

Civil Engineering

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**Ali Naidu –
SAICE 2010 President**

Focus on Joint Civils Division

**CANDIDATE ACADEMY
TO BE LAUNCHED**





Sepeidi

ON THE COVER

Ali Naidu – SAICE 2010 president



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PROFILE

"I'm not a complicated person; I live my life by simple truths," says Aligasen Naidu, President of SAICE for 2010. Honesty, integrity and ethical behaviour are for Ali 'simple truths' in an era where such character traits often are sacrificed on the road to power and profit. "I detest dishonesty in people... it's almost as if you've erected a stone wall in front of me when I realise that you have not been candid with me," he says with earnest conviction. Although reserved by nature Ali expresses himself without hesitation when it comes to matters of principle and other issues close to his heart. This was clear when he spoke to Lorraine Fourie about the highlights marking his professional and personal life

An unpretentious view of life



STACCATO ROAD TO CIVIL ENGINEERING

Ambalavanan Moganna Naidu – to quote the full complement of names his parents bestowed on him – grew up in Durban in the 1960s and 70s, entering the University of Durban-Westville in 1980.

"If you had asked me at school whether I wanted to do civil engineering I probably wouldn't have known how to spell it in the first place, never mind knowing what it was all about," Ali says with candour.

He came from a family of artisans, with the new generation pursuing traditional professional careers in educa-

tion and law, and was the first one who wanted to follow a career in the engineering profession, initially vacillating between medicine and engineering. His generation also experienced the turmoil of the politico-educational upheavals of the time, which led to Ali not completing his first-year BSc studies. "In 1981 exactly the same thing happened," he continues. Eventually the disruptions and lack of steady learning progress made him apply for enrolment at the University of Natal, for which he had to obtain ministerial permission. By this time he had settled on civil engineering as a career.

INTO WATER AFFAIRS BY DEFAULT

By 1984, when he graduated with a BSc Eng degree, the country had entered an economic recession. "Very little work was coming out of Natal, so I decided to move up to Johannesburg to see whether I could find my fortune there," Ali says. He shared lodgings with a friend. One evening a group of them sat chatting and surprise was expressed that there were no vacant positions for young engineers. "One of the guys, who had a friend working in the Department of Water Affairs and Forestry (DWA), challenged his mate to find me a job.



- 1 Ali Naidu, SAICE 2010 President, with wife Sarmashni and daughter Kaira, at the Niagara Falls
- 2 Ali and family in Toronto
- 3 Ali being 'capped' as President-Elect for 2009 at the April 2008 SAICE Council meeting by the then President Johan de Koker, with 2009 President Elsabé Kearsley looking on

understand where engineers fitted in, even though I had a civil engineering degree. I also learnt about the Afrikaans culture, the English culture, how to interact at that level, and how to separate the people from the job.”

Emerging wiser and more astute after this steep personal learning curve he joined Van Wyk & Louw Consulting Engineers (later Africon and now AURECON) in 1987. “I think I was probably headhunted... people were getting curious about ‘other’ engineers,” he says, grinning slightly.

GAINING STRUCTURAL ENGINEERING EXPERTISE

Ali was interested in design work, which he was given the opportunity to do at Van Wyk & Louw’s Pretoria office. He worked on various water schemes, mainly on the civil side, designing access roads to several dams of which the largest and most formidable was the Katse Dam in Lesotho. “Apart from the engineering challenges which the job presented, it broadened my interaction with engineers of my own age and different cultures.”

It was only when he asked for a transfer to the company’s Johannesburg office that Ali felt fully at ease, finding his niche in the corporate arena. “Johannesburg was a very different environment,” he says. He singles out the design of the Rietvlei Recreation Centre as a valued accomplishment at that stage of his life. “Once again, my involvement occurred almost by default. The structural engineer on the job was transferred and I inherited the project. It was a golden opportunity, because it was an important project to be given to handle as a youngster. It took our team close on three years to see it through to completion, allowing me more exposure to the structural engineering environment.” Other large industrial and commercial structures followed, among these the Johannesburg Civic Theatre and the Technikon RSA, all undertaken in the mid-80s.



Not holding out much hope I returned to Durban, when I was called up for an interview in Johannesburg. I attended and was successful to be appointed in the Planning Directorate of the Department of Water Affairs.”

As a graduate engineer he gained knowledge of the water resources planning. But Ali found the civil service an ‘uneasy’ working environment. “There wasn’t much work for me to do and I felt as if I was being tested for acceptance by other race groups at a time that DWAF did not employ people of colour.” Powerless to change the system single-handedly he dealt with the situation

by withdrawing into himself, feeling remote from his co-workers. “Because of the socio-political situation, I had grown up in a culture that was largely inward-focused, where we lived and socialised amongst ourselves. So this was a completely new experience for me,” he explains. “In later years I often told people that my first interaction with a white person was at age 21 and I was then 23 years old.” Though he left Water Affairs after 13 months he recognised that he had learnt a lot during that term. “It taught me about the system and the role of engineers in society. Previously I didn’t really

LEADING MULTIDISCIPLINARY TEAMS

In 1988 Ali joined the Engineering and Projects Division of South African Breweries (SAB) as design engineer and project manager. During his seven years at SAB he acquired the skills needed to manage and lead multidisciplinary industrial teams. He also added a postgraduate degree in Project Management from the University of the Witwatersrand to his qualifications in 1993.

Among the SAB capacity-building programmes that he project-managed he highlights the expansive Alrode project, where his responsibilities included design and site monitoring of the structural and civil design. "The development comprised a packaging hall, fermentation cellar, warehouse, a general purpose building, and site infrastructure," he

4 Ali, who enjoys travelling, pictured here in San Francisco

explains. "Capital investment was in the order of R1-billion, which in those days was a substantial amount."

SAB's expansion programme included putting up breweries throughout southern Africa. Ali, as part of a multidisciplinary team, was Lead Engineer on the structural engineering side and his work took him to construction sites in Durban, Prospecton, Cape Town, Rosslyn, Kgalagadi brewery (Botswana), and Maluti Mountains brewery (Lesotho).

THROWING IN HIS PLIGHT WITH PDNA

When SAB, for economic reasons, revised their expansion plans in 1993, Ali was offered alternate positions outside the country, which he declined. "It was on the eve of South Africa's first democratic elections and I was really looking forward to being part of the development and growth of this country," he says.

Still under wraps at the time was the fact that he had been doing work for PD Naidoo and Associates (PDNA) in his spare time. Ali recounts how he came to meet PDNA founder and chairman Dempsey Naidoo: "It's a strange story, but it's true. I had met Dempsey as early as 1986, when I first came to Johannesburg. One Sunday afternoon I was driving through Lenasia South when I saw a signboard inscribed PD Naidoo & Associates. I thought to myself: Ah, another engineer, and apart from being Indian he's also a Naidoo/Naidu. I took down the telephone number and called on Monday, introducing myself. Dempsey, quite surprised, said, let's have a chat – and that's how a long-lasting working relationship and friendship started."

Throughout Ali's years at Van Wyk & Louw and SAB, the two men were exchanging ideas, with Ali doing part-time design work for PDNA over weekends. "So when the crunch came at SAB, Dempsey and I said, 'Let's give this consultancy one big bash', and that's when I officially joined full-time, in August 1994."

Assisted by a small number of hand-picked people, Dempsey and Ali, who assumed the role of Managing Director of PDNA Consulting Engineers, started pushing the civil engineering practice. As MD, Ali's primary responsibility was the technical delivery and operations of the business. Among the structural projects handled he rates the Rosslyn expansion project, Grinaker Office Park, Gold Reef Casino, and various civil services and municipal engineering projects as of special interest because of the expertise gained from diverse engineering design requirements.

Referring to the provision of basic infrastructure, he calls to mind the first public sector project awarded to PDNA – the replacement of asbestos water mains in Vosloorus – and his early days in Johannesburg performing status quo studies of sparsely serviced areas. "I valued the role I could play in the social sphere: my participation in community meetings, public hearings, shaping politicians' attitudes, business facilitation and transformational facilitation," he says.

His design and management of rural water schemes stood him in good stead when he was contracted to formulate a business plan and evaluation and monitoring programmes for Consult Consortium, a private company appointed



by DWAF to provide basic water and sanitation works in Mpumalanga. "Consult Consortium was responsible for approximately R150 million of rural water infrastructure, and had the added responsibility to ensure that institutional and social development, operations and maintenance were addressed," elaborates Ali, who served on the Board of the Consortium.

A LATE STARTER

As for his personal life, Ali admits to being a late starter. "I only married at the age of 37. It was important to me to build a career first. In any event, it turned out to be good planning, because by the time I got married I had a greater degree of security in my life," he smiles.

The game of cricket brought Ali and Sarmashni together. "In Natal I used to play a lot of premier league cricket and I missed it very much when I came to Johannesburg. In time, a group of us started a cricket club which grew and came to be called the Johannesburg Cricket Club. Sarmashni was part of the circle of enthusiasts who gathered over weekends to watch the game." They were married in 1997 and she has formed a balancing factor in his life ever since.

Ali continues: "Especially in those first years she represented a very secure component, because she had already built a stable career in IT while mine was still risky at times." During their courtship the couple discovered that they had lived in the same area in Durban, but had never met in those years. "With Sarmashni about ten years younger than me I had long gone from the neighbourhood when she was still growing up," he explains. The couple has a daughter Kaira, who is now five years old.

ESPOUSING THE TEAM CONCEPT

Together with Dempsey, Ali has been instrumental in building a company with the right character blend for success. "Our first objective never was to promote our individual careers, but to build an organisation with a legacy into the future. If we were only interested in achieving success in the present day and age, then Dempsey and I might as well have pocketed the money and walked."

Possessing divergent temperaments, strengths and skills, the two men are a very balanced duo heading PDNA. "Where I would hand-pick people from

the industry whom I believe meet the requirements for the task at hand, Dempsey complements me in summing up their characters. We have always believed you can buy and you can build technology but you can't build character," he says with sincerity. "Dempsey has a good visionary faculty; I've got an eye to transform that vision into a practical reality," Ali articulates the hallmark of PDNA's operation through the years. "We've often been called the twin towers... because we co-exist in so many respects."

Ali was appointed CEO of PDNA (Consulting Engineering) in 1999 and he is currently Group CEO, with Dempsey in the Executive Chair. He serves on the Board of PDNA Holdings, as well as the boards of PDNA Consulting Engineers, PDNA Industrial Projects, PDNA International, PDNA Investments, Sage Computer Technologies (Chairman) and PDNA Properties (Chairman) – all enterprises that were developed from grassroots by the parent company.

During the past ten years he has been actively developing the airports construction capability within the group, bringing it on a par with international norms and standards. Sustained by effectual planning and implementation resources, this division has been responsible for several of the new aprons, taxiway extensions and retail areas at the former Johannesburg International (JIA), now O R Tambo Airport, as well as King Shaka International Airport, Durban, where he is leading the engineering joint venture. Following on the JIA infrastructure, Ali's strategic input was central in the concept planning of the adjacent JIA Industrial Park, Beluluane Industrial Park in Maputo, and the Automotive Supplier Park.

