliations.

### Key Dates

Abstract Submission Deadline: 15 May 2005

Confirmation of Acceptance: 15 June 2005

Submission of Full Paper: 15 October 2005

### Symposium Convenor

Mark Foley, Tonkin & Taylor Ltd, Nelson

### Administration

All inquiries to: The Conference Office  
University of Canterbury  
Private Bag 4800, Christchurch  
New Zealand  
Telephone: +64-3-364 2534  
Fax: +64-3-364 2057  
Email: [geotech2006@cont.canterbury.ac.nz](mailto:geotech2006@cont.canterbury.ac.nz)

Please send information on Trade Display Opportunities

Please send information on Sponsorship Opportunities



## REVIEWS

### Degrees of Belief - A Unique Perspective to Engineering

Subjective Probability and Engineering Judgement

The sub-title of the book has an allure. It entices the engineer or scientist into a perception that they are someone attempting to unravel the mystique embedded in exercising technical judgement?

Yes indeed, Steven Vick sets out to accomplish that task, and for those a bit seasoned in their walk through a professional life or for those with good aspirations for developing technical excellence, it provides a challenging read.

I suspect that most will glide through the initial 50 pages, which define what probability is and is not and outlines, using historical characters, knowledge, opinion and degrees of certainty. Then the challenge: two hundred and fifty pages devoted to the core purpose of the book. To quote the author: *"This book is about how to use probability and use it sensibly with appreciation of what it can and cannot do."* The approach to elucidating probability and risk has a geotechnical perspective. This is achieved through a balance of theory and a diverse variety of case studies that include the Challenger space shuttle disaster.

The remaining 100-odd pages cover experts and expertise; and judgement, probability and thinking. These pages provide a welcome relief from the current fashionability of Risk practitioners where many use theory to manipulate mathematics so that reports are available to assuage those responsible for committing to large capital investment or to asset management. The final chapters delve into the thinking process and provide an essential foundation to the reader. To again quote the author: *"Judgement is at the heart of engineering, but our appreciation of its inner workings is embryonic."*

A worthwhile, but not an easy read.

**Reviewed by:** Evan Giles  
URS New Zealand Ltd

**NB:** This review has been reprinted as the copy in the last edition of Geomechanics News issue 68, December 2004, was incorrect. Apologies to Evan Giles - editor.

#### Degrees of Belief – A Unique Perspective to Engineering

<b>Editor:</b>	Steven G Vick
<b>Publisher:</b>	ASCE Press
<b>Year published:</b>	2002
<b>ISBN:</b>	0-7844-0598 0
<b>Web shopping at:</b>	<a href="http://www.pubs.asce.org">www.pubs.asce.org</a>
<b>Price:</b>	US\$59.80

## Mapping in Engineering Geology

The Geological Society, Key Issues in Earth Sciences, 1

The objective of this publication is to “introduce a new generation of engineering geologists to the cost effective techniques of engineering geological and geomorphological mapping”. In his introduction Dr Griffiths describes the 1960s and 70s as formative years of engineering geological mapping, but expresses the view that that emphasis on mapping in engineering practice has since reduced, particularly in the last two decades. This is also a commonly held view among senior professionals in New Zealand’s geotechnical community. The modern emphasis on computer-generated logs and maps rather than sketch maps and hand-drawn geological logs are commonly cited examples. Excellent engineering geological maps are still produced today, but most engineering site investigations include merely a site layout plan and simple engineering logs of subsurface investigations, sometimes with a very simple map of the geology. Often these are difficult to use and serve little useful purpose to the engineers who pay for them. Many experienced engineering geologists and geotechnical engineers would agree with the author and wish graduate engineering geologists to be encouraged to learn the techniques of observation, analysis and presentation that are essential to good engineering geological mapping.

The publication collects 13 papers mainly reprinted from Quarterly Journal of Engineering Geology and Engineering Geology Special Publications of the Geological Society. The authors are almost all British, and include well-known names like Hutchison, Dearman, Brundsen and Fookes.

The publication includes essential reading like the Working Party report The preparation of maps and plans in terms of engineering geology (Anon 1972), which sets out the framework for engineering geological mapping

symbols, scales and techniques. Engineering geological mapping for civil engineering practice in the United Kingdom, (Dearman and Fookes, 1974), describes the use of mapping at that time and expected future trends. That paper includes many fine examples of engineering geological illustrations. Additional papers give examples of hazard zoning for land development with respect to slope instability, karst and dunes.

Engineering geological mapping is particularly important in New Zealand, where slope instability, flooding, volcanic and seismic hazards effect almost every engineering development. Partly as a consequence of this, New Zealand has produced engineering geologists who are held in high regard internationally. Emphasising the importance of good engineering geological maps to engineering projects is the job of us all, and to accomplish this, we should encourage graduates to learn techniques of mapping and presentation.

Griffiths’ publication forms an excellent learning tool and reference for engineering geologists. It contains many of the most useful contributions from the UK to engineering geological mapping practice. The papers are well written and contain many examples of excellent engineering geological maps from research and engineering practice.

This book is a must for those starting a career in engineering geology and a useful addition to the collection of all engineering geologists. Most importantly this book shouldn’t stay on the bookshelf, but should be often referenced.

**Reviewed By:** Tim McMorran  
URS, Christchurch

### Mapping in Engineering Geology – The Geological Society, Key Issues in Earth Sciences, 1

The Geological Society of London 2002.

<b>Editor:</b>	J.S Griffiths
<b>Publisher:</b>	The Geological Society, London
<b>Year published:</b>	2002
<b>ISBN:</b>	1-86239-101-7
<b>Web shopping at:</b>	<a href="http://www.geolsoc.org.uk">www.geolsoc.org.uk</a>
<b>Price:</b>	£27.50

## Geotechnical Engineering Education and Training

Proceedings of the First International Conference on Geotechnical Engineering Education and Training. Sinaia, Romania, 12th to 14th June 2000 Iacint Manoliu, Ion Antonescu, Nicoleta Radulescu. Editors Technical University of Civil Engineering, Bucharest, Romania.

This book comprises a series of papers presented at the First International Conference on Geotechnical Engineering Education and Training, Sinaia, Romania, 12th to 14th June 2000. These proceedings commence with a number of invited papers from internationally distinguished teachers in the field; Professor H Brandl, Professor F.B.J. Barends, Professor S. Prakash, Professor P. Seco e Pinto, Professor S. Sharma, and Professor I. Manoliu.

These invited papers cover a range of topics including the role and ethical responsibilities of geotechnical engineers in society, to the impact of modern information technologies on geotechnical engineering education, the history of education practices in geotechnical engineering, and overall trends in geotechnical engineering education. National reports are then presented on the nature and scope of the geotechnical education from 19 countries, including a report on New Zealand by Debbie Fellows.

These papers outline the types of programmes offered at both undergraduate and post graduate levels, and varying amounts of detail on the subject matter covered within the courses offered.

The remainder of the proceedings contain papers that broadly cover the following aspects of geotechnical engineering education:

- The place, role and content of geotechnical engineering in civil, environmental and earthquake engineering education curricula, at under graduate and post graduate level.
- Teaching, learning and assessment in geotechnical education practice.
- The use of information and communication technology in geotechnical engineering education

- Case studies in geotechnical engineering education
- History, lifelong learning and international cooperation in geotechnical engineering education.

I found the invited papers to be interesting reading, in particular the historical background to learning within geotechnical engineering. Some of the big picture issues that are covered by these papers is also well worth a read and present a number of interesting opinions on topics that do not surface often in the everyday life of a practicing engineer. The remaining sections of these proceeding areas cover topics of more specialised interest and cover a somewhat eclectic mix of subject matters. These proceedings will be of interest to the academic community and of real value to compare education standards and practices around the world, and to share interesting and creative methods to teach geotechnical engineering (through the use of case studies or computer based teaching methods for example). It is also of interest to those who would like to know more about the issues affecting education within geotechnical engineering. The national reports would be of use to employers considering job applications from engineers educated at foreign universities (inclusive of Algeria and the People's Republic of China!). For the practitioner, this book offers an insight into the education practices and probable future directions of research within geotechnical engineering.

While I found many of the papers to be interesting, this was not a book that can be readily read cover to cover and I suspect this book would start collecting dust on my bookshelf. These proceedings are likely to be of more value to the academic teaching community and for those with a particular interest on overseas best practice in education and trends within this field.

**Reviewed By:** Nathan Mckenzie  
Senior Geotechnical Engineer  
Beca Carter Hollings & Ferner

### Geotechnical Engineering Education and Training

**Author:** I Manoliu, I Anotonescu, N Radulescu  
**Publisher:** A.A. Balkema  
**Year published:** 2000  
**ISBN:** 90 5809 154 6  
**Web shopping at:** <http://www.balkema.ima.nl>

## PROJECT NEWS

### Banda Aceh – 8 weeks on since disaster struck

Phil Glassey, Geological & Nuclear Sciences

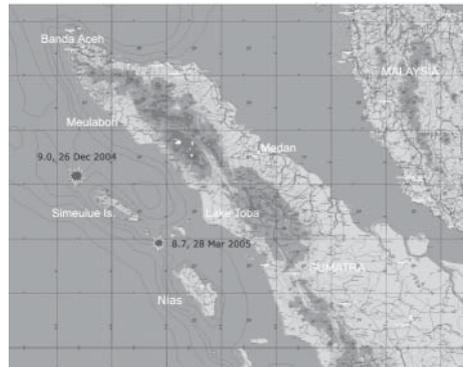
At short notice and with some trepidation mixed with excitement, I agreed to travel to Banda Aceh in Indonesia to be involved in discussions on Tsunami Reconstruction and Rehabilitation, scope potential projects for NZAid, and also look at opportunities for NZ expertise contained within the Natural Hazards NZ cluster and Earthquake Engineering Cluster. I arrived in Banda Aceh on 3 March 2005.

Fortunately a lot of the cleaning up had already been done, and the phones, electricity and water were working again (for the most part). Half of Banda Aceh, a city about the size of Christchurch, had been destroyed by the 26 December 2004 earthquake and tsunami. Imagine Christchurch, completely flattened from Brighton Beach to the Square, with all the debris, including dead bodies piled up from the Square to Hagley Park.

When I arrived, I discovered that up to 380 relief and aid organisations had registered with the Humanitarian Information Centre (HIC) in Banda Aceh. The relief effort appeared to be a circus, complete with circus tents. It seemed uncoordinated with many organisations working in isolation to provide relief and start rehabilitation. However, I found out that it was much better than first impressions and that many organisations had done magnificent work especially in those immediate weeks following the disaster.

The constant coming and going of staff from these organisations meant that there was not consistent representation on the Reconstruction and Rehabilitation Working Groups. Many international organisations were now gearing up for rehabilitation and reconstruction, as opposed to emergency relief, with new personnel arriving. These, plus a myriad of other organisations looking for opportunities, were overwhelming local government officials and the tiredness in their eyes showed. One provincial official pulled a pen from his pocket and said “this is all that is left of my office”. The Mayor of Banda Aceh had one engineer left on staff – the others were either dead or recovering from injury.

I was lucky enough to get a trip on a UN helicopter travelling to Meulaboh along the western coast of Aceh



Map of Aceh and North Sumatra. The epicentres of the December 04 and March 05 earthquakes are shown.

**Opposite:** The devastated town of Meulaboh.

province. From the air, a swath of destruction, up to 3 km wide in low lying places was apparent. Meulaboh was run over several times as the water sloshed back and forth in the estuary behind the city. The photos that I took did not do justice to the degree of destruction. There was plenty of evidence that this coast had subsided 1 – 2 m such as coconut palms in growth position in the surf zone. >



**Right:** The building survived but has nasty structural damage. **Opposite:** This hotel once had a lobby.



Supermarket Closed.



While being escorted around the city by my friendly and patient driver, Razil, I observed much earthquake damage. The fundamental building style is a two or three story design, comprising relatively thin concrete columns with un-reinforced brick walls, not connected to the columns, and concrete tile roofs. Many of the brick walls fell out, and provided little shear resistance, and as a result many of the columns were snapped. Interestingly enough, many of these buildings survived the earthquake, and one can only guess that construction standards may have had something to do with it. Other, more familiar construction types also collapsed or suffered damage. A new three-story supermarket had collapsed and the ground floor lobby of a relatively new hotel was 'pancaked', the other 5 stories remaining relatively intact. Japanese built facilities suffered little or no damage.

