Department of Civil Engineering
Clayton Campus

Annual Report

2002
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Civil Engineering Building – Clayton Campus
1. Introduction And Objectives

The Year 2002 saw the Department of Civil Engineering continue to expand its activities in research, teaching and professional services. The Department continued to provide a high level of teaching provision and research output while positioning itself for future change. Its mission is “To provide high quality Civil Engineering education, research and professional services globally for the mutual benefit of the students, the staff, the University, industry, the profession and the wider community”.

Undergraduate Teaching

The Department continued to present the Bachelor of Engineering program. Some students in this program combine their degree with Arts, Science, Law or Commerce degrees. The first cohort of students were accepted into the Bachelor of Technology (Infrastructure). The students completed their first year of study at Holmesglen Institute of TAFE then articulated into the program at Monash. Transition of the presentation of courseware from the Civil Engineering Web site (CLEO) to the University’s WebCT has also begun.

Postgraduate Education Programs

The Institute of Transport Studies distance education postgraduate program in transport studies was restructured into two masters programs: Master of Traffic and Master of Transport. The program still enables articulation through industrial programs, Graduate Certificates, and Postgraduate Diplomas in transport and traffic. All subjects will be offered by distance education. The new program has attracted considerable interest in the transport community.

The Department initiated a Master of Infrastructure Engineering and Management program in 2002. The program involved core subjects in Project Management, Evaluation and Asset Management. It attracted over 13 students.

Industry Education Programs

The Institute of Transport Studies still maintains its activities in the Bus and Coach and Parking industries. The programs have attracted continuing support. Industry is involved in the ongoing development of the program. The Water group continues to offer technology transfer programs to industry. These are well received and have provided training to over 50 students. The Geomechanics group offers short courses in Environmental Geomechanics.

Research

Strong research activities have continued in the key departmental strengths of structural, water, geomechanics and transport engineering. One hundred and ninety research projects have provided the focus for staff during 2002. Research funding support of $1,494,254 has been attracted to support these projects. The Department has 35 PhD and 26 MEngSc students.
Staff members were involved in the preparation of 1 book, 1 book chapter, 3 special issues journals, 32 journal articles, 52 conference papers, 2 research reports, 4 newspaper article contributions and 1 patent. Six PhDs, 2 Master of Engineering Science (Major Thesis) and 5 Master of Engineering Science (Minor Thesis) were completed in 2002. Staff attended 24 conferences. Staff, research students and visitors presented 23 seminars on their research and activities during the Departmental seminar series.

Visitors and Visits

The Department hosted seven visitors from all parts of the world. These visitors worked closely with departmental staff to develop research and teaching activities. The linkages developed between staff and these visitors ensure the maintenance of high standards of research and teaching as well as the strengthening of links between the department and other universities throughout the world. Departmental staff visited 30 institutions in 2002.

External Activities

Staff members were involved in the review of paper and journal editorial committees on 44 occasions and presented 16 seminars at other institutions. They were also involved in 26 professional associations.

Centres

**CRCCH (Cooperative Research Centre for Catchment Hydrology)**

The Cooperative Research Centre (CRC) for Catchment Hydrology has its Centre Office in the Department. Professor Russell Mein retired in June 2002 as its full time Director. Professor Rob Vertessy, of CSIRO and a Monash Honorary Professorial Fellow, was appointed as the new Director.

This CRC brings together, in a cooperative venture, four research and ten user organisations from Victoria, New South Wales and Queensland. All of the water-related staff in the Department are involved in the Centre, contributing to its Catchment Prediction, Sustainable Water Allocation, Urban Stormwater Quality and River Restoration Programs.

The CRC is now three and a half years into its second seven-year term of funding and performing well. A major independent review of the Centre was completed in 2001, with the Panel giving a highly favourable report to the quality of the research being done, the communication and adoption strategies and to general management of the Centre.

A new round of three-year projects has been approved for commencement in January 2003.

Full details can be found on the Centre’s web site at: http://www.catchment.crc.org.au/
ITS (Institute of Transport Studies) Monash Node

The Institute of Transport Studies has continued to expand its teaching activities in 2002. The Distance Education program for the Bus and Coach industry continues to attract a steady stream of enrolments and is proving to be a valuable course for people entering the industry and for those already in the industry who wish to progress to management positions. The Parking Education program continues to attract students from throughout Australia.

Full details can be found on the Institute’s web site at:
http://www.civil.eng.monash.edu.au/people/centres/its/

Staff Profile Management

The Department of Civil Engineering has continued to increase its staffing through the centres and external research funding. The core Department has had a considerable change in staffing over the year. The retirement and resignation of staff has opened the way to restructure several of the groups. These staff will be the basis for growth in the Department in the future.

2. Current Departmental Structure

In 2002, the Department operated through four sections: Geomechanics, Structures, Transport and Water, headed respectively by Dr M. Bouazza, A/Prof. R. Grzebieta/Prof. X.L. Zhao, A/Prof. G. Rose, Mr E. Weinmann.

The Management Committee consisted of Prof W. Young (Chairperson), Prof X.L. Zhao (Deputy Head), A/Prof G. Codner (Director of Teaching), Dr R. Al-Mahaidi (Director of Research), Mr C.D. Powell (Director of Support Services).

Staff Changes:

<table>
<thead>
<tr>
<th>New appointments:</th>
<th>Promotions:</th>
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<tbody>
<tr>
<td>Dr Asadul Haque</td>
<td>Dr Malek Bouazza (from Senior Lecturer to Associate Professor)</td>
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<tr>
<td>Dr Anthony Ladson</td>
<td>Dr Jay Sanjayan (from Senior Lecturer to Associate Professor)</td>
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<th>Resignations:</th>
<th>Retirements:</th>
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<tr>
<td>A/Prof. Tony Wong</td>
<td>Professor Russell Mein</td>
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<tr>
<td>Dr Wei Dong Guo</td>
<td>Mr Wolfgang Richter</td>
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<tr>
<td>Dr Xu Fan Gu</td>
<td>Mr Keith McKenry</td>
</tr>
<tr>
<td>Dr Roger Hadgraft</td>
<td>Mr Carl Bakes</td>
</tr>
<tr>
<td>Dr Geoff Taplin</td>
<td></td>
</tr>
</tbody>
</table>
List of Staff:

**Head of Department**
Professor William Young BE (Hons) N.S.W. MSc PhD GradDipMgt Deakin MBA Deakin FIEAust FITE FCIT CPEng

**Professors**
William Young  BE (Hons) N.S.W. MSc PhD GradDipMgt Deakin MBA Deakin FIEAust FITE FCIT CPEng
Xiao-Ling Zhao PhD Syd. ME Shanghai Jiao-Tong MASCE MIEAust CPEng MCCES
Russell Gordon Mein BAgE (Hons) MEngSc Melb. PhD Minn. FIEAust

**Emeritus Professors**
Eric Marwick Laurensen BE (Hons) PhD N.S.W., CPEng, FIEAust
Paul Grundy BCE(Hons) MEngSc Melb. PhD Cantab. FIEAust MISOPE CPEng

**Adjunct Professors**
Kenneth Wade Ogden BE (Hons) MEngSc Melb. DipCE Ballarat School of Mines PhD MITE FIEAust CPEng
Rahmi Akcelik MSc Istanbul Technology University PhD Leeds
Tony Richardson BE (Hons) MEngSc UNSW PhD FIEAust MITE

**Associate Professors**
Gary Peter Codner DipCE Caulfield I.T. BE (Hons) MBA PhD FIEAust
Raphael Hilary Grzebieta MgrInz (Hons) T.U. Cracow PhD MIEAust CPEng NPER MSAEA, MSAE
Chris Michael Haberfield BSc BE (Hons) Syd. PhD MIEAust CPEng
Robert John Keller BE (Hons) PhD Cant. MASCE MIEAust MIPENZ
Henry Robert Milner BE MEngSc Qld PhD Lond. FIEAust, CPEng NPER AIWSc
Geoffrey Rose BE (Hons) Queensland I.T. MSc PhD Northwestern MIEAust
Tony Hoong Fatt Wong BE PhD CPEng MIEAust MASCE

**Senior Lecturers**
Riad Al-Mahaidi BSc (Civil Eng) (Hons) Baghdad MSc PhD C'neil MIEAust MASCE CPEng
Abdelmalek Bouazza Civilng Algiers PhD Glas.
Roger George Hadgraft BE(Hons) MEngSc James Cook DipCompSc Qld PhD
Jayantha Kodikara BSc(Hons) Peradeniya PhD MITE MAGS
Jay G Sanjayan BSc (Eng)/(Hons) S. Lanka PhD MIEAust
Geoffrey Robert Taplin BE(Hons) Tas. MEngSc PhD CPEng NPR MICE MIstructE MIEAust
Peter Erwin Weinmann Diplng ETH (Zurich) MEngSc MIEAust CPEng
Man-Biu (Bill) Wong BSc (Eng) Lond. PhD N.S.W. CEng MICE, MIEAust, CPEng

**Lecturers**
Stephen Greaves BA Leeds MSc Wales PhD Louisiana MITE MITPC MICIT
Asadul Haque BE (Civil) MEng (Geo) PhD Wollong. MIEAust
Anthony Ladson BE (Hons) Melb. MSc Minn. PhD Melb
Jagoda Williams BE MEngSc Warsaw PhD Polish Acad. Sci. MASCE
Richard Murray Wootton BE Melb. DipCE Caulfield I.T. MEngSc TTTC
Assistant Lecturer
Astrid de Alwis BA Melb GDipT&DMgt RMITU MLogMgt MCIT

Research Staff
Wei Dong Guo BE (Hons) Hohai MEngSc Xi'an PhD UWA
Xu Fan Gu PhD
Tim Fletcher BForSc(Hons) Melb PhD Melb
Justin Lewis
Sara Lloyd
Fidelis Mashiri BScEng Zimb. MEng(Hons) Wollongong PhD
Fashihur Rahman BScEngg(Civil) MS Melb PhD VUT
Sergei Schreider PhD ANU
Roger Zou BE (Hons) Beijing ME Chinese Acad Sci PhD Tas.