CHOOSING SAICE

As committed as he is to upholding the ethical fibre of the company he has helped build, so strongly does Ali feel about the role he is able to play in SAICE.

"You might be surprised to know that I've been a member since 1984 – initially a student member after some professor at university shoved an application form into my hands." He considered resigning at one stage, but together with a few other historically disadvantaged civil engineers he decided to draw on the resources offered by organisations such as SAICE to help open up the

profession for the good of the greater South Africa. "Remember, we were the first generation of black professionals who had the opportunity to achieve our objectives on a level playing ground, and it is important for us to serve as role models for upcoming young engineers. The ethics, the moral values, those simple truths that I adhere to, are elements that have to be passed on. Secondly, I wanted to give something back to the profession, and when I had to decide which institution I feel most indebted to I chose SAICE. So from 2000 onwards I slowly found my way up the rank and file of the Institution."

In Ali's presidential year the sustainability of the environment, within the broader hypothesis of the effects of climate change, will rank high on the agenda. "I do not profess to be the doyen of greenness theories, but we have to find relevant ways to address the issue, in the process maintaining the right balance between progress and preservation. Our approach in Africa may, at present, not be on the same level as that of the Western world but our objectives and targets are no less pertinent."

STABILITY IN FAMILY LIFE

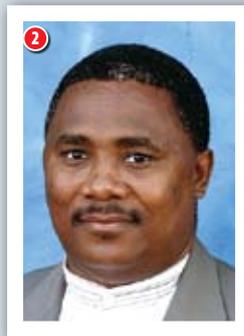
Home is the environment where Ali best relaxes – especially in the kitchen. He and Sarmashni love cooking together; cuisine varies, but Indian food still tops the list. "You will always find us chopping tomatoes, onions and so forth," he smiles. According to Sarmashni, breyani and curry is Ali's favourite recipe.

The couple complement each other well: In Ali's words Sarmashni is the "bubbly one – where there's a party, you'll find her at the centre", while he tends to be more reserved, though his professional position requires him to be in the public eye.

Since the arrival of Kaira, who is in pre-primary school, Ali tries to spend as much time as possible with his daughter. "I tend to go to office early in the morning and get my work done so that I can have quality time with her while she's still awake in the evening."

To Ali the family is the place where one's principles have their origin and he looks upon his own integrity with pride: "You can ferret around; you will find zero that is questionable." This is the yardstick by which he measures himself and others. ■

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OPINION

Climate change engineering

AFTER DENYING THE reality of climate change for decades, thousands of scientists, politicians and activists flocked to Bali three years ago to exchange data and opinions on climate change. I had earlier attended over half a dozen other global UN conferences on human settlement and the environment, and attended the Bali meetings in the hope of learning more and developing my contacts in disaster risk reduction. I was, however, poorly prepared for the enormity and gravity of the threat to our future that climate change poses. It is not just about carbon trading, environmental correctness or human settlement comfort, but about the risks of lethal destruction of our basic living conditions. The simple belief that retaining some forestation and reducing emissions will do the job ignores the severity of the danger we have created. The threat is not limited to the destruction of the orang-utan, the gorilla and other endangered species, but concerns the survivability of human life as we know it.

It is so serious that now even the politicians and industrialists in the U.S. have changed their minds. They have participated in the second global UN meeting in Copenhagen on climate change and came up with the brilliant idea of telling Indonesia to turn its palm oil estates into forests again and telling Brazil to forget about using the Amazon River. In France

and in this country we might as well ask wine farmers to plant trees in the vineyards and make forests again of the lush sunflower fields, or to bring the forests back to cover today's sugar plantations. Carbon trading is seen as a clever way of seeking permission to keep polluting and paying China, Brazil and Indonesia to refrain from economic development.

For all the political wrangling in Copenhagen, we are indeed facing very lethal threats. Yes, we must try to counter climate change, but for a long time to come we will face quite horrendous disasters due to the growing natural hazards we have caused. The UN is now mentioning the danger that as many as 200 million people may become "environmental refugees". Although South Africa has gracefully absorbed a few million refugees from Zimbabwe so far, it has not developed the knowledge and tools to take care of the 20 or 30 million Africans who may soon be knocking on our doors. The European governments are already desperate to stem the present flow of a few thousand Africans trying to land on their shores, but what will South Africa do when tens of millions of desperate and hungry neighbours arrive? How will South Africa keep its rivers under control when the evaporation rates of the surrounding oceans multiply the precipitation over its lands? How will South Africa

tame the droughts in between, which will destroy its already arid and marginal soils? Do we train mitigation engineers who can handle such threats? Climate change is real and it is here already. Climate change engineering, however, is not a part of our present curriculum.

Pollution resulting from human activities, in particular from airborne emissions, has now been accepted as the leading cause of climate change. Global warming is resulting in the melting of polar icecaps and glaciers, which results in a radical reduction of water supplies in high-altitude regions. Rising sea levels are threatening survival possibilities in coastal areas and already bringing salt water intrusions into many river delta areas and engulfing islands in the Pacific and Indian Oceans. Weather patterns are changing with a shifting of the position of the main energy-distribution systems on our planet, i.e. the ocean currents and the high-altitude air flows, the so-called "jet streams". Weather as we know has been severely influenced: monsoons, floods and droughts are no longer following the time schedules and routes we have become accustomed to. Small increases in ocean temperatures result in much higher evaporation rates, which in turn bring huge quantities of rain to the land masses. The changing air and ocean currents release massive precipitation to new locations and

are also altering the seasonal patterns on which much of our food production and settlements depend. We have changed the conditions that made monsoons reliable production factors in tropical agriculture. In many countries, including South Africa, fresh water supplies are under threat. We have removed so much of the vegetation cover of the land that water runs off before it can be retained by the soil.

Droughts are now visiting new regions of Africa, previously safe from droughts. Fluctuations in temperature and humidity are the key factors in locust breeding – are we prepared? Groundwater levels are falling, soil erosion washes and blows away the good earth on which we depend. South Africa currently gets much of its energy and water from its poorer neighbours, Mozambique and Lesotho. South Africa as a country may indeed be wealthy, but it will be very difficult to mobilise its poor, semi-literate rural population to combat risks they do not understand. “Service delivery” is the anthem, not production or social and environmental accountability. Unlike other African countries, there is little experience in self-help and an incredible dependence on the government. It seems that in comparison with other African countries, South Africa is very poorly equipped to meet the challenges brought about by climate change.

Man did not need climate change to cause more disasters. Many other human activities have already increased the impact of natural hazards: rapid unplanned urbanisation, deforestation, depletion of other vegetation covers, reckless resource extraction (such as increased groundwater extraction), increasing water and energy consumption and rapid population growth have all contributed to the increasing frequency and occurrence of disasters. Other human activities have caused further vulnerability to our misuse of resources: war and other conflicts are causing massive human displacements and endangering flora and fauna on a global scale.

The UN has launched significant changes in national planning policies by establishing risk-reduction authorities throughout Africa and Asia. South Africa was the third African country to adopt a disaster management act. But in spite of these efforts, disasters are on the rise. Climate change has arrived and it will take sustained global interventions to lessen it. In the meantime, the growing disasters have to be contained. For all the

international struggles to reduce carbon emissions, disasters are endangering entire populations. The case for developing new methods in disaster mitigation is indisputable. The topography of much of Africa has lost a great deal of its resilience to deal with the huge increases in floods and droughts, so that major land and settlement modifications are needed to protect the peoples of Africa.

South African engineers, architects and urban planners are poorly equipped and lack the professional knowledge to fulfil these tasks. The question is now: are the academic institutions in Africa willing and able to provide the knowledge to meet the challenges of climate change and risk reduction? Or will the African universities again wait to receive instructions from their colleagues in the North on how to protect their land and populations? The Netherlands have already toiled during the last ten years to deal with rising sea levels and have just completed major storm barriers and retention areas that will keep it dry, even when the seas rise a full metre.

Few civil engineers, architects or urban planners here have bothered to learn about the future challenges for their profession that climate change entails. It is often seen as a remote threat to other countries. Melting ice caps do not seem to pose a threat to South Africa, rising ocean temperatures do not seem to require much engineering expertise. Many colleagues believe that climate change will go away, although it may, luckily enough, yield new international funding for some projects for a few years. “After ten years it will be forgotten and the UN will find another theme to focus on,” some say. Climate change is the result of a century of abuse of the atmosphere and it will not go away in a decade. It is not just a threat to a few island dwellers out in the ocean, but is affecting us all.

There is a dire need for topographic modification: the present river systems will not be able to absorb the increased precipitation safely, as we saw in the Limpopo and Zambezi Rivers in 2000. Obviously, major retention options will be needed to prevent such disasters from happening again. Terracing and reforestation of hillsides as done in Cape Verde are rare here. South Africa needs to recharge its groundwater considerably; it needs to protect its soil from parching and wind erosion. Environmental engineering is of critical importance, but the government

There is a dire need for topographic modification: the present river systems will not be able to absorb the increased precipitation safely, as we saw in the Limpopo and Zambezi Rivers in 2000. Obviously, major retention options will be needed to prevent such disasters from happening again. Terracing and reforestation of hillsides as done in Cape Verde are rare here. South Africa needs to recharge its groundwater considerably; it needs to protect its soil from parching and wind erosion. Environmental engineering is of critical importance, but the government is not willing to maintain the academic positions, established earlier with private donations, to provide such knowledge, in spite of the spectacular recent inflow of students to that field of specialisation

is not willing to maintain the academic positions, established earlier with private donations, to provide such knowledge, in spite of the spectacular recent inflow of students to that field of specialisation. When the tsunami hit Asia, the National Disaster Management Centre in South Africa declared in a startling broadcast that this country is not vulnerable to tsunamis. Was this country seen as having special divine exemption from the laws of nature and the seas to claim such invulnerability? Denialism is obviously not limited to HIV/AIDS!

How many retrofitting techniques are South African engineers learning as cyclones are bound to increase in the region? How well are they trained in the flood-proofing of settlements and dwellings? How well are we protecting the coastline when mangrove swamps are allowed to make way for fish and shrimp farms? Do agricultural engineers learn about desertification? The mandatory disaster plans that all municipalities must deliver as part of the annual Integrated Development Plans (IDPs) pay attention to

emergency response, but do not contain much concrete mitigation planning. Who is guiding local government in mitigation work when the Disaster Act does not really define what it means in engineering and planning terms? Climate change engineering should be developed to equip engineers, architects, urban planners and agricultural engineers with the tools to develop mitigation works that will keep us safe while climate change is developing.

Sitting between two warming oceans, South Africa should think through the consequences of increased precipitation, spreading droughts and loss of topsoil. Run-off increases aggravate the water deficit. The present limitation of forest development may in the short term improve water use, but this measure does not increase the retention capacity of the land that is so desperately needed. It is a frightening example of short-time gain and long-term loss.

