MONASH UNIVERSITY

DEPARTMENT OF CIVIL ENGINEERING

CLAYTON AND CAULFIELD CAMPUS

ANNUAL REPORT

1999
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1. INTRODUCTION AND OBJECTIVES FOR 1999

The Department of Civil Engineering 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”.

1.1. Implementation of new teaching strategies

The Department continues to develop its new undergraduate program. The Department commenced its new Level 2 subjects in 1999. The subjects are given in a problem-based learning mode and represent a learning experience for both students and academic staff. The subjects involve larger and more integrated projects and groupwork. More attention needs to be given to the development of group dynamic skills for students. New level 3 subjects are being developed for presentation in 2000. The development of the associated courseware will allow greater flexibility of learning and presentation of the course.

1.2 New subjects and courses

The Institute of Transport Studies within the department has developed a distance education postgraduate program in transport studies. The program involves industry courses, Graduate Certificates, Postgraduate Diplomas, and Masters degrees (coursework only) in transport and traffic. It is possible to articulate from industry courses upward through to the Masters degree. The Master of Engineering Science degree by coursework and minor thesis continues to be available. All subjects will be offered by distance education with the program being introduced in 2000 with all subjects coming on-line over a two year period.

1.3 Engagement with Industry

The Department has initiated a number of research and teaching initiatives to engage with industry.

An Industry Advisory Committee involving engineers from government, private and research firms was set up to overview course developments and research directions. The Committee had useful input into the new undergraduate program, research activities and the setting of the Department’s Mission, Vision and Goals.

Level 4 projects have been initiated by the Geomechanics group which enable students to work with industry partners. Vacation employment is also provided for through the Department’s groups.

Staff have been involved in numerous major consulting activities. Research grants have been obtained from industry to fund fundamental research activities.

1.4 Teaching and Research Efficiencies

Teaching remains a considerable logistics problem while the department continues to provide the two "old" degrees at Caulfield and Clayton, together with the implementation of the new level 2 subjects at both campuses as well as developing the new level 3 subjects. This situation will continue during 2000 at which stage the old courses will cease. At that time efficiencies through reduction of contact hours and courseware development should be apparent.
The department has identified its research strengths and is focusing its activities in these areas. A Research Management Plan is being developed which provides a framework for the implementation of research in these key areas.

1.5. Centres

The Cooperative Research (CRC) for Catchment Hydrology is headquartered at Monash University, with Professor Russell Mein as its full-time Director. This CRC brings together, in a cooperative venture, three research and eight user organisations from Victoria, Queensland and NSW. All of the water-related academic staff in the Department were involved in the Centre, mainly (to June 1999) in its Urban and Flood Hydrology Programs.

The CRC was successful in its bid for a further seven years of funding under the Commonwealth CRC Program this year, with the expanded Centre (four research and ten user Parties from Queensland, NSW, and Victoria) commencing in July. Again the Water staff are involved in Centre Programs, notably Urban Stormwater Quality (with Associate Professor Wong as Program Leader), Sustainable Water Allocation, and River Restoration Programs. The Centre is, again, expected to attract a significant number of post-graduate students.

The Institute of Transport Studies has developed its teaching activities rapidly in 1999. The introduction of a distance education program for the Bus and Coach industry has resulted in attracting over 500 students. The Parking Education program continues to attract students.

The Institute of Transport Studies has increased its research student base and has focused on research in Intelligent Transport Systems area.

1.6. Staff profile management

The Department of Civil Engineering has continued to increase its staffing through the centres it is associated with and external research funding. Staffing from traditional government funds have decreased during 1999.

2. CURRENT DEPARTMENTAL STRUCTURE

In 1999, the Department operated through five sections – Geomechanics, Structures, Transport, Water, Integration, headed by Dr. J. Seidel, Prof. P. Grundy/Dr R. Al-Mahaidi, Mr P. Daly, A/Prof. T. Wong and Dr. R. Hadgraft respectively.

The Management Committee consisted of Prof. W. Young (Chair), A/Prof. C. Haberfield (Deputy Head of Department, Director of Research), A/Prof. G. Codner (Director of Teaching) and Mr. C.D. Powell (Director of Support Services).
2.1 Current Staff Numbers:

<table>
<thead>
<tr>
<th>Number of academic teaching staff</th>
<th>26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associates of Department</td>
<td>6</td>
</tr>
<tr>
<td>Number of technical staff</td>
<td>15</td>
</tr>
<tr>
<td>Number of secretarial/admin. staff</td>
<td>13</td>
</tr>
<tr>
<td>Number of research assistants*</td>
<td>14</td>
</tr>
<tr>
<td>* appointment not necessarily for whole year</td>
<td></td>
</tr>
</tbody>
</table>

2.2 Staff Changes

**New appointments:**
Mr Xue Fan Gu, Research Assistant

**Resignations:**
Dr. Brett Lemass, Senior Lecturer
Mr. Peter Daly, Lecturer
Dr. Ian Rutherford, Research Fellow

**Promotions:**
Mr. Quy Le, from Lecturer to Senior Lecturer

**Retirements:**
Mr. Quy Le, Senior Lecturer

2.3 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**
Paul Grundy BCE(Hons) MEngSc Melb. PhD Cantab. FIEAust MISOPE CPEng
Russell Gordon Mein BAgriE(Hons) MEngSc Melb. PhD Minn. FIEAust
William Young BE (Hons) N.S.W. MSc PhD GradDipMgt Deakin MBA Deakin FIEAust FTTE FCIT CPEng

**Emeritus Professors**
Eric Marwick Laurensen BE (Hons) PhD N.S.W., CPEng, FIEAust
Noel William Murray BE(Hons) Adel. PhD Manc. DIngEL FIEAust MICE MISStructE FTS

**Adjunct Professor**
Kenneth Wade Ogden BE (Hons) MEngSc Melb. DipCE Ballarat School of Mines PhD MITE FIEAust CPEng

**Associate Professors**
Gary Peter Codner DipCE Caulfield I.T. BE (Hons) MBA PhD FIEAust
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 AIWSc
Tony Hoong Fatt Wong BE PhD CPEng MIEAust MASCE
Senior lecturers
Riad Al-Mahaidi BSc (Civil Eng) (Hons) Baghdad MSc PhD C’nell MIEAust MASCE CPEng
Abdelmalek Bouazza CivEng Algiers PhD Glas.
Raphael Hilary Grzebieta MgrInz (Hons) T U. Cracow PhD MIEAust CPEng NPER MSAEA, MSAE
Roger George Hadgraft BE (Hons) MEngSc James Cook DipCompSc Qld PhD
Quy Le BE Auck. GradDipComp Chisholm I.T. CPEng MIEAust
Brett Lomass BE(Hons) PhD MIEAust CPEng NPER-3
Chun Qing (Barry) Li BE(Hons) ME Wuhan PhD N’cle (N.S.W.) MIEAust CPEng
Geoffrey Rose BE (Hons) Queensland I.T. MSc PhD Trowbridge MIEAust
Jay G Sanjayan BSc(Eng) (Hons) S. Lanka PhD MIEAust
Julian Peter Seidel BE (Hons) PhD MIEAust CPEng
Geoffrey Robert Taplin BE(Hons) Tas. MEngSc CPEng MICE MIStructE MIEAust
Peter Erwin Weinmann DipEng ETH (Zurich) MEngSc MIEAust CPEng
Bill Man-Biu Wong BSc (Eng) Lond. PhD N.S.W. CEng MICE, MIEAust, CPEng
Xiao-Ling Zhao PhD Syd. ME Shanghai Jiao-Tong MASCE MIEAust CPEng MCCES

Lecturers
Peter Scott Daly BE (Hons) Assoc. Fellow ACRS, MITE CPEng
Keith Harry McKenney BE MEngSc Melb. CPEng MIEAust
Samantha Yvonne Taylor BE MEngSc GradIEng CPEng
Jagoda Williams BE MEngSc Warsaw PhD Polish Acad. Sci. MASCE
Richard Murray Wootton BE Melb. DipCE Caulfield I.T. MEngSc TITC

Associates of the Department
Ian Boyd Donald BCE (Hons) MEngSc Melb. PhD DIC Lond. MIEAust
Alan Holgate BSc (Hons) Lond. PhD MICE MIEAust
Stuart Martin Cannon BSc (Hons) Plymouth UK MSc Cranfield PhD Brun. CEng UK MRINA
MSNAME
Geoffrey William Smith DipCE R.M.I.T. BE MEngSc Melb. CPEng FIEAust AIWSc
Barbara Oszarska MWood Tech PhD Poznan
Zuyu Chen BE Tsinghua PhD Tsinghua