Associates of the Department
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Zuyu Chen BE Tsinghua PhD Tsinghua
Frank Collins BE Syd MEngSc Syd PhD
Ian Boyd Donald BCE (Hons) MEngSc Melb. PhD DIC Lond. MIEAust
George Rechnitzer BE (Hons) MEng Melb.
Julian Peter Seidel BE (Hons) PhD MIEAust CPEng
Geoffrey William Smith DipCE R.M.I.T. BE MEngSc Melb. CPEng FIEAust AIWSc

Administrative Staff
Julia Arnold MB BS BSc(Med) BA(Hons) (Administrative Assistant, ITS)
Jenny Manson (Postgraduate Admissions Officer)
John Molloy BE(Civil) Melb Dip HEDelft, MBA Melb MIEAust (Business Manager, CRCCH)
Brenda O’Keefe (Administration Manager, Institute of Transport Studies)
Maevé O’Leary (Administrative Assistant, CRCCH)
Helen Parker (Administrative Assistant, Support Services)
David Perry BSc (For.) Post.Grad. Land Rehab. (Communication and Adoption, CRCCH)
Chris Powell (Director, Support Services)
Irene Sgoutras (Undergraduate Studies Administration Officer)
Noi Souvandy (Administrative Assistant, Support Services)
Dominique Thomson (Administrative Assistant to the Head of Department)
Virginia Verrelli (Administrative Assistant, CRCCH)

Technical Staff
Glenn Davis
Peter Dunbar
Jeff Doddrell
Roy Goswell
Andrew Haines BSc GradDipCompSc Melb
Michael Leach
Don McCarthy BAppSci (Photography) RMIT GradDip (Media Studies) Deakin MIPT
Kevin Nievaart
Anthony Nixon
Graeme Rundle
Alan Taylor
Godwin Vaz
Frank Winston BE(Hons) MEngSc
## Visitors to the Department:

<table>
<thead>
<tr>
<th>Name</th>
<th>Contact Details</th>
<th>Staff Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWOYEMI, L. (Dr)</td>
<td>The University of Melbourne, Melbourne, AUSTRALIA</td>
<td>A/Prof. H.R. Milner</td>
</tr>
<tr>
<td>BINH, D.V. (Mr)</td>
<td>Hanoi University of Civil Engineering, Hanoi, VIETNAM</td>
<td>Prof. X.L. Zhao</td>
</tr>
<tr>
<td>BISAGNI, C. (Prof)</td>
<td>Politecnico di Milano, Istituto di Ingegneria Aeronautica, ITALY</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>CHIRWA, C. (Prof)</td>
<td>Bolton Institute of Technology, UK</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>CLAYBROOK, J.</td>
<td>President Public Citizen, USA</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>EHROLA, E. (Prof)</td>
<td>Helsinki University of Technology, FINLAND</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>ERNVALL, T. (Prof)</td>
<td>Helsinki University of Technology, FINLAND</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>HIRT, M. (Prof)</td>
<td>Steel Structures Laboratory, Swiss Federal Institute of Technology, Lausanne, SWITZERLAND</td>
<td>Emeritus Prof. P. Grundy</td>
</tr>
<tr>
<td>HOBBS, A. (Prof)</td>
<td>Transport Research Laboratories, UK</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>KARBHARI, V. (Prof)</td>
<td>University of California, USA</td>
<td>Dr R. Al-Mahaidi</td>
</tr>
<tr>
<td>KAVAZANJIAN Jr, E. (Dr)</td>
<td>Geosyntec Consultants, California, USA</td>
<td>Dr M. Bouazza</td>
</tr>
<tr>
<td>LANGWIEDER, K. (Prof)</td>
<td>GDV Institute for Vehicle Safety, GERMANY</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>MAMALIS, A. (Prof)</td>
<td>National Technical University of Athens, GREECE</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>OTTE, D. (Prof)</td>
<td>Medical University of Hannover, Germany</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>PACKER, J. (Prof)</td>
<td>University of Toronto, CANADA</td>
<td>Prof. X.L. Zhao</td>
</tr>
<tr>
<td>RIZKALLA, S. (Prof)</td>
<td>Constructed Facilities Laboratory North Carolina State University, USA</td>
<td>Dr R. Al-Mahaidi</td>
</tr>
<tr>
<td>SADEGHI, M. (Dr)</td>
<td>Cranfield Institute of Technology, UK</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>SCHULLER, E. (Dr.)</td>
<td>Munich University, GERMANY</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>SUGIURA, K. (Prof)</td>
<td>Kyoto University, JAPAN</td>
<td>Prof. X.L. Zhao</td>
</tr>
<tr>
<td>TINGVAL, C. (Prof)</td>
<td>Swedish National Road Authority, SWEDEN</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>WARRIOR, N. (Dr.)</td>
<td>University of Nottingham, U.K.</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>WEBB, D. (Dr.)</td>
<td>Leeds Metropolitan University, U.K.</td>
<td>A/Prof. R. Grzebieta</td>
</tr>
<tr>
<td>YGNACE, J.L. (Dr)</td>
<td>INRETS (French National Institute for Transport and Safety Research), Lyon, FRANCE</td>
<td>A/Prof. G. Rose</td>
</tr>
</tbody>
</table>
3. **Course Offerings**

**Master of Transport and Traffic**

A major restructure of the Distance Education Postgraduate program in Transport and Traffic was undertaken in 2002. This resulted in the establishment of two distinct Master degrees: Master of Transport and Master of Traffic. These Master degrees require the completion of 8 subjects for students entering with a four-year Bachelor degree. Students have the option to complete a total of 12 subjects to qualify for a double Master degree. The revised course was advertised in a number of journals in the latter part of 2002 and the impact of that has been apparent because of the dramatic increase in visits to the ITS (Monash) website to obtain information about the program. On the basis of the enquiries and applications received up to the end of 2002, 2003 will see a record increase in the number of students involved in the program. This has provided reassurance that the revisions to the program introduced in 2002 have helped to stimulate student interest in the program.

**Master of Infrastructure Engineering and Management**

The Master of Infrastructure and its associated articulation pathway were initiated in 2002. The program has four core subjects and a set of engineering and commerce electives. The program attracted 13 students and is destined to expand in 2003. New engineering subjects in Water Engineering have been added to the program.

**Undergraduate Civil Engineering Program**

The Department continued to present the Bachelor of Engineering program. Some students in this program combine their degree with Arts, Science, Law or Commerce degrees. The Department took the first cohort of students into the Bachelor of Technology (Infrastructure). The students completed their first year of study at Holmesglen Institute of TAFE then articulate into the program at Monash. The Department began the transition from the utilisation of the Civil Engineering Web site for the presentation of courseware to WebCT.

4. **Research and Development**

**List of Research Projects Undertaken in 2002**

**Engineering Education**

- Environmental Engineering Education (Codner)
- Review of multimedia course materials available in Civil Engineering (Hedgengraft)
- Student use of the Department’s CLEO website (Hedgengraft)
- Training students for Problem-Based Learning (Hedgengraft)
- Applying Knowledge Management principles to civil engineering education (Hedgengraft)
- First Year engineering – can we do better? (Hedgengraft)
- Problem solving techniques in civil engineering practice (Hedgengraft)
- Reviewing Statistical Approaches (Hedgengraft)
- Computer support for conceptual design (Hedgengraft)
- Quality management, education and accreditation (Hedgengraft)
Environment

- Sustainable development indicators (Codner)
- Sustainable development of water resources in developing countries (Codner/M. Verrochi)
- Salinity management in the Murray Darling Basin (Codner/Kendall)
- Characterisation of stormwater pollutants in urban catchments (T. Wong/Wootton)
- Hydrological, Geomorphological and Ecological Impacts of Urbanisation on Aquatic Ecosystems (T. Wong)

Geotechnical Engineering

- Filtration under dynamic loading condition (Haque)
- Railway Geotechnics (Haque)
- Interface friction of soil-geosynthetics & geosynthetics-geosynthetics at very low pressures (Bouazza)
- Performance of geosynthetic clay liners (GCL) under various site conditions (Bouazza)
- Use of bopolymer or biofilm barriers for waste containment (Bouazza)
- Containment of contaminants with vertical cutoff walls (Bouazza)
- Geotechnical properties of oil contaminated soils (Bouazza)
- Geotechnical properties of municipal solid wastes (MSW) (Bouazza)
- Mechanical properties of soil tyre chip mixtures (Bouazza)
- Soil remediation using solidification/stabilisation process (Bouazza)
- Active containment barrier walls (Bouazza)
- The response of beams subjected to axial and lateral soil movements (Guo)
- Lateral pile response due to cyclic loading (Guo)
- Settlement prediction of large pile groups (Guo)
- Time dependent response of piles in clay (Guo)
- Response of vertically loaded piles due to land subsidence (Guo)
- Displacement-based analysis for reinforced slope (Guo)
- A unified approach for laterally loaded piles and piers (Guo)
- The dynamic response of pile/soil interfaces (Seidel)
- The shear behaviour of rock joints (Haberfield/Seidel)
- The performance of drilled pile shafts in rock (Seidel/Haberfield)
- The strength and deformation properties of rock masses (Haberfield)
- The influence of construction procedures on pile capacity in rock (Seidel/Haberfield)
- Development of a design methodology for screwed cast-in-place piling (Seidel)
- Pile Integrity Testing (Seidel)
- Slope stability – computer analyses (Haberfield)
- Ground anchors (Haberfield)
- Enhancing pile and anchor performance using expansive cements (Haberfield)
- Development of innovative cover systems to mitigate rainwater infiltration into ash fills (Kodikara) – (Linkage project)
- In-situ stabilisation of degraded unbound road pavements (Kodikara) – (Linkage project)
- Modelling of shrinkage cracking of clay soils (Kodikara)
Safety Technology and Crashworthiness Systems