South Africa is not a Pacific island, but the confidence about its invulnerability is hardly justified. The professional development of physical planners will

be vital to keep the region safe. Climate Change Engineering is hardly a luxury for this region. Mitigation engineers will soon be needed to design and implement the environmental changes that will allow the next generation to enjoy the beauty and safety of this country. □

ODPA Training Modules under development:

- Climate Change – Hazards and Vulnerability
- Carbon & Energy: Human Settlements in Climate Change
- Land Use and Environmental Protection
- Mitigation in Structural Engineering/ Retrofitting
- Hydrological Risk Management
- Coastal Risk Management
- Water and Sanitation in Emergencies
- Public Health in Climate Change
- Climate Change-Induced Forced Migration
- Community Participation and Training
- Community Management for Environmental Change



JOINT CIVILS DIVISION

Joint Civils Division Chairman's Report 2009

THE FOCUS

The Division's Mission and Vision, which were developed from the Agreement of Cooperation between ICE (Institution of Civil Engineers, London) and SAICE, provided the focus for the 2009 calendar of events. In summary the primary objectives are to:

- Promote and communicate ICE and SAICE publications, programmes and best practices initiatives
- Perform the normal ICE country representative services
- Organise and publicise the Brunel International Lectures
- Perform learned society activities that are of mutual interest to both ICE and SAICE with particular emphasis on matters of international importance
- Be the home of the NEC suite of contracts and provide education and training for South African users
- Arrange ICE-SAICE presidential visits
- Be the vehicle to adapt UL systems for South African applications.

DIVISION ACTIVITIES

The website was further developed and populated during the year to make it the primary source of the Division's interface with the membership.

Lectures were arranged in Gauteng and Cape Town in conjunction with the local branches. Topics included sustainability, dispute resolution, the economic outlook, risk management and the NEC.

Site visits included the Gautrain construction project, which was extremely well attended, and more recently the completed 2010 Soccer City Stadium.

The Division hosted the Brunel Lecture in Cape Town, entitled "Entering an Ecological Age – the Engineer's Role", presented by Peter Head OBE. The topic attracted a wider audience than engineers and was particularly well attended, with more than 120 participants.

During the year a decision was made to invite Dr Martin Barnes CBE, the originator of the NEC, to South Africa. Dr Barnes, President of the Association of

Project Managers, was the key speaker at a construction symposium at the University of the Witwatersrand on 25 August 2009.

Other speakers included Professor Yunus Ballim, Spencer Hodgson, Jerome Govender, Dr Sean Phillips and Professor Raymond Nkado. The afternoon session was particularly well attended, with 170 delegates. The event was supported through sponsorship by the major construction groups.

On 26 August 2009 Dr Barnes, together with Andrew Baird and Dr Ron Watermeyer, presented a very successful one-day session on getting to grips with the NEC Engineering and Construction Contract.

The combination of international best practice, coupled with local input, appears to be a successful recipe for future seminars.

The Division has continued to fund the localisation and publication of CESMM3. It is anticipated that with the finalisation of the earthworks section the document will be published in early 2010.

The 2nd Middle East and Africa Convention, "Accelerating infrastructure delivery – improving the quality of life", was held in Cape Town on 15 January 2010. The hosting of this event was a milestone for the Division. Delegates from the UK, from all over Africa and from the Middle East attended and were addressed by various speakers from the UK, Singapore, Dubai, as well as South Africa

The NEC list of adjudicators has been updated and is available on the website (www.jointcivils.co.za). With the assistance of the Division, the *New Civil Engineer* produced a very positive article on infrastructure development in South

Africa. The committee received positive feedback from both the local and international engineering communities.

2010 AND BEYOND

The 2nd Middle East and Africa Convention, "Accelerating infrastructure delivery – improving the quality of life", was held in Cape Town on 15 January 2010. The hosting of this event was a milestone for the Division. Delegates from the UK, from all over Africa and from the Middle East attended and were addressed by various speakers from the UK, Singapore, Dubai, as well as South Africa. The event provided the opportunity for the respective presidents of ICE and SAICE to further cement the good working relationship between the two institutions. Professor Paul Jowitt, President of ICE, remained on in South Africa to host the President's Apprenticeship Scheme in Durban.

The success of the "Martin Barnes" event has contributed towards directing the focus for 2010. The Division is plan-

ning to host a similar event next year.

Learned society activities are set to continue with a focus on international content. These activities will again be hosted in conjunction with local branches and other divisions.

The Division is seeing an increasing number of requests for the ICE Professional Review in South Africa. Addressing this is a major challenge facing the committee. The solution will depend on the number of candidates seeking accreditation on an annual basis.

The Division's focus remains on providing service to membership of both institutions, and the committee looks forward to the challenges of delivering that service in the year ahead.

APPRECIATION

I wish to extend my personal appreciation for the support over the two years as Chairman and for the energy and enthusiasm displayed by the committee members in undertaking their voluntary duties. ▣



News from the JCD secretary's desk

EVENTS

The Joint Civils Division (JCD) has managed another bumper year of events and happenings. It has organised and hosted several very high-profile events around the country. Notable among these events were the Brunel Lecture, presented by Peter Head in Cape Town and Johannesburg, the hosting of a one-day event with Dr Martin Barnes,

the originator of the NEC, support for the Wits Construction Symposium entitled "The Project Management Profession: Adding Value", as well as several very thought-provoking lectures in the JCD Lecture Series.

The JCD also arranged two site visits to the Gautrain Project, as well as to the nearly completed Soccer City Stadium in Soweto. Visits to these

major projects put civil engineering into perspective for those who take for granted that such feats of engineering just "happen"! Exposure to these high-profile projects also provides inspiration to young engineers to build their careers and to be innovative in their approaches to their everyday problem solving.

Tables 1, 2 and 3 summarise JCD 2009 activities.

Table 1 Events hosted and arranged by the Joint Civils Division in 2009

Date	Event	Presenter	Title	Venue
03-02-09	JCD Lecture Series	Andrew Baird, NEC Panel Member	Update on the NEC User Group and upcoming new NEC Contracts	Museum of Military History, Saxonwold
23-02-09	JCD Special Presentation	Dr Priti Parikh, Senior consultant, Arup International Development, London	Demonstration of the ASPIRE software Prototype (A sustainability poverty and infrastructure routine for evaluation)	SAICE House, Midrand
05-05-09	JCD Lecture Series	Andy Griffiths, Director – Goba (Pty) Ltd, Regional Representative Dispute Resolution Board Foundation	Introduction to dispute resolution boards	Museum of Military History, Saxonwold
02-06-09	JCD Lecture Series	Johan Rossouw, CEO Vunani Securities	Economic outlook and prospects for the domestic equity market	Museum of Military History, Saxonwold
07-07-09	JCD Lecture Series	Peter Morris, ICE Country Representative Zimbabwe	Zimbabwe in transition? Implications for the civil engineering sector	Museum of Military History, Saxonwold
22-07-09	Brunel Lecture	Peter Head (OBE)	Entering an ecological age – the engineer's role	Kelvin Grove, Newlands
23-07-09	Brunel Lecture	Peter Head (OBE)	Entering an ecological age – the engineer's role	Great Hall, East Campus, University of the Witwatersrand, Johannesburg
19-08-09	JCD Lecture Series	Johan Rossouw, CEO Vunani Securities	Economic outlook and prospects for the domestic equity market	University of Cape Town, New Chemical Engineering Seminar Room, Upper Campus
13-10-09	JCD Lecture Series JCD Annual General Meeting	Hylton Macdonald, Group Risk Manager for the Aveng Group	The secondary impacts of change	Museum of Military History, Saxonwold

Copies of most of these presentations can be downloaded from the Division's website: www.jointcivils.co.za

Table 2 NEC User Group Events hosted by the Joint Civils Division in 2009

Date	Event	Info
26-08-09	One-day seminar	<p>A day with the originator of the NEC: 26 August 2009, Midrand</p> <p>The SA Division of the NEC User Group and the Joint Civils Division of SAICE and ICE hosted a one-day event on 26 August 2009 in Midrand. Dr Martin Barnes, the originator of the NEC and President of the Association of Project Managers, was the main speaker. He was supported by presentations by Andrew Baird and Dr Ron Watermeyer.</p> <p>The event addressed issues such as:</p> <ul style="list-style-type: none"> ■ Why use the NEC ECC on a construction works project? ■ Target cost contracts and their potential application in South Africa ■ Dealing with compensation events and the Accepted Programme ■ Assessing compensation events and implementing the NEC3 contracting system.

Table 3 NEC Joint Civils Division site visits for 2009

Date	Event	Info
19-03-09	Gautrain Project site visits	The site visits started off with a short presentation on the Gautrain Project, and its current progress overall. Those who attended were then taken by bus to various parts of the site, including the Sandton Station, Mushroom Farm Park, Marlboro Road interchange, the precast yard, carriage maintenance depot, as well as the new station at OR Tambo International Airport. These two site visits were a great success, with the participants clamouring for more!
03-09-09		
09-10-09	Soccer City Stadium site visit	<p>The JCD arranged a site visit to the stadium where the 2010 FIFA World Cup Final will be held – Soccer City in Johannesburg. It was fascinating to see how one of the world's biggest stadiums has been constructed.</p> <p>As the venue for the opening match and the 2010 FIFA World Cup Final, Soccer City will be the focal point of the tournament. The Stadium, a classic, two-tiered bowl set on a spacious site south-west of the Johannesburg city centre, will stand as the cherished symbol of South African football's boom in recent years.</p> <p>It was constructed in 1987, becoming the country's first world-class stadium solely dedicated to soccer. Soccer City accommodates the SAFA offices and hosts most of the country's major soccer occasions: prime internationals featuring Bafana Bafana, impassioned derby matches between the giants (Chiefs and Pirates) and most Cup finals.</p> <p>In 2010, the upper tier will be extended around the stadium, an encircling roof will be constructed, a new changing room complex will be developed, and new floodlights will be installed. The stadium can seat 94 700 people.</p>



PARTNERSHIP WITH THE UNIVERSITY OF CAMBRIDGE PROGRAMME IN SUSTAINABILITY LEADERSHIP

The Joint Civils Division has established a relationship with the University of Cambridge Programme in Sustainability Leadership (CPSL) regarding joint events relating to civil engineering and sustainability. Details of these events can be found on the Joint Civils Division website (www.jointcivils.co.za).

The Cambridge Resilience Forum is a project of the South African office of the CPSL. The CPSL has extensive global experience working with leaders to deepen their understanding of the social, environmental and economic contexts in which they operate. Through their access to the wider University and their affiliation with HRH The Prince of Wales, they have a strong convening power and ability to draw top thinkers and experts.

CPSL's other activities include running senior executive seminars, offering tailor-made learning programmes to organisations and facilitating high-level leadership meetings on critical strategic issues.

We live in a world that is changing faster than our capacity to learn. This forces us to cope with more complex situations, leaving us with less chance to predict and even imagine the future.

The Cambridge Resilience Forum creates an enabling environment in which leaders and professionals learn by exchanging ideas, opinions and experience in

2 Peter Head OBE, presenter of the Brunel Lecture

3 Mike Lomas, chairman of the SAICE Joint Civils Division, presenting Dr Martin Barnes, CBE, and Andrew Baird with "Nelson Mandela Long Walk to Freedom" silver medallions in recognition of their pioneering role in producing the NEC

order to build more resilient organisations for what is likely to be a turbulent future.