The tsunami damage was by far the most difficult to comprehend. It was like a nuclear bomb had gone off, stripping just about everything at ground level. Most

Mosques seemed to be the only structures that survived the destruction.



Typical building construction.

interesting was that most of the mosques survived both the earthquake and the tsunami, and in some towns down the coast the mosque was the only thing left standing. Aceh is perhaps the most Muslim province in Indonesia, and there was a sense of the hand of Allah in the destruction, much like the biblical flood and plagues I guess. >



# New Services

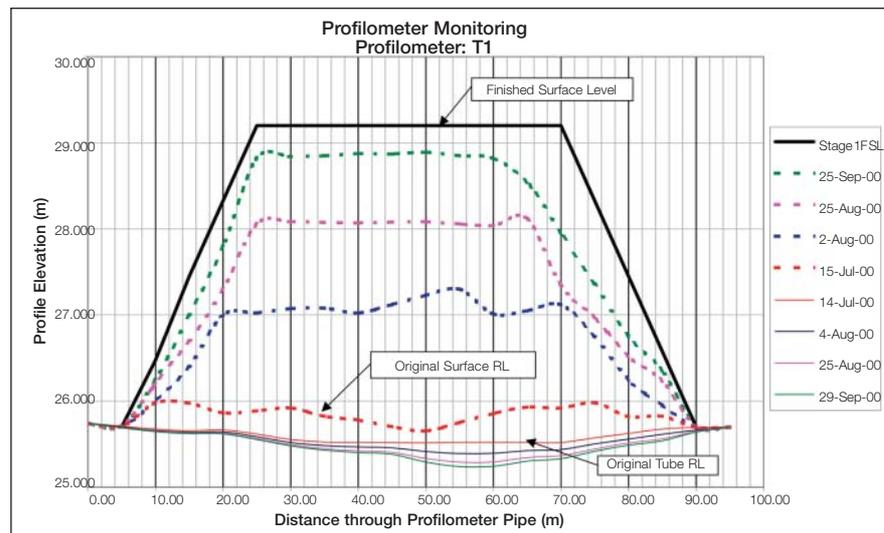
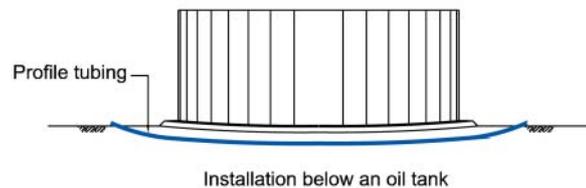
## Window Sampler

- Geotechnical investigations
- Environmental investigations
- Soil sampling
- Piezometer installation
- Coring to 10 m
- Cost effective
- Continuous core sample of 1 m or 2 m
- Excellent at identifying discrete bedding or layering
- Recovers sensitive soils i.e. liquifying sands
- Useful where access is difficult or there is a space constraint i.e. basements, gardens



## Hydrostatic Profilometer

- Settlement monitoring
  - Pavement embankments
  - Oil tanks
- Unobtrusive to construction traffic
- Low-cost installation
- Monitoring length of 130 m
- Monitoring height range of 4 m
- Output
  - Settlement profile versus fill surface level
  - Settlement versus time at a discrete point



INSTRUMENTATION • TESTING • MONITORING



**Auckland Laboratory**  
Tel: 64 9 355 6020  
e-mail: mail@geotechnics.co.nz  
www.geotechnics.co.nz

**Tauranga Laboratory**  
Tel: 64 7 571 0280  
e-mail: tauranga@geotechnics.co.nz





The wasteland that was part of the city of Banda Aceh.

Despite the tragedy, I found Banda Aceh an OK place. It is far more pleasant than Jakarta which is overcrowded and polluted. The people, who hadn't seen many foreigners because of the Indonesian Army (TNI) fighting the insurgent rebels (GAM) were naturally very friendly despite their trauma. There was no sign of GAM when I was there but plenty of TNI. I didn't get Delhi belly or Malaria (although I got bitten the little sods despite precautions) and really enjoyed the food. It was

a little hot at times however. But if you know where to go you can even get beer.

I also made it to Lake Toba in North Sumatra. Lake Toba is a caldera lake, similar to Lake Taupo, and is the eruptive centre of the largest eruption recorded in the geological record some 75000 years ago. An estimated 1500 cubic kilometres of material was erupted from this volcano.

The northern part of Sumatra has experienced several large earthquakes and at least seven tsunamis in the past 300 years. At least two of these, excluding the 26 December 2004, have affected large stretches of coast, with the 1907 tsunami affecting Banda Aceh. Yet, there is little understanding or knowledge of tsunamis. However, on the island of Simeulue, a cultural and oral tradition of tsunami associated with earthquakes exists, and of a population of 25000, with less than 7 minutes to respond after the earthquake, only seven people were killed.

Never forget!

# NZ Geotechnical Society 2005 Photo Competition

The year 2005 theme is:  
"Oh dear... "

Show us the things that geotechnical engineers, engineering geologists, and technicians in the profession get up to!!  
Photos of those fantastic projects you work on.



## WIN \$200

A perfect chance to win some drinks money for the office.

The winning photo will be printed in the December 2005 issue of the *NZ Geomechanics News* and put onto the Society Web Page.

### Send your entry to:

- The Geomechanics News Editor, Private Bag 1930, Dunedin by 30 October 2005
  - OR email to: p.glassey@gns.cri.nz (send as jpgs)
- Clearly mark your entry with your name and provide a caption for your photo

### Conditions of Entry:

1. Only amateur photographers may enter.
2. Photos must be taken by the entrant.
3. No computer generated pictures.
4. Any photographs received may be published in subsequent Society publications.
5. Winning entries will be final and no correspondence will be entered into.
6. NZ Geotechnical Society members only may enter.

# SICK OF THE BORING STUFF?

Let us do your hand augers, scala penetrometers and logging of test pits and boreholes.

Looking for something **deep** and **meaningful**? We also have the equipment to drill deeper than hand augers, provide better samples and can reach restricted access sites without the cost of machine-drilled boreholes.



## HAND AUGERS

Shear vane testing  
Scala penetrometers  
Logging test pits and boreholes



## WINDOW SAMPLER

Continuous semi-undisturbed sampling to 12m depth  
Undistributed tube samples  
Shear vane testing



## DYNAMIC PROBE

Continuous ground resistance probe  
Compatible with SPT and CPT  
Can penetrate dense/hard soils. Maximum depth of 25m

## FULL GEOTECHNICAL FIELD SERVICES

Carried out by our own fully trained, **university qualified** engineering geologists and geotechnical engineers. Report-quality logs.

Committed to **fast turnaround - quality results - value for money**. Let us help you reach solutions without the boring stuff.



**Soil Engineering Ltd**

Consulting Geotechnical Engineers

**Phone:** 09 838 0370 **Email:** [enquiries@soilengineering.co.nz](mailto:enquiries@soilengineering.co.nz) **Or visit:** [www.soilengineering.co.nz](http://www.soilengineering.co.nz)



**Soil Engineering Ltd**  
presents



# THE DANDO TERRIER MINI-RIG

Now available for hire



- Small manoeuvrable rig suitable for restricted access sites
- Provides continuous core samples up to 100 mm dia.
- Capable of depths down to 15m
- Can perform conventional SPT testing
- Can penetrate hard/dense soils or weak rock
- Can install casing in boreholes
- Rotary head for coring concrete or asphalt surfaces
- Ideal for contaminated ground sampling
- Great for installing instrumentation
- Can operate on sloping ground (up to 30°)
- Hire includes experienced operator and logging by university qualified field staff

For more information on the Terrier mini-rig, please call Marco Holtrigter on (09) 838 0370, or visit [www.soilengineering.co.nz](http://www.soilengineering.co.nz)

## Strengthening Ngaio Gorge Road Walls

David Stewart, Opus International Consultants

Wellington City Council has recognised the vulnerability of its road network through damage suffered particularly after large storm events and the potential for damage from earthquakes. Opus International Consultants has assessed the risks to the road network and developed a long-term strategy to manage the risks, based on the performance of the road network in earthquake and storm events. On this basis Ngaio Gorge Road was prioritised for risk mitigation, and to date three vulnerable retaining walls have been strengthened. Investigation, design and construction management for the wall strengthening work has been carried out by Opus.

Ngaio Gorge Road provides access from the city to the northern suburbs of Wellington and provides an alternative route to the north to the state highway. Ngaio Gorge Road is constructed on steep slopes with variable thicknesses of colluvium overlying greywacke bedrock.

The existing walls strengthened to date are of 1960s or 1970's construction and are up to 5 m high, with reinforced concrete columns on shallow foundations supporting horizontal concrete breastwork; with columns anchored with deadmen.

Work at the latest site, 'Wall 4', was completed in April 2005. Wall 4 has bedrock at a relatively shallow depth of up to 3 m below the wall foundation, and has been strengthened using new concrete columns and beams

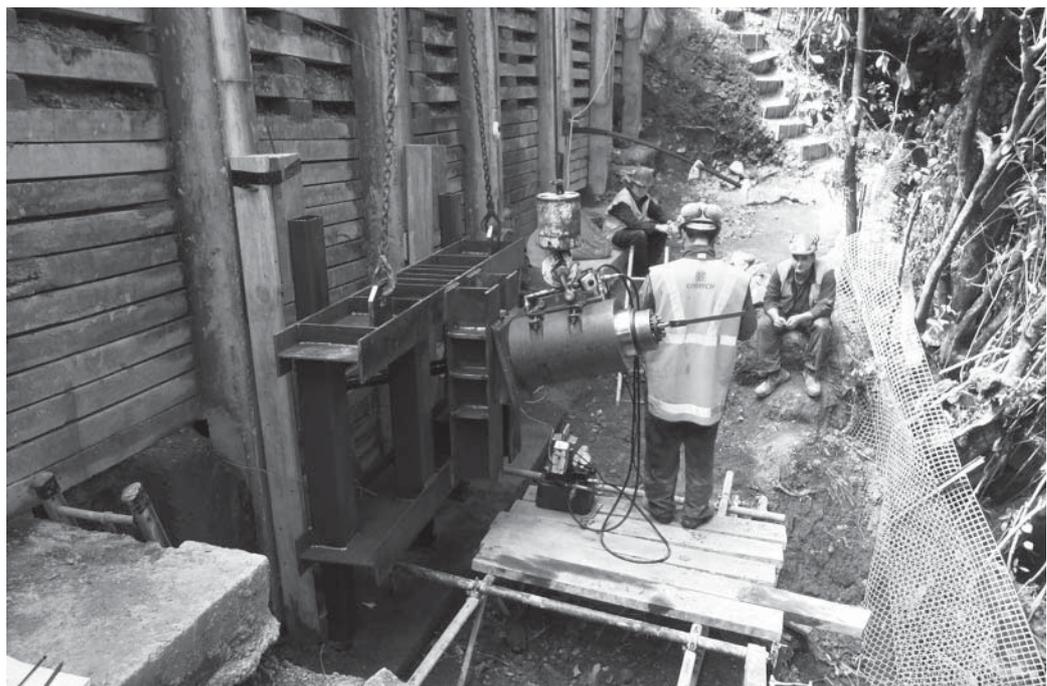
supported by bored piles, with rock anchors to carry the lateral earth and earthquake loads.

Work at Wall 4 involved:

- Construction of twelve 500 mm diameter bored reinforced concrete piles, below the existing wall pad foundations, with the piles extending 3 m into bedrock.
- Installation and proof testing of two trial rock anchors (Photo 1).
- New 500 mm square reinforced concrete columns between existing columns.
- Drilling and installation of two rows of rock anchors, 23 total anchors in all (Photo 2); anchors are double corrosion protected and up to 15 m long, with 3 m to 5 m long bond lengths.
- Construction of reinforced concrete ground and spreader beams at the level of the two levels of anchors (Photo 2).
  - Reinstatement of the original cantilevered timber footpath.

At nearby Wall 3, thick colluvium deposits underlie the road. Wall 3 is being strengthened using soil nails to strengthen the wall backfill and the slope below, with concrete beams to transfer the loads from the wall face, and mesh to support the slope below.

**Photo 1:** Proof testing of trial rock anchor, Wall 4





A key feature of the strengthening at Wall 3 is the soil nail trials (Photo 3) that have been completed to assess the bond capacity and the load-displacement performance of the soil nails. Six trial soil nails have been installed and tested using a variety of installation methods. The design of the production soil nails are currently being reviewed based on the results of the trials and the strengthening work will be carried out starting July/August of this year.