Administrative staff
Chris Powell (Director, Support Services)
Helen Parker (Administrative Assistant, Support Services)
Noi Souvandy (Administrative Assistant, Support Services)
Jenny Manson (Postgraduate Studies Officer)
Irene Sgouras (Undergraduate Studies Officer)
Elizabetheffreys (Manager, Courseware and Distance Education)
Yvonne Corelle (Program Director, ITS)
Brenda O’Keefe (Manager, ITS Administration)
Dominique Thomson (Administrative Assistant to the Head of Department)
Virginia Verrelli (Administrative Assistant to the Director, CRCCH)
Christine Gomez (Administrative Assistant to Professor)

Technical staff

<table>
<thead>
<tr>
<th>Graham Rundle</th>
<th>Ron Goswell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wally Richter</td>
<td>Michael Leach</td>
</tr>
<tr>
<td>Carl Bakes</td>
<td>Don McCarthy</td>
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<tr>
<td>Rob Alexander</td>
<td>Anthony Nixon</td>
</tr>
<tr>
<td>Andrew Haines</td>
<td>Alan Taylor</td>
</tr>
<tr>
<td>Roger Doultis</td>
<td>Frank Winston</td>
</tr>
</tbody>
</table>
3. ENROLMENT PATTERNS AND FUNDING

Undergraduate students

Postgraduate students

4. COURSE INITIATIVES

4.1 New Degree Program

In 1998, the Faculty of Engineering introduced a new common first year across all three Australian campuses (Clayton, Caulfield and Gippsland) followed by Sunway (Malaysia) in 1999. The Level 1 civil engineering subject, ENG1201, was revised in 1999 to take account of the experience gained from presenting the subject for the first time in 1998.

The new Level 2 subjects were introduced at the Clayton and Caulfield campuses for the first time in 1999. The subjects were:

- CIV2202 Surveying
- CIV2203 Communications
- CIV2204 Strength of materials
- CIV2205 Modelling and computing
- CIV2222 Steel framed structures
- CIV2223 Design of concrete structures
- CIV2224 Timber and masonry structures
- CIV2241 Introductory geoengineering
3. ENROLMENT PATTERNS AND FUNDING

Undergraduate students

Postgraduate students

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CIV2202 Surveying
CIV2203 Communications
CIV2204 Strength of materials
CIV2205 Modelling and computing
CIV2222 Steel framed structures
CIV2223 Design of concrete structures
CIV2224 Timber and masonry structures
CIV2241 Introductory geotechnology

9
CIV2261 Water supply I
CIV2281 Transport and traffic
MAT2911 Mathematical methods with applications I
MAT2912 Mathematical methods with applications II

Subjects are being developed for Level 3 of the new course. All level 3 subjects will be 6 credit points (changed from 4 credit points) with 4 contact hours. This represents an attempt to decrease the student contact hours while increasing the opportunity for student input into projects. This is in line with the department's move towards more student centred learning. The new level 3 subjects are given below:

- CIV3204 Engineering investigation
- CIV3205 Project management for civil engineers
- CIV3221 Building structures and technology
- CIV3222 Bridge design and assessment
- CIV3247 Geoengineering
- CIV3248 Groundwater and environmental geoengineering
- CIV3264 Urban water and wastewater systems
- CIV3282 Rural road and water engineering

4.2 Teaching Strategy

The department published its Teaching Strategy in March 1998. It emphasises a move towards student centred learning through project and problem-based subjects. The strategy can be accessed at:


As part of the strategy, a significant effort has been placed on developing the Department's web site for teaching. It provides students with flexible access to learning resources.

5. RESEARCH AND DEVELOPMENT

5.1 List of Research Projects undertaken in 1999

Geotechnical Engineering

- Sonic echo methods for NDT testing of cast-in-situ piles (Seidel)
- The dynamic response of pile/soil interfaces (Seidel)
- The shear behaviour of rock joints (Haberfield/Seidel)
- The strength and deformation properties of rock masses (Haberfield)
- The performance of drilled pile shafts in rock (Seidel/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)
- Deep Soil Mixing (Seidel)
- Pile Integrity Testing (Seidel)
- Slope stability – computer analyses (Haberfield)
- Ground anchors (Haberfield)
- Enhancing pile and anchor performance using expansive cements (Haberfield)
- Wellbore stability for the petroleum industry (Haberfield)
- Interface friction of soil-geosynthetics and geosynthetics-geosynthetics at very low pressures (Bouazza)
- Performance of geosynthetic clay liners (GCL) under various site conditions (Bouazza)
- Use of bimaterial 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)

**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 (Grundy)

Incremental collapse of tension legs and catenary risers (Grundy)

Interfacing of digital dial gauges to PCs' development of complementary software for data collection (McKenny).

Work product methods in structural engineering (Milner)

Theory and application of structural reliability (C. Li)

Economic optimisation of structural design (C. Li)

Risk assessment of transmission lines under severe thunderstorms (C. Li/Homes CSIRO)

Deterioration of concrete structures under aggressive environment (C. Li)

Experimental study to evaluate the mathematical model for behaviour of reinforced concrete walls in fire (Crozier/Sanjayan)

Properties of High Strength Concretes incorporating slag blended cements (Sanjayan)

Behaviour of high strength concrete under triaxial loading (Sanjayan)

Load bearing capacities of slender walls (Sanjayan/Crozier)

Innovative tubular connections at elevated temperature (Zhao/Grundy/B. Wong)

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

Fatigue of thin-walled welded tubular connections (Zhao/Grundy)

High tensile tubular struts under large deformation cyclic tension and compression (Zhao/Grzebieta)

High tensile tubular beams under large deformation cyclic bending (Zhao/Grzebieta)

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

Anchorage of plain bar reinforcement (Taplin)

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

Structural Behaviour of Steel Plates at Elevated Temperatures (B. Wong/Tan)

Temperature prediction of structural sections in fire (B. Wong/Ghojel)

Durability of structural members reinforced by fibreglass (Williams)
- Bonding in fibreglass-concrete structural composites (Williams)
- Using fibreglass reinforcement for flexural shear (Williams)
- Carbon fibre and concrete composite beams (Williams)

**Timber Engineering**
- Long term deflection performance of glued laminated timber (Milner)
- Application of the rate-process method in the prediction of wood adhesive durability (Milner)
- Mechano-torptive response of wood (Milner)
- 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)
- Deflection characteristics of nail plate spliced beams (McKenry)
- Moisture suction and micro-buckling influences on Mechano-sorptive creep in Timber (McKenry)

**Transport**
- "Level of service" of roads (Daly/Young)
- Modelling the effects of freeway incidents (Rose)
- Dynamic speed control on freeways (Rose)
- Telephone-based advanced traveller information systems (Rose)
- Travel awareness through survey feedback (Rose)
- Updating procedures for O-D matrices in traffic assignment (Rose)
- Capacity analysis of bicycle and pedestrian facilities (Rose)
- Impacts of safe routes to school schemes (Rose)
- Transport for the Disabled (Young)
- Modelling small area traffic model (Young)
- Environmental impacts of transport (Young)
- Electronic road pricing (Young)
• Environmental impacts of transport (Young)
• Modelling small area traffic networks (Young)
• Multistorey parking (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 inner city area (Young)
• Parking in multi-use facilities (Weng/Young)
• Equilibrium modelling of land use activities (Chandra, Young)
• Vehicle movement at intersections (Akcelik/Young)
• Sustainability and urban transport (Codner/Young)
• Review of Freight Transport Chain Case Studies for ARRB Transport Research for Austroads (Taylor)