THE BRUNEL LECTURE: "ENTERING THE ECOLOGICAL AGE - THE ENGINEER'S ROLE"

The Seventh Brunel International Lecture Series began on 9 June 2008 at 1, Great George Street, the home of ICE. The groundbreaking lecture travelled to key cities around the world throughout 2008 and 2009, and was delivered in South Africa on 22 July 2009 in Cape Town, and 23 July 2009 in Johannesburg to around 200 delegates.

The lecture outlines the challenges facing us as society really has to address the problems caused by climate change and a burgeoning world population.

The lecture was delivered by Peter Head, a Fellow of ICE and a Director of Arup. Peter reviewed the major changes required in the development of infrastructure, policy and the role of the engineer to enable climate change issues to be tackled in urban and rural areas, in both developing and developed countries. This lecture has particular relevance to South Africa where we have First and Third World infrastructure intermingling, creating serious challenges for managing the sustainable future of infrastructure delivery.

GETTING TO GRIPS WITH THE NEC ENGINEERING AND CONSTRUCTION CONTRACT (ECC)

The SA Division of the NEC User Group and the Joint Civils Division of SAICE and ICE hosted a one-day event on 26 August 2009 in Midrand on the NEC Engineering and Construction Contract. Dr Martin Barnes, President of the Association of Project Managers, was the main speaker and he was supported by Andrew Baird and Dr Ron Watermeyer.

Dr Martin Barnes was the original creator of the NEC suite of contracts and

was also involved in ICE's NEC panel during the drafting of NEC2 and NEC3, which were published in 1995 and 2005 respectively. He still advises the Institution on the contracts' strategic development.

Andrew Baird was a member of the original drafting panel of the NEC and remains an active member of this panel. He has participated in the drafting of NEC2 and NEC3 and has taken a leading role in the development of the Term Service and Supply contracts.

The event covered:

- Why use the NEC ECC on a construction works project?
- Target cost contracts and their potential application in South Africa
- Dealing with compensation events and the Accepted Programme
- Assessing compensation events
- Implementing the NEC3 contracting system.

Altogether 130 delegates, including 30 fully sponsored post-graduate students and lecturers from the University of Pretoria and the University of the Witwatersrand, enjoyed the event. Dr Martin Barnes has agreed in principle to return to South Africa during 2010 to repeat this event in Durban and Midrand.

ICE MEMBERSHIP

The Joint Civils Division has had detailed discussions with ICE in the UK to identify the most effective way for South African engineers to become Members of ICE and be granted Chartered Engineer status. If anyone is intending to apply for membership of ICE in the near (or distant) future, please refer to the Joint Civils Division website for information on the requirements for registration and the registration procedure. If you would like assistance with the registration process, or guidance on what to do, please complete the form available on the website (www.jointcivils.co.za).



JOINT CIVILS DIVISION PANEL OF NEC ADJUDICATORS

In 2008 the JCD established a Panel of NEC Adjudicators. This Panel is on the JCD website at www.jointcivils.co.za for anyone in the industry to refer to. The Chairman of the JCD has also been requested on several occasions to recommend the appointment of an adjudicator for disputes under various NEC contracts, where the parties cannot agree on whom to appoint, or where the contract data of the contract state this requirement.

The JCD Panel is the only accredited list of adjudicators specifically competent in the NEC suite of contracts. As such, the Division is always looking for new candidates to apply for admission to the Panel – the admission criteria and application forms are on the JCD website (www.jointcivils.co.za).

METHODS OF MEASUREMENT

The JCD is in the process of customising CESMM3 for South African conditions and practice. This will support the new SANS 2001 series of technical standards

published by the SABS. The publication of the Methods of Measurement will coincide closely with the final publication of the SANS 2001 series, which has experienced various delays at the SABS.

CHAIRMAN OF THE DIVISION FOR 2010 – DR RON WATERMEYER

Mike Lomas, an ICE Council member and ICE country representative, has served as chairman of the Division since its establishment. He handed over the chairmanship of the Division to Dr Ron Watermeyer at the AGM on 13 October 2009. Ron is no stranger to institution affairs. He served as secretary of the Railways and Harbours Division in 1982/1983, chairman of the Joint Structural Division in 1997/1998, Vice-President of IStructE in 2002 and President of SAICE in 2004. He is also a trustee of Engineers Against Poverty.

JOINT CIVILS DIVISION WEBSITE (www.jointcivils.co.za)

The JCD website was established in 2007 when the Division first began

operating. Since then, the website has grown and has become the central point of contact for many. Although the website's home page has experienced only some 5 500 visits since then, the remainder of the website continues to have a solid stream of visitors, from all parts of the globe, and for various purposes.

The site enjoys, on average, close to 2 000 page views each month from 450 individual visitors. Sixty-seven per cent of these visitors arrive at the site from search engine searches, with 13% coming from referring sites. The remainder are returning visitors who have bookmarked the site for reference purposes. Seventy-three per cent of the visits come from South Africa, while visitors from the UK, US, Canada, Namibia, United Arab Emirates, Botswana, Australia and Nigeria have also visited recently.

Do take a moment to view the vast array of information available from the JCD website.. There is more there than meets the eye! □



Prof Paul Jowitt
President: ICE
Executive Director: Scottish Institute of Sustainable Technology
Professor: Civil Engineering Systems Heriot Watt University
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Now is the Time

Prof Paul Jowitt is the 145th President of the Institution of Civil Engineers (ICE). This is a condensed version of his Presidential Address. The full address may be downloaded from <http://www.ice.org.uk/downloads/pjaddress.pdf>

NOW IS THE TIME?

It is easy to think of the 19th century as the halcyon days of civil engineering, but I put it to you today that tomorrow is the time for an engineering renaissance. A time to build and rebuild our infrastructure in a burgeoning world, in the face of the complexities of climate change, in the face of a globalised economy and the fallout from the collapse of the financial systems upon which it was built – and in a world where more than half of the world's population have no access to the infrastructure platform upon which civilisation and its survival depends. Yes, Now is the Time.

Of course, the great 19th century heyday of engineering took the early Industrial Revolution from the 18th century right through into the 20th

century. It simultaneously improved the health of a nation and the well-being of the common man – with improvements in water supply and sanitation, and greater equality of opportunity and social mobility. From it sprang the transportation systems of canals, highways, railways and ports; the power systems; water supply, sewerage and irrigation; the production and consumption of consumer goods on a massive scale in an increasingly urbanised society. But from it also sprang the problems of congestion, air pollution, damage to the environment, over-abstraction of watercourses, profligate resource use and global warming.

Despite our scientific understanding we did not anticipate the wider physical and non-physical consequences at the *systems level*. It was never anticipated that man's activities would lead to impacts on a global scale, impacts that now threaten the environment and humanity's place in it.

That 19th century era of great engineering in the UK and the West enjoyed two advantages, first, seemingly unlimited sources of energy – coal, oil and gas – and second, a world of apparently boundless capacity in terms of water, food, and other natural resources relative to human need,

and the false assumption that the fruits of the planet were a free good. It was largely unfettered by the demands of democracy, planning restrictions, with little regard for health and safety, and scant regard for the rights of other nations.

Not so today. Now we know differently. We are slipping towards an environmental catastrophe on a global scale, and with billions of people without access to the most basic of infrastructure.

Resolving all this will require tremendous innovation and ingenuity by engineers, working alongside other technical and non-technical disciplines. It needs the civil engineers' ability to take a systems view at a range of temporal and spatial scales – ranging from devices and products, through to the large scale delivery of infrastructure services.

This means not just a shift to whole life costs, but a shift to whole life values. It will require a combination of re-engineering existing infrastructure and provision of first-time infrastructure at a global scale, while simultaneously reducing carbon emissions by up to 80%.

But first let us look at the state we're in.

CLIMATE CHANGE

For all practical purposes, the climate change debate is over. We now know that

the continued use of fossil fuels is certain to accelerate the earth's climate to a point of no return within a generation. Now is the time for engineers to provide the solutions that will give the politicians in Copenhagen and beyond the confidence to make the right decisions.

At their Triennial Conference in London in 2006, the Institution of Civil Engineers and its American and Canadian counterparts signed the *Protocol for Engineering a Sustainable Future for the Planet*. In 2009, at the next Triennial Conference in St John's, Canada, the three institutions agreed to a follow-up action plan on Climate Change.

The St John's Protocol acknowledged the worldwide impacts of increased exposure to flooding, reduced access to drinking water supplies – and the threats to food security in large parts of Africa, Asia and Latin America – with implications for us all. We resolved to develop guidance to assess the vulnerability of civil infrastructure and *adaptation* measures to address those vulnerabilities. We resolved that Civil Engineers must lead the way in developing new *mitigation* technologies to reduce emissions over the whole life cycle of infrastructure systems.

THE FINANCIAL CRISIS

Over the past 50 years the world's economy has been built on the production, acquisition and disposal of consumer goods in an increasingly *material world*. But the material world has failed to have due regard for the underpinning infrastructure that provides the foundation upon which civilisation depends. Existing infrastructure has been left to rot, under-funded. Investment in new infrastructure has not been forthcoming anywhere quickly enough.

In a searing critique of the financial sector, Lord Adair Turner, chairman of the UK Financial Services Authority, recently described much of the City's activities as "socially useless" and questioned whether it had grown too large. And during a recent visit to the London School of Economics, Her Majesty the Queen asked: "*Why had nobody noticed the credit crunch was coming?*" A response came quickly from two leading economists from the British Academy, Professors Besley and Hennessy, who said: "*Many people did foresee the crisis... but the timing of its onset and its ferocity were foreseen by nobody.*"

Risk managers frequently lost sight of the bigger picture." And they ended by saying: "*So in summary, Your Majesty, it was a failure to understand the risks to the system as a whole.*"

As engineers we need to understand the system in which we operate. Unless we engage with those who determine policy and command the economy, and unless we start to speak in their discourse, then we will fail. And remember, too, civil engineering was founded on a moral imperative... "*Civil Engineering is the art of working with the great sources of Power in Nature for the use and benefit of society.*"

Now is the time to recapture that – not for ourselves, but to benefit the societies we serve and to influence those who set the policies that will enable us to do it.

Now is the time to unleash the skills of our engineers – a sentiment shared by the American Pulitzer Prize winner, Thomas L Friedman, writing a piece called "Time to Reboot" in the *New York Times* in December 2008. He wondered what had become of infrastructure, which was so crucial to improving the lives and productivity of millions, and instead why had "*we rewarded the best of our collective IQ to people doing financial engineering rather than real engineering.*" He finished the piece as follows: "*John Kennedy led us on a journey to the moon. Obama needs to lead us on a journey to rediscover, rebuild and reinvent our own backyard.*" Friedman was writing about infrastructure.