- Maximising occupant protection in side impact accidents - analysis of the basic injury mechanisms relating to near-side and far-side crashes (Grzebieta)
- Assessing the structural crashworthiness of petrol road tankers in rollover accidents (Grzebieta/Rechnitzer)
- Maximising the strength of spot-welded plates (Grzebieta)
- Roll-over vehicle crashworthiness (Grzebieta/Rechnitzer)
- Investigation of lower limb injuries in side impact crashes (Grzebieta/Amot/Fildes/Sparks)
- Investigation into the physics governing whiplash injuries (Grzebieta/Tingval)
- Design of crashworthy trains and trams (Grzebieta/Rechnitzer)
- Crashworthiness behaviour of roadside furniture utilising thin-walled structures (Grzebieta/Zhao/Tingval/Jian/Judd/Corben/Zou)
- Design of crashworthy timber light and power poles (Grzebieta/Milner/Zou)
- Crashworthiness of truck into bridge barrier impacts (Grzebieta/Zou)
- Investigation of seat back failure for a rear seating system (Grzebieta/Zou)
- Truck underrun analysis and simulation (Rechnitzer/Grzebieta/Zou)
- Crashworthiness of water-filled plastic temporary barriers (Grzebieta/Zou)
- Investigation of army tractor/passenger car impact (Zou/Grzebieta)
- Study on effectiveness of seat belt configuration for the Australia Army Rear Seating System (Grzebieta/Zou/Richardson)
- Development of High Performance Level Water-filled Plastic Barrier (Grzebieta/Zou/Powell)
- Investigation of Army Leopard Tank rollover and tree branch strike (Grzebieta/Zou/Richardson)
- Development of barrier systems for protection against Poles and Trees (Grzebieta/Rechnitzer/Powell/Zou)
- Investigation, reconstruction and modelling of serious injury crashes (Grzebieta/Zou/Rechnitzer/Powell)
- Safety of all terrain vehicles (Agricultural 4 Wheel Bikes) (Rechnitzer/Day/Grzebieta/Zou)
- Arm injuries in playground falls (Ozanne Smith/Sherker/Grzebieta/Powell)
Structures

- Cyclic pullout/pushout performance of concrete plugs in tubular piles (Al-Mahaidi/Grundy)
- Interface shear transfer across cracks in normal and high strength concrete (Al-Mahaidi)
- Strength determination of slender concrete wall panels with and without openings (Al-Mahaidi/Sanjayan)
- Shear strength of reinforced concrete bridges (Al-Mahaidi/Taplin)
- Flexural strength of reinforced concrete bridges (Taplin/Al-Mahaidi)
- Strength assessment of bridge decks (Al-Mahaidi/Taplin)
- Shear strengthening of concrete beams using fibre composites (Al-Mahaidi/Taplin)
- Investigation of bursting of anchorage zones in post-tensioned members (Al-Mahaidi)
- Reserve strength of offshore structures under repeated load (Grundy)
- Elastic behaviour, shakedown limit and ultimate strength of YT and KT tubular joints (Grundy)
- Prestressed grouted pile/sleeve connections (Grundy)
- Design criteria for bridge decks (Grundy)
- Innovative tubular connections at elevated temperature (Zhao/Grundy/B. Wong)
- Incremental collapse of tension legs and catenary risers (Grundy)
- Interfacing of digital dial gauges to PCs’ development of complementary software for data collection (McKenry).
- Reliability assessment of ageing highway bridges (Grundy)
- Life cycle performance evaluation and concrete bridge deterioration due to steel corrosion (Sanjayan/Taplin)
- Experimental study to evaluate the mathematical model for behaviour of reinforced concrete walls in fire (Sanjayan)
- Properties of high strength concretes incorporating slag blended cements (Sanjayan)
- Behaviour of high strength concrete under triaxial loading (Sanjayan/Setunge)
- Load bearing capacities of slender walls (Sanjayan)
- Corrosion-induced bond loss under operating loads and its effect on safe service life of reinforced concrete (Sanjayan/Al-Mahaidi)
- Investigation of steel bridge barriers VicRoads (Grzebieta/Zhao)
- Cyclic load capacity and time dependent strength of pre-stressed grouted tubular joints (Zhao/Grundy)
- Fatigue of thin-walled welded tubular connections (Zhao/Grundy)
- High tensile tubular beams under large deformation cyclic bending (Zhao/Grzebieta/Elchalakani)
- Predicting stresses in underwater shock loaded steel plates (Grzebieta)
- Investigation of the contribution of the void-filling compounds to the buckling strength of tubular sections (Grzebieta/Zhao)
- Structures subjected to impact and blast loading (Grzebieta/Zhao/Al-Mahaidi)
- Testing facility for heavily loaded bridge and barrier systems (Grzebieta/Zhao/Al-Mahaidi/Melchers/Lu/Mendis/Setunge)
- High tensile tubular struts under large deformation cyclic tension and compression (Zhao/Grzebieta)
Investigation of tube in tube column structures (Grzebieta/Zhao/Echikalaki)

Stability and strength of Very High Strength (VHS) circular tubes (Zhao)

Fire resistance of tubular columns filled with high strength concrete (Zhao/Grundy/B. Wong)

Developing equations for designing roadside crash barriers (Grzebieta/Zhao/Jiang)

Compressive membrane action in bridge decks (Taplin)

Incremental slip of stud shear connectors (Taplin)

Anchorage of plain bar reinforcement (Taplin)

Temperature prediction of steel/concrete composite structures (M.B. Wong/Ghojel)

Design and analysis of steel/concrete structures in fire (M.B. Wong)

Steel culvert corrosion (M.B. Wong)

Buckling strength of steel structures at elevated temperature (M.B. Wong)

Structural behaviour of steel plates at elevated temperatures (M.B. Wong/Tan)

Timber Engineering

Stressed skin housing using reconstituted wood panels (Milner)

Evaluation of the performance of structural glulam from lamination data (Milner)

Long term performance of reconstituted panel produces (Milner)

Long term deflection performance of glue laminated timber (Milner)

Application of the rate-process method in the prediction of wood adhesive durability (Milner)

Mechano-sorptive response of wood (Milner)

Deflection characteristics of nail plate spliced beams (McKeny)

Moisture suction and micro-buckling influences on Mechano-sorptive creep in Timber (McKeny)

Transport

"Level of service" of roads (Young)

Transport for the disabled (Young)

Environmental impacts of transport (Young)

Electronic road pricing (Young)

Modelling small area traffic networks (Young)

Modelling transport demand and parking management (Young)

Level of service in residential streets (Liepe/Daly/Young)

Performance-based standards for heavy vehicle (J. Stevenson/Young)

Parking provision in the inner-city area (Young)

Parking in multi-use facilities (Tan/Young)

Equilibrium modelling of land use activities (Chandra/Young)

Vehicle movement at intersections (Akcelik/Young)

Sustainability and urban transport (Codner/Young)

Modelling vehicle route choice, energy consumption and air pollution in regional centres (Young/Greaves)

Road space allocation for Public Transport (Young)

Mutual recognition of bus operator accreditation (Clements)

Australian bus safety (Rose/Hildebrand)
• Impacts of in-vehicle navigation systems on travel behaviour (Rose/M. Chan)
• Modelling and intelligent optimisation of field service territories (Youngman/Rose/Greaves)
• Red light running (Rose/Green)
• Car ownership of residents living in high density apartment developments (Rose/McNally)
• Part-time metering signals at roundabouts (Rose/Natalizio)
• Bicycle facility level of service (Rose/de Gruyter)
• Carpool car park (Rose/Hamilton)
• Impact of in-vehicle navigation systems on driver speed (Rose/Malley)
• Ramp Metering (Rose/Lawrence)
• Representation of shock wave propagation on motorways (Rose/Sanders)
• Mobile phone applications for public transport (K. Chan/Rose)
• An analysis of bus fatalities in Australia (Rose) [for Bus Association of Victoria]
• Travel Behaviour change opportunities of major events (Rose)
• Development of a national resource Kit for Travelsmart Officer training (Rose)
• Mobile phones as traffic probes (Rose/Nelson/Ygnace)
• Incorporating driver behaviour into vehicle emissions estimates (Greaves)
• Improving the accuracy of energy consumption and emissions estimates for urban public uses using on-road travel information (Greaves)
• Vehicle drive cycles (Sava/Young)
• Investigation into the use of persuasion techniques in transport policy (Seethaler/Young/Greaves)
• The benefits of accreditation in the road-based passenger transport industry (Clements/De Alwis)
• Using GPS data to build drive cycles for urban buses (Greaves)
• Evaluation of environmentally-focussed driver behaviour change programs (Rose/Greaves)
• Quantification of road pavement performance at a road network level and a road project level (Martin/Young)
• Internet-based travel survey of University students (Curwood/Greaves)
• Synthesis of parking generation rates (Nicholls/Greaves)
• The costs of not implementing ITS Technology (Langdon/Greaves/Grzebieta)
• Identifying driving patterns from Global Positioning (GPS) data (Counsel/Greaves)
• Measuring vehicle emissions – state of the practice/state of the art
• Accuracy and traffic simulation modelling (Young)
• Pedestrian crossing analysis (Charnock/Carter/Hashiholan/Young)
• Public transport provision in suburban Melbourne (Misić/Tran/Young)