The work has been carried out by:

- Construction Techniques Ltd as the main contractor, with Subcontractors :
- Darlington Drilling and Piling Ltd (Piling Work)
- Richardson Drilling Co Ltd (Drilling of holes for rock anchors and soil nails)
- Sparrow Construction Ltd (Construction of Reinforced columns, beams and walkway)

**David Stewart**

Opus International Consultants Ltd,  
 PO Box 12-003, Wellington, New Zealand  
 David.Stewart@opus.co.nz

**Photo 2:** Wall 4, showing new columns and beams and cantilevered walkway



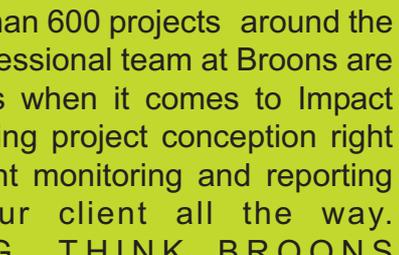
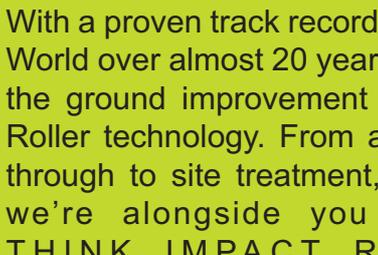
**Photo 3:** Drillsite for trial soil nail at Wall 3

# Rolling Dynamic Compaction

Use only the “Square” Impact Roller



from



With a proven track record of more than 600 projects around the World over almost 20 years, the professional team at Broons are the ground improvement specialists when it comes to Impact Roller technology. From advice during project conception right through to site treatment, settlement monitoring and reporting we're alongside you and your client all the way. THINK IMPACT ROLLING, THINK BROONS

Available in New Zealand

Call now **+61 8 8268 1988**

or our Technical Manager direct on **+61 409 677210**

[info@broons.com](mailto:info@broons.com) [www.broons.com](http://www.broons.com)

## Te Apiti Wind Farm: Megawatt-class Machines Aided by Geotechnical Expertise

Alexei Murashev, Senior Geotechnical Engineer, Opus International Consultants Ltd

In the words of New Zealand's Prime Minister, Helen Clark: "Te Apiti symbolises the country's transformation into a sustainable, innovative, world class economy.... It shows we're capable of completing outstanding technological and engineering projects," she said at the official opening of the Meridian Energy (Meridian) wind farm in December last year.

Te Apiti wind farm, the largest in the southern hemisphere and New Zealand's newest, has given Meridian Energy the capacity to feed up to 90MW into the national power grid from the 55 turbines built on the north side of the Manawatu Gorge, between Palmerston North and Woodville.



Photo 1: View of the Te Apiti Wind Farm

The site was chosen because wind speeds there are consistently high and constant. Te Apiti supplies power for on average 45 per cent of the time compared with 30 per cent of the time which is the norm for wind farms internationally.

Te Apiti is the first New Zealand wind farm to use megawatt-class machines - the NM72 turbines supplied by the Danish company - Vestas, the largest turbines currently in use in New Zealand.

The quick and successful development of Te Apiti owes much to the Meridian site management team, the geotechnical and other services provided by Opus International Consultants Ltd (Opus), and the physical works provided by Higgins Contractors. Opus brought the expertise of key specialists in geotechnical, seismic and structural engineering to the project. They worked closely with the Meridian project team and the Higgins Contractors' management team through the detailed design and construction phases.

The wind turbines were commissioned into the national grid within a year of the construction starting. This was

despite the February 2004 storm and floods, which caused major slips and washed away the Pohangina River Bridge, effectively closing Saddle Road, the main access route from Palmerston North. The only access, until a temporary crossing and later a Bailey bridge was built, was via the difficult Pahiatua Track. Even though construction was delayed by six weeks, it was completed within 12 months as per the original programme.

Given the large scale of the project, the variability of the site ground conditions and geotechnical risks, Opus developed and implemented an extensive geotechnical testing programme within a tight timeframe. It was critical to obtain and interpret the geotechnical data in a timely manner during the detailed design and construction processes.

Initial geotechnical work included desk studies, geological and geotechnical inspections and mapping. Further information on ground conditions was obtained from borehole and trial pit investigations (66 boreholes and 44 trial pits). Triaxial, unconfined compressive, shear box, and consolidation tests were undertaken to obtain information on strength and stiffness of the site materials. In-situ dynamic plate load tests using cyclic loading were carried out on a number of representative site materials to model the actual loading conditions and assess the material's potential for degradation of strength and stiffness. Downhole wave velocity measurements and spectral analysis of surface waves were undertaken at some turbine sites to refine the soil and rock profile. Thermal conductivity tests on the site materials were undertaken to assist the cable designers. To reflect the actual loading conditions, the site materials in dynamic plate load tests (cyclic loading), triaxial and shear box tests were loaded at a rate similar to the rate of loading of soils under the wind turbines. Up to four drilling rigs (drilling contractor - Griffiths Drilling Ltd) operated at the site during the investigation, and construction phases.

The completed geotechnical work allowed Opus to assess founding ground conditions for the wind turbines, seismic and static stability of the turbine platforms and adjacent hillsides, potential for accumulation of plastic deformation and strength/stiffness degradation in soils and soft rocks beneath the turbine foundation under the cyclic wind load, and to undertake geotechnical risk assessment and design of the turbine foundations.

The critical foundation design issues included:

- Choosing appropriate and cost-effective foundation

**Photo 2:** Excavation for Pad Foundation



option (based on a comparison of a number of foundation options, 16 m diameter pad foundation option was adopted).

- Soil strengths and stiffnesses, including rocking stiffness of the pad – soil system (a minimum required rocking stiffness of the system was specified by the wind turbine manufacturers).
- Special foundation design for sites where soils had low ultimate bearing capacity, high potential for accumulation of plastic deformations and degradation of stiffness under cyclic loading.
- Treatment of buried old channels filled with soft clays and silts under the turbine foundations.
- Static and seismic stability of steep hillsides near the edge of the turbine platforms.
- Stability of the soil – foundation – turbine system under extreme wind loads (350 year return period wind speed of 80 m/s at the hub height).

Construction phase geotechnical inspections and testing were also undertaken to confirm founding conditions for individual turbines, and to undertake certification of the turbine foundations. The construction sequence is shown in Photographs 2 to 6.

Post-construction risk assessment for the turbine sites,

roads and cable routes for the span of the wind farm's design life and development of recommendations on monitoring concluded the geotechnical work on the site.

Through the course of the project our team worked closely with Meridian's Te Apiti Project Manager, David Green, who was fully supportive of the extensive and thorough geotechnical investigation programme and the detailed post-construction risk assessment for the wind farm.

As befits the largest such farm in the southern hemisphere, the statistics are also impressive. A total 21 km of roads were constructed to allow crane access to the turbine sites, which are spread across 1,150 ha of very hilly farmland. Approximately 1,000,000 cu m of earth was excavated for the roads and for the turbine foundations. The latter took around 21,000 cu m of concrete to construct, with each turbine supported on a 16 m diameter pad foundations requiring 380 cu m of concrete. The turbine towers are each 70 m high and fitted with a 1.65MW turbine with three 36 m blades, giving a total height of 106 m. The project had a total value of more than \$180 million.

In addition to the geotechnical work and structural design of the turbine foundations, Opus also provided the preliminary site and access route appraisal, feasibility



**Photo 3:** Pouring the Concrete Pad Foundation



**Photo 4:** Installing Nacelle



**Photo 5:** Installing the Blades

**Photo 6:** Completed Wind Turbine



and cost assessment, turbine site selection (in conjunction with Meridian’s wind engineers), platform and access road design, identification of key engineering risks for the whole project, inputs to the assessment of environmental effects.

Meridian Energy says the Te Apiti wind farm represents an investment in infrastructure which is necessary for developing a sustainable future for New Zealand. It has also been allocated carbon credits by the Government in recognition of its contribution to reducing greenhouse gas emissions. Meridian Energy Chief Executive, Dr Keith Turner, says “Te Apiti went from consent to completion in just over a year. “We see this as an extremely positive example of what can be achieved when communities and companies work collectively together,” he says.

Te Apiti’s success shows that New Zealanders appreciate the importance of clean, renewable energy sources. This is very positive for our energy future.

**Alexei Murashev,**

Senior Geotechnical Engineer  
 Opus International Consultants Limited  
 PO Box 12-003, Wellington, New Zealand.  
 Alexei.murashev@opus.co.nzoption (based on a comparison of a number of foundation options, 16m diameter pad foundation option was adopted).

## Geotechnical Investigations and Testing for Wellington

Inner City Bypass Josephine Speed, Opus International Consultants Ltd

The Wellington Inner City Bypass (ICB) project involves developing an arterial route from the existing Terrace Tunnel South Portal to the Basin Reserve, in Wellington City. It involves the construction of 700 m of new road and the upgrade of 400 m of existing road. It also includes construction of cycleways, footpaths and several new urban spaces.

Between the Basin Reserve and Willis Street, both north and southbound routes are at ground level, with 50 km/h speed limit. From Willis Street, the northbound route descends into a trench that takes it to the southern portal of the Terrace Tunnel.

Opus International Consultants are designing and managing the ICB construction on behalf of Transit New Zealand and the Wellington City Council. They have developed a number of innovative solutions to resolve the geotechnical challenges.

### Wall Systems

The trench structure will pass under a new bridge at Vivian Street and will require extensive retaining structures. The innovative trench design incorporates a propped reinforced trough structure and 200 m long soil nail retaining walls between the Terrace Tunnel portal and Abel Smith Street. This will be the largest soil nail wall in New Zealand with about 7000 m of soil nails supporting the wall.

### Soil Nail Trials

A series of soil nail trials has been carried out to test the performance in the variable ground conditions of the area. A technique called “post grouting” is being used, and involves the installation of soil nails which are re-grouted under pressure through pre-installed grout tubes to crack the initial grout and seal any voids at the nail/soil interface and enhance the bond capacity to improve performance. This is the first time post grouting will be used for soil nailing in New Zealand.

Seventeen test soil nails were installed in 2002 and pullout tested to failure to assess the bond strength. A further 12 test soil nails were installed and tested this year. The post grout was dyed using a different colour so it is easily identifiable and 6 nails were exhumed to study post grout cover, post grout node spacing and performance in different geological conditions that will be encountered when the wall is constructed.

### Groundwater Management

Extensive geotechnical site investigations have been carried out to determine ground and groundwater conditions of the bypass route and surrounding areas. This has been particularly important for the depressed trench section of the bypass adjacent to existing buildings. In the propped wall section, groundwater levels will be temporarily lowered during construction, then allowed to recharge. In the soil nail sections, groundwater levels will be permanently lowered. During construction a limited amount of excavation will be opened at any one time to minimise the amount of drawdown in groundwater levels. Building condition surveys - before during and after construction - are being undertaken.

A programme was developed to monitor the groundwater, ground deformation, and subsidence using piezometers, inclinometers and settlement stations – all installed prior to commencement of excavation. Multiple piezometers were installed in many of the boreholes to record and monitor the groundwater levels in different aquifers. Over 90 vibrating wire and standpipe piezometer combinations were installed in 41 different boreholes throughout the Wellington Inner City Bypass area, measuring a number of different aquifers. Vibrating wire piezometers were used at locations important for construction monitoring, as they respond quickly to groundwater level changes that may occur during construction. All 41 piezometer sets will be monitored regularly throughout the Wellington

Photo 1: Installation of Soil Nail



Photo 2: Soil Nail Creep Test





**Photo 3:** Exhumation of Soil Nail



**Photo 4:** Drilling Artesian Pressure Relief Wells

Inner City Bypass construction, a difficult undertaking in a dynamic urban environment, with traffic, vandalism, road maintenance, and urban development.

Pressure relief wells are currently being drilled to relieve the high artesian groundwater pressures in bedrock, below a section of the trench.

The primary contractor is Fulton Hogan, with sub-contracts for the soil nailing by NZ Civil and Richardson Drilling and instrumentation and monitoring by Griffiths Drilling and Geotechnics.

**Josephine Speed**

Opus International Consultants, Wellington  
Josephine.Speed@opus.co.nz

## STANDARDS, LAW AND INDUSTRY NEWS

### Why doesn't New Zealand have a geotechnical database?

Beverley Curley, Engineering Geologist, Opus International Consultants Limited

As a recent immigrant to New Zealand from the UK (now working for Opus International Consultants Ltd) I was surprised to find that New Zealand or Transit did not have a geotechnical database for storing and displaying the plethora of geotechnical information that has been obtained over the years.