This doesn't just apply to the USA. Many developed economies face similar issues. But it's not about infrastructure for its own sake, but about infrastructure that provides sustainable urban environments, and about infrastructure that inspires. It was Winston Churchill who said: "*We shape our buildings, and afterwards our buildings shape us.*" Now is the time to shape our cities for future fulfilment. And despite the economic situation, now is the time to invest in the critical infrastructure that inspires.

Now is the time to rebuild our economic systems and re-invest in our infrastructure – and future-proof it against climate change and catastrophic systemic failures from natural and other sources.

CRITICAL INFRASTRUCTURE

It is bad enough when infrastructure fails through natural causes. It is unacceptable that it should fail by neglect.

Over the past 50 years the world's economy has been built on the production, acquisition and disposal of consumer goods in an increasingly material world. But the material world has failed to have due regard for the underpinning infrastructure that provides the foundation upon which civilisation depends. Existing infrastructure has been left to rot, under-funded. Investment in new infrastructure has not been forthcoming anywhere quickly enough

Regulatory cycles of 4-5 years are out of step with asset lifetimes of 25-50 years. So it's vital that we understand the potential impacts of the failure cycle and its societal context.

We need to manage infrastructure lifelines in all phases of their lifetimes. The risks of infrastructure breakdown – and the scale of its consequences – are increasing from a range of random and non-random sources, including climate change, potential over-dependence on high technology infrastructure, and increasing urbanisation (in both the developing and developed worlds). We are often only hours away from social collapse if critical infrastructure fails.

Now is the time to look at the bigger picture – in terms of timescales, in terms of connecting disciplines, in terms of whole world thinking, in terms of *systems*. The prevailing Western and North American view of science and technology has been essentially reductionist, which doesn't encourage a systems or holistic view of the world.

In recent years we have justly and proudly celebrated the anniversaries of great engineers – Telford's 250th, Brunel's 200th, Hawksley's 200th. This year is the bicentenary of Charles Darwin – one of the first systems thinkers, at least in "Western" philosophy. As civil engineers, we need to develop systems level solutions to enable us to give better advice and to arrive at better decisions.

In a recent presentation to the ICE Council, the UK Government's Chief Scientific Advisor, Professor John Beddington, outlined ten 21st century Challenges as the "perfect storm":

1. Urbanisation
2. Population
3. Food Security
4. Poverty Alleviation
5. Energy Demand
6. Climate Change
7. Water Demand
8. Counter Terrorism
9. Infectious Diseases
10. Biodiversity

These challenges are not independent – they are interconnected. They are the *emergent properties* of large-scale, complex systems. And one way or another, civil engineers have a positive role to play in addressing all of these.

Earlier this year the Royal Academy of Engineering and the Institution of Civil Engineers held a workshop to examine

the key issues of water security, covering water resources and urbanisation in Asia, agriculture in Sub-Saharan Africa and sustainable water resources development in Europe. The recurrent message that emerged was the need to adopt a systems approach to water security – to develop a systems-level understanding to enable better decision-making. Rivers and aquifers don't respect national borders and this has the potential for international conflicts – not least in the Middle East, in Africa, and in the Indian subcontinent.

DISASTER RISK REDUCTION

The criticality of infrastructure is not confined to the developed economies of the world. The effects of climate change and the fallout from political strife add to the catalogue of disaster relief work.

The ICE has long been a supporter of RedR – the Register of Engineers for Disaster Relief. There is hardly a place in the world where engineers from RedR have not been deployed in the wake of some disaster or another to bring humanitarian relief – re-establishing, or establishing from scratch, the fundamental human requirements of water supply, sanitation, power, shelter, food and medical supplies and other essential services. But civil engineers also need to be proactively involved in international development, not just responding to disasters after they've happened.

The world's population is now over 6 billion and set to rise to 9 billion by 2050. Urbanisation is increasing apace. There is a tide of humanity heading from the countryside to the city. Tens of millions per year. The demand for effective infrastructure services is immense.

Lack of access to basic infrastructure is at the root of world poverty and the human tragedies associated with it. Many communities are marginalised with little access to even the most basic of infrastructure, education and healthcare, and tenuous legal tenure to land or property. And even in the emerging economies of such as India and Brazil, there is scant evidence that the underclasses are benefiting significantly from their countries' transformation into technologically driven powerhouses. Most are still living in what are euphemistically called 'unplanned settlements' – slums. From Mumbai to Nairobi, from Cape Town to Rio, the urban landscape is scarred by amorphous, slum-grey shanty towns, built

from whatever materials come to hand, with water courses polluted by sewage and solid waste.

The solutions today are deceptively straightforward – the provision of basic urban infrastructure and effective infrastructure services.

There are certain prerequisites for development, without which attempts to improve livelihoods in the developing world will be unlikely to succeed. These include reasonable governance structures, a functioning civil society, an effective local economy, and freedom from persecution, conflict and corruption.

A functioning local business sector can also reduce poverty through direct involvement in the development of effective and sustainable infrastructure, providing an internal demand for local skills and employment. This is exemplified by the work of Ron Watermeyer – a former President of the South African Institution of Civil Engineering. Watermeyer was seconded to the South African government in 1995 and led Soweto's contractor development programme. He was closely involved in community-based job creation programmes and the development of local engineering businesses and enterprises.

But infrastructure delivery also requires investment. Those mired in poverty do not have – and cannot afford – all the resources necessary to resolve their plight. They will need external investment from business and the international agencies, and assistance from the worldwide engineering community.

There will be no spectators as the future unfolds. But there are particular roles for civil engineers.

The ICE is doing all it can to build engineering capacity at the international scale. We are working with the Royal Academy of Engineering, the South African Institution of Civil Engineering and the Africa Engineers Forum to build engineering capacity in Africa. We are working with UNESCO and Engineers against Poverty on university curricula for engineering for international development.

SUPPORTING YOUNG ENGINEERS

The current state of the economy is having profound effects on civil engineering – and civil engineers. We know that many civil engineers have lost their jobs, and the recruitment of graduate engineers has slowed. But Now is *not* the time to lose a

generation of young engineers. Now is the time to encourage, nurture and support the engineers of the future.

We must do this throughout the engineering profession – individually as role models, corporately through the engineering industry and professionally through the institutions. The Graduates and Student members of the Institution are our lifeblood.

Many of our Graduates are members of Engineers for Overseas Development – an initiative started by Ian Flower of ICE-Wales to “assist in the development and training of graduates by challenging them to undertake projects that improve public health in developing countries”. Many of our younger members are also members of Engineers without Borders – a student-led charity established to “facilitate human development through engineering”. At the international scale, many engineering students from the developed and developing worlds are taking part in the Mondialogo Engineering Awards, developing engineering projects to address the UN MDGs – crossing boundaries,

disciplines, nationalities and cultures. Now is the time to give our young engineers all our support and encouragement.

One of the ICE’s distinguished Past Presidents was Thomas Hawksley, an engineer committed to the provision of public services, to the provision of the underpinning infrastructure upon which civilisation depends, and committed to developing the next generation of engineers to deliver these goals. Hawksley made some very pertinent observations about supporting young engineers in his Presidential Address. They are worth repeating.

He advised them to maintain their skills in mathematics and engineering science, to develop their language skills and to keep up to date with cognate subjects. He advised them to practise as much as possible the art of mental computation, for this would give them the means of almost intuitively arriving at the best of several alternative plans or methods. He advised them to develop a knowledge of form and function, and an understanding of practice. In short, to balance engineering knowledge – both theoretical and practical – with a

disciplined body of general knowledge, and the need to develop skills of discrimination and judgement through close observation of sound engineering practice.

The role of mentoring the next generation of engineers is vital and this is reflected in many companies’ ethos today – knowledge sharing, is vital for global engineering organisations.

Now is the time to support our young engineers, the time to unleash their skills and enthusiasm. Now is the time to build engineering capacity worldwide for international development, and to deliver the UN Millennium Development Goals. Now is the time for an engineering renaissance, the time to build and maintain the critical infrastructure upon which civilisation depends – both at home and abroad. The time to take a systems view of the world and deliver systems level solutions.

Providing the platform for a sustainable future for succeeding generations has never had a more important moral, economic, social and environmental imperative. Now is the time to deliver.

Now is the Time □



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ICE 2nd Middle East and Africa Regional Convention – 15 January 2010

FOLLOWING ON THE success of the first Middle East and Africa Convention held in Cairo in January 2008, the Institution of Civil Engineers (ICE) agreed to hold this event every two years, with the second convention being held in Cape Town.

Civil engineers are faced today with many challenges to deliver infrastructure in a manner that satisfies current

societal expectations. Environmental, economic and social imperatives, as well as the ever increasing population in developing countries, necessitate a new approach to infrastructure delivery. The theme for the ICE Middle East and Africa Regional Convention was accordingly **“Accelerating infrastructure delivery – improving the quality of life”**.

ICE representatives from Bahrain, Botswana, Egypt, Ghana, Lebanon, Mauritius, Nigeria, Oman, Qatar, United Arab Emirates, Uganda, South Africa,

Syria, Tanzania and Zimbabwe had the opportunity to meet and interact with one another, the speakers and the ICE President, Prof Paul Jowitt, the ICE Director General, Tom Foulkes, senior ICE officials, and the South African delegates who attended.

The organising committee invited a mix of local and international speakers to share their expertise and experience around the Convention theme. The speakers and topics for the public day of the Convention included:

1 ICE Middle East and Africa country representatives

Speakers and topics for the public day of the Convention

Mike Lomas (ICE Middle East and Africa Council Member)	▪ Welcome
Prof Paul Jowitt (President ICE)	▪ International development
Ali Naidu (President SAICE)	▪ SAICE Strategy and International Cooperation
Ronnie Khoza (CEO Construction Industry Development Board)	▪ Developing the African Construction Industry
Dr Iraj Abedian (CEO Pan-African Capital Holdings)	▪ Unlocking finance for infrastructure delivery
Tim Askew (CEO Atkins, Middle East & India)	▪ The construction industry in the Middle East: Past, Present and Future
Dr Brian Bruce (CEO Murray and Roberts)	▪ Africa – the neglected continent
Andrew Marsay (Arup)	▪ Engineering the future
Prof George Ofori (University of Singapore)	▪ Industry performance in the new millennium
Ron Watermeyer (Director Soderlund & Schutte)	▪ Shaping future civil engineering practice

(The conference presentations may be downloaded from www.jointcivils.co.za/?PageID=63)

At the end of the day's proceedings, the ICE President, Prof Paul Jowitt, issued the following statement flowing out of the deliberations of the conference:

CONFERENCE STATEMENT ON “ACCELERATING INFRASTRUCTURE DELIVERY – IMPROVING THE QUALITY OF LIFE”

Economic and technical progress, which has dominated the past two or three centuries, did not anticipate the wider physical and non-physical consequences at a systems level. It was never anticipated that man's activities would lead to impacts on a global scale that could threaten the environment and humanity's place in it. It is now becoming clear that the earth is no longer able to withstand and rebound from human activity. It has limits. A more systems view of the world is needed and solutions at a systems level need to be developed to address the following two issues of truly global proportions:

1. Engineering the world away from an environmental crisis caused in part by previous generations in terms of greenhouse gas emissions and profligate resource use.
2. Providing the infrastructure platform for an increasingly urbanised world and lifting a large proportion of the world's growing population out of poverty.