Water
• Updating the Flood Frequency chapter of Australian Rainfall and Runoff (Hadgraft and Q.J. Wang, University of Melbourne)
• Building an electronic version of Australian Rainfall and Runoff (Hadgraft)
• Rock ramp fishways (Keller)
• Vertical slot fishways (Keller)
• The role of vegetation in flood plain roughness (Keller)
• The hydraulics of pool/riffle formation in rivers (Keller)
• Design of minimum energy structures (Keller)
• Estimation of extreme design rainfalls and floods (Weinmann/Siriwardena/Mein/Laurenson)
• Estimation of extreme rainfall risks – a joint probability approach (Weinmann/Laurenson)
• Holistic approaches to design flood estimation (Weinmann/Siriwardena/Mein/Laurenson)
• Effects on rainfall estimation errors on flood modelling (Weinmann/Seed)
• Impact of sand slugs on geomorphic variability (Rutherford/Mein)
• Hydraulic conductivity measurement for forested soils (Vertessy/Mein/Dunkerley)
• Geomorphic predictors of hydrologic response (Mein/Bates)
• Leaf area, interception, and transpiration in mountain ash forest (Vertessy/Tapper/Mein)
• Model prediction uncertainty under uncertain parameter information (Connell/Nathan/Mein)
• Sustainable water allocation – development of integrated water balance, climate and economic models (Codner/Weinmann)
• Frequency of extreme rainfall and flood events (Laurenson/Weinmann/Kuczera)
• Evaluation of the Performances of Constructed Wetlands in Stormwater Pollution Control (T. Wong/Wootton)
• Evaluation of the Performance of Gross Pollutant Traps (T. Wong/Wootton)
• The role of Wetland Vegetation on Stormwater Pollutant Removal (T. Wong)
• Pollutant Adsorption and Uptake Processes in Stormwater Bioretention Systems (T. Wong)
• Development and Evaluation of Water Sensitive Urban Design (T. Wong)
• A Decision Support System for Stormwater Quality Management (T. Wong)

Environment
• Sustainable development indicators (Codner)
• Salinity management in the Murray Darling Basin (Codner/M. Kendall)
• Sustainable development of water resources in developing countries (Codner/M. Verrochi)
• Characterisation of Stormwater Pollutants in Urban Catchments (T. Wong/Wootton)
• Hydrological, Geomorphological and Ecological Impacts of Urbanisation on Aquatic Ecosystems (T. Wong)

Engineering Education
• Environmental Engineering Education (Codner)
• The use of hypertext-based course materials for engineering education (Hadgraft)
• Development of Java-based course materials (Hadgraft)
• The development of network-based student support services (Hadgraft)
• The effect of learning styles on the student use of hypermedia (Hadgraft)
• How to empower students and staff within a university department (Hadgraft)
Road safety 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/Fildes/Sparke/Zou)
- Assessing the structural crashworthiness of petrol road tankers in roll-over accidents (Grzebieta/Rechnitzer)
- Maximising the strength of spot-welded plates (Grzebieta)
- Investigation of the contribution of the void-filling compounds to the buckling strength of rectangular hollow sections (Grzebieta/Murray)
- Investigation of safe lifting loads for agricultural tractors (Grzebieta/Rechnitzer)
- Roll-over vehicle crashworthiness (Grzebieta/Rechnitzer)
- Investigation of lower limb injuries in side impact crashes (Grzebieta/Fildes/Sparke)
- Investigation into the physics governing whiplash injuries (Grzebieta/Tingval)
- Design of crashworthy trains (Grzebieta/Rechnitzer)
- Maximising crashworthiness of roadside infrastructure (Grzebieta/Tingvall/Corben/Zou)

5.2 Research Funding for 1999

<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>Strengthening of reinforced concrete t-beam bridges using carbon fibre reinforced polymer strips</td>
<td>Australian Research Council Small Grant</td>
<td>$17,000</td>
</tr>
<tr>
<td>R. Al-Mahaidi</td>
<td>Theoretical and experimental investigation into the ultimate strength of reinforced concrete t-beam bridges – two APA (I) scholarships</td>
<td>Australian Research Council Strategic Partnership with Industry-Research &amp; Training (SPIRT) VicRoads</td>
<td>$62,000 per year for three years</td>
</tr>
<tr>
<td>G. Taplin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P. Grundy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R. Al-Mahaidi</td>
<td>To present a paper at the ISOPE conference in France, give a seminar at Cornell University and a visit to the labs of the US Federal Highway Administration</td>
<td>Monash Research Fund Travel Grant 1999 – Round 1</td>
<td>$2,000</td>
</tr>
<tr>
<td>A. Bonuzza</td>
<td>Development of Active Containment Barriers for Contaminated Land Remediation and Waste Containment</td>
<td>Australian Research Council Strategic Partnership with Industry-Research &amp; Training (SPIRT) Enrid</td>
<td>$10,000</td>
</tr>
<tr>
<td>Investigators</td>
<td>Title</td>
<td>Grantor</td>
<td>Amount Awarded</td>
</tr>
<tr>
<td>-------------------</td>
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</tr>
<tr>
<td>A. Bouazza</td>
<td>Development of a new concept for waste containment: the stabilised sand mining tailings barrier – APA(I)</td>
<td>Australian Research Council Strategic Partnership with Industry Research &amp; Training (SPIRT) South Eastern Regional Waste Management Group (SERWMG) and Pioneer Australia</td>
<td>$65,000</td>
</tr>
<tr>
<td>P. Grundy, X.L. Zhao, R.H. Grzebieta</td>
<td>Tubular steel members and connections under high amplitude dynamic loading</td>
<td>Australian Research Council Large Grant</td>
<td>$66,010</td>
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<tr>
<td>P. Grundy</td>
<td>Incremental collapse of tension legs and catenary risers</td>
<td>Australian Research Council Small Grant</td>
<td>$17,000</td>
</tr>
<tr>
<td>P. Grundy, C.Q. Li, Mr. G. Boully</td>
<td>Reliability-based assessment of load capacity of existing bridges – APA (I)</td>
<td>Australian Research Council Strategic Partnership with Industry Research &amp; Training (SPIRT) VicRoads</td>
<td>$10,000</td>
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<tr>
<td>C. Haberfield</td>
<td>A micro-mechanical approach to the shear behaviour of rock joints</td>
<td>Australian Research Council</td>
<td>$40,621</td>
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<td>C. Haberfield</td>
<td>Performance of near surface weathered rock masses</td>
<td>Australian Research Council Small Grant</td>
<td>$17,500</td>
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<tr>
<td>C. Haberfield</td>
<td>Presenting papers, 9th International Congress on Rock Mechanics, Paris</td>
<td>Monash Travel Grant (Round 2-99)</td>
<td>$1,000</td>
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<tr>
<td>E. Laurenson, G. Kuczera, P. Weinmann</td>
<td>Estimation of extreme rainfall risks (jointly with University of Newcastle)</td>
<td>Australian Research Council Strategic Partnership with Industry Research &amp; Training (SPIRT) – Commonwealth Bureau of Meteorology, Victorian Dept. of Natural Resources</td>
<td>$26,600</td>
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<td>H.R. Milner</td>
<td>Performance of open girder floor systems</td>
<td>Pryda</td>
<td>$60,000</td>
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<td>H.R. Milner</td>
<td>Long term strength of particle board</td>
<td>Australian Wood Panels Association</td>
<td>$30,000</td>
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<td>H.R. Milner</td>
<td>Kiln drying of East Gippsland hardwood</td>
<td>Special Monash Development Fund</td>
<td>$75,000</td>
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<tr>
<td>Investigators</td>
<td>Title</td>
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<tr>
<td>G. Rose</td>
<td>Development and testing of an enhanced drive time algorithm</td>
<td>VicRoads</td>
<td>$4,700</td>
</tr>
<tr>
<td>J. Sanjayan</td>
<td>High early strength concrete using alkali activated slag</td>
<td>Independent Cement &amp; Lime/Blue Circle Southern Cement/Australian Steel Mills</td>
<td>$30,000</td>
</tr>
<tr>
<td>J. Seidel</td>
<td>Development of a design methodology for screwed cast-in-place piling APA(I)</td>
<td>Australian Research Council Vibro-Pile (Aust) Pty Ltd</td>
<td>$10,000</td>
</tr>
<tr>
<td>J. Seidel</td>
<td>The response of pile-soil interfaces during pile driving and dynamic testing events</td>
<td>Australian Research Council</td>
<td>$60,932</td>
</tr>
<tr>
<td>J. Seidel</td>
<td>Development of an improved method for determination of pile integrity</td>
<td>Australian Research Council Small Grant</td>
<td>$17,500</td>
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<tr>
<td>S.Y. Taylor</td>
<td>Review of Freight Transport Chain Case Studies</td>
<td>ARRB Transport Research (for AustRoads)</td>
<td>$20,000</td>
</tr>
<tr>
<td>X-L Zhao</td>
<td>Dynamic performance of Duragal floor systems – APA (I)</td>
<td>Australian Research Council BHP Steel Tubemakers of Australia Structural and Pipeline Products</td>
<td>$10,000</td>
</tr>
<tr>
<td>P. Grundy</td>
<td>Cold-formed tubular connections under fatigue load</td>
<td>Australian Research Council</td>
<td>$46,431</td>
</tr>
<tr>
<td>L. Koss</td>
<td></td>
<td></td>
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<tr>
<td>X-L Zhao</td>
<td>Two invited keynote papers, 52nd Annual Assembly of the International Institute of Welding, Lisbon, Portugal</td>
<td>Monash Travel Fund (Round 2.99)</td>
<td>$1,000</td>
</tr>
<tr>
<td>P. Grundy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-L Zhao</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**TOTAL FUNDING AWARDED IN 1999** $693,294.00

