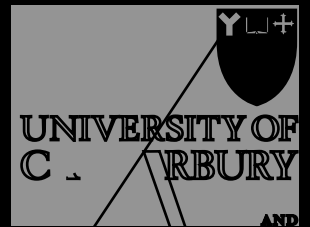


CE News



2005 Departmental Staff

* - Emeritus professors

Academic/Research Staff

Chris Allington : Structural concrete

John Berrill : Geomechanics, engineering seismology

Lis Bowman : Geomechanics

Andy Buchanan : Timber and fire engineering

Des Bull: Structural concrete design, earthquake engineering

Athol Carr : Structural dynamics, finite element analysis

Tom

CENews

Number 19 2005-2006

Editor: Ian Mason

Design: Melody Callahan

Printer Production: The Caxton Press

Many thanks to all those who contributed articles and photos in the making of CE News.

CE News is an annual publication by the University of Canterbury Department of Civil Engineering. It is for staff, students, alumni, friends and industry. Views expressed are those of the contributors, not necessarily the University.

Enquiries should be directed to:

University of Canterbury, Civil Engineering Department
Private Bag 4800
Christchurch, New Zealand 8020
Attn: CENews Editor

Printed April 2006.

One of the distinguishing features of engineering is that it is focused on making things work. To quote the US Engineering Council for Professional Development:

"Engineering is the profession in which a knowledge of the mathematical and natural sciences, gained by study, experience and practice, is applied with judgement to develop ways to utilize economically the materials and forces of nature for the benefit of mankind."

Whilst some may argue with the details and wording of this definition, the applied nature of engineering activities is not in dispute. In this respect, experimentation, field-work and real world implementation of new ideas can be regarded as essential components of our activities as professional educators and researchers. Here at the University of Canterbury, it is our technical support staff who make these aspects of engineering possible. Their presence provides academic staff with the means to try out new concepts (often at full-scale), gives students valuable practical experience, and offers to all the benefit of those practical skills typically required in the implementation of new, innovative and sometimes "wild" ideas. In the doing, something new is often learned and to adapt the title of a recent movie, much can be "Gained in Translation", through such a collaborative process.

Technical activities can be wide and varied. Machining, welding, surveying, instrument operation and maintenance, software development, electronics design and manufacture, installation of field instruments, and the collection of water and soil samples, not to mention going shopping for all those necessary bits and pieces, are some which come to mind. Technical staff also assist with demonstrating undergraduate laboratories, assisting with post-graduate research, and engaging in such fun activities such as standing in the Avon River for a whole afternoon, setting up one wooden bridge after the other, during the annual bridge-breaking contest. **If any one person could do all these things they would surely be a Supertech! Does Supertech exist?**

Learning from the Boxing Day tsunami

Erica Dalziell was part of a seven-strong New Zealand team of engineers, scientists and civil defence experts which travelled to southern



southern T s030(e)20(a)2 EX/P10(t)30(s)3r0(s)20(030(e)20(/Tf0 1 Tf9)200)20(a)20(f)26(y)20(,)20()TJ/Spa/ActualTextFEFF0032 BDC 10.888 0 Td(2)TjEMC 0.417 0 Td(0)

New Faces



Tom Cochrane

Dr. Tom Cochrane joined the department in February 2005 as a Lecturer in Natural Resources.



Greg McRae

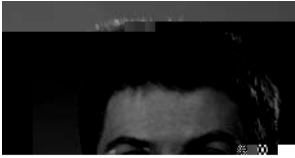
Greg is a New Zealander and University of Canterbury graduate who arrived in 2005 to take up an Associate Professorship in structural engineering. After graduating BE Civil(Hons) from this department in 1984, he spent a year working with a civil/structural consulting firm in Wellington, before returning to the University of Canterbury to undertake doctoral research on the behaviour of steel structures in earthquakes. "Because of our strong structures program, I was subsequently offered a fellowship to

work with a leading earthquake research group in Tsukuba, Japan for two years," says Greg. "Then it was off to San Diego, where I had the privilege of working with Nigel Priestley (a former lecturer from Canterbury who has been responsible for a number of major developments in earthquake engineering worldwide) for 2.5 years." For the past 11 years, Greg has held an academic position at the University of Washington, Seattle, USA.