Sustainability is about maintaining a dynamic balance between the demands of people and what is ecologically possible. Sustainable development accordingly has two key concepts – the need for sustainable habitats in which present and future generations can live healthy lives, and the idea that the state of technology and social organisation, both now and in the future, imposes limits on the environment's ability to meet present and future needs. Sustainable development can also help to eradicate poverty as it is rooted in the simple concept of providing a better

quality of life. It is a way of looking at all resources that will lead to a higher quality of life for the current generation, without compromising that of future generations.

Sustainable development needs to be driven from two distinctly different starting points. Affluence and over-consumption give rise to the so-called “green” agenda (earth agenda) which focuses on the reduction of the environmental impact of urban-based production, consumption and water-generation on natural resources and ecosystems, and ultimately on the world's life support system. Poverty and underdevelopment give rise to the so-called “brown” agenda (people agenda) which focuses on the need to reduce the environmental threats to health that arise from the poor sanitary conditions, crowding, inadequate water provision, hazardous air and water pollution, and accumulations of solid waste (see Table 1).

The Middle East and Africa is a region that faces both “green” and “brown” issues and has many examples of extremes in both affluence and over-consumption, and poverty and underdevelopment. The tackling of poverty and underdevelopment is being hampered by shortcomings in the delivery and maintenance of infrastructure as evidenced in a recent World Bank report (Foster, V, 2008) which examined infrastructure in 24 countries that together account for 85% of GDP, population and infrastructure aid flows of Sub-Saharan Africa. This report found that:

- in some countries infrastructure provision is not focused where it is most needed
- countries typically only manage to spend about two-thirds of the budget allocated to investment in infrastructure
- about 30% of infrastructure assets are in need of rehabilitation.

Sustainability is about maintaining a dynamic balance between the demands of people and what is ecologically possible. Sustainable development accordingly has two key concepts – the need for sustainable habitats in which present and future generations can live healthy lives, and the idea that the state of technology and social organisation, both now and in the future, imposes limits on the environment's ability to meet present and future needs

2 Prof Paul Jowitt, ICE President



Table 1 Sustainable development needs to be driven from two distinctly different starting points – the so-called green and brown agendas

GREEN AGENDA		BROWN AGENDA
Ecosystemic wellbeing	Key concern	Human wellbeing
Forever	Time frame	Immediate
Local to global	Scale	Local
Future generations	Concerned about	Low income groups
Protect and work with	Nature	Manipulate and use
Use less	Services	Provide more
Affluence and over-consumption		Poverty and underdevelopment

Civil engineers can contribute to both the “green” and “brown” agenda in the Middle East and Africa region throughout the life cycle of a project – planning, design, procurement, construction, maintenance and deconstruction. These processes must not only be responsive to sustainable development imperatives, but also capable of delivering and maintaining infrastructure more efficiently.

Public infrastructure planning processes for the development and maintenance of infrastructure need to be strategic and focused on mandates for service delivery with a medium and long-term mindset. Such processes need to balance needs for physical infrastructure with those for social infrastructure. Projects need to be prioritised in an objective and equitable manner as infrastructure and budget planning processes are interconnected and dependent on each other.

The design of infrastructure needs to be not only fit for purpose, but also contributing to sustainable development. The design needs to take account of the anticipated results of climate change, including increased incidence and severity of storms, floods, droughts, sea level rise and storm surge, as well as the impacts over its life cycle of solutions that cause change (adverse or beneficial) to economic conditions, the environment, society or quality of life.

Public infrastructure planning processes for the development and maintenance of infrastructure need to be strategic and focused on mandates for service delivery with a medium and long-term mindset. Such processes need to balance needs for physical infrastructure with those for social infrastructure. Projects need to be prioritised in an objective and equitable manner as infrastructure and budget planning processes are interconnected and dependent on each other

The procurement of infrastructure needs to be conducted in a fair, equitable, transparent, competitive and cost effective manner that promotes sustainable development objectives. These include the minimising of the harmful effects of development on the local environment; the use of environmentally sound goods, materials and construction technologies; the participation of targeted enterprises and labour; and construction technologies that increase employment and alleviate or reduce poverty. Procurement strategies, processes, procedures and methods should be designed around the provisions of the family of ISO/DIS 10845 standards for Construction Procurement and managed in a manner that minimises the scourge of fraud and corruption.

Performance in the delivery of infrastructure needs to improve and optimal outcomes need to be delivered within available budgets. This necessitates culture changes, as shown in Table 2.

The choice of the contracting system can facilitate or frustrate performance. The NEC3 family of contracts integrates risk and project management processes, and provides a wide range of contracting strategies, including price based, cost reimbursable, target cost and management contract. This family of contracts is accordingly well placed to support the required culture change and broader project objectives.

Regional collaboration is necessary to:

- support the development of the construction sector within countries
- establish research and teaching institutions specialising in regional issues such as water treatment, sewerage purification and non-carbon energy generation
- build professional engineering capacity within both the public and private sector to plan, design and deliver infrastructure that satisfies sustainable development imperatives
- tackle the issue of corruption and promote transparency.

Collaboration between developed and developing countries is essential. Engineering institutions have an important role to play in this regard.

Civil engineers have an advocacy role to play in informing the public of the unintended consequences of unsustainable development in all its forms, influencing government to do the right things, and advancing the political will for change. □

Table 2 Culture changes required for performance improvement in the delivery of infrastructure

FROM	TO
Master-servant relationship of adversity	Collaboration between two experts
Fragmentation of design and construction	Integration of design and construction
Allowing risks to take their course, or extreme and inappropriate risk avoidance, or risk transfer	Active, collaborative risk management and mitigation
Meetings focused on the past – what has been done, who is responsible, claims etc	Meetings focused on “How can we finish project within time and available budget?”
Develop project in response to a stakeholder wish list	Deliver the optimal project within the available budget
“Pay as you go” delivery culture	Discipline of continuous budget control
Constructability and cost model determined by design team and cost consultant ONLY	Constructability and cost model developed with contractor’s insights
Short-term “hit-and-run” relationships focused on one-sided gain	Long-term relationships focused on maximising efficiency and shared value
Procurement strategy focused on selection of form of contract	Selected packaging, contracting, pricing and targeting strategy and procurement procedure aligned with project objectives
Project management focused on contract administration	Decisions converge on the achievement of the client’s objectives
Training is in classrooms unconnected with work experience	Capability building is integrated within infrastructure delivery

New NEC3 contracts – expanding the family to cover the full range of commonly encountered types of contracts

THE NEC3 SUPPLY CONTRACT, the NEC3 Supply Short Contract and the associated guidance notes and flow charts were launched in January 2010. The new documents will extend NEC3's scope beyond procurement of works and services to the purchase and supply of equipment and materials.

The Supply Contract is intended for the supply of high-risk/value goods

including transformers, turbine rotors, rolling stock, loading bridges, transmission plant and cable. The Supply Short Contract is for items of lower risk/value, such as building materials, simple plant and equipment, stationery, personal protection equipment, manufacturing parts, components and store items.

NEC3 is a family of contracts that facilitates the implementation of sound

project management principles and practices, as well as defining legal relationships. It is suitable for procuring a diverse range of works, services and supply ranging from major framework projects to minor works and purchasing of supplies and goods.

SA Division of the NEC Users Group

The current NEC3 family of contracts

Contract	When to use
Engineering and Construction Contract (ECC3)	When a Contractor is required to provide engineering and construction work, including any level of design responsibility
Engineering and Construction Short Contract (ECSC3)	When a Contractor is required to provide engineering or construction work which: <ul style="list-style-type: none"> does not require sophisticated management techniques comprises straightforward work imposes only low risks on both the Employer and the Contractor
Professional Services Contract (PSC3)	When a Consultant is required to provide professional services
Term Service Contract (TSC3)	When a Contractor is required for a period of time to manage and provide a service such as: <ul style="list-style-type: none"> maintenance of highways in a particular area periodic inspection of bridges and reporting cleaning of streets in an urban area refuse collection and disposal collection and recycling of waste materials maintaining public parks and landscaping maintaining heating, lighting and ventilation of buildings providing security personnel for an installation, site or building servicing and maintaining airport buildings
Term Service Short Contract (TSSC3)	When a Contractor is required for a period of time to manage and provide a service which: <ul style="list-style-type: none"> does not require sophisticated management techniques comprises straightforward work imposes only low risks on both the Employer and the Contractor
Engineering and Construction Sub-Contract (ECS3)	When a Subcontractor is required to perform engineering and construction work when the Contractor has been appointed under the ECC3
Engineering and Construction Short Sub-Contract (ECSS3)	When a Subcontractor is required to perform engineering and construction work when the Contractor has been appointed under the ECC3 which: <ul style="list-style-type: none"> does not require sophisticated management techniques comprises straightforward work imposes only low risks on both the Subcontractor and the Contractor
Adjudicators Contract (AC3)	When the appointment of one or more Contractors is required to carry out construction work or to provide design or advisory services on an as-instructed basis over a term
Framework Contract (FC3)	When an Adjudicator is required to decide disputes under the NEC family of contracts (It may also be used to appoint an Adjudicator under other forms of contract)

Each of these contracts comes with its own Guidance Notes and often also its own Flow Charts.



NEC3 Briefing Note – managing project risks through the NEC3 Engineering and Construction Contract

PROVISIONS FOR A RISK REGISTER

The NEC3 ECC does not specifically define “risk”. It is therefore defined in accordance with the common usage of the term, namely “danger”, “possibility of loss, injury or other adverse situation” or “the possibility of commercial loss”. The ECC does, however, define a “Risk Register” (Clause 11.2(14)) as a register of risks which are either:

- listed in the Contract Data by either the Employer or the Contractor immediately prior to the formation of the contract or
- notified by the Project Manager or Contractor in terms of the contract as an early warning matter, i.e. a matter (see Clause 16) which:
 - increases the total of the Prices
 - delays Completion
 - delays meeting a Key Date
 - impairs the performance of the works in use.

Clause 16 also permits the Contractor to give early warning of any other matter which could increase his total cost, but excludes a matter for which a compensation event has previously been notified.

The Risk Register therefore only deals with contract-related risks which might impact on project objectives relating to time, cost and quality/performance, and excludes risks relating to design and legislated matters, such as the management of health, safety and the environment, unless they negatively impact upon the total of Prices, Completion, meeting a Key Date or the performance of the works in use.

The definition for the Risk Register states that the Risk Register includes a description of the risk and a description of the actions which are to be taken to avoid or reduce the risk.

Clause 16 requires that:

- the Project Manager enters early warning matters in the Risk Register
- those who attend a risk reduction meeting
 - cooperate in making and considering proposals on how the effect of the registered risks can be avoided or reduced
 - seek solutions that will bring advantage to all those who will be affected
 - decide on the actions which will be taken and who, in accordance with the contract, will take them

- decide which risks have been avoided or have passed and can be removed from the Risk Register
- the Project Manager revises the Risk Register to record the decisions made at each risk reduction meeting and issues the revised Risk Register to the Contractor.