### 5.3. CRC and Key Centre Activity

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 1999 include:

- W2 Stream Restoration (Rutherford)
- U1 Gross pollutant management and urban pollution control ponds (Wong)
- FL1 Holistic approach to rainfall-based design flood estimation (Weinmann)
- FL3 Hydraulic derivation of stream rating curves (Keller)
- Technology Transfer Program (Perry)

Total funding for these and other projects, and for the CRC Office activities at Monash, was $1.35m in 1999.
### 5.4. Postgraduate students and research topics in 1999

<table>
<thead>
<tr>
<th>Student Name</th>
<th>PhD or Master</th>
<th>Project Title</th>
<th>Main Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abernethy, Bruce (Mr)</td>
<td>PhD</td>
<td>The role of Vegetation in River Bank Stability</td>
<td>Dr. I. Rutherford</td>
</tr>
<tr>
<td>Ali-Khail, Masood (Mr)</td>
<td>PhD</td>
<td>Dynamic Performance of DuraGal Floor Systems</td>
<td>Dr. X-L. Zhao</td>
</tr>
<tr>
<td>Arndt, Naomi (Ms)</td>
<td>PhD</td>
<td>Biomechanical Analysis of Leg in Side Impact Automobile Crashes</td>
<td>Prof. B. Fildes (MUARC)/Dr. R. Grzebieta</td>
</tr>
<tr>
<td>Bailey, Mark (Mr)</td>
<td>PhD</td>
<td>Improved Techniques for Treatment of Uncertainty in Physically-Based Models of Catchment Water Balance</td>
<td>Prof. R. Mein</td>
</tr>
<tr>
<td>Barley, Rebecca (Ms)</td>
<td>PhD</td>
<td>The recovery of Geomorphic complexity in streams</td>
<td>Dr. I. Rutherford</td>
</tr>
<tr>
<td>Baikharev, Tanya (Ms)</td>
<td>PhD</td>
<td>Chemistry Microstructure and Durability of Alkali Activated Slag Concrete</td>
<td>Dr. J.G. Sanjayan</td>
</tr>
<tr>
<td>Canlappa, Disha (Mr)</td>
<td>PhD</td>
<td>The Constitutive Behaviour of High Performance Concrete Under Lateral Confinement</td>
<td>Dr. J.G. Sanjayan</td>
</tr>
<tr>
<td>Chen, Xi (Ms)</td>
<td>PhD</td>
<td>Quantitative Wellbore Stability Analysis</td>
<td>A/Prof. C. Haberfield</td>
</tr>
<tr>
<td>Collingwood, Ben (Mr)</td>
<td>PhD</td>
<td>The Effect of Construction Practices on the Capacity of Rock- Socketed Piles</td>
<td>Dr. J. Seidel</td>
</tr>
<tr>
<td>Collins, Frank (Mr)</td>
<td>PhD</td>
<td>High Early Strength Concrete using Alkali Activated Slag (AAS)</td>
<td>Dr. J.G. Sanjayan</td>
</tr>
<tr>
<td>Crozier, Damian (Mr)</td>
<td>PhD</td>
<td>Behaviour of slender reinforced concrete walls in fire</td>
<td>Dr. J.G. Sanjayan</td>
</tr>
<tr>
<td>Dale, Ken (Mr)</td>
<td>PhD</td>
<td>Behaviour of Tubular Connections Under Variable Repeated Loads</td>
<td>Prof. P. Grundy</td>
</tr>
<tr>
<td>Daly, Peter (Mr)</td>
<td>PhD</td>
<td>Modelling transport demand and parking</td>
<td>Prof. W. Young</td>
</tr>
<tr>
<td>Davis, Sharon (Ms)</td>
<td>PhD</td>
<td>Measurement of 50 forest soil hydraulic properties and the implications for physically-based catchment models</td>
<td>Prof. R. Mein</td>
</tr>
<tr>
<td>Don Mei Wang (Mr)</td>
<td>PhD</td>
<td>Development of a new concept for waste containment – the stabilised sand mining tailings barrier (title of PhD thesis still to be advised)</td>
<td>Dr. A. Bouazza</td>
</tr>
<tr>
<td>Elchalakani, Mohamed (Mr)</td>
<td>PhD</td>
<td>Innovative Tubular Member subjected to High Amplitude Dynamic Loading</td>
<td>Dr. R. Grzebieta/Dr. X-L. Zhao (shared)</td>
</tr>
<tr>
<td>Student Name</td>
<td>PhD or Master</td>
<td>Project Title</td>
<td>Main Supervisor</td>
</tr>
<tr>
<td>--------------</td>
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</tr>
<tr>
<td>Eley, Rachel (Ms)</td>
<td>PhD</td>
<td>Influence of vegetation on stream rating curves</td>
<td>A/Prof. R. Keller</td>
</tr>
<tr>
<td>Feikema, Paul (Mr)</td>
<td>PhD</td>
<td>Tree growth and water relations of eucalypt plantations over saline shallow groundwater</td>
<td>Prof. R. Mein</td>
</tr>
<tr>
<td>Gu, Xue Fan (Mr)</td>
<td>PhD</td>
<td>The Behaviour of Sandstone Concrete Joints</td>
<td>Dr. J. Seidel</td>
</tr>
<tr>
<td>Hammond, Lloyd (Mr)</td>
<td>PhD</td>
<td>Structural response of air-backed to far-field underwater explosions</td>
<td>Dr. R. Grzebieta</td>
</tr>
<tr>
<td>Hewitt, Dean (Mr)</td>
<td>PhD</td>
<td>The influence of mechanical damage on the side wall integrity of a bulk carrier</td>
<td>Prof. P. Grundy</td>
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<tr>
<td>Hoang, Tam (Ms)</td>
<td>PhD</td>
<td>A joint probability approach to rainfall-based design flood estimation</td>
<td>Mr. P.E. Weinmann</td>
</tr>
<tr>
<td>Jordan, Phillip (Mr)</td>
<td>PhD</td>
<td>Combination of rainfall estimates from Radar and Rain gauges to improve flood forecasting</td>
<td>Mr. P.E. Weinmann</td>
</tr>
<tr>
<td>Khalaf, Hussein (Mr)</td>
<td>PhD</td>
<td>Reliability-based assessment of load capacity of existing bridges</td>
<td>Prof. P. Grundy</td>
</tr>
<tr>
<td>Lloyd, Sara (Ms)</td>
<td>PhD</td>
<td>Best practice in water-sensitive urban design</td>
<td>A/Prof. T. Wong</td>
</tr>
<tr>
<td>Mashiri, Fidelis (Mr)</td>
<td>PhD</td>
<td>Thin-Walled Tubular Connections under Fatigue Loading</td>
<td>Dr. X-L Zhao</td>
</tr>
<tr>
<td>McNamara, David (Mr)</td>
<td>PhD</td>
<td>A hydrologic analysis of break of slope plantations</td>
<td>Prof. R. Mein</td>
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<tr>
<td>Milani, Nick (Mr)</td>
<td>PhD</td>
<td>Behaviour of tubular connections under variable repeated loading</td>
<td>Prof. P. Grundy</td>
</tr>
<tr>
<td>O'Sullivan, Sharon (Ms)</td>
<td>PhD</td>
<td>An investigation into the relationship between leaf area, transpiration rates and canopy interception in different age classes of Eucalyptus regnans</td>
<td>Prof. R. Mein</td>
</tr>
<tr>
<td>Paterson, Darryn (Mr)</td>
<td>PhD</td>
<td>Predicting the duration and effects of freeway incidents</td>
<td>Dr. G. Rose</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. M.B. Wong</td>
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<tr>
<td>Pearce, Helen (Ms)</td>
<td>PhD</td>
<td>A Micro-Mechanical Approach to the Shear Behaviour of Rock Joints</td>
<td>A/Prof. C. Haberfield</td>
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<tr>
<td>Richards, Betty (Ms)</td>
<td>PhD</td>