In the England & Wales, the Highways Agency (HA) have developed a GIS based geotechnical database system called HAGDMS, the Highways Agency Geotechnical Data Management System, the launch of which coincided with the publication of HD41/03 Maintenance of Highway Geotechnical Assets – Volume 4 Section 1 of the Design Manual for Roads and Bridges. The aim of the standard is to “assess the condition of highway geotechnical assets and plan an ordered and cost effective programme of repair and preventative works” and as such “it is necessary to have a clear systematic and committed approach to condition inspection and reporting.” Guidelines were produced to accompany HD41/03 in the form of a HAGDMS GAD Geotechnical Asset Surveying Manual. Definitions of earthwork types & geometry, defects types, vegetation and water observations (including drainage) along with any reinforcing were made. After gathering this information the earthwork and/or defect is classified along with an assessment of its likely classification in 5 years time.

All of this field data and other information is then uploaded into HAGDMS, at which point all of those with access to the system, such as HA, Managing Agents (of HA areas) and companies doing work for the HA can browse the data and download any information. However the information on HAGDMS is not just restricted to data obtained during GAD inspections and the reports associated with the earthworks of defects, but HAGDMS is a massive borehole log, trial pit log and reports database and library. Currently there are 971 reports on HAGDMS, some of which have more than one volume and over 14000 boreholes and trial pits have been geo-referenced and appear on HAGDMS for the M25 alone and of which over 95% have had the borehole log uploaded so anyone (with access) can view and print off the relevant geotechnical information without ever leaving their desks.

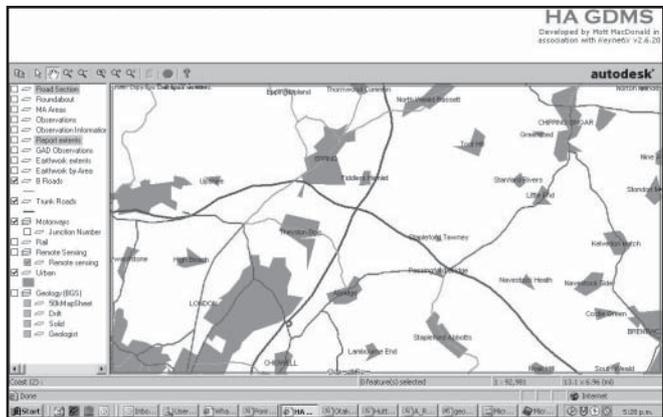


Figure 1: General road network view for northeast M25 area, UK.

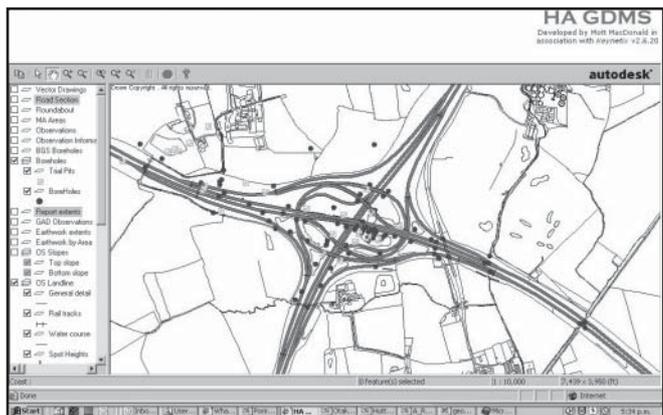


Figure 2: M25, J25, M11 J6 interchange – road network, landline data borehole and trial pit locations.

The database is easy to navigate, with standard GIS tools. The first background you see is the road network with motorways (that's state highways). Different layers become available as zoom is applied. Landline (Ordnance Survey) data can be turned on or off, the same for geology (solid and drift). The GAD observations (colour coded of course) can also be enabled or disabled. Further investigation of the GAD observations (earthworks or defects) reveals photographs, reports and borehole logs etc that may have been uploaded. Zoom in even further and some sections of the HA network have undergone remote sensing, including thermal imaging, aerial photographs and LIDAR.

**BREAKING NEWS**

**18 May Rainstorm Damage**  
Bay of Plenty

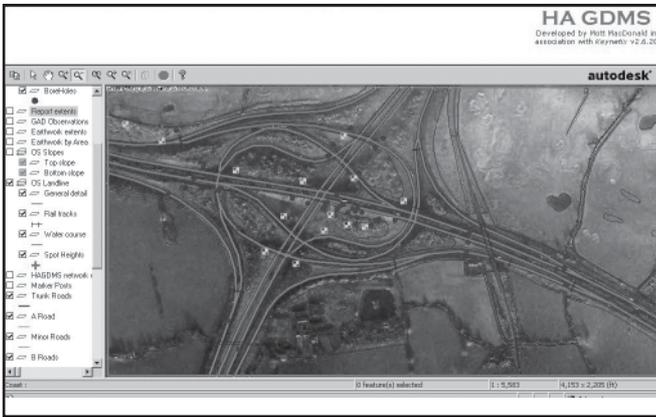


Figure 3: IKONOS imaging.

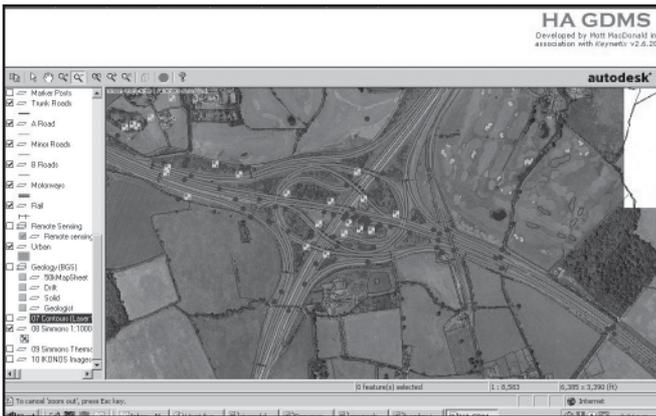


Figure 4: Aerial photography with road network and borehole and trial pit locations.

I found HAGDMS a really useful tool and made my job a lot more efficient without the hunting through reports after you’ve managed to locate them. Why doesn’t New Zealand have a similar system? I’m sure we have the technology and the people to set this kind of system up, which in the long run saves time and space – both costly commodities. Wouldn’t this kind of database be useful in this country?

**Beverley Curley**

Engineering Geologist  
Opus International Consultants Limited  
PO Box 12-003, Wellington, New Zealand.  
Beverley.curley@opus.co.nz



Photo 1: Debris flow damage at Matata as a result of the 18 May rainstorm.



Photo 2: Landslide damage in Otumoetai, Tauranga.



Photo 3: Clean-up operations under way in Matata on the Awatariki Stream debris flow fan on the western side of Matata.



Photo 4: Clean up operations underway on the Waitepuru Stream debris flow fan on the southern side of Matata.

Photo Credit: Dick Beetham, GNS

## TECHNICAL ARTICLES

Sergei Terzaghi, Sinclair Knight Merz

This will be my final column on this topic for a while, as by the time you read this, I will be settling into a new position in Australia. Depending on circumstances I may be able to contribute further columns on other topics as an overseas correspondent, or on any other topic that is suggested to me.

Let us review briefly what I have covered, not necessarily in the order that they appeared:

- We have looked at the influence of choice of soil model and how that might affect the behaviour of the project that one is analysing, even when all the parameters are ostensibly the same.
- We have looked stress paths with relation some of the soil models. I might comment though we have not looked at the strain paths that are generated as a consequence of the difference soil models. I will have to leave that as an exercise for those of you who are interested. I suggest to you though that the differences in strain paths resulting from the different models are much larger than the differences in stress paths (and they are large enough). As we move into regulatory regimes demanding greater control on deformation (with safety generally being satisfied if the deformations are sufficiently small), understanding the issues of stress paths and strain paths being followed becomes greater.
- We have looked at pore pressure generation under undrained loading. This is a topic I would have liked to have re-visited. This is a topic that is not well understood, and is often over-simplified in the literature.
- We have looked at Poisson's ratio, and emphasise that this is only a pseudo number with respect to soils. It only has meaning at very small strains (i.e. under 0.03%)
- We have had a look at slope stability issues with respect to Finite Element and limit equilibrium methods. This is also a topic deserving of further investigation, not because of the similarities (which is greater than people realise), but because of the differences and greater understanding of the problem at hand that can be achieved.
- As part of the discussions of different models we have looked into the differing behaviour of soils under shear and under compression, and also between 'virgin' loading and re-loading. This is a topic that also warrants further discussion, especially with respect to the differences between sands and clays.

There are of course a multitude of topics that I would have liked to have addressed, and may do so sometime

in the future. One topic that I would like to leave some final comments on is that of use of interface elements. These play a critical part in soil-structure interaction, particularly with respect to low order elements or finite difference solutions.

These elements provide the additional degrees of freedom to permit sliding and 'gapping' behaviour between a hard structural element and a softer soil element. The exact formulation does somewhat depend on the code being used, and it is essential that the practitioner familiarise themselves with the details and the conditions necessary for their use. It is usually essential to carry on the interface beyond the edge of the structure in order to permit any appropriate flow around the edge of the structure. Failure to do so is one common reason for odd results when trying to model structures, particularly when plastic behaviour is involved.

If interface elements are not implemented within the element library, one ability to accurately model the soil-structure interaction is somewhat limited, as the conditions present at the soil-structure interface are different to those assumed in the formulation of the elements, and also there is a distinct change in the contact properties of the two materials. Ignoring the change would appear to be a way of creating a perfectly rough contact, but unfortunately, the numerical formulation does not permit that. Rather what one has created is a numerical discontinuity, which all codes have difficulties with.

Simple experimentation with a footing or sliding wall should convince of one of this. Use of an interface on a cohesive elastic soil (so that one can compare with analytic solutions) with both stiff and flexible footings should convince one of this.

As a final comment, I have in the course of these columns introduced the reader to many issues that are worthy of further investigation. Equally there are many more that are worthy of comment that I have not covered as yet. All of these topics contains subtleties to trap the unwary. For those who work in the field, particularly as the regulatory demands grow greater, you must be aware of the limitations and constraints of both the models that you are working with, and also the design philosophy that you are working with.

**NB:-** Geomechanics News wishes Sergei well with his new role in Australia and thanks him for his regular contribution (editor).

# More than 3 in 1?



State-of-the-art Electronic  
Cone Penetrometer Testing

Continuous Soil Coring

Fully Cased Holes. No Water  
to supply. No Cuttings generated

Automatic SPT, providing reliable,  
consistent, calibrated results

Hydraulic Conductivity Testing  
of discrete material layers

All these and more  
on one **All-Terrain Rig**

Call today for bookings



*Providing Geotechnical and Environmental Investigation  
Services in the Auckland & Northland Regions*

Phone (06) 867 3035

Mobile (021) 611 032

Fax (06) 867 3037

# Opus specialises in geotechnical testing & investigations throughout New Zealand



Cone Penetrometer Testing



Permeability Testing



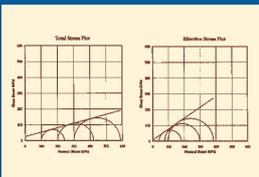
Gyrotory Compaction



NDM Testing



Triaxial Testing



Triaxial Test Results

- Cone Penetration Testing - electronic/manual
- Investigation drilling management
- Instrumentation
- Geophysical down hole bore logging
- Triaxial - including Repeat Load Triaxials
- Consolidation and Permeability Testing
- Soil Classifications

Opus also provides testing services for aggregates bitumen/asphalt, concrete and soils.

**Bill Hickman**  
Central Laboratories  
138 Hutt park Rd  
Lower Hutt  
Phone: 04 587 0600  
bill.hickman@opus.co.nz

**John Cunningham**  
Hamilton Laboratory  
Fox St  
Hamilton  
Phone: 07 856 2870  
john.cunningham@opus.co.nz

**John Evans**  
Auckland Laboratory  
Unit A, 7 Ride Way  
Albany  
Phone: 09 415 4660  
john.evans@opus.co.nz

**Phil Woodmansey**  
Dunedin Laboratory  
Philip Laing House  
144 Rattray St, Dunedin  
Phone: 03 471 5500  
phil.woodmansey@opus.co.nz

# OPUS

## Materials Advisory Services



Materials  
Construction Supervision  
Pavements  
Aggregate  
Soils Testing

# → LABORATORY SERVICES

FOUNDATION ENGINEERING OPERATES AN IANZ ACCREDITED SOILS TESTING LABORATORY, OPERATING UNDER ISO 17025.

