Dear Alumni

I am very pleased to be able to report that your School has never been in such a strong position - across all aspects of teaching, research, profile and finances. As we move to the future, I feel it is important that we acknowledge the work and tireless contribution of Scientia Professor David Waite to the School during his six year tenure as our Head of School.

The School’s focus remains firmly directed to its core business of excellence in teaching and excellence in research. By any measurement, whether it be teaching accolades, testimonials or rankings, or in research grants, published papers and higher degree student completions, the School is a great success. In the QS World University Rankings, we were ranked 17th in the world, an accomplishment of which we are duly proud. Our current success derives from the significant efforts of a great many dedicated staff and students, past and present.

Our challenges for the coming years are to continue to raise the School profile, to further develop our collaborations locally, nationally and internationally and to look for opportunities wherever they exist.

I thank you for your continuing interest in the activities and achievements of the School.

PROFESSOR STEPHEN FOSTER

School Statistics 2012

<table>
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<th>Category</th>
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SAGE merges with CVEN

After more than 40 years as an independent school, the School of Surveying and Geospatial Engineering (SAGE) will again unite with its alma mater the School of Civil and Environmental Engineering (CVEN).

CVEN Head of School, Professor Stephen Foster, welcomes the SAGE team to the School. Bringing together the related disciplines of surveying/geospatial and civil/environmental engineering within one School will facilitate interdisciplinary teaching and research activities relating to natural and engineered systems. It is expected that SAGE undergraduate and postgraduate programs, and research activities, will continue as before. Most SAGE academic, research and technical support staff will join the team at CVEN, with the exception of Professor Andrew Dempster and the research staff and students associated with the Australian Centre for Space Engineering Research (ACSER), who will join the School of Electrical Engineering & Telecommunications.

The outmoded image of the surveyor on the road with the tripod has evolved significantly with huge advances in electronic instruments for survey applications, greater use of IT, and new career options. Nowadays surveyors provide critical engineering services for all construction, mining, land development, and mapping projects. They help shape our landscape and their services underpin a broad range of economic activities.

SAGE students use robotic total stations, high speed laser scanners, satellite and radar remote sensing imagery, high precision GPS/GNSS positioning connected wirelessly to the internet, high resolution digital imagery, and powerful geographic information systems software. We have advised CVEN on the recent purchase of an Unmanned Aerial Vehicle (UAV) for mapping purposes to help us stay abreast of spatial industry trends.

“We expect our new colleagues in CVEN will be excited by the capabilities of the modern equipment and techniques we now use”, said former Head of School and current President of the International Association of Geodesy, Professor Chris Rizos.

“We are leaders in GPS positioning and applications, and we are at the forefront of developments in several new satellite navigation systems being developed by Russia (GLONASS), the EU (Galileo), China (BeiDou) and Japan (QZSS)."

UNSW graduates are driving advances in high precision positioning infrastructure which underpins many construction, mining, precision agriculture machine automation activities, environmental applications and emergency services.

“One of our current research programs is investigating the implementation of a next generation datum for Australia which provides a coordinate framework for all users; even folks with a mapping app on their mobile phone. High precision satellite positioning has forced our hand, so this new datum will take into account tectonic movement and deformation of the Earth. It’s very challenging, but we are leading the world in research in this area.”

With the current resources boom, many of our graduates are attracted by the high salaries to work as mining surveyors. There is a skills shortage and graduates receive numerous job offers even while still undertaking their studies. According to a new report by BIS Shrapnel, Australia’s ambitious 2020 industry and infrastructure development goals are at risk if the growing shortage of surveyors and geospatial professionals is not addressed. CVEN can play an important role in educating Australia’s future surveying and geospatial engineering professionals.
In February 2013 the School hosted an Innovative Industry Research Forum at UNSW’s CBD campus in O’Connell St. Over fifty industry representatives from thirty engineering organisations - from both public and private sectors – attended the Forum, meeting with senior School academics and listening to presentations from academic leaders in the fields of engineering construction and management, geotechnical engineering, structures, sustainability, transport and water engineering in all its many facets.

The sheer breadth and depth of research at the School impressed industry participants and the discipline-specific panel discussions between industry and academics were of mutual benefit. The Forum is part of the School’s vision of better communication between the leaders of industry practice and those at the cutting edge of engineering research and education.