<td>Investigation of catchment geomorphologic and flood frequency characteristics within the scale invariance framework</td>
<td>Prof. R. Mein</td>
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<tr>
<td>Richards, Sarah (Ms)</td>
<td>PhD</td>
<td>Use of Organically Modified Clays for Soil Remediation and Waste Containment</td>
<td>Dr. A.M. Bouazza</td>
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<tr>
<td>Richardson, Shane (Mr)</td>
<td>PhD</td>
<td>Roller Protective Structures for (Military) 4 x 4 vehicles</td>
<td>Dr. R. Grzebieta</td>
</tr>
<tr>
<td>Shirzadin, Amir (Mr)</td>
<td>PhD</td>
<td>Determination of the Structural Integrity of Bulk Carriers through Monitoring Systems</td>
<td>Prof. Paul Grundy</td>
</tr>
<tr>
<td>Student Name</td>
<td>PhD or Master</td>
<td>Project Title</td>
<td>Main Supervisor</td>
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<tr>
<td>Sironic, Elizabeth (Ms)</td>
<td>PhD</td>
<td>A Study of Void-Filled Thin-Walled Rectangular Steel Sections</td>
<td>Dr. R. Grzibieta</td>
</tr>
<tr>
<td>Slater, Jim (Mr)</td>
<td>PhD</td>
<td>Cast in-situ screw piling</td>
<td>Dr. J. Seidel</td>
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<tr>
<td>Somes, Nicholas (Mr)</td>
<td>PhD</td>
<td>An investigation of the performance of constructed stormwater wetlands</td>
<td>A/Prof. T. Wong</td>
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<tr>
<td>Stolinski, Richard (Mr)</td>
<td>PhD</td>
<td>Side Impact Protection - occupants in the far-side seat</td>
<td>Dr. R. Grzibieta</td>
</tr>
<tr>
<td>Tan, Yun Weng (Mr)</td>
<td>PhD</td>
<td>A Study of Parking Movement in Multi-Storey Parking Systems</td>
<td>Prof. W. Young</td>
</tr>
<tr>
<td>Taplin, Geoff (Mr)</td>
<td>PhD</td>
<td>Incremental Slip of Composite Beams under Repeated Load</td>
<td>Prof. P. Grundy</td>
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<tr>
<td>Taylor, Jack (Mr)</td>
<td>PhD</td>
<td>The Structural Use of Particle Board</td>
<td>A/Prof. H.R. Milner</td>
</tr>
<tr>
<td>Vangpaisal, Pok (Mr)</td>
<td>PhD</td>
<td>Performance of Geosynthetic Clay Liners as a Gas Barrier</td>
<td>Dr. A. Bouazza</td>
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<tr>
<td>White, Lindsay (Mr)</td>
<td>PhD</td>
<td>An investigation of hydraulic issues associated with fishways</td>
<td>A/Prof. R. Keller/ Dr. I. Rutherford</td>
</tr>
<tr>
<td>Wilkinson, Scott (Mr)</td>
<td>PhD</td>
<td>The Development of Depth Variation in Rivers</td>
<td>A/Prof. R.J. Keller</td>
</tr>
<tr>
<td>Xu, Fan Gu (Mr)</td>
<td>PhD</td>
<td>The Behaviour of Sandstone Concrete Joints</td>
<td>A/Prof. C. Haberfield</td>
</tr>
<tr>
<td>Chan, Merle (Ms)</td>
<td>MEngSc</td>
<td>The Effectiveness of Road Safety Audit</td>
<td>Dr. G. Rose</td>
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<tr>
<td>Chandra, Ed (Mr)</td>
<td>MEngSc</td>
<td>Employment Location Choice in Land Use Transport Interaction</td>
<td>Prof. W. Young</td>
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<tr>
<td>Chin, Victor (Mr)</td>
<td>MEngSc</td>
<td>The Dynamic Response of Pile Soil Interface</td>
<td>Dr. J. Seidel</td>
</tr>
<tr>
<td>Cleven, Michael (Mr)</td>
<td>MEngSc</td>
<td>Bond Loss Due to Steel Corrosion in Reinforced Concrete</td>
<td>Dr. C.Q. Li</td>
</tr>
<tr>
<td>Fung, Hin Wong (Mr)</td>
<td>MEngSc</td>
<td>Strength of high strength concrete walls with openings</td>
<td>Dr. R. Al-Mahaidi</td>
</tr>
<tr>
<td>Giaccio, Craig (Mr)</td>
<td>MEngSc</td>
<td>Theoretical and experimental investigation into the ultimate strength of reinforced concrete T-beam bridges</td>
<td>Dr. R. Al-Mahaidi</td>
</tr>
<tr>
<td>Green, Janice (Ms)</td>
<td>MEngSc</td>
<td>Estimation of extreme rainfall risks</td>
<td>Mr. P.E. Weinmann</td>
</tr>
<tr>
<td>Hewitt, Martin (Mr)</td>
<td>MEngSc</td>
<td>Shakedown and incremental collapse of catenary risers and tension legs in offshore platforms</td>
<td>Prof. P. Grundy</td>
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<tr>
<td>Isaac, Chris (Mr)</td>
<td>MEngSc</td>
<td>Initiation of Chloride-induced Steel Corrosion in Concrete</td>
<td>Dr. C.Q. Li</td>
</tr>
<tr>
<td>Kabbara, Saf (Mr)</td>
<td>MEngSc</td>
<td>Freeway travel time prediction using artificial neural networks</td>
<td>Dr. G. Rose</td>
</tr>
<tr>
<td>Kalra, Rajiv (Mr)</td>
<td>MEngSc</td>
<td>Life cycle performance evaluation of concrete bridges deteriorating through steel corrosion</td>
<td>Dr. C.Q. Li</td>
</tr>
<tr>
<td>Lee, Tuan Kwan (Mr)</td>
<td>MEngSc</td>
<td>Shear strength of T-beam bridge deck repaired using CFRP (Carbon Fibre-reinforced plastic)</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>Macaulay, Jemima</td>
<td>MEngSc</td>
<td>Roundabout Capacity Analysis: Gap Acceptance</td>
<td>Ms. S. Y. Taylor</td>
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<tr>
<td>Saharanam, Renuka</td>
<td>MEngSc</td>
<td>Storm bank undercutting; distribution and processes</td>
<td>Dr. I. Rutherford</td>
</tr>
<tr>
<td>(Ms)</td>
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<td></td>
<td></td>
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<tr>
<td>Saf, Kabbara (Mr)</td>
<td>MEngSc</td>
<td>Freeway travel time prediction using artificial neural networks</td>
<td>Dr. G. Rose</td>
</tr>
<tr>
<td>Sonnenberg, Andrew</td>
<td>MEngSc</td>
<td>Shear Strength Assessment of RC T-Beam Bridges</td>
<td>Dr. R. Al-Malhiidi</td>
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<tr>
<td>(Mr)</td>
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<td></td>
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<tr>
<td>Szymakowski, Jerry</td>
<td>MEngSc</td>
<td>The Performance of Near Surface Rock Masses</td>
<td>A/Prof. C. Haberfield</td>
</tr>
<tr>
<td>(Mr)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vangpaisal, Pok (Mr)</td>
<td>MEngSc</td>
<td>Performance of Geosynthetic Clay Liners as a Gas Barrier</td>
<td>Dr. A.M. Bouazza</td>
</tr>
<tr>
<td>Youngman, James (Mr)</td>
<td>MEngSc</td>
<td>A Model for Improving the Delivery of Field Service Support with Applications to Emergency Services</td>
<td>Dr. G. Rose</td>
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</table>