Greg is enthusiastic about the return home. "We all know that the University of Canterbury has a great engineering school, but it is nice to visit other countries to confirm it!" he says. "Japan, San Diego and Seattle offered different cultures, languages(!) and opportunities. Some other countries have more resources to pour into research than New Zealand, and I have had the chance to learn from, as well as contribute to, the state of the art. However, NZ engineers and researchers have developed some of the best concepts around and these are well respected in many places. I am sure that this is partly due to our strong relationships with industry and our desire to obtain simple and robust solutions which we can discuss with non-technical people."

It was on his sabbatical leave to New Zealand a few years ago that Greg met his wife, Ing – a physicist. "When our family size increased by 50%, and we were told that there was a position at the University of Canterbury that exactly fitted my interests, regarding steel structures, we decided that it was time to move home. Although we have been here for only a few months we feel quite settled. We have bought a kayak and hope to enjoy more of the great Kiwi outdoors. It is great to be home!"

People



Massimo Fragiacomò

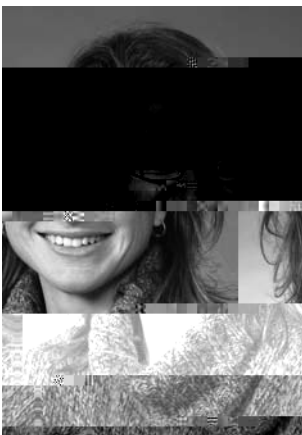
Massimo Fragiacomò joined the Department in May, 2005 as a Senior Lecturer in Timber Structures, and the Carter Holt Harvey Fellow in Wood Structures. This is 3-year fixed term position, sponsored chiefly by Carter Holt Harvey, a leading Australasian producer of Laminated Veneer Lumber (LVL). His main areas of expertise are in Earthquake Engineering, Timber, Steel and Composite Structures. He is the author of 14 international journal papers, and has another 44 papers published in international and Italian conference

proceedings, and in Italian journals.

Massimo was born in 1967 in Trieste, at the very north-eastern end of Italy, bordering the former Yugoslavia. "New Zealanders have a very good reputation in this city on account of the role played by NZ troops at the end of World War 2," says Massimo. "The New Zealand troops were the first of the allied forces to enter the city after the downfall of the Third Reich and they protected the people from Yugoslavian partisans who entered the city at the same time. The Kiwis established a good relationship with the population and the citizens of Trieste still retain good memories of them."

Massimo completed his first degree in Civil (Structural) Engineering at the University of Trieste in 1992, graduating with the maximum score. After finishing his compulsory military service as a midshipman in the coastguard, he started working as a civil engineer with the local city council, gaining experience in administration, design, construction supervision and building management. After 5 years in this job, he enrolled as a postgraduate student in the Faculty of Architecture of the University of Venice. In 2001, he completed his PhD in Design and Conservation of Structure, with a thesis on long-term behaviour of timber-concrete composite structures. Following this he worked for 6 years as research engineer at the University of Trieste, where he also taught steel design at the Faculty of Architecture. He has also spent 6 months at the UK Building Research Establishment and one and a half months at Colorado State University (USA), where he worked on timber-concrete composite structures.

In his spare time, Massimo enjoys running, tramping, skiing, mountaineering, and ski-mountaineering. He is married to Paola, with whom he shares a love of travelling, art, hiking and good food. "However, if you wish to have some advice about cooking, refer to Paola, and ask me only about structural engineering," says Massimo.



Lis Bowman

Dr Elisabeth (Lis) Bowman joined the Department in September 2005 as a Senior Lecturer in Geomechanics. She received a BA degree (in Engineering) in 1994 from Cambridge University in the UK, before working for four years as a design civil engineer with consultants Gifford in Southampton and London. During this time she worked on a variety of projects, both in the office and on site – from structural bridge design to road widening, along with geotechnical design and geoenvironmental monitoring.

Pedro Lee

Pedro Lee joined the department in November 2005 as a Lecturer in Fluids Engineering. Originally from Hong Kong, Pedro has lived in Australia for the past 16 years prior to coming to New Zealand. He received his Bachelor of Civil and Environmental Engineering, along with the University Medal, from the University of Adelaide in 2000. He started his PhD





Structural Dynamics in Pavia

As announced in the February, 2005 issue of CE News (#18), Athol Carr was invited to present a course on Structural Dynamics at the Rose School at the University of Pavia in May, 2005. Athol reports on his visit as follows.