Water

• Sustainable water allocation – development of integrated water balance, climate and economic models (Codner/Weinmann)
• Frequency of extreme rainfall and flood events (Laurenson/Weinmann/Kuczera)
Joint probability approaches to design flood estimation (Weinmann/Rahman)
Stabilisation of river banks with groynes (Keller)
Design of minimum energy structures (Keller)
Impact of sand slugs on geomorphic variability (Rutherfurd/Mein)
Model prediction uncertainty under uncertain parameter information (Connell/Nathan/Mein)
Integration of water balance, climatic and economic models (Schreider)
Developing an Australian handbook of stream roughness coefficients (Ladson)
Optimising urban stream rehabilitation planning and execution (Ladson)
Developing tools to predict scour of rehabilitation works (Ladson)
Performance of stormwater control devices (Wootton)
The role of wetland vegetation on stormwater pollutant removal (T. Wong)
Pollutant adsorption and uptake processes in vegetated swales and stormwater bioretention systems (Wong/Fletcher)
Development and evaluation of water sensitive urban design (T. Wong)
A decision support system for stormwater quality management (T. Wong/Fletcher)
Development of integrated stormwater modelling (Fletcher)
Predicting stormwater quality, treatment and impacts (Fletcher)
Evaluating the economic & social performance of stormwater management (Fletcher)
Hydrologic modelling in the catchment under intensive agricultural development and coupling of hydrological and economic models (Schreider)

Research Funding for 2002

<table>
<thead>
<tr>
<th>Investigators</th>
<th>Title</th>
<th>Grantor</th>
<th>Amount Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>R. AL-Mahaidi</td>
<td>Investigation of failure mechanisms of concrete T-Beams strengthened with carbon fibre composites</td>
<td>Engineering Faculty Grants Scheme – 2002</td>
<td>$13,804</td>
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<tr>
<td>R. Grzebieta</td>
<td>Crashworthiness behaviour of roadside furniture utilising thin-walled structures</td>
<td>ARC Large Research Grants Scheme (now known as ARC Discovery)</td>
<td>$65,000</td>
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<tr>
<td>R. Grzebieta</td>
<td>Testing facility for heavily loaded bridge and barrier systems</td>
<td>ARC – Infrastructure</td>
<td>$603,000</td>
</tr>
<tr>
<td>P. Grundy</td>
<td>Tubular steel members and connections under high amplitude dynamic loading</td>
<td>ARC Large Grant</td>
<td>$48,000</td>
</tr>
<tr>
<td>Investigators</td>
<td>Title</td>
<td>Grantor</td>
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<tr>
<td>T. Bakharev</td>
<td>Development of scientific and experimental basis for manufacture of building materials with special properties based on geopolymers</td>
<td>ARC – Discovery</td>
<td>$81,000</td>
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<tr>
<td>J. Sanjayan</td>
<td>Development of web-based multimedia modules for teaching concrete theory and design.</td>
<td>Collaborative Melbourne/Monash Teaching and Learning Courseware Grants</td>
<td>$10,000</td>
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<tr>
<td>A. Bouazza</td>
<td>Gas transmissivity of unsaturated non woven geotextiles</td>
<td>Engineering Faculty Grants Scheme – 2002</td>
<td>$15,955</td>
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<tr>
<td>A. Bouazza</td>
<td>Prefabricated vertical drains enhanced soil vapour extraction system for in-situ remediation of contaminated soils</td>
<td>Monash Research Fund 2002 Project Grant</td>
<td>$30,000</td>
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<tr>
<td>A. Bouazza</td>
<td>Settlement of municipal solid waste</td>
<td>ARC – Linkage – Pioneer Australia Waste Management Pty. Ltd. [APA(l)]</td>
<td>$22,545</td>
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<tr>
<td>A. Bouazza</td>
<td>Hydraulic durability of geosynthetic clay liners in steep slope sealing systems for landfill constructed in former quarries</td>
<td>ARC – Linkage – Geotabrics Australasia Pty. Ltd. [APA(l)]</td>
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<td>A. Bouazza</td>
<td>Development of efficient and effective ground improvement techniques</td>
<td>ARC SPIRT (transferred from J. Seidel), [APA(l)]</td>
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<td>S. Greaves</td>
<td>Improving the accuracy of energy consumption and emissions estimates for urban public buses using on-road travel information</td>
<td>New Staff Member Research Fund 2002</td>
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<td>A. Haque</td>
<td>Modelling of railway track-formation behaviour based on field and laboratory tests</td>
<td>New Staff Member Research Fund 2002</td>
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<td>R. Keller</td>
<td>Effectiveness of Australian Fishway Design</td>
<td>Agriculture Foresteries and Fisheries Australia (AFFA)</td>
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<tr>
<td>J. Kodikara</td>
<td>Experimental investigation of unsaturated flow behaviour of geomaterials</td>
<td>New Staff Member Research Fund 2002</td>
<td>$15,000</td>
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<td>J. Kodikara</td>
<td>Attending International workshop on characterisation and engineering properties of natural soils, National University, Singapore 2-5 December, 2002</td>
<td>Engineering Travel Grant 2002, Round 2</td>
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<tr>
<td>Investigators</td>
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<td>Amount Awarded</td>
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<td>J. Kodikara</td>
<td>Modelling of shrinkage behaviour of marginal materials stabilised with cementitious additives</td>
<td>Engineering Faculty Grant</td>
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<tr>
<td>F Mashiri</td>
<td>Presented two papers at Third International Conference on Advances in Steel Structures (ICASS’02), 9-11 December, 2002, Hong Kong</td>
<td>Engineering Research Fund Travel Grant, 2002, Round 2</td>
<td>$600</td>
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<tr>
<td>H Milner</td>
<td>Design values for Australian Glulam</td>
<td>Forest &amp; Wood Products, Research &amp; Development Corporation</td>
<td>$139,237</td>
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<tr>
<td>W Guo</td>
<td>The response of beams subjected to axial load and lateral soil movements</td>
<td>ARC – Discovery</td>
<td>$65,000</td>
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<tr>
<td>G Rose</td>
<td>Analysis of Australian Bus Fatalities</td>
<td>Bus Association of Victoria</td>
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<tr>
<td>G Rose</td>
<td>Development of a National Resource for TravelSmart Officer Training</td>
<td>Sustainable Energy Authority of Victoria</td>
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<tr>
<td>J Sanjayan</td>
<td>Development of web-based multimedia modules for teaching concrete theory and design</td>
<td>Collaborative Melbourne/Monash Teaching and Learning Courseware Grants</td>
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<tr>
<td>G Taplin</td>
<td>Continuous steel-concrete composite beams under repeated loading</td>
<td>Monash University Research Fund</td>
<td>$30,000</td>
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<tr>
<td>B Wong</td>
<td>Durability of corrugated metal structures in Tasmania 2002</td>
<td>Industry Grant</td>
<td>$13,000</td>
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<tr>
<td>W Young</td>
<td>Evaluation of total transit system</td>
<td>Department of Infrastructure</td>
<td>$26,000</td>
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<tr>
<td>S Greaves</td>
<td>Modelling vehicle route choice energy consumption and air pollution in regional centres</td>
<td>Engineering Faculty Grants Scheme – 2002</td>
<td>$17,238</td>
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<tr>
<td>G Rose</td>
<td>Fatigue of welded composite tubular connections</td>
<td>Engineering Faculty Grants Scheme – 2002</td>
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<tr>
<td>P Grundy</td>
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<tr>
<td>X-L Zhao</td>
<td>Fire resistance of tubular steel columns filled with high performance high strength concrete</td>
<td>ARC Discovery</td>
<td>$61,000</td>
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<tr>
<td>V Rangan</td>
<td></td>
<td></td>
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<tr>
<td>L Han</td>
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<td>TOTAL FUNDING AWARDED IN 2002</td>
<td></td>
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<td>$1,494,254</td>
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</tbody>
</table>
CRC and Key Centre Activity

The Cooperative Research Centre in Catchment Hydrology

Projects of the CRC for Catchment Hydrology always involve more than one Party to the CRC. Core projects which were predominantly based at Monash in 2002 include:

♦ Sustainable Water Allocation, Program 4
  Project 3.1: Integration of water balance, climatic and economic models (Gary Codner)

♦ Urban Stormwater Quality, Program 4
  Project 4.1: Stormwater pollutant sources, pathways and impacts (Tim Fletcher)
  Project 4.2: Stormwater Best Management Practices (Tony Wong)

♦ River Restoration, Program 6
  Project 6.2: Optimising urban stream rehabilitation planning and execution (Tony Ladson)
  Project 6.5: Hydraulics and performance of fishways in Australian Streams (Bob Keller)
  Project 6.6: Developing tools to predict the scour of rehabilitation works (Bob Keller)

Monash was also the base for the CRC supporting program:

♦ Communication and Adoption, Program 7 (David Perry)

Total funding for these and other projects and for the CRC Office activities at Monash was $1,311,400 in 2002.

ITS (Institute of Transport Studies) Monash Node

The Institute of Transport Studies has continued to expand its research activities in 2002. It has increased its research student base and was delighted to secure external support from the Bus Association of Victoria, the Department of Infrastructure and VicRoads for the establishment of Australia’s first Chair in Public Transport. The position was advertised towards the end of 2002 and it is expected to be filled in the first half of 2003. The total funding for this project is $525,000.

MTEC (Monash Timber Engineering Centre)

The Timber Centre’s key projects included:
• Design values of Australian glulam beams (project funded through collaborative research grant awarded by the Forest & Wood Products Research and Development corporation)
• Establishing a Furniture Testing and Development Facility which will start its activities early 2003.
• Monitoring and managing a nation-wide quality control program for the manufacturing of finger-jointed glulam timber beams. The Centre is also in the process of developing a similar system for timber glulam for non-structural
applications (undertaken after developing relevant Australian Standard for such applications).
- Undertaking research tasks for the analysis of timber bridges in Victoria and trying to develop maintenance procedures to rehabilitate the bridges.
- The Glued Laminated Timber Association of Australia (GLTAA) approved funding to start a research project for developing design methods of timber connections using epoxied steel bars with glulam timber.