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

<table>
<thead>
<tr>
<th>PRESENTER</th>
<th>SEMINAR TOPIC</th>
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</thead>
<tbody>
<tr>
<td>William Young</td>
<td>Does the Department of Civil Engineering have a future?</td>
</tr>
<tr>
<td>Roger Hadgraft</td>
<td>Problem-Based Learning- it’s more than just projects</td>
</tr>
<tr>
<td>Geoff Taplin</td>
<td>Behaviour of composite beams under repeated loading</td>
</tr>
<tr>
<td>Pok Vangpaisal</td>
<td>Gas permeability of Geosynthetics Clay Liners (GCLs)</td>
</tr>
<tr>
<td>Tanya Bakharev</td>
<td>Early Hydration and Microstructure of Alkali-activated Slag Cements</td>
</tr>
<tr>
<td>Raphael Grzebieta</td>
<td>Road-side crash barriers – modelling and crash testing</td>
</tr>
<tr>
<td>Keith McKenery</td>
<td>Analysis of the incremental collapse of plane frames by displacement calculation</td>
</tr>
<tr>
<td>Helen Pearce</td>
<td>A micro-mechanical approach to the shear behaviour of rock joints</td>
</tr>
<tr>
<td>Lindsay White</td>
<td>Stream rehabilitation principles and techniques in North America</td>
</tr>
<tr>
<td>Rebecca Bartley</td>
<td>Changing geomorphic variability in stream disturbed by sediment slugs</td>
</tr>
<tr>
<td>Scott Wilkinson</td>
<td>Why are there pools in rivers?</td>
</tr>
<tr>
<td>Tony Wong</td>
<td>The CRC urban stormwater quality research program</td>
</tr>
<tr>
<td>Sarah Richards</td>
<td>Adsorptive properties of clay</td>
</tr>
<tr>
<td>W. Young/E. Jeffreys</td>
<td>Guided learning courseware development in the Dept of Civil Engineering</td>
</tr>
<tr>
<td>Darryn Paterson</td>
<td>Drive Time System</td>
</tr>
<tr>
<td>PRESENTER</td>
<td>SEMINAR TOPIC</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Michael Cleven</td>
<td>Bond loss due to reinforcing steel corrosion in concrete</td>
</tr>
<tr>
<td>Chris Haberfield/Heads of Section</td>
<td>Research opportunities in the Department of Civil Engineering</td>
</tr>
<tr>
<td>Ken Dale</td>
<td>Shakedown Analysis of Tubular Connections</td>
</tr>
<tr>
<td>Chris Isaac</td>
<td>Initiation time for chloride induced steel corrosion in concrete under service load</td>
</tr>
<tr>
<td>Jim Youngman</td>
<td>They Also Serve Who Only Stands and Waits: problems in the delivery of emergency road service</td>
</tr>
<tr>
<td>Bob Milner</td>
<td>Structural response of open girder timber floor systems</td>
</tr>
<tr>
<td>Naomi Arndt</td>
<td>Leg Injuries in Side Impact Crashes</td>
</tr>
</tbody>
</table>

5.6. 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>Prof. John Harris from CeLTS (Centre for Learning and Teaching Supports), Monash University</td>
<td>Around the world or around the corner- Offering Monash Programs at a distance</td>
</tr>
<tr>
<td>Prof. Dr. Ing. Hans H. Schmidt from University of Stuttgart &amp; Smoltczyk and Partners, Stuttgart, Germany</td>
<td>Retaining Structures for temporary excavations</td>
</tr>
<tr>
<td>Dr. Arezki Tagnit-Hamou, Associate Professor from the Civil Engineering Department, Sherbrooke University, Canada</td>
<td>Cement and Concrete Research at Sherbrooke University</td>
</tr>
<tr>
<td>Dr. Abdul-Rahim Sabouni, Adjunct Professor from UAE University, Public Works Department of Abu Dhabi, United Arab Emirates</td>
<td>Expert System Methodology for the Diagnosis of Deteriorated Reinforced Concrete Structures</td>
</tr>
<tr>
<td>Associate Professor Hiroaki Kitoh from the Department of Civil Engineering, Osaka City University, Japan</td>
<td>Steel Plate and Concrete Composite Slabs so-called Robinson's Slab</td>
</tr>
</tbody>
</table>
5.7. Publications

Books


Journal papers


Mein, R.G. (1999), Research into practice: making an impact (The 1999 Munro Oration), Aust J Water Resources (accepted for publication)


Conference Publication


Mashiri, F.R., Zhao, X.L. and Grundy, P. (1999) Fatigue Strength of Thin-Walled Tube-to-Plate T-joints under In-Plane Bending, Second International Conference on Advances in Steel Structures, Hong Kong, December


Reports


Expert Commentary


5.8. Thesis Accepted for a Higher Degree

PhD

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Supervisor</th>
<th>Thesis title</th>
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</thead>
<tbody>
<tr>
<td>Bruce</td>
<td>Abernethy</td>
<td>Dr. I. Rutherfurd</td>
<td>On the role of woody vegetation in riverbank stability</td>
</tr>
<tr>
<td>Francis</td>
<td>Collins</td>
<td>Dr. J. Sanjayan</td>
<td>High early strength concrete using alkali activated slag</td>
</tr>
<tr>
<td>John</td>
<td>Cox</td>
<td>Prof. K.W. Ogden</td>
<td>Maximising the contribution of the Australian road transport system to national outcomes</td>
</tr>
<tr>
<td>Sun</td>
<td>Xu Dong</td>
<td>Prof. R.G. Mein</td>
<td>Hydrological application of weather radar for catchment rainfall and flood estimation</td>
</tr>
<tr>
<td>White</td>
<td>Gary</td>
<td>Dr. R. Grzebieta</td>
<td>The collapse modelling of thin-walled square steel sections subjected to combined bending and torsion and its relation to predicting the roll-over strength of passenger car roofs</td>
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</tbody>
</table>

MEngSc (Research)

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Supervisor</th>
<th>Thesis title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frank</td>
<td>Winston</td>
<td>A/Prof. R.J. Keller</td>
<td>Minimum energy loss waterways, design and numerical performance modelling</td>
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MEEngSc (Coursework & Minor Thesis)

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<tr>
<th>First Name</th>
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<th>Thesis title</th>
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<tr>
<td>Brett</td>
<td>Mitsch</td>
<td>A/Prof. R.J. Keller</td>
<td>Hydraulic aspects of ornamental foundations</td>
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<td>Chris</td>
<td>McCarthy</td>
<td>Prof. P. Grundy</td>
<td>Investigation of a simplified method for including joint flexibility in determination of static behavior of braced frames</td>
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<td>Craig</td>
<td>McGooch</td>
<td>Dr. G. Rose</td>
<td>Updating future year origin-destination matrices when using matrix estimation methods</td>
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<td>Francis (Aik Foo)</td>
<td>Lau</td>
<td>Dr. R. Al-Mahalil</td>
<td>Investigation of the behaviour of prestressed concrete super T-Beam under serviceability limit state</td>
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<tr>
<td>Gerrard</td>
<td>Young</td>
<td>Dr. R. Hadgraft</td>
<td>Low flow frequency analysis: comparison of a fixed kernel non-parametric model with various parametric models for selected Victorian streams</td>
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<td>Mow Ying (Phillip)</td>
<td>Yap</td>
<td>Prof. W. Young</td>
<td>Modelling fuel consumption in a parking lot</td>
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<tr>
<td>Ren</td>
<td>Li Ping</td>
<td>A/Prof. G. Codner</td>
<td>Mining and sustainable development; the application of Australian best mining practice in China</td>
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6. STRATEGIC DIRECTIONS FOR THE FUTURE

The Department has a strong reputation with industry for producing graduates and research outcomes of the highest quality. The Department’s strengths lie in the quality and dedication of its staff, its extensive laboratory facilities and equipment, engagement in community activities and strong links with industry. Each member plays an important personal role in defining the collective future of the Department.

The Department vision was outlined in 1999. It states:

As members of the Department of Civil Engineering, we:

- Recognise the diverse skills which our fellow staff and students bring to the Department. We actively promote the development of staff and students, and seek new members who enhance the quality of the Department.
- Pride ourselves in our teaching, and pursue and implement innovative and student-oriented education techniques and philosophies. We prepare graduates who can give professional leadership, are equipped to accommodate, initiate and implement change, and who have a lifelong desire to learn.
- Pursue innovative and significant Civil Engineering research, with research areas focussed to ensure adequate resources, funding and collaboration.
- Engage with industry, the profession, the University and the wider community to ensure the provision of appropriate Civil Engineering services to all markets, and fulfillment of our social obligations.
- Work in focussed, collaborative, well-resourced groups in structures, geomechanics, water and transport.
・ Work to understand the needs of our existing markets and develop new markets and products in order to maximise existing opportunities and create new opportunities to attract our income.

The Departmental goals are:

1. **Personnel**
   ◆ Assist staff to develop their full potential and to achieve success in attaining the career goals that are mutually beneficial to themselves and the Department.
   ◆ Reward innovation and excellence.

2. **Teaching**
   ◆ Set and maintain standards of undergraduate, postgraduate, continuing and industry focused Civil Engineering education.
   ◆ Maximise each student’s individual potential and equip each graduate with appropriate skills, knowledge and attitudes.
   ◆ Position the Department to recognise and take advantage of educational opportunities in areas congruous with the mission wherever they occur.
   ◆ Develop courseware that allows easy access to the distance education market as well as flexible learning on campus.
   ◆ Develop a viable continuing education program that meets the needs of students and industry.

3. **Research**
   ◆ Conduct high quality research in our areas of strength, which meets the immediate and long-term requirements of the profession.
   ◆ Support the development of well-resourced and clearly focused research groups (and centres) in these areas to provide research leadership and meet industry’s needs.

4. **Community and Professional Service**
   ◆ Promote and bring to the community the professional skills and resources of the Department.
   ◆ Encourage academic staff to engage in public debate on issues of professional and community concern in their areas of expertise.
   ◆ Support the engagement of staff in consulting activities that are to the mutual benefit of the Department and staff members.