Associate Professor Thomas (Tommy) Wiedmann, a Senior Research Scientist at CSIRO has joined the School. Tommy has long-standing expertise in integrated sustainability assessment and environmental footprint analysis – developing and applying environmental input-output analysis as part of a holistic concept to life cycle assessment, industrial ecology and sustainable consumption and production research. In 2012 Tommy received the Thomson Reuters Citation Award in Economics. He has coordinated a number of research projects funded by the European Commission and Australian and UK Governments, and led a groundbreaking research project which provided the UK’s national carbon footprint for the very first time.

Professor Brian Uy is the new Director of the School’s Centre for Infrastructure, Engineering and Safety (CIES), after serving as Professor of Structural Engineering and the Foundation Director of the Institute of Infrastructure Engineering at the University of Western Sydney. Involved in research in steel-concrete composite structures for over 20 years, Brian has co-authored over 500 publications including over 140 journal articles. Much of this research has been underpinned by competitive grant funding from ARC granting schemes and from industry, totaling more than $22 million Australian dollars.

Currently Professor Uy is Chairman of the Standards Australia Committee BD32 on Composite Structures and a member of BD90 on Bridge Structures. Back at his alma mater – (BE Hons 1 ’92, PhD ’95) where he also served on academic staff from 1999-2004 - Brian is looking forward to leading CIES to further excellence and growth.

WHAT’S NEW AT CVEN

Innovative Industry Research Forum

Sustainability Appointment

New Director for CIES
Why civil engineering

My understanding of high level maths and sciences started late in high school and I think a new HSC subject called ‘Engineering Science’ really catalysed my interest in Civil Engineering. I was fascinated by the link between materials and physics and when I realised civil engineers used maths and physics to design high-rise structures, I was hooked.

Clearest memories of School days

Bonding with fellow students helped me get through the course in four years, and thus collaborative teamwork became the foundation of my career. Room 609 was a smoky focal point; CIVSOC was a powerhouse; and the Uni bar is still a significant personal memory where I met my future wife, Lyn. Neil Mickleborough and Ian Gilbert were influential in my understanding of concrete but it took me years to understand just what Ray Lawther and Francis Tin-Loi were really on about!

Career rewards and challenges

I remember catching Peter Kneen wandering around a stadium membrane roof in KL and a Malaysian student colleague at a site meeting on a remote port project in Borneo. I am blessed to have gained experience consulting on complex projects around the globe from New York City’s water supply tunnels and LNG projects in Russia, to hydroelectric projects in rural Uganda. Each presented its own particular technical challenges overlaid with understanding local regulatory requirements.

Engineers will need to be flexible and adapt to inevitable global market changes and shifts in technologies. We will need to step up, guide and influence our leaders as technical stewards of our built environment.

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I had a real desire to do some further study and was fortunate to have a timely conversation with Prof Robin Fell who had developed a funded research plan to explore issues of landslide risk. Following the Thredbo landslide of 1997, this was a topical area for geotechnical engineers and asset owners such as road agencies and water authorities.

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Why civil engineering

As a young boy I looked up to my two successful Civil Engineer uncles as role models. That led to me finishing a BSc in Civil Engineering at Tehran University. I developed a strong interest in structural engineering which led me to complete my postgraduate degrees at UNSW as an overseas student. I chose UNSW for the reputation of its academic staff and its diverse research programme. Living in Sydney turned out to be even better than I expected.

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Amongst other things, I recall the supportive academic staff (Dr Ray Lawther, in particular, who was always willing to help with a tricky technical question); conversations with my fellow PhD students that made our studies a less lonely experience; and the view to the south from the sixth level of the Civil Eng building particularly when the planes were landing and taking-off at Sydney Airport in the evening.

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Engineering challenges of the future

Engineers need to be able to think in terms of materials use, alternative technologies and energy consumption. Smarter design and genuine game-changing innovation is the real challenge for us.

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Survey camp was great fun. I remember three women shared a cabin and in our spare time we competed to see who could fit through a wire coat hanger. One of the guys was far more adventurous. There was an excursion to a nearby pub, and a dare that ended in a naked man jumping up and down outside our cabin when we answered the door.

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In 1988 I shared the role of project structural engineer for the Sydney Opera House Upgrade. We developed packages of work for design and construction with a $40 M budget estimate. I protested at a proposed halving of the budget, and funds were retained. It is very rewarding to know that the final cost of the works, completed eight years later, was indeed $40M.

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There are now numerous specialisations within civil engineering. This creates a large number of interfaces. Ideally we need people who are across more than one specialisation, so that there are no omissions at the interfaces. I would also like to see compulsory training introduced in people management for all people required to lead a team.

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To be frank, I remember excellent academic staff (Professor Ian Lee, Ian Cordery and Ken Faulkes to name a few) and somewhat idle students, myself included. Mid career, I spent 12 rewarding years on the School’s staff. It struck me that the students were much more motivated and focused.