**We currently offer the following comprehensive range of tests:**

<b>Classification Tests</b>	Water Content Atterberg Limits Linear Shrinkage Solid Density Particle Size Distribution	
<b>Chemical Tests</b>	Allophane Content Organic Matter Content	
<b>Compaction Tests</b>	NZ Standard NZ Heavy	
<b>Consolidation Tests</b>	One Dimensional Oedometer Swelling Tests	
<b>Strength Tests</b>	Unconfined Compressive Strength Triaxial Tests	Total Stress Effective Stress (Pore Pressure)
	CBR Value	Soaked Tests Unsoaked Tests
	Stabilised Soil Testing	
<b>Permeability</b>		
<b>Field Tests</b>	Density Tests	Sand Replacement Sampling Tube (Corecutter) Nuclear Density Meter
	Strength Tests	Penetrometer Vane Shear Strength Plate Bearing Test Impact Value of Soil
	Percolation Tests	



**For all your testing requirements:**

please contact our Laboratory Manager, Ms Nataliya Agarkova

**phone** 64 9 523 5626  
**fax** 64 9 523 5627  
**email** lab@fel-nz.com  
**web** www.fel-nz.com

**Or call in and see us at**  
26 Patey Street (off Great South Road)  
Remuera  
Auckland



# Powerful Solutions for Data Management and Reporting



Since 1986, the developers of gINT Software have set the industry standard for user-customisable database management and reporting software for geotechnical and geoenvironmental professionals. Now, it's the world's most popular software of its type, with over 5,500 licenses worldwide.

## Why gINT?

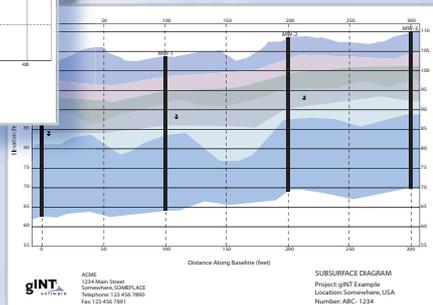
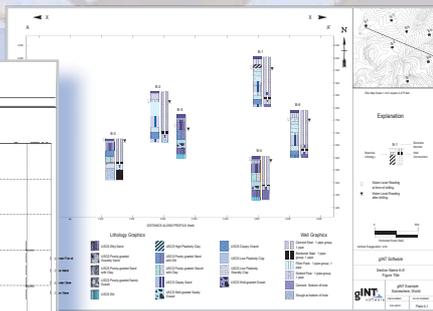
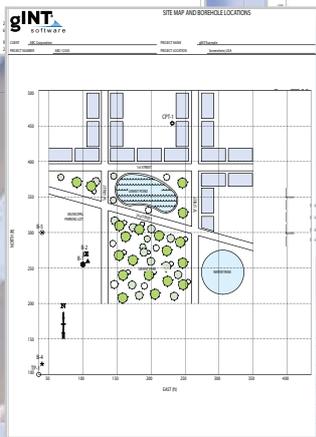
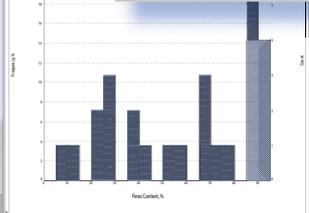
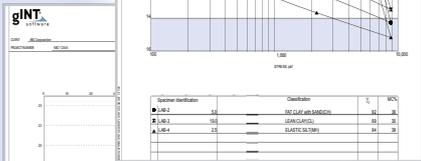
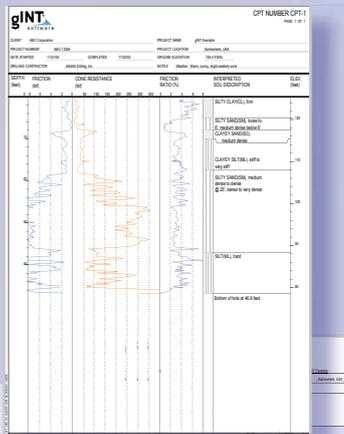
- Best-engineered product in the industry
- Fully customisable, high-performance solution
- Automates routine tasks and calculations
- Easily imports and exports from AutoCAD, Excel and many other formats

### REPORT STYLES

- Borehole Logs
- 2D & 3D Fences
- Graphs
- Histograms
- Tables
- Text Documents
- Site Maps

### SERVICES

- Report Design
- Legacy Data Translation
- gINT Rules Applications
- Project Consulting
- Training
- Database Design
- Software Development



“Wow, this is one amazing program!”  
— Charles H. Cammack  
*URS Corporation*

“I was really impressed with the ease of using gINT!”  
— Brian Tracey  
*Tonkin & Taylor, Ltd.*

Ask about our **FREE DEMO!**

Call +1 707 838 1271

Email: [sales@gintsoftware.com](mailto:sales@gintsoftware.com)

[www.gintsoftware.com](http://www.gintsoftware.com)

## THE BOB WALLACE COLUMN

Does anyone know what Value Engineering means? I've heard it mentioned a few times and I wasn't very sure so I thought I'd better look it up in my Penguin Dictionary of Civil Engineering. Unfortunately, there is no entry. Which is probably no great surprise given that my edition was published in 1979 and even then it had only been re-issued to take account of metrication.

I thought Value Engineering was a modern phenomenon, so I concluded that the most obvious place to look for an accurate definition would be the all-seeing, all-powerful Google. Reference to that particular search engine generated 36,200,000 matches in 0.27 seconds. Fortunately, right at the top of the list was a website for SAVE – the premier international society devoted to the advancement of Value Engineering.

This sounded promising, one click of the right hand mouse button and behold, I was almost struck blind by glorious revelation and enlightenment. The SAVE website home page proclaims that the application of Value Engineering methods offers decreased costs, increased profits and better quality. According to SAVE it is a function orientated, systematic team based approach to providing value in the delivery of a product or service.

Such a modern definition, full of the latest buzzword vocabulary was a bit much for my somewhat limited vocabulary and dated Roget's Thesaurus. However, I was enthused by the subsequent promise that the application of Value Engineering methods "easily produces 30% savings in constructing a project" and that for every \$1 invested in Value Engineering there would be net savings of \$10.

It sounds almost too good to be true.

I'm sure this may come as a complete surprise to some of my loyal readers but construction projects face many challenges including budget constraints, safety issues, environmental impacts. For those that are familiar with these problems you will be interested to hear that, according to SAVE, by applying Value Engineering methodologies to construction projects in the US, highway and transportation departments saved the taxpayers over \$1 billion in 2000.

According to Rodney E. Slater the U.S. Secretary of Transportation at the time, "Value engineering demonstrates President Clinton's commitment to common sense government." Need I say anymore?

Whilst Value Engineering may be a relatively recent development in the NZ construction industry, it is not quite

the modern, forward thinking and innovative approach you may have first thought. SAVE International is holding its 45th Annual Conference in San Diego between the 26th and 29th June. For those Transit delegates that maybe interested in going, registration for the golf day closes on 20th May (By the time you've read this you may already be too late – don't blame me, speak to the editor).

A common theme in many of my articles has been recent trends in the NZ construction market. This time last year I concluded that successful contractors in NZ were now being given the opportunity to make more money for less effort and that the "Engineer's" role in many contracts had been reduced to little more than an irritant with no formal responsibility. I was advocating that it was time for Engineers to fight back. It was time for Engineers to think up innovative engagement agreements that provided similar benefits to those that the contractors are receiving.

It would seem that my call for action has been heard, and acted upon. I must admit that my suggestion for simply uniformly increasing base rates in a blatantly illegal, collusive, price fixing scam have been wisely ignored. However, a far more subtle and no less lucrative approach is being adopted by the quick witted and commercially astute Engineers in NZ that was assuredly inspired by my column. It's called Value Engineering.

For those that maybe interested in how it works, it is quite simple and I am sure you will agree it is quite brilliant. All you need to do is follow this basic, four-step program to earn more money.

- Step 1** – Be engaged and get paid to design a major civil engineering project.
- Step 2** – Ensure your design is overly conservative and impracticable to construct.
- Step 3** – Award the construction project on contract terms that require the contractor to consult with you to identify Value Engineering opportunities.
- Step 4** – Identify less conservative, more practicable construction solutions and get paid to re-design the job that you've already been paid for once.

The outcomes are guaranteed. You will make more money, the contractor will have a job they can build profitably and the client thinks he has been through a process that has resulted in reduced costs. Live long and prosper under the guidance of SAVE!

## COMPANY PROFILES

### Keith Gillespie and Associates Ltd

Established in 1989, Keith Gillespie and Associates Ltd (KGA) a small practice providing specialist consultancy services in geotechnical and civil engineering. It provides these services to other consultants, government bodies, territorial authorities, developers, contractors, insurance companies, solicitors and private individuals. Based on Auckland's North Shore, the practice operates throughout New Zealand and abroad.

The two principals in the practice both trained as civil/structural engineers before concentrating on geotechnical engineering. This enables KGA to provide strong support to developers, architects, engineers, contractors and Territorial Authorities to ensure smooth and economical progress of projects.

The importance of high quality standards is at the forefront of all work undertaken. In this respect, ongoing training of staff is fundamental. With the demise of the government departments as training grounds for young professionals, it now falls on the consulting practices to provide the training necessary to develop up and coming engineers. KGA also supports the concept of Chartered Professional Engineers, with both principals being IPENZ Practice Assessors.

Integral with high quality standards are high ethical standards. Nowhere is this more necessary than when carrying out peer reviews or providing expert witness services.

KGA provides a wide range of services, from simple site appraisals to full geotechnical engineering investigations and designs. The importance of an initial site appraisal is stressed to staff and clients alike. This is the time when

most of the geotechnical issues are identified and often when potential solutions are formulated. KGA is also frequently called upon to provide peer review and expert witness support.

With its broad construction industry background, KGA has strong problem solving capabilities. These capabilities are regularly called upon by Territorial Authorities, insurance companies and contractors to address problems such as temporary works needs and failures, slope movements, foundation deformations or just the plain unexpected.

Typical projects undertaken by KGA include ground investigations, foundation and retaining structure design, slope stability assessments, subdivision design and earthworks control, temporary works design, failure investigations, peer reviews and expert witness support.

Further information on the practice can be found on our web site [www.KGA.co.nz](http://www.KGA.co.nz)

#### Contact Details:

##### Keith Gillespie and Associates Ltd

753 Beach Road  
P.O. Box 35 876  
Browns Bay  
Auckland

Tel: (09) 478 6655  
Fax: (09) 478 6169  
Email: [KGA@kga.co.nz](mailto:KGA@kga.co.nz)

**PERMATHENE** GEOSYNTHETIC SOLUTIONS

- Erosion Control  
Biodegradable ECB's, permanent TRM's
- Drainage, Waterproofing and Paving  
Drainage modules, dimpled sheeting, dpc's, grass pavers
- Gabions and Mattresses  
Welded steel modular, twisted wire
- Geogrids  
Bi-axial, Uni-axial: Polypropylene, HDPE, Polyester
- Geotextiles  
Woven, non-woven, filtration, de-watering tubes
- Geomembranes  
HDPE, Polypropylene, GCL: Landfills, containment, gas proofing



1. Design: Our own qualified Engineers
2. Supply: ISO 9001, ISO 14001 Certified
3. Installation: In accordance with local and international standards
4. Project Management: To provide a complete geotechnical solution

Memberships:



International Erosion Control Association



International Geosynthetics Society

New Zealand (Head Office)  
Permathene Ltd  
404 Rosebank Rd, Avondale  
PO Box 71-015, Auckland 1007, New Zealand  
Tel: +64 (0) 9 968-8888 Fax: +64 (0) 9 968-8890

Australia  
Permathene Pty Ltd  
Suite 143/ 272 Victoria Av  
Chatswood, Sydney, NSW 2067  
Tel: +61 (0) 2 9411 8648 Fax: +61 (0) 2 9410 3928

www.permathene.com sales@permathene.com

© Permathene 2004

## Boart Longyear Drillwell

What's in a name? A lot really. A lot of capital investment, a lot of growth, employment for more than 100 kiwis, better equipment, an international network of highly qualified staff, safer working practices, tighter environmental controls and a quality system designed to minimise delays, downtime and contractual disputes.