NOTE 1: Clause 32.1 requires that revised programmes reflect the effects of notified early warning matters, while Clause 63 requires that where an early warning which an experienced contractor could have given and an early warning was not given, compensation events will be assessed as if an early warning had been given.

NOTE 2: In Options C and D (Target contract), Option E (Cost reimbursable contract) and Option F (Management contract), a failure by the Contractor to give an early warning required in terms of the contract which results in costs being incurred is a Disallowed Cost. Such costs are at the Contractor’s risk.

NOTE 3: The PMBOK® Guide (2000 edition) uses the term “risk response plan” as an alternative term for risk register. A risk response plan is defined as *a document detailing all identified risks, including description, cause, probability of occurring, impact(s) on objectives, proposed responses, owners and current status.*

THE STRUCTURE OF A RISK REGISTER

Table 1 illustrates the structure of a Risk Register which is consistent with the pro-

visions of the ECC relating to the management of risk. The status of identified risks can be changed from time to time.

Each risk event can be triggered by one or more causes and can result in one or several outcomes. The actions to avoid or to reduce risk can include “monitor and review from time to time” or “take no action” if the likelihood (probability of frequency or the chance that an event will occur) is low in relation to a specific course of action.

A = Actioned

N = Take no action

M = Monitor and review

T = To be actioned

Note: The terms in Table 1 have the following meanings:

■ **Risk event:** specific happening that can influence the subject matter of an early warning

■ **Cause:** the trigger of the event

■ **Possible outcome:** the increasing of the Prices, a delay to Completion, a delay to meeting a Key Date, an impairment of the performance of the works in use or an increase in the Contractor’s total cost □

Table 1 Structure of the Risk Register and an example of an entry

#	Entry date	Description of the risk			Action to avoid or reduce risk			Action status*
		Risk event	Cause	Possible outcome	Description of action	Responsibility for action	Timetable for Implementation	
1	06-10-09	Piling for block A de-layed	Unforeseen geological conditions	Completion delayed Less time available to meet first Key Date Total of Prices may increase	An alternative pile design using different equipment is required	Project Manager	By 21-10-09	T

Engineering Council UK rebrands

Reflecting its growing international reach and influence, the Engineering Council has now dropped the “UK” from its name. One of the key deciding factors is that the professional qualifications awarded by the Engineering Council, namely Chartered Engineer, Incorporated Engineer and Engineering Technician, are fast becoming internationally recognised standards of competence. In an increasingly globalised economy this recognition is vitally important to employers.

Andrew Ramsay, CEO of the Engineering Council says, “A major benefit for engineers on our register and holders of Engineering Council accredited academic qualifications is that the rigour of the Engineering Council’s UK-SPEC assessment of competence is widely recognised by the rest of the world. In fact, the title Chartered Engineer is now one of the most recognised international engineering qualifications.”

A significant 25% of engineers on the Engineering Council’s register now work outside the UK, and a further 10–15% of registrants are non-UK citizens. Individuals holding Engineering Council titles currently reside in 45 countries. This includes over 10 500 in Hong Kong, more than 7 000 in North America and a similar number in Australia and New Zealand.

This makes international issues vitally important to the Engineering Council. It is a leading member of engineering bodies across the globe, through which it works to continually increase global recognition of those who satisfy its standards. Activities include providing the Chair of the International Engineering Alliance (IEA), as well as membership of the European Federation of National Engineering Associations’ (FEANI) governing board. In addition, it has regular contact with appropriate UK government departments and EU Commission directorates.

The Engineering Council has also been granted a licence to award EUR-ACE labels to UK-accredited degrees by the European Network for Accreditation of Engineering Education (ENAE).

To help incorporate the understanding of global issues such as sustainability, climate change and poverty into the teaching of engineering, the Engineering Council has joined forces with UK-based higher education institutions and other relevant bodies in a project being implemented by independent NGO Engineers Against Poverty (EAP) and funded by a grant from the Department for International Development.

Andrew Ramsay adds, “With so much importance being placed on our international activities and the growing interest in our titles from engineers outside the UK, it seemed appropriate to drop the UK part of our name, and simply to become known as the Engineering Council in future.” □



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Report back on perspectives expressed at the Wits Project Management Symposium (August 2009)

THE SCHOOL OF Civil and Environmental Engineering of the University of the Witwatersrand hosted a Construction Symposium on *The Project Management Profession: Adding Value*.

The aim of this symposium was to:

- Stimulate fresh thinking through the inputs of international and local experts who have unique perspectives on construction and project delivery
- Enable delegates to share insights into how best practice is achieved in today's challenging project environment
- Capture lessons, stimulate relevant research and create an ongoing platform for moving from ideas to action.

Dr Martin Barnes, the President of the Association for Project Management and originator of the NEC, was the keynote speaker. Other speakers were: Spencer Hodgson, former CEO of the CIDB; Jerome Govender, CEO of the Bombela Concession Company; and Dr Sean Philips, former chief operations officer of the national Department of Public Works. The event was attended by 130 members of the South African construction industry and the academic community. It explored the role of Project Management and new approaches to the delivery of infrastructure. Discussion was stimulated by the four presentations dealing with the UK experience, Wits's Capital Projects Programme, the Gautrain project and new approaches to public sector delivery in South Africa.

The Joint Civils Division (JCD) was a major sponsor of this event. The other sponsors were Grinaker-LTA, Group Five, Murray and Roberts, and WBHO.

The four presentations are summarised below.

DEVELOPMENTS IN PROJECT MANAGEMENT AND CONSTRUCTION DELIVERY IN THE UK

Dr Martin Barnes CBE spoke about the range in application of project management, the argument about whether project management should be done in-house or hired in, the client's project management role, the trends and techniques of project management and construction delivery options.

Introduction

Project management is a very-fast moving scene. It's not like the older professions – the sort of 100-year-old professions. It's only been in existence for something like 40 years. As a modern professional activity or modern specialised activity, project management techniques are evolving

all the time. For example, in the 60s, 70s and 80s people weren't talking about risk management. Now it's regarded as a fundamental part of project management.

Project management is now a well-established profession in the UK – it has established education, training and qualifications run or managed or controlled by the Association of Project Management. A Royal Charter declaring it to be a profession is expected before the end of the year.

The application of project management

Project management is practised across all industries and activities. In the UK, for example, project management is applied in every public sector activity dealt with by central or local government. In the construction sector, project management is applied at all levels and not just on the larger projects. This is the change that has happened in the last 15 years.



1 Dr Martin Barnes

There was a time not that long ago when project management techniques were applied only at the interface between the client and the main contractor and did not go very far down the supply chain into the subcontractors, suppliers of materials, plant and all the rest of it. Increasingly, project management is applied on all levels of the project supply chain and consequently project managers are required at every level in the supply chain. Project management is, however, not well established in the design professions.

In-house versus hired-in expertise

Martin argued that there should not be any real distinction between in-house versus hired-in project management at the interface with the client or project sponsor. The reason for this is that the tasks are exactly the same irrespective of whether or not they are done by the client with its salaried staff or done for the client by people hired as project management consultants or project management contractors. Further down the supply chain, i.e. below the interface between the client and the whole project, the argument about in-house versus hired-in occurs for two reasons – every project needs project management and domain knowledge is important. There are very few areas of project management where the top project manager needs domain knowledge. But down the supply chain domain knowledge *is* needed. As a result, project managers lower down in the chain are invariably in-house.

Role of the client

A good project manager will choose the procurement contract and not leave it to the in-house legal department. The reason for this is that there are very few lawyers who understand project management. Consequently, when they are drawing up a contract, they will make it something that protects the person who is paying them to do it from aspects that have led to legal problems in the past. They don't design contracts to stimulate better management of the project.

A project manager should help to assemble the design brief and should assemble and manage the design team. A project manager also needs to manage the internal and external stakeholders as they can do serious damage to the project if they don't remain onside.

Trends and techniques

The original techniques in project management, namely scheduling, programme, drawing up networks and cost control, are taken for granted. Those things are so well established that everybody does them. Nobody argues about different ways of doing them. Evidence of a project manager's success in keeping time and cost control effective is measured in terms of building things within the original budget and bringing them to use on time. Nobody is all that bothered about how the detailed paperwork is undertaken. The only important thing is that it's forward-looking not backward-looking.

The only decisions one can make are decisions about what's going to be done in the future. What matters is that one can still finish the project with the money one has left. One can't reinvent the past, and can't spend money one has already spent. The task is to manage the remaining work, with the money one has got left and to finish in the time one has got left.

Construction delivery options

If you had asked a civil engineer at any time up to about 1975 in the UK: "What procurement strategy do you adopt?" he or she would have said: "What is a procurement strategy?" The only procurement strategy that was used is that you could choose contractors by competitive tender and sign them up to the Institute of Civil Engineers' standard form of contract. Nobody did it any other way. So there was no choice of a procurement strategy. Now there are a lot of choices.

Teamwork and collective decision-making is essential. The last power station built in the UK was a big nuclear power station with about 6 000 organisations in the supply chain. Every one of those organisations had a contractual interface with somebody else. Accordingly, there were 5 999 interfaces. Suppose that in every one of those interfaces there was no interaction for decision-making and there was potential for a dispute, which is how things used to be done. How was anything ever produced on time and within budget when the only person who wanted it finished on time and within budget was the client? All the other 5 999 were in it for their own benefit. If the project was delayed, it was always somebody else's fault.

Suppose one could run a project in which there was collaboration at every interface, in which people were jointly

trying to think ahead, making decisions collectively and avoiding disputes very energetically. What a huge difference that would make!

Project management is management of uncertainties. No project is carried out exactly in accordance with the original programme. The subtlety of project management is in reacting to the unexpected. The client changes his or her mind (this is very common). The economy changes so the demand changes and the objectives for the project have to change. This subcontractor lets one down, this material is no longer available, or whatever it is. Every week there are unexpected things happening.

Until recently, design team members were appointed by the client on percentage fees, while a single contractor was appointed through a competitive tender with some subcontractors nominated. The client's management of the construction phase was done by the architect or engineer. Payments to the contractor were assessed using bills of quantities.

Why would anybody pay somebody who is to design something for the project such that they get paid more, if they exceed the budget? It's amazing how it went on for so long! It doesn't happen now.

Very seldom anymore is a single contractor appointed by means of a competitive tender that does not share the risk and that doesn't need to make collaborative decisions. Management for the client of the construction phase by the architect or the engineer is also very seldom done now, because the architect or engineer can become famous and successful by being a good designer and yet have no knowledge of project management at all. Bills of quantities are also seldom used nowadays.

Commonly now one gets a combination of design by the client and design by the contractor on the same project. The client has the things designed for him that he minds about and allows the contractor to design the rest. Paying a gain share in terms of a target cost contract is becoming very popular. This is where the client and the main contractor, and sometimes some subcontractors, share the cost risks. At the end of the project the total cost is worked out, and the difference between the target agreed to at the start and the total cost is shared between the client and contractor in some way. This gives both the client and contractor an interest in solving problems and promotes joint decision-making about the uncertainties.