**Postgraduate students and research topics in 2002**

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Phd/Master</th>
<th>Project Title</th>
<th>Main Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arndt, Naomi (Ms)</td>
<td>PhD</td>
<td>Biomechanical Analysis of Leg in Side Impact Automobile Crashes</td>
<td>A/Prof R. Grzebieta</td>
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<tr>
<td>Chakrabarti, Srijib (Mr)</td>
<td>PhD</td>
<td>Application of stabilising additives in the In-Situ rehabilitation of road pavements</td>
<td>Dr J Kodikara</td>
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<tr>
<td>Chan, Merie (Ms)</td>
<td>PhD</td>
<td>The impact of in-vehicle navigation systems on drivers' travel behaviour</td>
<td>A/Prof G Rose</td>
</tr>
<tr>
<td>Chin, Victor (Mr)</td>
<td>PhD</td>
<td>The dynamic response of pile-soil interfaces during pile driving and dynamic testing events</td>
<td>A/Prof A Bouazza</td>
</tr>
<tr>
<td>Elchalakani, M (Mr)</td>
<td>PhD</td>
<td>Cyclic behaviour of tubular members</td>
<td>Prof X-L Zhao /A/Prof R Grzebieta</td>
</tr>
<tr>
<td>Giaccio, C (Mr)</td>
<td>PhD</td>
<td>Theoretical and experimental investigation into contribution of the flange to the shear strength of a reinforced concrete T-beam</td>
<td>Dr R Al-Mahaidi</td>
</tr>
<tr>
<td>Green, Janice (Ms)</td>
<td>PhD</td>
<td>Estimating the probability of extreme rainfalls: a joint probability approach</td>
<td>Mr E Weinmann</td>
</tr>
<tr>
<td>Hon, Alan (Mr)</td>
<td>PhD</td>
<td>Investigating the behaviour of T-beam bridge decks in flexure</td>
<td>Dr G Taplin</td>
</tr>
<tr>
<td>Hui Jiao (Mr)</td>
<td>PhD</td>
<td>Fracture behaviour of welded connections in cold-formed tubular sections</td>
<td>Prof X-L Zhao</td>
</tr>
<tr>
<td>Patterson, Natalie (Ms)</td>
<td>PhD</td>
<td>Design of Steel Frames and Composite Columns for Fire Conditions</td>
<td>Dr B Wong</td>
</tr>
<tr>
<td>Maheswaran Tharmalingam (Mr)</td>
<td>PhD</td>
<td>Corrosion induced deterioration and its effect on safe service life of concrete structures</td>
<td>A/Prof J Sanjayan</td>
</tr>
<tr>
<td>Pham, Huy Binh (Mr)</td>
<td>PhD</td>
<td>Failure mechanisms of FRP repaired concrete beams</td>
<td>Dr R Al-Mahaidi</td>
</tr>
<tr>
<td>Khalaf, Hussein (Mr)</td>
<td>PhD</td>
<td>Reliability-based assessment of load capacity of existing concrete</td>
<td>Dr G Taplin</td>
</tr>
<tr>
<td>Lee, Tuan Kuan (Mr)</td>
<td>PhD</td>
<td>Shear strength of concrete-t-beams repaired using CFRP</td>
<td>Dr R Al-Mahaidi</td>
</tr>
<tr>
<td>La Motta, Joseph (Mr)</td>
<td>PhD</td>
<td>Engineered moisture and oxygen barriers for coal ash and overburden waste fills at Loy Yang Power Station complexes</td>
<td>Dr J Kodikara</td>
</tr>
<tr>
<td>Martin, Tim (Mr)</td>
<td>PhD</td>
<td>Predicting pavement performance at a road network and road project level</td>
<td>Prof W Young</td>
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<tr>
<td>Ling, Tong Wei (Mr)</td>
<td>PhD</td>
<td>Longitudinal fillet welds in very high strength (VHS) circular tubes</td>
<td>Prof X-L Zhao /Dr R. Al-Mahaidi</td>
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<tr>
<td>Lloyd, Sara (Ms)</td>
<td>PhD</td>
<td>Exploring the opportunities and impediments of sustainable stormwater management schemes</td>
<td>A/Prof T Wong</td>
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<tr>
<td>Lokuge, Weena (Ms)</td>
<td>PhD</td>
<td>Constitutive behaviour of high strength concrete under cyclic loading</td>
<td>A/Prof Jay Sanjayan</td>
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<tr>
<td>Nezamian, Abe (Mr)</td>
<td>PhD</td>
<td>Bond strength of concrete plug embedded in tubular steel piles</td>
<td>Dr R Al-Mahaidi</td>
</tr>
<tr>
<td>Student Name</td>
<td>PhD or Master</td>
<td>Project Title</td>
<td>Main Supervisor</td>
</tr>
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<tr>
<td>Richards, Sarah (Ms)</td>
<td>PhD</td>
<td>Contaminant attention in natural and organically modified clays</td>
<td>A/Prof A Bouazza</td>
</tr>
<tr>
<td>Richardson, Shane</td>
<td>PhD</td>
<td>Rollover Protective Structures for (Military) 4 x 4 vehicles</td>
<td>A/Prof R Grzebieta</td>
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<tr>
<td>Sironic, Lizi (Ms)</td>
<td>PhD</td>
<td>A study of void filled thin-walled rectangular steel sections</td>
<td>A/Prof R Grzebieta</td>
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<tr>
<td>Sumnerbury, Andrew</td>
<td>PhD</td>
<td>Shear strength assessment of KU 1-beam bridges</td>
<td>Dr R Al-Mahaidi</td>
</tr>
<tr>
<td>Stolinski, Richard</td>
<td>PhD</td>
<td>Side impact protection – occupants in the far-side seal</td>
<td>A/Prof R Grzebieta</td>
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<tr>
<td>Szmykowski, Jorry</td>
<td>PhD</td>
<td>Rational approach to the behaviour of jointed soft rock masses under very low confining pressure</td>
<td>A/Prof C Haberfield</td>
</tr>
<tr>
<td>Tan Yang Weng</td>
<td>PhD</td>
<td>A study of parking movement in multi-storey parking systems</td>
<td>Prof W Young</td>
</tr>
<tr>
<td>Taylor, Geoffrey</td>
<td>PhD</td>
<td>Promoting treatment processes in constructed stormwater treatment wetlands for nitrogen transformation and removal</td>
<td>A/Prof T Wong</td>
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<tr>
<td>Taylor, Jack</td>
<td>PhD</td>
<td>The use of particleboard in building structures</td>
<td>A/Prof H Milner</td>
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<tr>
<td>Thaveesak, Vangpaisal</td>
<td>PhD</td>
<td>Performance of geosynthetic clay liners as a gas barrier</td>
<td>A/Prof A Bouazza</td>
</tr>
<tr>
<td>Wang, Dong Mei</td>
<td>PhD</td>
<td>Development of a new concept for waste containment</td>
<td>A/Prof A Bouazza</td>
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<tr>
<td>White, Lindsay</td>
<td>PhD</td>
<td>An investigation of hydraulic issues associated with fishways</td>
<td>A/Prof R Keller</td>
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<tr>
<td>Wilkinson, Scott</td>
<td>PhD</td>
<td>The development of depth variation in rivers</td>
<td>A/Prof R Keller</td>
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<td>Yang, Yannan</td>
<td>PhD</td>
<td>Life cycle performance evaluation of concrete bridges deteriorating through steel corrosion</td>
<td>Dr Jay Sanjayan</td>
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<tr>
<td>Youngman, James</td>
<td>PhD</td>
<td>The modelling and intelligent optimisation of field service territories</td>
<td>A/Prof G Rose</td>
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<tr>
<td>Afsar, Mehmet</td>
<td>MEngSc</td>
<td>Using continuous surface wave method for near surface site characterisation</td>
<td>A/Prof A Bouazza</td>
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<tr>
<td>Barton, Andrew</td>
<td>MEngSc</td>
<td>Effectiveness of Australian Fishway Design</td>
<td>A/Prof R Keller</td>
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<tr>
<td>Biggin, Margot</td>
<td>MEngSc</td>
<td>Environmental consequences of water allocation proposals</td>
<td>A/Prof G Codner</td>
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<tr>
<td>Chandra, Ed</td>
<td>MEngSc</td>
<td>Modelling land-use and transport interaction: an activity location model based on critical accessibility</td>
<td>Prof W Young</td>
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<tr>
<td>Forsterling, Karsten</td>
<td>MengSc</td>
<td>Fire resistance of steel tubular columns filled with high performance high strength concrete</td>
<td>Prof X-L Zhao Dr J Sanjayan</td>
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<tr>
<td>Fletcher, Peter</td>
<td>MEngSc</td>
<td>Research into improvement of Coode Island Silt by deep soil mixing</td>
<td>Dr A Bouazza</td>
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<tr>
<td>Francis, Bernie</td>
<td>MEngSc</td>
<td>Laterally loaded piles in a weak rock mass</td>
<td>A/Prof C Haberfield</td>
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<td>Ghee, Eng How</td>
<td>MEngSc</td>
<td>The response of beams subjected to axial load and lateral soil movement</td>
<td>Dr W Guo</td>
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<tr>
<td>Griffith, Marnie</td>
<td>MEngSc</td>
<td>Decision-making and policy setting under uncertainty</td>
<td>A/Prof G Codner</td>
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<tr>
<td>Jiang, Tony</td>
<td>MEngSc</td>
<td>The fundamental mechanics of the crashworthiness behaviour of roadside safety barrier made from thin-walled structures</td>
<td>A/Prof R Grzebieta/Prof X-L Zhao</td>
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<tr>
<td>Johnson, Sarah</td>
<td>MEngSc</td>
<td>The ecological response of urban streams to stormwater</td>
<td>A/Prof T Wong/Dr T Fletcher</td>
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<tr>
<td>Judd, Dean</td>
<td>MEngSc</td>
<td>The evolution of anastomosing rivers – the Riverine Plain, South Eastern Australia</td>
<td>A/Prof R Keller</td>
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<tr>
<td>Student Name</td>
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<td>Main Supervisor</td>
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<tr>
<td>Kong, Kee Ho (Mr)</td>
<td>MEngSc</td>
<td>Design of axially loaded piles in normal to problematic ground conditions*</td>
<td>Dr J Kodikara</td>
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<tr>
<td>Kwan, Pek Soon (Mr)</td>
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<td>Development of efficient and effective ground improvement technique</td>
<td>A/Prof A Bouazza</td>
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<tr>
<td>Lee, Chen (Mr)</td>
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<td>Cyclic bending behaviour of beams made from cold-formed square hollow sections (SHS) C450 Tubes</td>
<td>A/Prof R Grzebieta Prof. X.L. Zhao</td>
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<tr>
<td>Lee Kah Ying (Mr)</td>
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<td>Models of Pile Failure Due To Soil Movement*</td>
<td>Dr J Kodikara</td>
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<tr>
<td>Lee, Kok Ying (Mr)</td>
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<td>Shrinkage, tensile stress, UCS (Unconfined Compression Stress) and permeability characteristics of chemically stabilised scoria</td>
<td>Dr J Kodikara</td>
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<td>Lee Yee Teck</td>
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<td>Grouted sleeve connections of circular hollow steel members under large deformation cyclic loading</td>
<td>Prof X-L Zhao E/Prof P. Grundy</td>
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<tr>
<td>Lim, K K (Mr)</td>
<td>MEngSc</td>
<td>Analysis of pipes resting on ocean beds</td>
<td>Dr R Al-Mahaidei/ Dr J Ang</td>
</tr>
<tr>
<td>Nahlawi, Hani (Mr)</td>
<td>MEngSc</td>
<td>Desiccation cracking of clay layers</td>
<td>Dr J Kodikara</td>
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<tr>
<td>Pardo, Lucas (Mr)</td>
<td>MEngSc</td>
<td>Design of Heavy Duty Pavements using Reinforced Unbound Sub-bases</td>
<td>Dr J Kodikara</td>
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<tr>
<td>Ramchurn, Avijeet (Mr)</td>
<td>MEngSc</td>
<td>Improvement to water resource management models</td>
<td>Mr E Weinmann</td>
</tr>
<tr>
<td>Sabaraham, Renuka (Ms)</td>
<td>MEngSc</td>
<td>Stream bank undercutting : distribution and processes</td>
<td>A/Prof R Keller A/Prof I Rutherford</td>
</tr>
<tr>
<td>Seethaler, Rita (Ms)</td>
<td>MEngSc</td>
<td>The evaluation of transport programs subject to the use of persuasion techniques</td>
<td>Prof W Young Dr S Reeves</td>
</tr>
<tr>
<td>Tan Hang Hong (Mr)</td>
<td>MEngSc</td>
<td>Design of plywood web beam portal frames</td>
<td>A/Prof H Milner</td>
</tr>
<tr>
<td>Tan Su Kwong (Mr)</td>
<td>MEngSc</td>
<td>Improving the reliability of low strain integrity testing interpretation</td>
<td>Dr J Kodikara</td>
</tr>
</tbody>
</table>