Boart was founded in Johannesburg in 1936, by Sir Ernest Oppenheimer in an endeavor to find uses for low-grade natural diamonds called "boart". Longyear dates back to 1890 when Edmund J Longyear sank his first diamond drill hole in the wilderness of the Mesabi Iron Range in Minnesota, USA. Together, diamond drilling came of age and today the Boart Longyear network employs some 8,000 people worldwide with operations across the Americas, Europe, Sub-Saharan Africa and Asia Pacific.

The March 2003 acquisition of Drillwell Exploration by Boart Longyear has set a benchmark for drilling services in New Zealand, offering equipment, safety, quality, experience, service and environmental controls recognised globally as first class.

Their geotechnical capabilities are supported by:

- A management team committed to offering the best quality geotechnical drilling services possible.
- Extensive geotechnical drilling experience including in-situ testing, core orientation, down-hole instrumentation, delicate coring and sampling, all with regular training in best practice.
- More than 350 years of in-house New Zealand drilling expertise to call upon.
- ISO 9001:2000 Quality Certification, OSHAS 18001:1999 Health and Safety Certification, and most recently accreditation with an ISO 14000:1996 Environmental Management System Certification.
- A new wireline actuated core-sampling system for hollow stem augers.

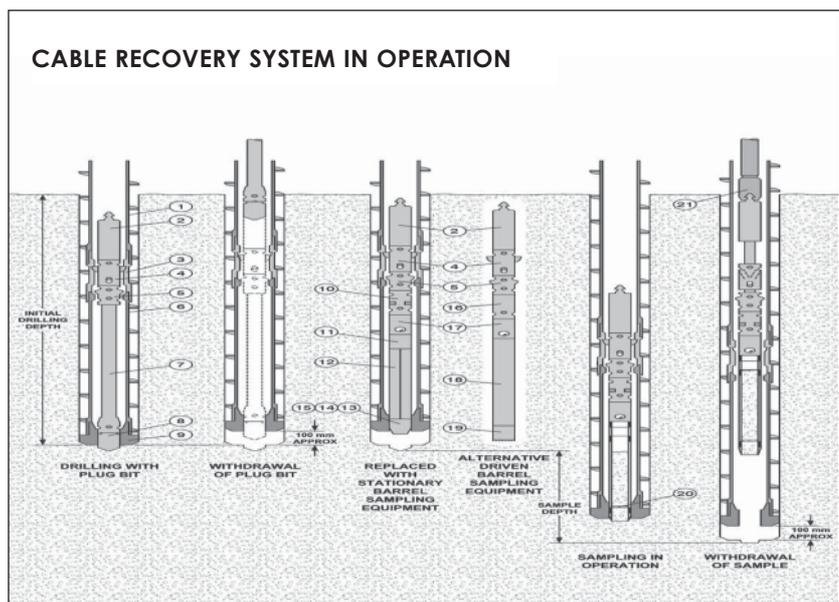
**Right:** Augers with a difference: Clean and efficient wireline core sample recovery is now possible with the new auger kit.

- A new purpose-built modular heli-portable drill unit capable of HQ coring to 100 metres.
- Triple tube coring systems used in conjunction with a variety of catchers, nozzles and polymers to provide excellent core recovery in most ground conditions.
- SPT testing in accordance with NZS 4402
- Well installations in accordance with NZS 4411
- A range of drill configurations to gain access to remote or difficult sites, including safe and efficient heli-lifting expertise.

Further improvements may be expected in the future, with the likely introduction of sonic drilling capabilities provided by Boart Longyear's Rota Sonic drilling technology.

Boart Longyear Drillwell now maintain in excess of 35 drilling rigs in New Zealand, including ten multi-drive truck mounted top drive and Kelly rigs; ten trailer, tractor and track mounted top drive rigs; ten heliportable seismic rigs; two track, skid or heliportable deep hole rigs, and two x high speed heliportable coring rigs. Their full range of services can be viewed by visiting their website on [www.drillwell.co.nz](http://www.drillwell.co.nz)

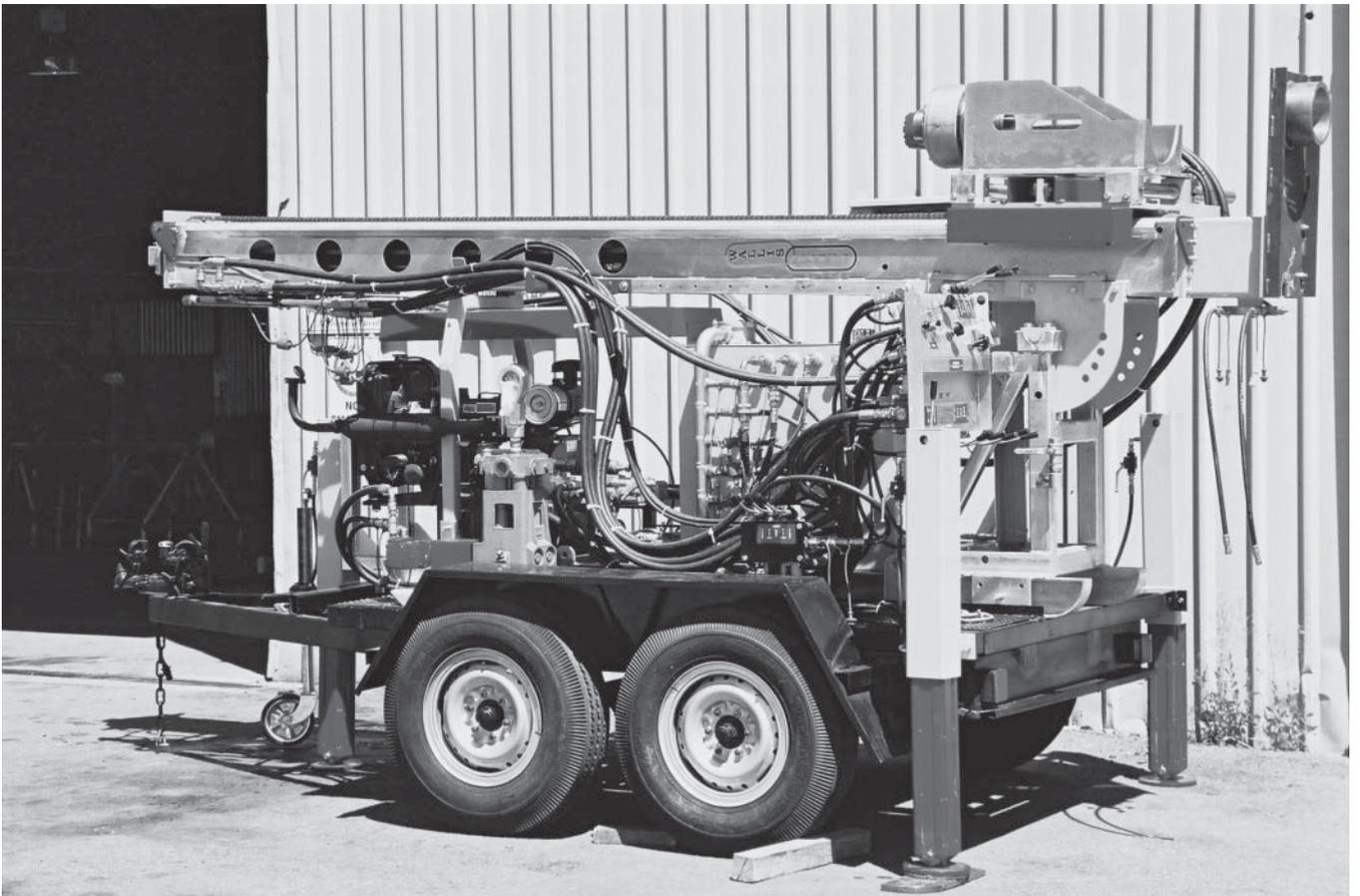
For Geotechnical or Environmental drilling enquiries, please contact Project Manager Andre Mazur in the first instance





**Left:** One of Drillwell's newest additions: A track mounted Davie Drill complete with two sets of leveling blades, 12 tonne main haul winch, hydraulic rod clamping and breakers. Angle capable with a depth range of 500 plus metres HQ size.

**Below:** Also new – and purpose built for serious helicopter work: A modular EVH 3300 drill unit, angle capable with a depth range of 100 metres HQ size.



## MEMBER PROFILES



### Merrick Taylor

#### Occupation

Geotechnical Design Engineer,  
Beca Infrastructure Ltd, Auckland

#### Good Intentions?

My initial intention on leaving high school (1995) was to be a geologist –the intrepid kind who travels the world working for wealthy oil tycoons in happening places like Siberia, Nigeria, places that end in “stan”, and Iraq. Alas, this was a short-lived ambition as the Asian economic crises reshaped my view to more down to earth (read: stable) career ambitions: The oil price & gold price dropped as demand fell, major mergers between the likes of Mobil and Exxon took place leaving geologists with many years experience walking the streets looking for work. I worked the summer of 1998/99 for the now non-existent Fletcher Energy Company in Taranaki, where there was the concern for jobs and the share price was low – affecting company morale.

I had previously worked for Beca in New Plymouth as a “roading assistant”, driving around the highways of Taranaki inspecting bridges, holding the pogo stick for the office surveyor, doing RAMM surveys, signage and sideroad inspections: Generic roading maintenance stuff, but great summer holiday work out of doors. This introduced me to civil engineering, and while roads and sewers didn’t exactly ring my bell, it was there that I heard about “geotechnical engineering”, usually from a civil engineer muttering under his breath about how conservative and expensive they were. I later discovered it was usually said civil engineers who didn’t involve geotechnical input until problems emerged!

#### What now?

So I completed my BSc in Geology at Canterbury, and decided to hedge my bets on either Engineering Geology or Civil Engineering as a more stable career than straight geology.

In the end I completed the papers year of the MSc in Eng Geol as a postgrad diploma before being finally accepted into 2nd Pro Civil Engineering to complete the BE (Hons) in 2001. It was a toss up between embarking on an 18 month long thesis, which some of my classmates spent two years on, or spending those two years completing the BE and broadening my ability to do some engineering.

#### Gainful Employment.

Getting a job proved easy. The year 2000 was the turning

point for the NZ economy, and by 2001 companies were screaming for new graduates. My student experience over the summers with Beca in Wellington had given me the foot in the door, and I started with them in November of that year. The graduate experience was not completely new, as I had already worked for them before. The work was mostly related to large roading projects and involved all manner of general civil work, with a smidgen being geotech (logging boreholes and testpits, scalas and hand augers). The first six months was certainly the hardest to adjust to, because the reality of work and the abstractness of the academic study meant I felt I had to start from scratch to learn “the trade” of being a civil engineer; all the “practical” and “management” stuff of how things ‘are just done’ that is never covered (could it be?) at a Uni course. Having said that, none of my first years experience was directly design related – so those skills taught at uni were merely latent, and not yet exercised and cemented in my understanding.

#### Getting Down and Dirty.

My main interest was geotech and eng-geol, but the scope for me to do this work was sporadic initially. Until two of our senior geotech engineers left us, leaving a major project to be done without them. All of a sudden there was more geotech work than I could shake a stick at, and I was the only one to do it (but hey I’d logged a couple of boreholes, no sweat right? !). The stress levels went with it, or should I say, the project managers. Within 6 months I was exposed to foundation design for bridges, liquefaction assessments, retaining wall design etc. It was great, but more training would help, so I headed to Auckland for “3 months training” working in our large geotechnical group there. This happened when Aqua had been announced and I was due to head south to start work on this project. To cut the story short I switched to work on the Central Motorway Junction (CMJ) Core Stage 2 Upgrade which turned out to be a good move. I decided to stay on with the CMJ project, which has kept me busy for most of the last 18 months. I’ve learnt a lot about retaining wall design, and working with structural engineers has been great. The construction aspects have been good experience as well.

## Typical Week

It has varied a lot from site inspections and logging to straight office work designing various types of retaining walls (MSE, tied back and cantilever concrete pile right down to little concrete barrier walls), analysing slopes, a few pavements here and there, bridge abutments etc, drafting reports, marking up drawings; and generally just the usual GSD (Getting Stuff Done).

## Highs and Lows

Finally getting paid after six years as a student. Finally paying off that student loan this year, oh wait, you mean career wise?

Working with the design team on CMJ Core has definitely been a highlight for me. I learnt so much from woe to go, and has certainly kicked me off on the path to geotechnical engineering.

Working with some great people from geotechnical to structural to the construction team at Fletchers.