"I arrived in Pavia with a feeling of great trepidation a week before the course was due to start. Previous courses had been given by world-renowned academics and my version was to be somewhat different, with an emphasis on numerical time-history methods, and much less emphasis on modal- and frequency-based approaches. The course involved 30 hours of lectures and 30 hours of tutorials spread over four weeks, with an examination the week after the course was completed, and graduation shortly after that. Lecture sessions lasted two and a half hours on Tuesday, Wednesday and Thursday mornings, with tutorials in the afternoons. This left the students 4 days to cover all the problems and homework before the next week's lectures commenced. (All courses at the Rose School are of one month, or less, duration and the students take no other courses at that time).

The 21 postgraduate students attending my course came from Italy, Portugal, Greece, USA, Columbia, Pakistan and Sri Lanka, and I quickly became aware that I was the only one whose native language was English! However, the Rose School students are carefully selected and although some had no dynamics in their undergraduate training, they were all very eager to learn. In my nearly 40 years of lecturing I do not think I have ever enjoyed teaching a class as much as I did with this group of enthusiasts. Although the tutorials were scheduled for two and a half hours, it was often after 4 hours that I was turning the lights out in the lecture room for the night.

By now, Rose School students must be getting used to a New Zealand flavour in their earthquake engineering studies. The Reinforced Concrete course that preceded my Dynamics course was given by Mike Collins from Toronto, and the Bridge Engineering course that was to follow, was given in part by Nigel Priestley. John Berrill has also given courses on Geotechnical Engineering at the Rose School.

It was not all work however, and we made the most of the long weekends, with one spent in Venice, one in Florence, and one at a European Lacemakers convention in Ballaria on the Adriatic Coast, with a visit to San Marino on the way home. On the last weekend we walked both ways along the Cinque Terre (the five villages)

just south of Genoa. This was something not to be missed, the scenery was spectacular and the exercise was needed. We have yet to visit Milan, as marking examination papers took precedence when the opportunity presented itself - Milan, although just 30 km away, will have to wait for another time."

Supertech will pass on knowledge of the practical to shed light on the theory of the lecture room.



Home and Away – sabbatical tales

Andy Buchanan was on study leave for all of 2005, spending the first five months in Christchurch, in a quiet office in the School of Forestry. He then travelled to the UK where he was based for the remainder of the year. During his time in Christchurch, Andy moved back into research activities, mainly in his key areas of timber construction and fire safety, especially the overlap between these two. Anticipating the new carbon tax, he wrote an article for the New Zealand Timber Design Journal entitled "How will timber buildings help New Zealand meet Kyoto Protocol commitments?" later shortened for a popular piece in the Christchurch Press.

To assess how well the structural teaching in the Department is meeting the needs of the profession, Andy made visits to the structural engineering offices of the Holmes Consulting Group in Christchurch and Auckland. Another major job during this time was negotiating funding for a new government-funded chair in timber structures with the Ministry of Agriculture and Forestry. In preparation for this activity the University invited Hon Jim Anderton, Minister of Forestry to visit in February, 2005. The funding was later announced as part of the government's Forest Industry Development Initiative.

The UK visit was based at the University of Bristol, which has built up a strong relationship with Canterbury over the years. Andy's main project was producing a third edition of the Timber Design Guide in collaboration with many NZ contributors, due for publication late 2006. The Bristol experience included many useful discussions on all aspects of teaching and research in civil engineering, attending a project-based student field trip to Wales and writing a set of personal notes on "What makes a good course?"

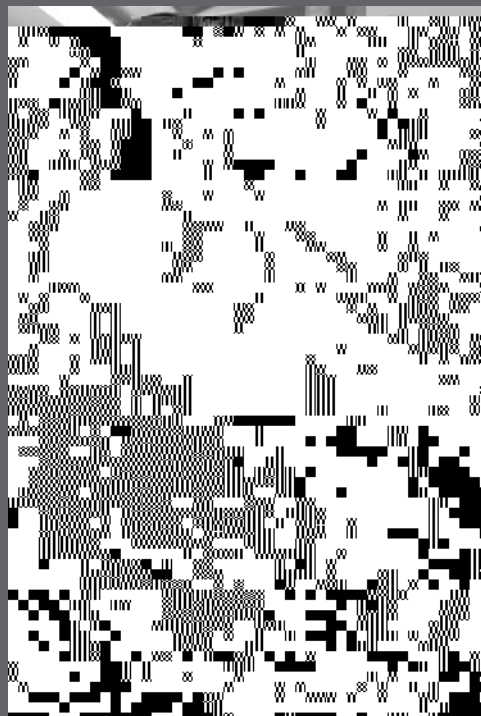
Local visits from Bristol included Arup Fire in Bristol, and the University of Bath and Buro Happold offices in Bath. In London Andy spent a day each at the Building Research Establishment and the Arup offices. At both venues he talked to both timber engineering people and fire engineering people. Canterbury graduates were met at many locations. In Edinburgh he visited the Centre for Timber Engineering at Napier University and the Centre for Fire Safety Engineering at the University of Edinburgh.