List of Research Seminars given by staff and postgraduate students of the Department

<table>
<thead>
<tr>
<th>Presenter</th>
<th>Seminar Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nezamian, Abe (Mr)</td>
<td>Bond Strength of Concrete Plug Embedded in Tubular Steel Piles</td>
</tr>
<tr>
<td>Barton, Andrew (Mr)</td>
<td>Hydraulics of Vertical Slot Fishways</td>
</tr>
<tr>
<td>Tong Wei Ling (Mr)</td>
<td>Longitudinal Fillet Welds in Very High Strength (VHS) Circular Tubes</td>
</tr>
<tr>
<td>Rose, Geoff (A/Prof)</td>
<td>Study leave reflections and some potential reforms to the Departmental Seminar System</td>
</tr>
<tr>
<td>Haines, Andrew (Mr) &amp; Vaz, Godwin (Mr)</td>
<td>A computer survival kit for postgrads (and staff)</td>
</tr>
<tr>
<td>White, Lindsay (Mr)</td>
<td>Fishy tails from Yarrawonga Fishlock</td>
</tr>
<tr>
<td>Jiang, Tony (Mr)</td>
<td>Simple methods to predict dynamic performance of road safety barriers</td>
</tr>
<tr>
<td>Nahlawi, Hani (Mr)</td>
<td>Dissciation Crackling of Clay Layers</td>
</tr>
<tr>
<td>Presenter</td>
<td>Seminar Topic</td>
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<tr>
<td>---------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Richards, Sarah (Ms)</td>
<td>Impact of soil structure on contaminant transport</td>
</tr>
<tr>
<td>Keller, Robert (A/Prof)</td>
<td>An application of Iowa Vanes to River Stability (Encounters with a Physical Model)</td>
</tr>
<tr>
<td>Zhao, Xiao-Ling (Prof)</td>
<td>Outside Study Program in Japan (Universities, Companies visited, some interesting observations)</td>
</tr>
<tr>
<td>Al-Mahaidi, Riadh (Dr)</td>
<td>Outside Study Program experience in the USA - FRP for Retrofitting of Concrete Structures</td>
</tr>
<tr>
<td>Keller, Robert (A/Prof)</td>
<td>An Amble in the Hills (Travel to the Himalayas)</td>
</tr>
<tr>
<td>Codner, Gary (A/Prof)</td>
<td>IEAust Accreditation Process for Undergraduate Engineering Degrees</td>
</tr>
<tr>
<td>Chakrabarti, Srijib (Mr)</td>
<td>Stabilisation of Crushed Basaltic Rocks using Cementitious Additives</td>
</tr>
<tr>
<td>Taylor, Geoff (Mr)</td>
<td>Promoting Treatment Processes in Constructed Stormwater Treatment Wetlands for Nitrogen Transportation and Removal</td>
</tr>
<tr>
<td>Fletcher, Peter (Mr)</td>
<td>Building on Coode Island Silt in the Port of Melbourne</td>
</tr>
<tr>
<td>Johnson, Sarah (Ms)</td>
<td>The ecological response of urban streams to stormwater</td>
</tr>
</tbody>
</table>

List of Research Seminars presented by visitors to the Department

<table>
<thead>
<tr>
<th>Presenter</th>
<th>Seminar Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Edward Kavazanjian Jr, Principal at Geosyntec Consultants California, USA</td>
<td>New (Draft) U.S. Federal Requirements for Seismic Design of Highway Bridges</td>
</tr>
<tr>
<td>Professor Jeffrey Packer, Department of Civil Engineering, University of Toronto, CANADA</td>
<td>Jointing of Steel by Nailing and Toughness of Steel Hollow Sections</td>
</tr>
<tr>
<td>Professor Manfred Hirt, Director of the Steel Structures Laboratory, Swiss Federal Institute of Technology, Lausanne, SWITZERLAND</td>
<td>Tubular trusses for steel-concrete composite bridges</td>
</tr>
<tr>
<td>Assoc Professor Kunitomo Sugihara, School of Civil Engineering, Kyoto University, JAPAN</td>
<td>Recent trends in pseudo-dynamic test for dynamic response evaluation</td>
</tr>
<tr>
<td>Dr Jean-Luc Ignace, INRETS (French National Institute for Transport and Safety Research), Lyon, FRANCE</td>
<td>Travel time estimation using mobile phones as probes</td>
</tr>
</tbody>
</table>
Publications

Books


Book chapters


Special Issue Journals


Zhao, X.L. and Grzebieta, R.H. (2002). Special Issue on Thin-Walled Steel Tubes, Pergamon, Oxford, ISSN 0263-8231, V40 No2, February.

Journal papers


*Edited Conference Proceedings*

Conference Publications


Grzebieta, R. (2002). Crashworthiness design – It is all a matter of ductility, International workshop on impact and crashworthiness (IWIC2002), Swinburne University of Technology, Melbourne, December.


Reports


Newspaper article contributions


Grzebieta, R.H. and Rechnitzer, G.R. (2002). Deadly Design – We can build roads that eliminate death, Herald Sun, P21, Friday, 1st March.


Patents


Thesis Accepted for a Higher Degree

PhD

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>Supervisor</th>
<th>Thesis title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hammond</td>
<td>Lloyd</td>
<td>A/Prof. R Grzebieta</td>
<td>The structural responses of submerged air-backed plates to underwater explosions</td>
</tr>
<tr>
<td>Bartley</td>
<td>Rebecca</td>
<td>Prof. R Mein</td>
<td>Quantifying the geomorphic recovery of disturbed streams: using migrating sediment slugs as a model</td>
</tr>
<tr>
<td>Bailey</td>
<td>Mark</td>
<td>Prof. R Mein</td>
<td>Improved techniques for the treatment of uncertainty in physically-based models of catchment water balance</td>
</tr>
<tr>
<td>Eley</td>
<td>Rachel</td>
<td>A/Prof. R Keller</td>
<td>A parametric study of stream rating curves</td>
</tr>
<tr>
<td>Pearce</td>
<td>Helen</td>
<td>A/Prof. C Haberfield</td>
<td>Experimental and analytical investigation into the shear behaviour of rock joints</td>
</tr>
<tr>
<td>Wilkinson</td>
<td>Scott</td>
<td>A/Prof. R Keller</td>
<td>On the formation and maintenance of alluvial pool-riffle sequences</td>
</tr>
</tbody>
</table>
MEngSc (Research)

<table>
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<tr>
<th>Last Name</th>
<th>First Name</th>
<th>Supervisor</th>
<th>Thesis title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tan</td>
<td>Han Hong</td>
<td>A/Prof H. Milner</td>
<td>Design of plywood web box beam portal frames</td>
</tr>
<tr>
<td>Teck</td>
<td>Lee Yee</td>
<td>Prof. X.L. Zhao</td>
<td>Grouted steel connection of circular hollow steel members under large deformation cyclic loading</td>
</tr>
<tr>
<td>Tan</td>
<td>Su Kwong</td>
<td>Dr J. Kodikara</td>
<td>Improving the reliability of low strain integrity testing interpretation</td>
</tr>
</tbody>
</table>

MEngSc (Coursework & Minor Thesis)

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>Supervisor</th>
<th>Thesis title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Fiona</td>
<td>A/Prof. G. Rose</td>
<td>Red light running in Australia</td>
</tr>
<tr>
<td>Natalizio</td>
<td>Emmanuel</td>
<td>A/Prof. G. Rose</td>
<td>Roundabouts with metering signals</td>
</tr>
<tr>
<td>McNally</td>
<td>Kate</td>
<td>A/Prof. G. Rose</td>
<td>Car ownership of residents living in high-density apartment developments</td>
</tr>
<tr>
<td>Packianathan</td>
<td>Santa</td>
<td>Dr G. Taplin</td>
<td>The impact of soil moisture variation on the vehicle loading of reinforced concrete box culverts</td>
</tr>
<tr>
<td>Yurisich</td>
<td>Robert</td>
<td>Mr E. Weinmann</td>
<td>Relationship between restriction rules and urban water supply system performance</td>
</tr>
</tbody>
</table>

5. **Strategic Directions For The Future**

The Departments mission is to provide high quality Civil Engineering education, research and professional services globally for the mutual benefit of the students, the staff, the University, industry, the profession and the wider community.