Career rewards and challenges

Two projects with very challenging technical problems are especially memorable: Working with an international team on re-engineering the North Rankin A platform in the early 1980s, and managing to get Burnley Tunnel re-opened in less than a week when the side wall failed in 2000. More recently, I have had to challenge a number of orthodoxies and have managed to take multiple technical reviewers on the journey.

Most rewarding? That’s easy. Working with very bright and motivated young engineers.

Why civil engineering

I thought that civil engineering would be a creative profession that suited my competencies. I won a cadetship with NSW Public Works and, as I was keen on surfing, upon completing my undergraduate degree at the University of Sydney I opted to commence work in the Harbours & Rivers Branch. My supervisors encouraged me to undertake a Masters Degree specialising in Water and Coastal Engineering at UNSW.

Clearest memories of School days

I was studying subjects in the Masters Degree part time and at night. There was little opportunity to engage in the University lifestyle doing it that way. Nevertheless, we had a most notable lecturer, Doug Foster, a towering intellect and a regular bloke who, after the lectures, would take us down to the pub where the discussions continued.

Career rewards and challenges

The most rewarding aspect of my career to date was undertaking original research and development in coastal engineering for NSW Public Works. This comprised hydrographic survey, metering of currents and waves, diving, sediment sampling and sedimentary geology with experts from the NSW Mines Department. The biggest challenge was establishing a coastal engineering section within the Dubai Municipality of the United Arab Emirates.

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Undoubtedly tapping into the rapidly advancing technology will be the greatest challenge of the future, but it will also provide the greatest opportunities. Smart roads, smart water systems, smart buildings, advances in computing power and faster communications will all fundamentally change how we address future problems.

To be perfectly honest, I don’t think that I chose Civil Engineering for any of the right reasons. I grew up in rural northern NSW and realised I was not suited to that life. Engineering was therefore an obvious choice, as it required leaving home to study in Sydney.

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Early in my career I realised that engineering isn’t all about formulas and problem solving. It’s also about effective communication. Engineers soon learn that we are required to write well and deal with our aversion to public speaking.

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The American Society of Civil Engineers recently elected Professor Mark Bradford (DSc ’98) to the grade of Distinguished Member, the second Australian ever to be so honoured. Mark, Research Director at the School’s Centre for Infrastructure Engineering & Safety (CIES), acknowledged the great honour attached to the award noting, ‘The Distinguished Membership is an acknowledgement of the cutting edge research being undertaken in structural engineering in Australia. The team I work with punches well above its weight in delivering research outcomes on the international stage, in fundamental mechanics, structural and computational mechanics, experimental techniques and in influencing industry practice.’

Dr Robert Care AM, (BE Hons ’73, PhD ’78) was recently given a special international UNSW Alumni Award by UNSW Chancellor Mr David Gonski for his outstanding achievements and leadership. Chair of the UK Middle East Africa Division for the Arup Group, Robert currently lives in London but was able to be in Sydney to personally receive his award. Last year Robert was awarded an Order of Australia (AM) in the Queen’s birthday honours for services to engineering, the business sector, international humanitarian programs and the sport of athletics. “There are huge possibilities ahead for engineering.” Robert said. “Whether it is resource scarcity or security (water, energy, food etc) or climate change, the challenges are immense. Engineers have to ensure they are not just talking to themselves,” he said. “This indicates a change of emphasis in the engineer’s role and the engineer’s education.”

John Hodgkinson (BE ’68), an Australian road pioneer of concrete pavement technology, was awarded the 2012 Roads Australia Award for technical excellence. John has been a leading figure in the road transport sector for more than 30 years, and is responsible for introducing new technologies in design, pavement materials and repair methods, including rapid slab replacement. He was instrumental in the use of ‘cross stitching’ on the F3 in the 1980s – a method that is now a standard technique used by maintenance managers.

Professor Kurt Lambeck (BSurv Hons 1 ’63 University Medal) has recently been awarded the Legion of Honour – the highest decoration in France – in recognition of his contribution to the field of science. Lambeck first visited France in the 1970s to help set up the French (CNES) program in space geodesy – particularly in the area of geophysics, and worked for many years at the Institut de Physique du Globe (IPGP). Immediate past President of the Australian Academy of Science, in late 2012, Professor Lambeck was awarded the 750,000 Swiss Franc Balzan prize for Solid Earth Sciences of ‘exceptional contribution to the understanding of the relationship between post glacial rebound and sea change levels.’