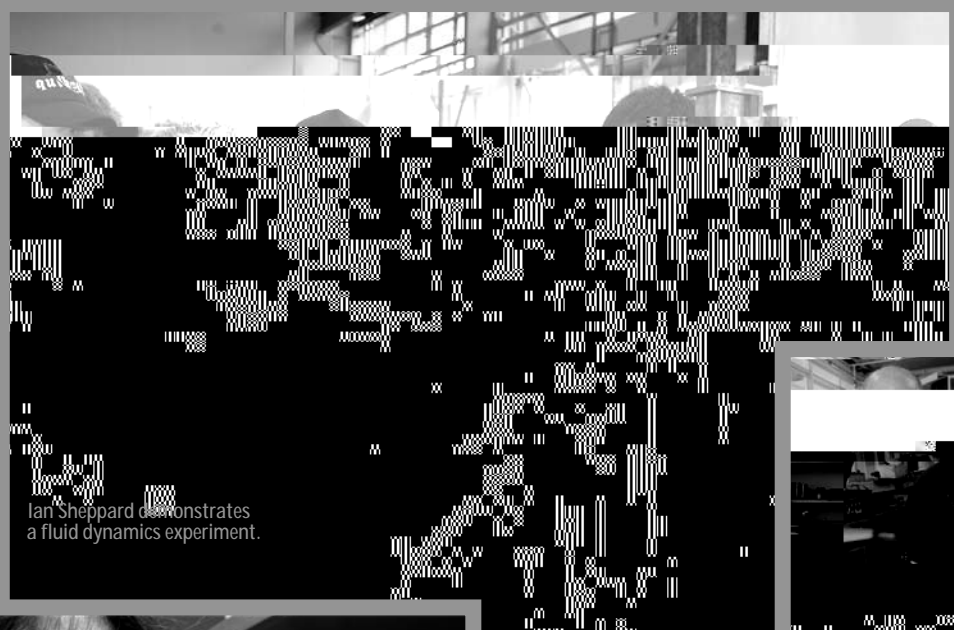
Several other international visits were made during the year. In Beijing, Andy attended the 8th International Symposium on Fire Safety Science with colleagues Peter Moss and Tony Parkes. The paper on "Fire Performance of Continuous Reinforced Concrete Beams" was well received. Karlsruhe, Germany was the venue for the CIB Working Commission on Timber Structures, followed by visits to Stuttgart and Dresden.

The UK time was cut short by a serious traffic accident in late October. While out early-morning jogging Andy was hit by a bus. The accident resulted in five weeks in hospital with a serious head injury, clearly putting an end to all teaching and research at Bristol. Andy is now back in Christchurch making a strong recovery, and he hopes to be back at work full-time by mid 2006.



Photo above, left to right: George Hadjisophocleous (Carleton University), Andy Buchanan, Tony Parkes and Andre Dantas on the Great Wall of China, September, 2005





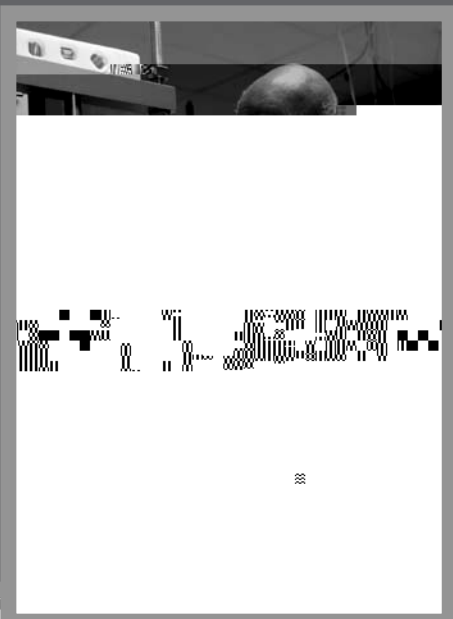
Ian Sheppard demonstrates a fluid dynamics experiment.