It aims to push this mission forward in a number of areas. The Departments research profile has been developing at a rapid rate. This emphasis will be reinforced and encouraged over the next few years.

In a teaching sense the Department will aim to improve the presentation and delivery of its undergraduate programs through increased usage of multimedia presentations of material. At a postgraduate level it will add to the distance education offerings by focusing on broadening the character of the Master of Infrastructure Engineering and Management program.
6. Professional Activities

Conference Attendance

Al-Mahaidi, R. 3rd Diana World Conference on Finite Elements in Civil Engineering Applications, Tokyo, Japan (session chair), October
International workshop on Structural Health Monitoring and participated in a short course on the use of fibre optics sensors in monitoring of structures, organized by ISIS Canada, Winnipeg, Canada, September
IABSE Symposium (Session Chair), Melbourne Australia, September

Fletcher, T.D. 2nd Water Sensitive Urban Design Conference, Brisbane, September
9th International Conference on Urban Drainage, Portland, USA, September.
Biennial Meeting of the International Environmental Modelling and Software Society, Lugano, Switzerland June.
Hydrology and Water Resources Symposium, Melbourne, May

Greaves, S. ITE International Conference, Melbourne, 12-13 September

Grzebieta, R. International Crashworthiness Conference ICRASH2002, Melbourne, February
International Workshop on Impact and Crashworthiness (IWIC2002), Melbourne, December
3rd DEKRA Symposium – Passive safety of commercial vehicles, Germany, October

Kodikara, J.K. Inaugural Conference on Geotechnical Pavement Engineering, Melbourne, August
International Workshop on Characterization and Engineering Properties of Natural Soils, Singapore, December.

Mein, R.G. 27th Hydrology and Water Resources Symposium, Melbourne, May

Rose, G. 5th Malaysian Roads Conference, Kuala Lumpur, October
ITE International Conference, Melbourne, September

Taplin, G. IABSE Conference, Melbourne, September

Weinmann, P.E. 27th Hydrology and Water Resources Symposium, Melbourne, May

Wong, M.B. 17th Australasian Conference on the Mechanics of Structures and Materials, Griffith University, Gold Coast, June
3rd International Conference on Advances in Steel Structures, Hong Kong, December

Zhao, X.L. IABSE Symposium, Melbourne, September
7th International Conference on Steel and Space Structures, Singapore, October
Third International Conference on Advances in Steel Structures 
to be held in Hong Kong, December
ISOPE Conference, Kitakyushu, Japan, May
IIW (International Institute of Welding) Fatigue Seminar at TIT 
(Tokyo Institute of Technology), Tokyo, April
International Workshop on Tubular Connections – The Way 
Ahead, Kumamoto University, June

Zou, R. 
International Crashworthiness Conference, Melbourne, February
International Workshop on Impact and Crashworthiness, 
Melbourne, December.

**Official Contribution to Professional Organisations**

**Al-Mahaidi, R**
Member, Organising Committee IABSE 2002 Conference, 
Melbourne
Member, ASCE/ACI committee 447 "Finite Element Analysis of 
RC Structures"
Member, ACI committee 440 "Fiber Reinforced Polymer 
Reinforcement"
Founding Member, Polymer Composites in Construction 
Steering Committee, Composites Institute of Australia.
Founding Member, FRP Rehabilitation Subcommittee, 
Composites Institute of Australia.
Member, International Advisory Committee, 3rd Diana World 
Conference on Finite Elements in Civil Engineering Applications

**Codner, G.P.** 
Chair, IEAust College of Environmental Engineers
Member, National Board, IEAust Environmental Engineering 
Society
Member, IEAust Congress

**Fletcher, T.D.** 
Member, Organising Committee, Urbanization and Stream 
Ecology Symposium, Melbourne, December.

**Greaves, S.P.** 
Member of ITE Executive Board; ITE Student chapter coordinator

**Grzebieta, R.H.** 
Member Australian Road Safety Barrier Committee for AS/NZS 
3845 (Committee CE 33)
Vice Chairman Australian College of Road Safety (National 
committee)
Member Victorian Chapter Australian College of Road Safety

**Haque, A.** 
Member, Working Party with Rail Infrastructure Corporation (RIC) 
of NSW

**Kodikara, J.K.** 
Member, Australian Standard Committee on Soil Stabilisation 
Member, Austroads Committee on Pavement Stabilisation 
Member, Australasian Chapter on International Geosynthetic 
Society

**Mein, R.G.** 
Corresponding Member, Water Engineering Committee, Institution 
of Engineers, Australia
Member, Organising Committee for 27th Hydrology and Water 
Resources Symposium, May 2002
Rose, G.R.  Corresponding Member, National Committee on Transport, Institution of Engineers, Australia
Speaker, AITPM Technical Forum, September

Schreider, S.  Member, International Scientific Committee, Hydrology Symposium, Melbourne, October

Taplin, G.  Member, Standards Committee BD/32/2 – Composite Beams
Secretary, International Scientific Committee, IABSE 2002 Conference

Weinmann, P.E.  Member, Revision Committee for Book III, Section 3 of "Australian Rainfall and Run-off"
Member, Organising Committee, 27th Hydrology and Water Resources Symposium, IEAust

Wong, M.B.  Member, Australian Institute of Steel Construction, Victorian Committee
Member, Institution of Engineers Australia, Structural Branch, Victorian Committee

Young, W.  Member, Standards Association of Australia Parking Committee
External Examiner, Master of Engineering Science, Nanyang University of Technology

Zhao, X-L.  Chairman, IIW Sub-commission XV-E on Tubular Structures
Member, ASCE Committee on Structural Connections
Member, Int. Advisory Committee, 7th Int. Conf. On Steel and Space Structures, Singapore
Member, Int. Advisory Committee, 3rd Int. Conf. On Advances in Steel Structures, Hong Kong
Member, Int. Scientific Committee, Conference on Advances in Structures, Steel, Concrete, Composite and Aluminium, ASSCCA’03, Sydney (to be held June 2003)
Member, Int. Scientific Committee, 4th Int. Conf. On Thin-Walled Structures, UK (to held May 2004)
Member, CIDECT Working Groups
Chairman, Standards Australia Committee CS/23
Member, AISC/WTIA Panel 6 – Structures

Visits to Other Institutions

Al-Mahaidi, R.  ISIS Canada, Winnipeg, Canada, September
University of Manitoba, Winnipeg, Canada, September
University of Colorado, Boulder, Colorado, September
University of North Carolina, Raleigh, NC October
City University, London, October
Hosei University, Tokyo, Japan, October

Fletcher, T.D.  University of New South Wales (Institute of Environmental Studies), December
Griffith University, School of Environmental Engineering (several throughout 2002)
Grzebieta, R.H.  
Bolton Institute, UK, October  
Hannover University, Germany, October  
German Insurance Association Institute for Vehicle Safety, October  
Krakow Technical University, Poland, October-November  

Haque, A.  
University of Wollongong, October  

Kodikara, J.K.  
Nanyang Technological University, Singapore, December  
University of Moratuwa, Sri Lanka, December  

Schreider, S.  
Helsinki University of Technology, Laboratory of Water Resources, Finland, June-July 2002  

Wong, M.B.  
Nanyang Technological University, Singapore  

Zhao, X.L.  
Nagoya University, Japan  
Aichi Institute of Technology, Japan  
Nagoya Institute of Technology, Japan  
Tokyo Institute of Technology, Japan  
Osaka City University, Japan  
Kyoto University, Japan  
Tohoku University, Japan  
Hokkaido University, Japan  
Kyushu University, Japan  
Kumanoto University, Japan  
The University of Tokyo, Japan  
Hosei University, Japan  

Zou, R.  
Vehicle Crash Centre, Tsinghua University, Beijing, China, September.  