5. **Administrative and Technical Support**
   ◆ Provide the administrative and technical support necessary to attain the teaching, research and service goals.
   ◆ Encourage all staff to be proactive in the development of more efficient and effective administrative and managerial methods.

6. **Leadership**
   ◆ Provide quality leadership and practice sound management at all levels of the Department.
   ◆ Promote a spirit of teamwork that recognises and celebrates the achievement of teams.
   ◆ Encourage and support Groups and Centres to be innovative in their fields.

7. **Resources and Facilities**
   ◆ Maintain resources and facilities at a level that allows the teaching, research and service goals to be achieved.
   ◆ Develop planning systems to minimise the impacts of external change on the Department.
   ◆ Build a flexible working environment, which facilitates the attainment of the above goals in an atmosphere of satisfaction and pride.
7. PROFESSIONAL ACTIVITIES

7.1. Conference Attendance

Al-Mahaidi, R.  
International Conference on Mechanics of Structures, Materials and Systems, Wollongong, February  
Composites: Innovations and Structural Applications Symposium, Sydney, February  
9th ISOPE'99 Intl Conf., Brest, France, May-June

Codner, G.P.  
Australasian Environmental Engineering Conference, Auckland, New Zealand, July  
11th Australasian Conference on Engineering Education, Adelaide, September

Daly, P.  
ITE 6th International Conference on Road Safety and Traffic Enforcement, Melbourne, September

Donald, I.B.  

Grzebieta, R.H.  
Madymo Users Conference, Melbourne, March  
"Aus Top Tec" Topical Technical Symposium, SAE, Melbourne, September  
6th ITE International Conference on Road Safety and Traffic Enforcement: Beyond 2000, Melbourne, September  
Young Engineers Conference, Melbourne, October  
Road Safety Research Policy and Education Conference, Australian Safety Transport Bureau, Canberra, November

Haberfield, C.M.  
8th ISRM Congress, Paris, France, August  
8th ANZ Conference on Geomechanics, Hobart, February

Hadgraft, R.G.  
11th Australasian Conference on Engineering Education, Adelaide, September  
3rd National Teaching Forum, Canberra, December

Keller, R.J.  
28th Congress of International Association for Hydraulic Research, Graz, Austria, August

Mein, R.G.  
CRC Association Conference, Melbourne, April  
Water99 Joint Congress, Brisbane, July  
Inaugural Victorian Flood Management Conference, Wangaratta, September

Sanjayan, J.G.  
Int. Conf. on Infrastructure Regeneration and Rehabilitation improving the Quality of Life through Better Construction, Sheffield, UK, July

Taplin, G.  

Taylor, S.Y.  
First International Conference on City Logistics, Cairns, July  
Road Pricing and Taxation Seminar, Adelaide, September  
Bus Maintenance Conference, Melbourne, June
Weinmann, P.E.  
*Water 99 Joint Congress, Brisbane, July*  
*XXVIII IAHR Congress – Hydraulic Engineering for Sustainable Water Resources Management, Graz, Austria, August*  
*2nd Inter-Regional Conference on Environment – Water, Lausanne, Switzerland, September*

Wong, M.B.  
*Monash University Internationalisation, Flexible Learning and Technology Conference, Clayton, September*  
*16th Australasian Conference on the Mechanics of Structures and Materials, Sydney, December*  
*4th Asia-Pacific Conference on Computational Mechanics, Singapore, December.*

Wong, Tony H F  
1st South Pacific Conference on Comprehensive Stormwater and Aquatic Ecosystem Management, Auckland, New Zealand, 22-26 February 1999  
8th International Conference on Urban Storm Drainage, Sydney, 30 August – 3 September, 1999

Young, W.  
*4th International Conference on Intelligent Transport Systems, ITSA Adelaide, May*  
*NRTT Future Directions Workshop, Melbourne, August*  
*European Economic Community Mission on Integration of Transport, Sydney, February*  
*ITE International Conference on Road Safety Enforcement, Melbourne, September*

Zhao, X.L.  
*Second Australasian Congress on Applied Mechanics, ACAM’99, Canberra, February*  
*IW (International Institute of Welding) Annual Assembly, Lisbon, Portugal, July*  
*CIDECT (International Committee for the Development and Study of Tubular Structures) Annual Meeting, Amsterdam, the Netherlands 47th WTIA (Welding Technology Institute of Australia) Conference, Gold Coast, October*  
*16th Australasian Conference on the Mechanics of Structures and Materials, Sydney, December*  
*Second International Conference on Advances in Steel Structures, Hong Kong, December.*
7.2. Official Contribution to Professional Organisation

Al-Mahaidi, R. Member, ACI-ASCE Committee 447: Finite Element Analysis of Reinforced Concrete Structures.

Bouazza, M. Member, ISSMGE-TC5: Environmental Geotechnics
Member, IAEG commission 14 on Waste Disposal
Committee Member, Australian Geomechanics Society, Victorian Branch
Member Scientific Committee, 3rd International Congress on Environmental Geotechnics, Lisbon, Portugal
Co-Chairman workshop on Triaxial Testing of Soils, 6th IGS, Atlanta, USA


Daly, P. Member, Scientific Committee, Int. Assoc. for Travel Behaviour Conf. (1998-2000)
Secretary, Executive Board, Institute of Transportation Engineers (ITE) Australia and New Zealand
Convenor, Monash Student Chapter, Institute of Transportation Engineers (ITE)

Fenton, J.D. Member, Int. Assoc. of Hydraulic Research

Grundy, P. Member, ME/5/15 Standards Australia Subcommittee - Crane Runways
Member, Int. Institute of Welding Commission XV-E, Tubular Joints
Chair, ISOPE Technical Committee, Tubular Structures

Grzebieta, R.H. Member, National Australian Standards Committee CE/33 Road Safety Systems Barriers (AS/NZS 3845)
Corresponding Member, National Committee on Transport, IEAust
Member, National Executive Committee of the Australian College of Road Safety
Member of Executive Committee of the Australian College of Road Safety, Victorian Chapter

Haberfield, C.M. Member, ASTM, Committee on Pressuremeters D18.02.07, USA
Chair, National Committee, Australian Geomechanics Society
Australasian Vice President, International Society for Rock Mechanics
Ex-Officio, Victoria Group Committee of the Australian Geomechanics Society
Member, Organising Committee, GeoEng2000 – Int. Conf. on Geotechnical and Geological Engineering, Melbourne 2000
Chairman, Technical Committee, GeoEng2000, Int. Conf. on Geotechnical and Geological Engineering, Melbourne 2000
Member, Society Consultant Committee, IEAust

Hagraft, R.G. Member, Higher Education Research and Development Society of Australia
Member, Australasian Association for Engineering Education
Member, Problem-Based Learning Assessment and Research Centre

Mein, R.G. Corresponding Member, Water Engineering Committee, Institution of Engineers, Australia
Sanjay, J.G. Member, Concrete Institute of Australia Committee, Victorian Branch Committee Member, Australian Concrete Research Forum

Taplin, G. Member, Standards Committee BD/32/2 – Composite Beams

Taylor, S.Y. National Committee on Transport Engineers (NCTR) IEAust National Committee on Transport IEAust Vic Transport Branch Committee

Weinmann, P.E. Member, Revision Committee for Book VI of “Australian Rainfall and Run-off“

Wong, M.B. Australian Institute of Steel Construction, Victorian Committee

Wong, Tony H F Chairman, National Committee on Water Engineering, Institution of Engineers, Australia Chairman of Technical Sub-committee, 10th World Water Congress, Melbourne, March 2000 Chairman of Revision Panel – Australian Rainfall and Runoff – Chapter 14 Urban Stormwater Management

Young, W. Member, Chartered Institute of Transport Committee Member, Standards Association of Australia Parking Committee

Zhao, X-L. Member, International Institute of Welding, Subcommission XV-E Tubular Structures Member, CIDECT Working Group - Joints Behaviour and Fatigue Member, CIDECT Working Group - Stability and Fire Resistance Member, Standards Australia Committee CS/23 - Security Screen Doors Member, AISC/WTIA Panel 6- Structures Australian Delegate to IIW Commission XV – Fundamentals of Design and Fabrication for Welding

7.3 Visits to Other Institutions

Al-Mahaidi, R. Cornell University, USA, June University of Wollongong, February Labs of the Federal Highway Administration, Washington DC, June