Ray Allan sets up a lathe.



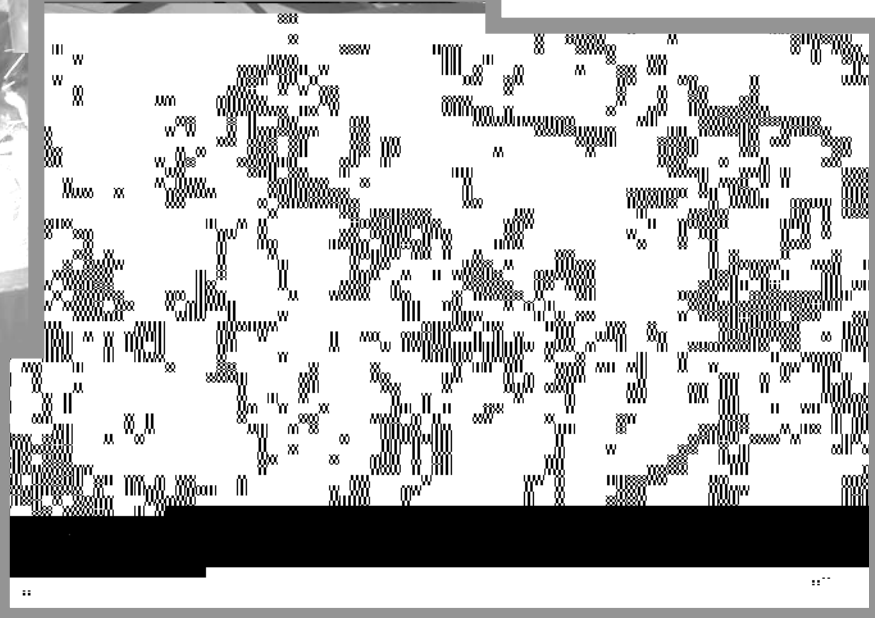
Engineers check...



Siale Faitotonu adjusts a triaxial soil testing rig.



Nigel Dixon arc welds a structural steel floor.



Russell McConchie supervises instrumenting of a beam for structural testing.

Farewells

Bruce Hunt

Dr Bruce Hunt has been a valued member of the staff of the Civil Engineering Department, with a speciality in fluid mechanics, since 1973. Originally from Pennsylvania, USA he arrived in the Department from a position at Washington State University, immediately taking up a Senior Lectureship, and was promoted to Reader (Associate Professor) in 1979.

Bruce's research record is outstanding. His mathematical ability has enabled him to contribute in many areas, including Dam Break problems, Seismic Response Reservoirs, Water Waves and Thermal Calculation for Bridges. However, his greatest love was the mathematics of groundwater and approximately two thirds of his 75 journal publications are in this area. I believe Bruce has only taken one sabbatical leave in his 33 years with the Department and rarely goes to overseas conferences. In spite of this, he is well known and respected internationally and in 2005 he was given the best paper award by American Society of Civil Engineers Journal of Hydrologic Engineering for his paper entitled 'Spring Depletion Solution', at the World Water and Environmental Congress in Alaska, USA.

He was an excellent teacher. His students remember him for his patience and rigour, and clarity of presentation. Julian Weir (a relatively recent student) recalls that, although he had taken Bruce's undergraduate course, "I did not fully appreciate Bruce's skills and wisdom until I took his post-graduate groundwater paper." Bruce gave many postgraduate courses in the groundwater area and some of the students were geologists, with less mathematical background. Peter Callendar was one of these and comments:

"Coming from a geological background, the mathematical content of the course was daunting. However, this was compensated by Bruce's commitment and dedication to helping students understand his lectures. In my case this extended to a demonstration of Bruce's exceptional patience as he spent many hours outside of the formal lectures explaining the mathematical basis for his approach to characterising groundwater flow.