I was recently awarded the Hume scholarship to do further geotechnical study overseas (is there ever too much?). This will be a highlight to come.

The Lows would be those times when you feel you are losing traction in your current life position (either work or study, whatever), and you feel its time to move on but don't know quite where or how. Of course these times are also the most exciting as you can start to think a bit more outside the square you've had till now about what you want to do and where you want to go, these ideas lead you to actions that can open up a world of new opportunities.




---

## Ann Williams

---

### Occupation

Associate, Senior Engineering Geologist and Hydrogeologist  
Beca Infrastructure Ltd, Auckland

## Background

Once I discovered that geology was a profession in which you could be gainfully employed crashing through bush and around mountains, I redirected my Optometry intermediate and completed an MSc in geology. I have a particular interest in the application of geology to understanding a wide range of engineering problems. As water often has a key role in such interactions, I undertook post-graduate study in both resource and environmental management and in hydrogeology.

## Advice?

After 3 and half years experience can I give any? Anyone's advice is situational to them and their experiences. Remember they have their own point of view, which will colour any advice they give. Ultimately you must experience and discover things for yourself, so don't hang on to every word of advice, but take it for what it is. Life is essentially empirical –not theoretical.

OK, in my experience thus far you have to keep asking the question: *Is the experience I'm getting now the right sort that I need to get me where I want to go?* If the answer is no, then it requires some pro-active action on your part to change things – no one's going to do it for you. Having said that, never burn your bridges. Always try and create a position where you have more options than you can shake the proverbial stick at. Then the hardest part will be the choosing!

## Ambitions

I'm saying ciao this year and heading to London for a bit of an OE. Firstly a year at Imperial College studying towards an MSc in Soil Mechanics and Engineering Seismology, then perhaps some European work experience before heading home. Why? I so miss being a poor student! And what the hell, you only live once!

Long-term ambitions? Simply to be good at what I do and have a meaningful existence (the ultimate quest?). The medium and short term tend to provide the targets to aim for. What would be really nice is doing something for the benefit of society, until I figure out what that is and how to go about it, I'll keep doing engineering – it's the closest practical thing I can think of at this point.

## Working as an engineering geologist

My understanding of the nature and distribution of soils and rocks throughout the North Island of New Zealand was established through my early field-dominated work experiences with DSIR (summer job), Worley Consultants (now Maunsell – I have recollections of being referred to as the *Worley Bird*), and Works Consultancy Services Ltd (now Opus).

I then did the OE thing for a year (all travel, no work), backpacking and cycling through Jamaica, Europe,

Scandinavia, Nepal, and parts of Pakistan and Thailand. On returning to New Zealand, I joined Beca.

Since coming to Beca I have worked on an enormous variety of projects in a wide range of locations throughout New Zealand and South-east Asia. I remember Toan coming to me one day and asking whether I'd like to go "up north" for a project. I agreed. It turned out that *up north* was, like *way* up north, Lae, Papua New Guinea. This was the first of many jobs based in out-of-the-way places. I remember my hairdresser saying *what do you do again? You're like – an explorer or something*. And yes, I guess that's how it feels when you turn up on an island called Gag, 200-odd kilometres off the coast of Irian Jaya and are tasked with sorting out the engineering geology. Is there any evidence of active faulting? Are there rocks suitable for concrete production? What about for a runway pavement? What are the constraints on plant site development? What constraints are there on port development due to tsunami? What about water supply?

My work ranges from forensic examination of causes of slope failure to identification of rocks suitable for use in concrete, asphaltic concrete or as riprap, to calculation of the amount of seepage through a structure or settlement below it, to low permeability liner design, to groundwater based water supply, to fault activity or tsunami hazard assessment.

I am presently NZGS treasurer and NZ liaison with the IAEG Australasian VP.

### **Memorable experiences**

Include:

Being "rescued" by our client representative in a small boat through surf and again by the PNG army in a *MASH* style (showing my age) helicopter. Our friendly local team had been fired up by an uninformed troublemaker;

Living under a tarpaulin on a beach in West Timor: the clattering of hermit crabs migrating across the beach and through my "room" each night; the size of the long drop prepared for me (I was the only woman on site and they could have buried me 5 times deep and twice across in it); printing a page of bugs each morning (bugs were attracted to the light above the printer the previous evening); when

my pumping test team mobilised in the middle of the night as the pump reached its cut-out, whistles blew, people were running to monitor their allocated bores and I lost a few team members in test pits. All good until the rainy season began. An awesome local team.

### **Having malaria**

Finding that I had a ticket out of West Timor when I was stationed in East Timor the day before I was due to fly home for Christmas.

### **A typical week**

I will confess to spending rather more of my time in the office than in the past, which I guess is a function of the passing of time and the evolution of roles from investigator to team leader. I talk a lot, provide internal review of work, prepare proposals, liaise with clients, participate in meetings, problem solve and do project work.

I presently work 32 hours (minimum) a week to allow me to spend one full weekday with my toddler. Beca have provided a flexible framework to enable me to meet the changing needs of a young family while maintaining my career.

### **Highs and Lows**

Most satisfying is developing a pragmatic solution to a challenging problem, which meets well the needs of a client.

Most depressing is missing an opportunity or failing to engage with a client.

### **Advice**

You can do whatever you want to do in your career. It is up to you to be motivated and to seek out and develop opportunities. Don't wait for it to happen to you, because it probably won't. Seek out technical and personal mentors – there are some wise people out there.

### **Ambitions**

To walk the length of South America; to spend more time in the Himalaya; to do something memorable.

## EVENTS DIARY

Links are available from the NZ Geotechnical Society website – [www.nzgeotechsoc.org.nz](http://www.nzgeotechsoc.org.nz)

### 2005

**JUNE 15-7, 2005 Amsterdam, Holland,**  
IS-Amsterdam 2005 Underground  
Construction in Soft Ground TC 28 of the  
ISSMGE

**Conference Themes:**

- Tunnelling in soft ground
- Monitoring of underground constructions
- Numerical analysis
- Deep excavations
- Mitigating measures

Web: <http://www.tc28-amsterdam.org>

**AUGUST 22-24, 2005 Paris, France**  
50 years of Pressuremeters, International  
Symposium

**Themes include:**

- History of Pressuremeters, their use and in design
- Equipment and drilling techniques
- The pressuremeter theory and the interpretation of test results
- The status and future of pressuremeters in geotechnical investigations and design
- Presentation and discussion of the results

Web: [pfe.enpc.fr/web2003/dyn/html/45001.htm](http://pfe.enpc.fr/web2003/dyn/html/45001.htm)

**SEPTEMBER 12-16 2005**

Osaka, Japan 16th International  
Conference of ISSMGE

The object of the 16th International Conference is to provide an opportunity for engineers and scientists working geotechnical engineering to meet and present new ideas, achievements and experiences. The IYEGC 2005 will also take place in parallel with the conference.

**Themes of the Plenary Sessions:**

- Soil Mechanics in General
- Infrastructure and Mobility
- Environmental Issues of Geotechnical Engineering
- Enhancing Natural Disaster Reduction Systems
- Engineering Practice and Education

Web: [www.icsmge2005.org](http://www.icsmge2005.org)

**SEPTEMBER 19-21 2005**

Western Australia, Australia "Frontiers in  
Offshore Geotechnics" (ISFOG)  
The Australian Research Council Special Research  
Centre for Offshore Foundation Systems (COFS)  
"Frontiers in Offshore Geotechnics" (ISFOG).

ISFOG-05 is supported by TC1 (Offshore and  
Nearshore Geotechnical Engineering), ISSMGE.

**Themes include:**

- Deep water systems (anchors, suction caissons )
- Shallow water systems (piles, footings, jack-ups)
- Pipelines
- Soil characterisation
- Offshore site investigation
- Geophysics
- Geohazards
- Renewable energy facilities

Web: [www.isfog.com](http://www.isfog.com)

**SEPTEMBER 22-24 2005 Chicago, USA**  
DFI 2005 Annual Conference on Deep  
Foundations

**Topics Include:**

- Case studies involving foundation systems common to the area and within similar ground conditions
- Historical evolution of deep foundations
- Relationship between use of design, construction, and equipment
- Quality control, quality assurance and non-destructive testing
- Innovation in all aspects of deep foundations and earth retention
- Practice-oriented research

Web: <http://www.dfi.org>

**SEPTEMBER 26-30 2005 Zurich, Switzerland**  
Alptransit Geological Symposium

**Themes include:**

- Geological Risk and Counter Measures
- Geological Predictions and reality
- Geology, rock mass properties and excavation methods

Web: <http://www.geat05.ethz.ch>

**SEPTEMBER 28-30 2005, Kathmandu, Nepal**  
Fifth Asian Regional Conference

Engineering geology for major infrastructure  
development and natural hazards mitigation

Web: <http://www.ngs.org.np/iaeg.htm>

**SEPTEMBER 29-30 2005 Portugal, Lisbon**

Modelling and Safety in Geotechnical Engineering; 2nd  
Portuguese-Spanish Geotechnical Meeting

**OCTOBER, 13-14 2005 Salzburg, Austria**  
54th Geomechanics Colloquy

**Themes include:-**

- Influence of orientation of rock mass structure on the behaviour of tunnels
- Mechanical excavation
- Tendering and submission of geotechnical services
- Influence of ground water on soft ground tunnelling

Web: <http://www.oegg.at>

**NOVEMBER 7-10, 2005 Taipei, Taiwan**  
Design, Construction and Operation of Long Tunnels

**Themes include:**

- Geological and hydrological Investigation Techniques
- Excavation and Support under deep overburden
- Ground Stability and Water Ingress Treatment for Tunnelling
- Procurement and Risk for Long Tunnels
- Contract and Insurance for Long tunnels
- Construction Practices of Long Tunnels
- Management and Emergency treatment for Long Tunnels
- Safety and Security systems in Long tunnels
- Mechanical, Electrical and traffic Control Facilities
- Pavements in Long Tunnels
- Case studies on Long Tunnels
- Other related subjects.

Web: <http://longtunnel2005.taneeb.gov.tw>

**NOVEMBER 1-3, 2005 Banff, Alberta, Canada**

Fifth International Conference on Computer Applications in the Minerals Industries

CAMI 2005

**Major themes:**

- Advances in mine design, mine optimisation and reclamation planning technologies
- Mine Equipment: design, selection, and real-time health and performance monitoring
- Mine and Machine Automation
- GIS, GPS, Telecommunications, Artificial Intelligence, and Internet Application
- Rock Mechanics and Geotechnical Applications: Underground and Surface Mine Stability, Groundwater, Tailings and Waste Disposal, Drilling and Blasting
- Computer Simulation
- Real-Time Mine Management Systems: Mine Maintenance, Production Management.
- Computer Applications in Mining Education

Web: <http://www.mpes-cami-swemp.com/>

---

## 2006

**FEBRUARY 17-18, 2006 Nelson, New Zealand**  
NZ Geotechnical Society Symposium.

“Earthquakes and Urban Development.”

**Conference Themes:**

- Seismic design standards: The Building Act; Building owner requirements; Building insurance implications; Public expectations
- Seismic hazard and risk assessment
- Engineering geology of seismic induced landslides
- Developments in Paleoseismic research
- Site specific seismic spectra and attenuation models, subsoil categories and loading codes
- Seismic lateral earth pressures on retaining walls
- Liquefaction and lateral spreading
- Ground improvement
- Seismic slope stability analysis and inundation prediction
- Faulting and building set-back lines and near fault effects
- Preparedness and response to a seismic event

- Alignment of structural and geotechnical seismic design models
- Seismic induced ground deformations

**MAY 29-31 2006 Ljubljana, Slovenia**  
XIII Danube - European Conference on Geotechnical Engineering

“Active geotechnical design in infrastructure development”

**Conference Themes:**

- Measurement and interpretation of ground properties: Geotechnical and environmental aspects
- Improvement of ground properties
- Case histories of interactive geotechnical design
- Static and dynamic soil structure interaction
- Risk assessment and risk management
- Geotechnical challenges related to transport infrastructure
- Durability of infrastructure

Web: <http://www.danube-conference2006.si>

**MAY 19-21, 2006 Norway Trondheim**  
International Symposium on In-Situ Rock Stress

**Conference themes:**

- New and improved techniques for in-situ rock stress measurements for civil, mining and petroleum activities
- Interpretation of in-situ rock stress measurements
- Other means of determination of insitu rock stress
- Application of in-situ rock stress data for engineering purposes in civil, mining and petroleum engineering

In addition, interesting news and experience from theoretical and practical application of insitu rock stress are most welcome. Particularly lessons learned in this field.