Haberfield, C.M. University of Stuttgart, Germany, August

Hadgraft, R.G. Queensland University of Technology, Brisbane Australia National University, Canberra Australia Catholic University, Canberra University of Western Australia, Perth

Sanjayan, J.G. University of Sheffield, UK, July Cambridge University, UK, July
Taylor, S.Y.  
University of California, Irvine, California (USA), October  
Cambridge Systematics, Oakland, California (USA), October  
University of California, Berkeley, California (USA), October  
University of California, Davis, California (USA), October  
George Mason University, Virginia, USA, October-December  

Wong, M.B.  
Nanyang Technological University, Singapore, December  

Young, W.  
Gadjah Mada University, Yogyakarta, Indonesia, January  

Zhao, X.L.  
University of South Australia, September  
University of Western Sydney, December  
University of Sydney, December  
Hong Kong Polytechnic University, December  
Hong Kong University of Science and Technology, December  

7.4. Editorial Services  

Al-Mahaidi, R.  
Reviewer, *Australian Civil Engineering Transactions*  
Reviewer, *International Journal of Engineering Structures*  
Reviewer, *Australian Journal of Structural Engineering*  
Reviewer, *Int. Conf. on Mechanics of Structures, Materials and Systems*  
Reviewer, ACUN-2 International Conference  

Bouazza, M.  
Member, Editorial Board, *Int. Jnl. of Geomembrane & Geotextile*  
Reviewer, *6th Int. Conf. on Goresynthetics*  
Reviewer, *Int. Jnl. of Geomembrane & Geotextiles*  
Reviewer 8th ANZ Conference on Geomechanics  

Daly, P.  
Reviewer, *Accident Analysis and Prevention*  
Reviewer, *Road and Transport Research*  

Fenton, J.D.  
Member, Editorial Board, *Coastal Engineering*  

Grundy, P.  
Member, Editorial Board, *Jnl of Marine Structures*  
Member, Editorial Board, *Jnl of Strain Analysis*  

Grzebieta, R.H.  
Member, Editorial Board, *Int. Jnl. of Crashworthiness*  
Reviewer, *Int. Journal of Applied Finite Elements and Computer Aided Engineering*  
Reviewer, *Australian Journal of Structural Engineering*  
Reviewer, *Int. Journal of Solids and Structures*  
Reviewer, *Int. Journal of Impact*  

Haberfield, C.M.  
Reviewer, *Australian Civil Engineering Transactions*, IEAust.  
Reviewer, *Int. Jnl. of Rock Mechanics*  
Reviewer, ASCE, Geotechnical Engineering Division  
Reviewer, 8th ANZ Conference of Geomechanics  

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Keller, R.J.  
Associate Editor, *Int. Jnl of Hydraulic Research*

Li, C.Q.  
Member, Editorial Board, *Int. Jnl. of Building Research and Information*

Rose, G.  
Editor-in-Charge, *Transport Engineering in Australia*

Seidel, J.P.  
Technical Editor, Fulcrum, Deep Foundations Institute  
Reviewer, *Australian Civil Engineering Transactions*  
Reviewer, *ASCE Jnl Geotechnical Engineering Division*  
Reviewer, *ATSM, Jnl of Geotechnical Engineering*  
Reviewer, *Canadian Geotechnical Journal*  
Reviewer, *8th ANZ Conference on Geotechnical Engineering*

Weinmann, P.E.  
Reviewer, *Australian Journal of Water Resources*  
Member, Scientific Committee, *2nd Inter-Regional Conference on Environment-Water, Lausanne, Switzerland*

Wong, Tony H F  
Reviewer, *Urban Water*  
Co-Editor, Proceedings of the 10th World Water Congress

Young, W.  
Associate Editor and member, Editorial Advisory Board, *Int. Jnl Transportation*  
Reviewer, *ISATA 1999 Conference (Int’l Symposium on Automotive Technology and Automation*  
Member, Programming Committee, *ISATA 2000*  
Member, Scientific Committee, *9th International Association for Travel Behaviour Conference*  
Member, International Technical Committee, *Civil & Environmental Conference, New Frontiers and Challenges, Thailand*

Zhao, X.L.  
Member, Editorial Group, IFW Recommended Fatigue Design Procedure for Welded Hollow Section Joints

7.5. Services to Expert Bodies

Hadgraft, R.G.  
Member, Committee for University Teaching and Staff Development

Seidel, J.P.  
Member, IEAust Accreditation Panel for Engineering Associates

Taylor, S.Y.  
Member, Department of Infrastructure Freight Reference Group

7.6. External Seminars, Courses & Workshops

Al-Mahaidi, R.  
Seminar, NLFEM analysis of Shear in Concrete T-beams, Cornell University, USA, June  
Presentation on shear strength assessment of aging concrete T-beam bridges at the Bridge Assessment Workshop, VicRoads, Melbourne, April

Daly, P.  
Workshop (invitation only) on Motorcycle Safety and the Road Environment, Melbourne, August  
Accident Investigation and Prevention Workshop (Course Leader), November

Haberfield, C.M.  
Seminar, Design of piles in rock, Melbourne, August
Hadgraft, R.G. Workshop on Problem-Based Learning and Technology for the Aust. Soc. Educ. Technology, October

Keller, R.J. Seminar Environmental Issues in River Engineering & Development, Caulfield, December

Mein, R.G. Flood Estimation Workshop for Melbourne Water staff, Caulfield Campus, June (with Tony Wong)

Taylor, S.Y. Traffic Engineering and Management Workshop, Sydney, July
Freight Movements in Australia: Results through a pragmatic approach. University California, Irvine, USA. October

Weinmann, P.E. Workshops, CRC-FORGE, Melbourne, June, July, August

7.7. Special Presentations


Young Engineers Conference, Invited Debate Leader and Academic Representative for Expert Panel, SAE, Melbourne, October.

Hadgraft, R.G. Mindmapping Workshop, Faculty of Education, November
Flexible Learning, HEPCIT Seminar, November

Mein, R.G. 1999 Munro Oration at Water 99 Joint Congress, Brisbane, 6-8 July 1999
The Jack Beale Lecture, Water Resources Foundation, ANU, Canberra. 19 October 1999

Taylor, S.Y. Commentary on “Future Options” – Road Pricing and Taxation, Adelaide, September
“Transport Engineering Management” (for the Graduate Diploma in Logistics Management, Caulfield)
Freight Movements in Australia: Results through a pragmatic approach, University of California, Irvine, USA, October

Wong, Tony H F Industry Seminar on Constructed Wetlands (Tony Wong, Peter Breen – CRCFE & Alf Lester (LFA Pty Ltd) – Adelaide (11 October 99); Perth (12 October 99)
Invited speaker at the Ellenbrook Wetland Design Workshop in Perth organised by the Water and Rivers Commission, WA (13-15 October 99)
6-day Short course on Planning and Design of Stormwater Management Measures (Tony Wong – Course Director; Chris Chesterfield & Scott Seymour of Melbourne Water – invited speakers; Peter Breen of CRCFE – invited speaker). Course included a 1-day field inspection of constructed stormwater wetlands in urban residential areas. (22-29 November 99)
Invited speaker at the Workshop on Urban Waterway Ecosystem Health organised by Environment Australia. (8 December 99)
Invited speaker at the Stormwater Management Seminar – Geelong & Ballarat (Victoria) organised by the Corangamite CMA (9 December 99)
Young, W.  Transport Planning Processes and Procedures - Gadjah Mada University, Yogyakarta, Indonesia, January

7.8. Consulting

Al-Mahaidi, R. & Tuplin, G.  Strength assessment of three RC bridges, VicRoads

Codner, G.P.  Review of methods for quantifying capacity shares, Department of Natural Resources and Environment (Vic)

Donald, I.B.  Cliff stability, Daveys Bay, Mt Eliza
Embarkment stability on soft clay – VicRoads

Haberfield, C.M.  Stability of East Arm Wharf, N.T. Department of Transport Works
Failure of Granite facades, Tress Cox & Maddox

Wong, T.H.F.  Conceptual Design of the North Garden Wetland for Ballarat City Council

Young, W.  Consultant to NRTC (Performance-based Standards for Heavy Vehicles)

Zhao, X.L.  Testing of Oktalok Space Frame Module, Spaceltech Pty Ltd
Testing of DuraGal Bracing, JIB Industries Pty Ltd
Testing of DuraGrade Bracing, Palmer Tube Mills (Aust) Pty Ltd

7.9. Professional Development

Young, W.  Professional Development Program, Monash University, February
World Masters of Business, Melbourne, May
AVCC Management program, University of NSW, June
Flexible Learning Workshop, Monash University, July

8. FUNDING POSITION

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