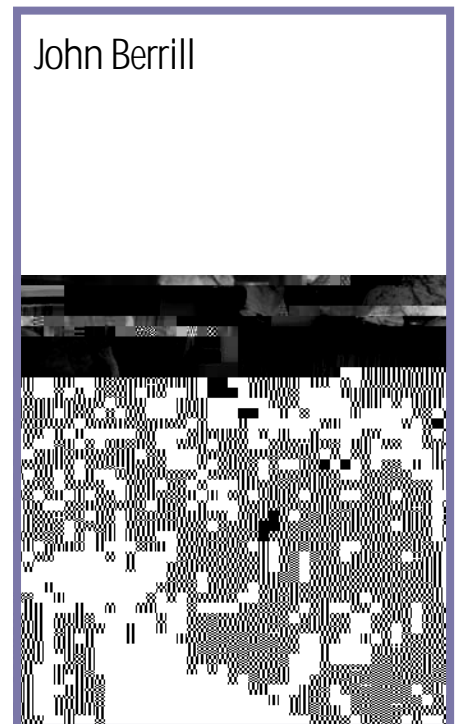
Bruce has had a strong influence on the development of many of the careers of people now working in the New Zealand groundwater industry. One of the founding partners of the consulting firm I now work with had been one of Bruce's early Master's students. At that particular time there were only two students doing his Master's course and Bruce told me of his dismay one day when he turned up to the regular scheduled lecture time to find that, on account of the weather, his two students (the entire class) were absent. He later found they had gone skiing for the day. However, he recalled that one of the students broke his leg on that particular skiing expedition, which demonstrated there is some justice in the world if appropriate respect is not shown to the mathematics of groundwater flow!"

Bruce's contributions to the profession are reflected by David Scott of Environment Canterbury, who has worked on groundwater for over thirty years:

"Since working with Environment Canterbury I have appreciated Bruce's interest in solving practical problems such as his development and refinement of analytical solutions for well interference and stream depletion of pumping. In particular, his recent interest in providing these solutions as Excel macros have made them accessible to a much wider range of users - people who may have been intimidated by partial differential equations have been able to gain a sense of how the solutions work through the use of these tools. I've recently had the pleasure of collaborating with Bruce on the evaluation of some of these solutions and have been impressed by his tenacity when confronted by a difficulty.

Through his teaching, project supervision and research Bruce has made a very significant contribution to the development of the capacity to understand the behaviour of groundwater systems. I hope that, in retirement, he will be able unable to resist the lure of a difficult problem and that his contribution and collaboration will continue."

In the department, Bruce was a strong advocate for the fluid mechanics syllabus. Where changes were discussed he always did his homework, forming and expressing his sometimes traditional, sometimes controversial, views, extremely well.



Bruce Steven

When I completed my ME in 1992, the opportunity came up to start work as a full-time researcher at the Canterbury Accelerated Pavement Testing Indoor Facility (CAPTIF), a full-scale pavement testing facility owned and funded by Transit New Zealand but operated under contract by Bryan Pidwerbesky on behalf of the Department of Civil Engineering and the University of Canterbury. The first few years were very enjoyable as I was based at the McLeans Island site along with the operations manager, Alan Fussell, getting my hands dirty helping to construct test pavements and collect data. When the facility underwent a major upgrade in 1996/7 I moved back to the Ilam campus, and started working on other pavement related research projects, in addition to the CAPTIF work.

Not long after I started, the facility was awarded part of a major OECD international research project investigating the relationship between heavy vehicles and pavement deterioration. This research contract has been one of the highlights of my career as it gave me the chance to work with leading pavement and vehicle researchers from around the world. After

visiting other testing facilities around the world, people are amazed that we could produce high quality results with such a (comparatively) small budget and workforce - a view endorsed by overseas researchers we have hosted. This could be put down to the efforts of Alan, Bryan, Frank Greenslade and other technical staff, and the way they have built pavements and developed the required instrumentation over time.

When I relocated back to the campus I became involved with laboratory testing and some teaching, along with starting a part-time PhD. My PhD work was an attempt to assemble a larger number of small pieces of information that had been collected over several projects into a numerical model that could be used to predict the response of a non-linear, mostly elastic, solid otherwise known as a pavement. Now that I have completed my PhD, the opportunity has come up to work as a Project Scientist at the Partnered Pavement Research Centre, located at University of California, Davis, USA. The program is a long-standing multi million dollar per year program funded by the California Department of Transportation. There will be three major changes for me to make – i) switching from a circular testing machine to two linear machines (Heavy Vehicle Simulators from South Africa), ii) working in a team of 14 researchers rather than as a “sole practitioner” and iii) the not so small task of relocating my family to another country!