Web: [www.rockstress.org](http://www.rockstress.org)

**MAY 26-30, 2006 Cardiff UK**

ISSMGE 5th ICEG (International Congress on Environmental Geotechnics)

**MAY 26-30, 2006 China Hong Kong**

ICPMG 2006 (International Conference on Physical Modelling in Geotechnics 2006)

**AUGUST 4-6 2006 International Conference on Physical Modelling in Geotechnics.**

**SEPTEMBER 6-10 2006 Nottingham, UK**

10th International Congress of the International Association of Engineering Geology and the Environment.

“Engineering geology of tomorrow’s cities.”

**Conference Themes:**

- The geology of cities
- Legacy of the past

- Climate change
- Planning and geohazards
- Urban site investigation
- Dereliction, pollution and contaminated land
- Environmental urban geotechnics
- Substructures and underground space
- Geodata for the urban environment
- Infrastructure for the city and its region
- Resources for the city
- Education and training in, and public awareness of, urban geoscience

Web: <http://www.iaeg2006.com>

**SEPTEMBER 18-22, 2006 Japan, Yokohama**

8ICG (8th International Conference on Geosynthetics)

**NOVEMBER 8-10, 2006 Singapore**

Rock Mechanics in Underground Construction;

4th ARMS (Asian Rock Mechanics Symposium) 2006

---

## 2007

**JULY 7-13, 2007 Lisbon, Portugal**

11th ISRM Congress

**Conference Themes:**

- Rock engineering and environmental issues
- The path from characterisation to modelling
- Surface and shallow underground structures
- Earthquake engineering and rock dynamics
- Petroleum engineering and hydrocarbon storage.
- Plus several workshops are planned.

Web: <http://www.isrm2007.org>

---

## 2008

**MAY 30- AUGUST 4, 2008 China PR Xian**

10th International Symposium on Landslides and Engineered Slopes

## NEW ZEALAND GEOTECHNICAL SOCIETY INC.

### Management Committee Address List 2005

NAME	POSITION	ADDRESS, EMAIL	PHONE, FAX
McManus, K (Kevin)*	Chairman	PO Box 6080 Riccarton Christchurch k.mcmanus@xtra.co.nz	027 201 7793 Mobile 03 343 2679 Ph 03 364 2677 Fax
Marsh, J (John)	Immediate Past Chairman	Beca Carter Hollings & Ferner PO Box 6345 Wellesley St Auckland jmarsh@becce.co.nz	09 300 9174 Work 09 300 9300 Fax
Azimullah, I (Imrana)+	Management Secretary	51 Staincross Street Titirangi Auckland nzgs@paradise.net.nz	09 817 4786 Home 09 817 4786 Fax 021 211 0048 Mobile
Williams, A (Ann)*	Treasurer	Beca Carter Hollings & Ferner PO Box 6345 Wellesley St Auckland awilliams@becca.co.nz	09 300-9172 Work 09 575-6462 Home 09 300-9300 Fax
Glassey, P (Phil)*	Geomechanics News Dunedin Branch	Geological & Nuclear Sciences 764 Cumberland Street Private Bag 1930 Dunedin p.glassey@gns.cri.nz	03 479 9684 Work 03 477 5232 Fax 027 249 0439 Mobile
McMorran, T (Tim) *	Committee member	URS 287 Durham Street P.O. Box 4479 Christchurch tim_mcmorran@URSCorp.com	03 374 8506 Work 03 377 0655 Fax 029 374 8004 Mobile
Laws, M (Michael) #	Young Geotechnical Professionals Representative	PO Box 9806 Newmarket Auckland Mlaws@skm.co.nz	09 5295373 Home 09 913 8999 ext 8627 Work 09 913 8901 Fax
Murray, J G (Grant)	ISSMGE Australasian Vice President	Sinclair Knight Merz Ltd P O Box 9806 Auckland gmurray@skmconsulting.com	09 913 8984 Work 09 913 8901 Fax 09 524 5078 Home 021 271 1992 Mobile
Baynes, F J (Fred)	IAEG Australasian Vice President	9 Chester Street, Subiaco, Western Australia 6008, AUSTRALIA fredb@inet.net.au	+61 8 9382 1259 Work +61 8 9382 1564 Fax
St George, J (John)	ISRM Australasian Vice President	Department of Civil and Environmental Engineering University of Auckland Private Bag 92019 Auckland j.stgeorge@auckland.ac.nz	+64 9 373 7599 ext 88195 Work +64 9 373 7462 Fax

\* Elected members of committee

+ Appointed position

• Co-opted position

## NEW ZEALAND GEOTECHNICAL SOCIETY INC.

### Objects

- a) To advance the study and application of soil mechanics, rock mechanics and engineering geology among engineers and scientists.
- b) To advance the practice and application of these disciplines in engineering.
- c) To implement the statutes of the respective international societies in so far as they are applicable in New Zealand.

### Membership

Engineers, scientists, technicians, contractors, students and others who are interested in the practice and application of soil mechanics, rock mechanics and engineering geology.

Members are required to affiliate to at least one of the International Societies.  
Students are encouraged to affiliate to at least one of the International Societies.

### Annual Subscription

Subscriptions are paid on an annual basis with the start of the Society's financial year being 1st October. A 50% discount is offered to members joining the society for the first time. This offer excludes the IAEG bulletin option and student membership. No reduction of the first year's subscription is made for joining the Society part way through the financial year.

**Basic membership subscriptions (inclusive of GST), which include the magazine, NZ Geomechanics News, are:**

<b>Members</b>	<b>\$67.50</b>
<b>Students</b>	<b>Free</b>

**Affiliation fees for International Societies are in addition to the basic membership fee:**

<b>International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)</b>	<b>\$24.00</b>
<b>International Society for Rock Mechanics (ISRM)</b>	<b>\$33.00</b>
<b>International Association of Engineering Geology &amp; the Environment (IAEG)</b>	<b>\$21.00</b>
<b>(with bulletin)</b>	<b>\$70.00</b>

All correspondence should be addressed to the Secretary. The postal address is:

NZ Geotechnical Society Inc, P O Box 12 241, WELLINGTON

**The Secretary**  
NZ Geotechnical Society Inc.  
The Institution of Professional Engineers New Zealand (Inc)  
P.O. Box 12-241, WELLINGTON

## NEW ZEALAND GEOTECHNICAL SOCIETY INC. APPLICATION FOR MEMBERSHIP

(A Technical Group of the Institution of Professional Engineers New Zealand (Inc))

**FULL NAME (Underline Family Name):** .....

**POSTAL ADDRESS:** .....

**Phone No:** ( )..... **Fax No:** ( )..... **E-MAIL:** .....

**DATE OF BIRTH** .....

**ACADEMIC QUALIFICATIONS:** .....

**PROFESSIONAL MEMBERSHIPS:** ..... **Year Elected**.....

**PRESENT EMPLOYER:** .....

**OCCUPATION:** .....

**EXPERIENCE IN GEOMECHANICS:** .....

**.STUDENT MEMBERS:** .....

**TERTIARY INSTITUTION:** ..... **SUPERVISOR:** .....

**SUPERVISORS SIGNATURE:** .....

**Note** that the Society's Rules require that in the case of student members "the application must also be countersigned by the student's Supervisor of Studies who thereby certifies that the applicant is indeed a bona-fide full time student of that Tertiary Institution". . . ; Applications will not be considered without this information).

**Affiliation to International Societies:** (All full members are required to be affiliated to at least one society, and student members are encouraged to affiliate to at least one Society. Applicants are to indicate below the Society/ies to which they wish to affiliate).

**I wish to affiliate to:**

International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)	Yes/No
International Society for Rock Mechanics (ISRM)	Yes/No
International Association of Engineering Geology (IAEG)	Yes/No
& the Environment (with Bulletin)	Yes/No

**DECLARATION:** If admitted to membership, I agree to abide by the rules of the New Zealand Geotechnical Society

Signed ..... Date ...../...../.....

**ANNUAL SUBSCRIPTION:** Due on notification of acceptance for membership, thereafter on 1st of October. Please do not send subscriptions with this application form. You will be notified and invoiced on acceptance into the Society

**PRIVACY CONDITIONS:** Under the provisions of the Privacy Act 1993, an applicant's authorisation is required for use of their personal information for Society administrative purposes and membership lists. I agree to the above use of this information:

Signed ..... Date ...../...../.....

---

**(for office use only)**

Received by the Society .....

Recommended by the Management Committee of the Society .....

**NEW ZEALAND GEOTECHNICAL SOCIETY INC. PUBLICATIONS 2005**

<b>Publication Name</b>	<b>List Price Members</b>	<b>List Price Non-Members</b>
<b>New Zealand Geomechanics Society Conferences:</b> Proceedings of Technical Groups, Vol 22, Issue 1G <i>Geotechnical Issues in Land Development</i> Hamilton 1996	\$20	\$35
Proceedings of the New Zealand Geotechnical Society Symposium – <i>Roading Geotechnics 98</i> Auckland 1998	\$40	\$70
Proceedings of the New Zealand Geotechnical Society Symposium – <i>Engineering and Development in Hazardous Terrain</i> Christchurch 2001	\$50	\$70
Proceedings of the New Zealand Geotechnical Society Symposium – <i>Geotechnics on the Volcanic Edge</i> Tauranga 2003	\$50	\$70
<b>Australia – New Zealand Conferences on Geomechanics:</b> <i>Proceedings of the 3rd Australia – NZ Conference on Geomechanics</i> Wellington, May 1980 ( Vols 1, 2 & 3 per set)	\$10	\$30
<i>Proceedings of the 2nd Australia – NZ Young Geotechnical Professionals Conference</i> , Auckland, December 1995	\$25	\$40
<i>Proceedings of the 5th Australia – NZ Young Geotechnical Professionals Conference</i> , Rotorua, March 2002 (spiral bound reprint)	\$75	\$85
<i>Proceedings of the 6th Australia – NZ Conference on Geomechanics</i> Christchurch, February 1992	\$50	\$100
<i>Proceedings of the 9th Australia – NZ Conference</i> February 2004 – 'To the end of the Earth' – Vol 1	\$120	\$150
– Vol 2	\$120	\$150
<b>Other Publications:</b> <i>NZ Geomechanics News</i> Collection 1970–2003 Volumes 1–66 (CDRom)	\$25	\$40
<i>Shear Vane Guidelines</i>	\$15	\$20
<i>Guidelines for the Field Description of Soils and Rocks in Engineering Use</i>	\$10	\$13
<i>Stability of House Sites and Foundations – Advice to Prospective House and Section Owners</i>	\$1	\$1
Back Issues of <i>NZ Geomechanics News</i>	50c	50c

**Prices do not include GST or postage & handling**

**Orders to:**

Imrana Azimullah, Management Secretary  
51 Staincross Street, Titirangi, Auckland  
Email: nzgs@paradise.net.nz

## ADVERTISING INFORMATION

*NZ Geomechanics News* is published twice a year and distributed to the Society's 500 members throughout New Zealand and overseas.

The magazine is issued to society members who comprise professional geotechnical and civil engineers and engineering geologists from a wide range of consulting, contracting and university organisations, as well as those involved in laboratory and instrumentation services.

Advertisement Location	Single Issue	Advert. Size (mm)
<b>Black &amp; White</b>		
Full Page Internal	\$225	185 wide x 265 high
Half Page Internal	\$175	90 wide x 265 high
Quarter Page Internal	\$150	185 wide x 130 high 90 wide x 130 high
<b>Colour</b>		
Back Cover	\$600	210 wide x 297 high
Inside Cover (Front or Back)	\$500	210 wide x 297 high
Full Page Internal	\$400	210 wide x 297 high
A3 Centrefold	\$750	420 wide x 297 high
<b>Inserts</b>		
Insert to be posted with magazine – \$200/flyer		
Maximum size single A4 page		
Special price given on request for other types and sizes		
<b>Note</b>		
1. All rates exclude GST		
2. Space is subject to availability		
3. A 3mm bleed is required on all ads that bleed off the page. Bleed must be set up on all files that are supplied.		
4. Advertiser to provide all flyers		

If you are interested in advertising in the next issue of *NZ Geomechanics News* please contact:

### Management Secretary

Imrana Azimullah  
51 Staincross Street  
Titirangi  
Auckland  
Email: nzgs@paradise.net.nz