Van Mai Nguyen (BE Hons 1 ’03) has been shortlisted as one of six successful women engineers for the 2013 UK First Women of Engineering supported by the UK Institution of Mechanical Engineers. Mai, an international student from Vietnam and graduate of CVEN, is currently a civil engineer for London Bridge Associates. She has been nominated for her achievements in tunnelling expertise, and for her work in helping city planners recognise its potential for sustainable urban development.
A near decade-long restoration project of a Hunter Valley wetland has earned a team of engineers from the UNSW Water Research Lab, Manly Vale a National Trust Heritage Award for environmental conservation.

Natural hydrology has been restored to roughly 600 hectares at the Tomago Wetlands just north of Newcastle, and locals have begun seeing the return of migratory wading birds – an important indicator of improving ecological health.

“In 2004 this whole area was completely dry and looked like a farm paddock,” says Dr William Glamore, lead project engineer.

“Extensive flooding in the 1950s resulted in short sighted drainage infrastructure being installed over the next two decades. These drainage lines were essentially ditches with floodgates that closed when the tides rose, and while they allowed freshwater to escape, they prevented the water from re-entering the wetlands, which was very detrimental,” he says.

The site is now part of the Kooragang Nature Reserve, which is recognised under an international convention dedicated to the protection of wetlands.

As part of their restoration project, Glamore and his team from UNSW have developed an automated floodgate system called SmartGate, which controls, at various points, the volume of water re-entering the wetland.

At this particular site, researchers want to create a saltwater marsh to attract migratory wading birds. This means allowing just enough tidal water in, but not so much that it fosters the growth of mangroves – which deter the birds – or encroaches on farmland beyond the perimeter of the wetland, as this could pose problems for agricultural productivity. The engineers also want incoming saltwater to neutralise the sulphuric acid in the soil.

Construction of the third and final stage of the restoration plan is now underway and proceeding well. The project also involves the NSW Parks and Wildlife Services and NSW Fisheries.
Online Registration

The CVEN Alumni Registration is a contact point between the School and our graduate community. We would like to keep in touch with our graduates so that you can be kept informed of key developments in the School. School Alumni can perform an essential on-going contribution to the School in the following ways:

- Feedback on School direction and areas for improvement.
- Participate in School programs and processes including curriculum review, student mentoring, raising participation rates of women in the BE programs, fundraising, supporting industrial training, and other relevant activities.
- Provide financial or mentoring support for students as in CEVSOC (undergraduate society), or CERSA (research student society) activities.
- Attend research or industry seminars.

Please let us know where you are by filling out the online Registration form. [http://www.civeng.unsw.edu.au/information-for/alumni-industry/alumni](http://www.civeng.unsw.edu.au/information-for/alumni-industry/alumni)

You will receive a copy of the biannual CVEN Newsletters and our Annual Report.

Please note that due to IT changes our old online alumni registration data has been archived. We therefore invite all our alumni to re-register with your up-to-date contact details.

Trends in the School Profile

<table>
<thead>
<tr>
<th>STUDENT NUMBERS</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
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<tbody>
<tr>
<td>Total EFTSU*</td>
<td>592</td>
<td>669</td>
<td>805</td>
<td>985</td>
<td>1172</td>
<td>1312</td>
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<tr>
<td>BE</td>
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<td>1173</td>
<td>1307</td>
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<td>1509</td>
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<td>287</td>
<td>322</td>
<td>329</td>
<td>345</td>
<td>358</td>
<td>391</td>
<td>454</td>
</tr>
<tr>
<td>GradDip/GradCert</td>
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<td>25</td>
<td>30</td>
<td>40</td>
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<td>56</td>
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<tr>
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<td>70</td>
<td>72</td>
<td>60</td>
<td>88</td>
<td>102</td>
<td>121</td>
</tr>
<tr>
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<td>6</td>
<td>5</td>
<td>5</td>
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<td>PhD</td>
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<tr>
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<tr>
<td>BE (Civil)</td>
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<tr>
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<td>23</td>
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<td>54</td>
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<tr>
<td>BE (Civil with Architecture)</td>
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<table>
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<tr>
<th>STAFF (Full-time, tenured)</th>
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<td>Technical (School)</td>
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<td>12</td>
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<tr>
<td>Administration (School)</td>
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<td>8</td>
<td>9</td>
<td>10</td>
<td>9</td>
<td>12</td>
<td>12</td>
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| STUDENT/STAFF RATIO        | 23.7  | 26.8 | 28.8 | 32.3 | 39.01| 41.0 | 39.2 |

* Effective Full-Time Student Unit