One of the best things about working here has been the atmosphere of openness and congeniality that exists throughout the Department. Despite my non-permanent employment status, people have always been interested in what I was working on and have usually had the time to answer impromptu questions about both their own work and m

Alan Williman 1914-2004

It is noted with regret that Alan Williman, who joined the Department of Civil Engineering in 1952 and retired in 1979, died in December 2004, shortly after his 90th birthday.

Alan gained a BSc (Eng) from London University in 1936 and worked as a Civil Engineer until World War II, during which time he served in the Royal Engineers doing bomb disposal and road upgrading in France and Germany. He joined the University of Manchester Institute of Science and Technology (UMIST) as a lecturer in 1949, gaining an MSc (Eng) in 1951, before emigrating to NZ with his wife, Barbara, and their three children. During 1954/55, Alan applied his engineering skills to the building of his own house (one of the first houses in Christchurch with a concrete slab floor). Alan married Joan Lester in 1966, a few years after Barbara had died after a long illness.

During the 1950's Alan taught Drawing and Design, as well as Surveying, before finally settling into Highway and Traffic Engineering. He was the driving force behind the development of NZ's first (and only) pavement testing facility, known then as the 'Willywheel'. This facility was first used by Bill Patterson (now a Pavement Engineering specialist with the World Bank) for his PhD study, and was subsequently developed by Phil Seddon, who had been a student of Alan's at UMIST and had joined the Civil Engineering Department in 1975. The facility, now known as

was estatin(d)20()20(i)20(n)20p)20d nu0(d)F(t)20(r)20as nidtr tty

Team Italia

If you think that "Team Italia" sounds like the name of a sporting franchise you'd be close to the mark. In this case however, the "players" are all civil engineers, who like to think of themselves as competing on the world structures circuit in a series of intense, but friendly, games. The team was "founded" in 2004 by current chief coach Stefano Pampanin from Italian club, Pavia, and assistant coach Alessandro Palermo (in New Zealand for the 2004-2005 season), from Milan. They took their name from a suggestion made by 3rd pro local player Alistair Boys, and now boast a truly international line-up. Current and immediate past players come from New Zealand, Italy, France, Germany, Turkey, China, Colombia, Malaysia, and Taiwan. Present membership allows for a full line-up of 11 players to be fielded, with varying numbers of short-term visitors available as substitutes.

In 2005, Alessandro's club wanted him back, so unfortunately he returned to Milan in August (see accompanying article). Adopting fresh tactics, the club welcomed technical manager and researcher Dr. Uma Ashok, "bought on the market for an excellent fee," according to Dr. Pampanin. In fact, the team has been very active in the transfers market. Didier Pettinga travelled to the ROSE School in Pavia in 2004 for Masters and PhD degrees (supported by full scholarships). Didier has also been busy playing a series of world tour "exhibition matches" and honing his skills, travelling back to the University of Canterbury in 2004 and 2005, also spending four months in Toronto, Canada and presenting his work at a conference in Greece. Another exchange player from the ROSE school is Mario Galli, who "came over

Grads speak

Kate Medicott

Kate Medicott is a BE Environmental (Hons) graduate from the class of 1997, whose career to date has involved working in several interesting parts of the world. Following graduation and travels in Latin America, Kate spent 3 years with consultants Beca, Carter, Hollings and Ferner in New Zealand, before setting off for the Peoples Democratic Republic of Laos. "I was interested in development work, and on the advice of a friend took up residence, and presented my CV to various development organisations in the area," says Kate. Over the next 3.5 years Kate worked on community development projects involving planning, management, water supply and sanitation issues, with WHO, UNICEF and the UNDP. Then in 2003 she returned to New Zealand to take up the position of Water and Emergencies Programme Manager, with international aid agency Oxfam.

Since then, Kate's environmental engineering skills have been put to particularly good use whilst managing Oxfam's water and emergencies programme. More recently her field skills were

put to the test in the disputed north-east region of Sri Lanka, following the tsunami of December, 2004.

"In the first days after the tsunami, local Oxfam staff assisted with ferrying the injured to hospital, and distributed cooked food," writes Kate. "They were also able to distribute a stock of water tanks to many camps - because they had these in hand from responses to a drought and a flood that also happened in 2004. These were then filled and chlorinated each day."