**Editorial Services**  

<table>
<thead>
<tr>
<th>Name</th>
<th>Position/Institution</th>
</tr>
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</table>
| Al-Mahaidi, R.| Reviewer, Australian Civil Engineering Transactions  
Reviewing International Journal of Engineering Structures  
Reviewing Australian Journal of Structural Engineering |
| Bouazza, M.   | Member, Editorial Board, Int. Jnl. of Geomembrane & Geotextile  
Reviewer, Int. Jnl. of Geomembrane & Geotextiles  
Reviewer, J. of Geotechnical and Geoenv. Eng. (ASCE) |
| Fletcher, T.D. | Reviewer, Water Reources Research and Water Journals  
Reviewer, 9th ICUD Conference, Portland, USA  
Reviewer, Hydrology and Water Resources Symposium, Melbourne |
| Grundy, P.    | Member, Editorial Board, Jnl. of Marine Structures  
Member, Editorial Board, Jnl. of Strain Analysis  
Reviewer, Australian Journal of Structural Engineering  
Reviewer, Journal ISOPE  
Reviewer, Marine Structures |
<table>
<thead>
<tr>
<th>Name</th>
<th>Role and Details</th>
</tr>
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<tbody>
<tr>
<td>Grzebieta, R.H.</td>
<td>Member, Editorial Board, Int. Jnl. of Crashworthiness</td>
</tr>
<tr>
<td></td>
<td>Member, Editorial Board, Australian Journal of Structural Engineering</td>
</tr>
<tr>
<td></td>
<td>Member, Editorial Board, Electronic Journal of Structural Engineering</td>
</tr>
<tr>
<td></td>
<td>Reviewer, Int. Journal of Impact Engineering</td>
</tr>
<tr>
<td></td>
<td>Reviewer, Proceedings ICRASH2002, 3rd International Crashworthiness Conference, SAE Australia</td>
</tr>
<tr>
<td></td>
<td>Reviewer, Int. Journal Solids and Structures</td>
</tr>
<tr>
<td>Guo, W.D.</td>
<td>Reviewer, Journal of Geotechnical and Geoenvironmental Engineering, ASCE</td>
</tr>
<tr>
<td>Hadgraft, R.G.</td>
<td>Reviewer, Australasian Journal for Engineering Education</td>
</tr>
<tr>
<td>Keller, R.J.</td>
<td>Associate Editor, International Journal of Hydraulic Research</td>
</tr>
<tr>
<td>Kodikara, J.K.</td>
<td>Editorial Panel, Proceedings of the Inaugural Conference on Geotechnical and Pavement Engineering, Melbourne, Australia</td>
</tr>
<tr>
<td></td>
<td>Reviewer, Geosynthetic International</td>
</tr>
<tr>
<td></td>
<td>Reviewer, Computer Geotechnics</td>
</tr>
<tr>
<td>Rose, G.</td>
<td>Editorial Panel, Transport Engineering in Australia</td>
</tr>
<tr>
<td>Sanjayan, J.G.</td>
<td>Reviewer, Cement and Concrete Composites</td>
</tr>
<tr>
<td></td>
<td>Reviewer, Cement and Concrete Research</td>
</tr>
<tr>
<td>Weinmann, P.E.</td>
<td>Reviewer, Australian Journal of Water Resources</td>
</tr>
<tr>
<td>Wong, M.B.</td>
<td>Reviewer, Int. J. for Numerical Methods in Engineering</td>
</tr>
<tr>
<td></td>
<td>Reviewer, Journal of Structural Engineering, ASCE</td>
</tr>
<tr>
<td>Wong, T.F.</td>
<td>Reviewer, Urban Water</td>
</tr>
<tr>
<td>Wootton, R.M.</td>
<td>Reviewer, 27th Hydrology and Water Resources Symposium</td>
</tr>
<tr>
<td>Young, W.</td>
<td>Associate Editor and member, Editorial Advisory Board,</td>
</tr>
<tr>
<td></td>
<td>Transportation</td>
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<tr>
<td></td>
<td>Member, Scientific Committee, International Association for Travel Behaviour Conference</td>
</tr>
<tr>
<td>Zhao, X.L.</td>
<td>Member, Editorial Board, Thin-Walled Structures</td>
</tr>
<tr>
<td></td>
<td>Member, Editorial Board, Electronic Journal of Structural Engineering</td>
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<tr>
<td></td>
<td>Reviewer, Journal of Structural Engineering, ASCE</td>
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<tr>
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<td>Reviewer, Advances in Structural Engineering Int. Journal</td>
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<td></td>
<td>Reviewer, International Journal of Offshore and Polar Engineering</td>
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<td>Reviewer, International Journal of Crashworthiness</td>
</tr>
<tr>
<td></td>
<td>Reviewer, Engineering Structures – An International Journal</td>
</tr>
<tr>
<td>Zou, R.</td>
<td>Reviewer, International Crashworthiness Conference</td>
</tr>
</tbody>
</table>
Services to Expert Bodies and Expert Advice

Grzebieta, R.H. Member National Road Safety Strategy Panel, Australian Transport Safety Bureau, Canberra
Member International VC-Compat Truck Underrun Protection Committee
Expert evidence provided: Coronial Inquest into Death of Nicole Franks in Go-Kart Crash, Wollongong.
Expert evidence provided: Murder Trial in the Shooting of Police Officers Silk & Miller, Melbourne Supreme Court.

Kodikara, J.K. Expert Pavement Reference Group, Austroads

Mein, R.G. Reviewer, Australian Research Council

Young, W. National Road Transport Commission (NRTC) - Performance-Based Standards Review

External Seminars, Courses, Workshops & Conferences

Al-Mahaidi, R. Use of FRP Composites in Retrofitting of Concrete Structures (with Dr Sami Rizkalla), Monash University, July

Bouazza, M. Geotechnical Earthquake Engineering (two half-day short course with visiting academic, Dr E. Kavazanjian), Monash University, August-September

Fletcher, T.D. MUSIC Training Courses in Melbourne, Sydney, Brisbane, June and November,
Forum on Water Sensitive Urban Design (Southwest Sustainability Forum), December

Grundy, P. Workshop on Fatigue of Steel Structures (following IABSE Symposium), Melbourne, September
Workshop on Structural Monitoring of Bridges (following IABSE Symposium), Melbourne, September

Grzebieta, R.H. Co-Chairman, International Crashworthiness Conference ICRASH2002, Melbourne, February
Co-Organiser, International Workshop on Impact and Crashworthiness (IWIC2002), Melbourne, December

Kodikara, J.K. Short Course on Design of clay covers for landfills, EPA Seminar on Design of Landfill Liners to the Sri Lankan Geotechnical Society
Seminar on Soil Stabilisation for Road Pavement at Blue Circle Cement, Geelong, Victoria

Weinmann, P.E. "Practical issues in extreme flood estimation" Workshop at Hydrology and Water Resources Symposium, Melbourne, May
"CRC-FORGE Application Workshop", Perth, 10-12 December
Wong, M.B. Speaker and organiser for a short course on "Fire Resistance of Steel and Concrete Structures", Nanyang Technological University, Singapore, December

**Special Presentations**

Al-Mahaidi, R. Presentation on proposed Infrastructure Monitoring, Evaluation, Rehabilitation and Maintenance IMERM – CRC, April

Fletcher, T.D. Industry seminars: Model for Urban Stormwater Improvement Conceptualisation in Melbourne, Sydney, Brisbane, Perth, Adelaide, June


Kodikara, J.K. Dean’s Seminar: “Behaviour of Geomaterials Interacting with Atmosphere”.


Wong, M.B. Organise seminar for iClass, a software for on-line lecturing and teaching

Zhao, X.L. Keynote address at 7th Int. Conf. On Steel and Space Structures, Singapore, October: “Cold-Formed Tubular Members and Connections under Dynamic Loading”.

**Consulting and Contract Research**

Al-Mahaidi, R. Evaluation and strength assessment of the Elwood Canal Bridge (This is the oldest surviving concrete T-beam bridge in Australia, built in 1905, designed by Sir John Monash) for ARRB and VicRoads. Evaluation and strength assessment of the Thistle Street bridge, for ARRB and VicRoads. Performance review of six jetties in Port Philip Bay for ARRB.

Codner, G.P. IEAust accreditation for Queensland University of Technology’s Department of Civil and Environmental Engineering courses.

Fletcher, T.D. MUSIC workshops, Melbourne Water Review of proposed Stormwater Quality Charging Scheme, Melbourne Water Stormwater Management: Interim Guidance and Gap Analysis, NSW EPA
Grzebieta, R.H.  
Investigation of Crash Bollards for Security Ram Road Systems, Leda Engineering & ASIO
Analysis of Trainer Module on Leopard Tank Subjected to Rollover, Land Engineering Agency, Australian Army.
Analysis of seat belt restraints and seat crashworthiness, Land Engineering Agency, Australian Army.
Truck crashes into Road Side Concrete Barriers, VicRoads.

Kodikara, J.K.  
Review of HELP and Pollute Modelling for Meinhardt

Weinmann, P.E.  
Review of hydrologic risk of Dartmouth Dam (SKM)
Hydrological monitoring requirements (Central Highlands Water)

Young, W.  
Investigation of pedestrian flows modelling at a central city railway station for the Department of Infrastructure

Zhao, X.L.  
Tubular Arches in Southern Cross Station for Windward Structures Pty Ltd

Zou, R.  
Crash Barrier Testing for Barrier Systems

Professional Development

Al-Mahaidi, R.  
Two short courses on structural health monitoring and the use of fibre optic sensors in monitoring of structures, organized by ISIS Canada, September

De Alwis, A.  
Completion of Master of Logistics Management

Greaves, S.P.  
Completion of the Graduate Certificate in Higher Education

Grzebieta, R.H.  
Crash Reconstruction Course, Tuggernong Federal Police Complex, (provided by University of Florida, USA and ACT Federal Police), Canberra ACT, July

Haque, A.  
Intensive supervising training program (2 days), Berwick campus

Taplin, G.  
Completion of Master of Multimedia

Schreider, S. Yu.  
“SafeTrek” 4-Wheel Drive Training, Melbourne Research Supervisor Training Program, Monash University, Berwick

Wong, M.B.  
“Opportunities in Steel Construction” seminar, October

Zhao, X.L.  
Outside Study Program in Japan

Zou, R.  
Crash Reconstruction Course, Tuggernong Federal Police Complex, (provided by University of Florida, USA and ACT Federal Police), Canberra ACT, July
7. Funding Position

<table>
<thead>
<tr>
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<th>2001</th>
<th>2002</th>
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</thead>
<tbody>
<tr>
<td>DEST &amp; Other Education</td>
<td>$4,392,581</td>
<td>$5,714,756</td>
</tr>
<tr>
<td>Research (incl. contract research, CRC, Key Centres)</td>
<td>$4,322,003</td>
<td>$5,603,129</td>
</tr>
<tr>
<td>External Earnings</td>
<td>$1,281,748</td>
<td>$1,242,584</td>
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<tr>
<td>Other education</td>
<td>$1,184,861</td>
<td></td>
</tr>
<tr>
<td>Donations</td>
<td>$36,929</td>
<td>$30,999</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$11,218,122</strong></td>
<td><strong>$12,591,465</strong></td>
</tr>
</tbody>
</table>