"We were working in 9 temporary camps with local organisations working on water and sanitation. I was leading Oxfam's team there to build temporary toilets and arranging sufficient water to be trucked to meet daily needs. We also needed to construct bathing cubicles to provide privacy for women while washing, and to install rubbish bins and arrange daily collection. Work in temporary camps was vital to ensuring a healthy living environment and dignity for survivors. Huge challenges also lay in assisting people to move home and in preparing permanent relocation sites for those who were unable to return home. Part of this work involved cleaning wells and testing water quality for those going home and planning permanent facilities with communities in their new locations. Throughout, making sure we could provide enough water of adequate quality was a real challenge. We were monitoring residual chlorine, but trying to ensure there was not too much or it would put people off and they would use unsafe wells, or the lagoons instead."

Days were long and exhausting. "Initially there was very little food - certainly no fish - but always the Sri Lankan staple of rice and curry and a sugary bun for breakfast. The tea was excellent," says Kate.

In terms of job satisfaction Kate says, "By working with local people we were able to make a huge difference in people's daily lives and health, but there were also

Transportation Engineering

Peddling Pedal Power

Transportation engineering Lecturer Glen Koorey likes his bike. As well as being a nationally regarded expert in planning and design for cycling, he is also chair of the local cycle advocacy group "Spokes Canterbury." So it's perhaps no surprise that he's active in promoting the cycling message to his colleagues. A great opportunity to do this arose as part of the nationwide Bike Wise Week 2005, held from 12 –20 February, which promoted biking as a fun and healthy means of transport and recreation for all ages.

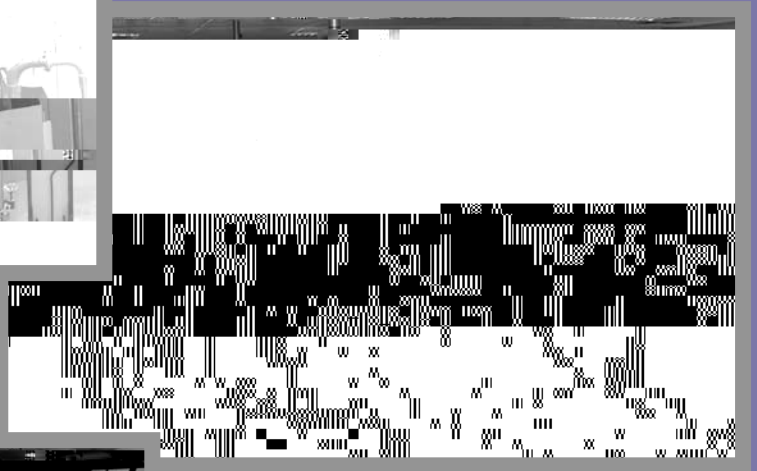
Glen entered the department in the Bike Wise Business Battle 2005. The "Battle" involved

Environmental Engineering

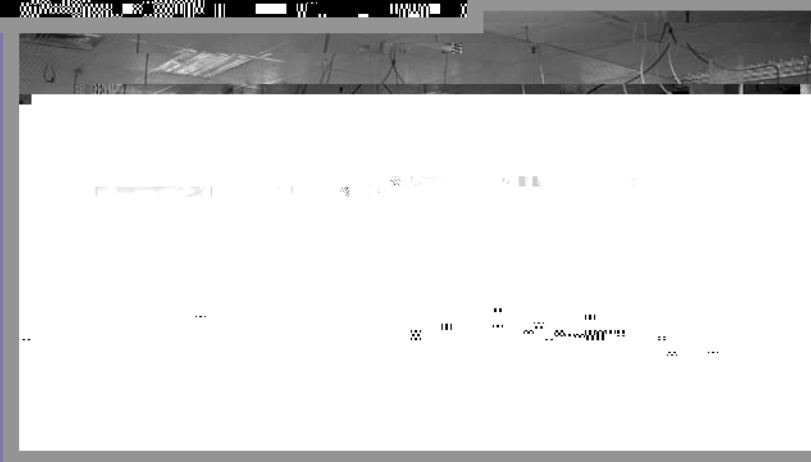
Compost standard published

Ian Mason was part of a 16 strong expert





Workshop and laboratory facilities
Department of Civil Engineering
University of Canterbury
www.civil.canterbury.ac.nz



From top down: fluids laboratory, environmental laboratory, workshop and structures laboratory, geomechanics laboratory, transport laboratory