Framework contracts have also become popular. This is where, in order to develop a good long-term relationship between the client and the contractor, one appoints a framework contract for a period of time to deal with recurring requirements of a similar nature.

A CLIENT'S PERSPECTIVE – THE EXPERIENCE OF THE WITS CAPITAL PROJECTS PROGRAMME

The University of the Witwatersrand's Capital Projects Programme (CPP) was established in 2008 (see <http://web.wits.ac.za/AboutWits/CapitalProjects/AboutUs/Overview.htm>) to direct a project portfolio exceeding R1 billion by 2012. The programme is managed by a Campus Development and Planning Division which reports to the Capital Projects Steering Group established by the Vice-Chancellor to co-ordinate and support the project priorities, budgets and the fundraising efforts. The director of the Wits Capital Projects Programme, Spencer Hodgson, has been seconded to Wits by Murray and Roberts as part of its commitment to national skills and academic excellence. He presented some insights into this programme.

The building environment at Wits is a complex one due to: the multiplicity of client users and competing requirements; noise and disruption to academic programmes; the health and safety of not only workers, but also students and the public; the mix of new buildings, extensions and refurbishments; the limited or non-existent space for decanting staff and students; and the complex operational requirements within Wits's management system. Those responsible for the Capital Projects Programme took a conscious decision to move away from the preplanned traditional contracting approach ("them-and-us") towards an integrated project team approach. This was done to improve project performance as it was recognised that it is essential in a programme of this nature to do the same thing every time, have standard policies, procedures, contracts and reporting, norms, standards and details, and enter into long-term collaborative relationships. A decision was taken to change over to the NEC contracting system in order to stimulate a culture shift towards collaboration,

efficiency and greater certainty as this contracting system:

- enables projects to be managed effectively
- facilitates collaboration through its early-warning and risk management provisions and "pain and gain" target cost contracting option
- enables framework contracts to be entered into to allow a number of building projects to be constructed by a contractor over a period of time, subject to satisfactory performance
- enables contracting strategies such as "develop and construct" to be implemented.

One of the major challenges has been the paradigm shift towards the delivery of projects within a controlled budget as the prevailing industry paradigm is "It's OK to go over budget – the user (client) wants it" and "we can complete the design after the contract has been priced as we are well able to manage scope creep". This has necessitated:

- a structured approach to the work breakdown structure being taken to define rational work components and to allow early cost estimates to be developed
- early integration within the professional team based on a controlled budget paradigm
- early integration with the contractor by using the NEC target cost contract approach and elemental costing models.

Wits is nearing completion of the first project (Chamber of Mines – 4th quadrant) delivered by a framework contractor following a competitive selection process in terms of which a target cost was tendered. A target cost is being negotiated with the same contractor to construct laboratories and to convert the Charles

Skeen Stadium into lecture theatres. The process to appoint a second framework contractor to deliver projects on the Parktown campus has begun.

Spencer outlined the thrust of the new culture of collaboration that is being sought to improve performance and deliver optimal outcomes within budget as follows:

FROM	TO
Master-servant relationship of adversity	Collaboration towards shared goals
Fragmentation of design and construct	Integration of design and construct
Allow risks to take their course	Active risk management and mitigation
Meetings focused on the past – what has been done, who is responsible, claims, etc	Meetings focused on "How can we finish the project within the time and budget available?"
Develop the project in response to a stakeholder wish list	Deliver the optimal project within the budget available
"Pay-as-you-go" delivery culture	Discipline of continuous budget control
Constructability and cost model determined by design team and quantity surveyor only	Constructability and cost model developed with contractor's insights
Short-term "hit-and-run" relationships focused on one-sided gain	Long-term relationships focused on maximising efficiency and shared value



2 Spencer Hodgson

AN INDUSTRY PERSPECTIVE – THE EXPERIENCE OF GAUTRAIN

Jerome Govender, Chief Executive Officer of the Bombela Concession Company which holds the 20-year concession to design, build, part-finance, operate and maintain the R25,4 billion Gautrain rail system, outlined the Gautrain project. This project, which ushers in a new era of rail transport for the country, will provide a safe, efficient and reliable service to commuters in Gauteng and in so doing will fulfil an important role in urban regeneration and economic development.

Phase 1 of the project is due for completion during 2010 and will consist of the section from Sandton to OR Tambo International Airport, and from Marlboro to just south of Midrand. The balance of the project will be completed during 2011. The project is designed to carry 100 000 commuters per day at start-up. The network will be nearly 80 km long once both Phases 1 and 2 have been completed and various journey options will be available between key stations. Ten stations will be built along the route, serving principal

commuter areas, as well as providing an efficient service to the airport.

The Gautrain will offer international standards of public transport with high levels of safety, reliability, predictability and comfort. Travelling at a maximum speed of 160 km/h, it will connect Hatfield Station in Pretoria with Johannesburg Park Station in about 42 minutes, and Sandton Station and OR Tambo International Airport in less than 15 minutes. The train service will be complemented by a dedicated bus fleet which will transport passengers in air-conditioned comfort between the stations and surrounding suburbs and business nodes. Both the trains and the buses will be fully accessible to people with disabilities.

The construction of the alignment, bridges and tunnels of the Gautrain has constituted a civil engineering project of immense proportions with:

- 6 million m³ of cut-to-fill earthworks
- approximately 15 km of tunnels (3 km of which were drilled by a tunnel-boring machine)

- 16 viaducts with a total length exceeding 10 km
- approximately 50 bridges (overpasses and underpasses)
- over 100 000 m³ of concrete
- 10 stations with 10 000 car parking bays.

The construction of the project has required the largest mobilisation of engineering and construction skills on a single project in South Africa to date. Local expertise has been complemented by specialist personnel representing 26 different nationalities – making Gautrain a truly international project.

Environmental management considerations enjoy a high profile on the project. All construction activities are governed by the Environmental Management Plan (EMP), with daily inspections and regular audits being conducted on all the sites by trained environmental personnel. Environmental interventions include search-and-rescue exercises to find and relocate rare and endangered fauna and flora from the rail reserve, the installation of water treatment

plants to pretreat groundwater pumped from the tunnels before release, recycling of rock removed from the tunnels, dust suppression and the cultivation of 5 000 indigenous trees to replace the 2 500 removed during construction.

With safety and security being central to Gautrain's offering, Bombela's Integrated Safety and Security Programme will cover all scenarios of degraded and emergency operation of the system. Bombela has developed a number of important measures to mitigate the risks, including:

- recorded CCTV coverage of all stations and trains, as well as key locations along the route
- 24-hour security guard presence in all stations and parking areas
- continuous satellite tracking of all feeder and distributor buses
- secure fencing along the route to prevent unauthorised access and vandalism of critical system assets.

Jerome also touched on the important challenge of managing stakeholder perceptions and aspirations in a high-profile

3 Jerome Govender

4 Dr Sean Philips



megaproject. Popular views of Bombela's deliverables and time frames are frequently not aligned with contractual requirements.

A DEVELOPING COUNTRY PERSPECTIVE – INFRASTRUCTURE DELIVERY IN LIMPOPO

There is a common perception that there are severe capacity constraints for infrastructure delivery in poor and rural areas in South Africa. This is fuelled by the history of under-expenditure and poor service delivery, particularly by weaker rural municipalities. Dr Sean Philips, a former head of a provincial department of public works and Deputy Director-General of the national Department of Public Works, talked on the question: "What role can procurement play in addressing the problem?"

Drawing on work done through a Business Trust-funded project involving the national Department of Education, Sean pointed out that formulation of procurement strategy is a missing element in the CIDB procurement toolbox (see www.cidb.org.za/procurement/procurement_toolbox/default.aspx). A review of the existing education infrastructure plans, planning processes and quality of underlying data in Limpopo indicated that:

- A logical and reasonably robust planning methodology, underpinned by equity considerations and the directing of expenditure towards most urgent needs, was employed.
- The infrastructure plan will generally not result in procurement of "wrong things".
- Procurement and contracting strategies were required to enable infrastructure plans to be produced in the right way. Organs of state (with some exceptions) generally utilise only time-honoured and familiar procurement strategies which tend to be highly resource-intensive for the client. They do not draw on the full range of procedures and methods described in the CIDB documents to achieve the best value solution in a given situation. This frequently results in poor and disappointing delivery outcomes.

A procurement strategy identifies the best way of achieving objectives and value for money, taking into account prevailing risks and constraints. It is a combination of the delivery management strategy, the contracting strategy and the procurement arrangements.

The first step in developing a delivery management strategy is to

gather information to inform decision-making. The second step is for the client to formulate its primary and secondary procurement objectives. The third step is to make strategic delivery management decisions relating to the meeting of needs through a programme of projects or a series of independent projects, PPPs, implementing agents or framework agreements and the packaging of the work into construction works contracts. The key to the methodology is that the choice of options is dependent on the spend analysis, organisation analysis, market analysis and objectives.

The second stage in developing a procurement strategy is to decide on the contracting strategy for each package and the professional services required. This involves the identification of the most appropriate contractual arrangements (design by employer, construction management, design and build, develop and construct, management contractor), the pricing strategy (priced contract with activity schedule/bills of quantities, cost reimbursement or target cost) and the form

of contract (JBCC series 2000, GCC2004, FIDIC or NEC3), and thereafter the identification of requirements for outsourced services and the selection of a contracting strategy for professional contracts.

The final stage in developing a procurement strategy is to decide on the procurement arrangements for each package, i.e. the quality strategy, procurement procedure, use of eligibility criteria, targeting strategy and tender evaluation procedure.

The Limpopo Department of Education's five-year plan revealed that 2 406 projects needed to be delivered at a cost of R5,6 billion (at an average cost per project of R2,3 m). Twenty-seven new school projects, 148 repair and rehabilitation projects, and 1 000 classroom block projects accounted for 25, 24 and 27% of the budget respectively. Routine maintenance, water and sanitation, and the construction of new Dinaledi Schools and upgrading of model C schools accounted for the remaining 1 231 projects and 24% of the budget. The application of the model for arriving at a procurement strategy identified 74 packages over five

years, which is a drastic reduction from the historic 2 406 packages (plus independently appointed professional service providers) that would have resulted had the historic approach been adopted. There are, however, challenges in implementing the procurement strategy as the choices require framework contracts and the application of the NEC3 family of contracts, something that the Department has no experience of.

The envisaged challenges to rolling out the methodology to other organs of state include:

- client difficulty in deciding on objectives
- clients unwilling to balance opposing objectives
- absence of open-minded programme managers
- resistance to change, particularly from professional service providers.

The overall conclusion is that infrastructure delivery in rural areas need not be constrained by lack of capacity. Capacity can be in-sourced without sacrificing development objectives. □



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Engineers Against Poverty

Engineers Against Poverty (EAP) is a UK-based international development NGO committed to producing practical policies and innovative solutions to support the alleviation and eventual ending of world poverty. EAP is supported by a number of engineering institutions, including the Institution of Mechanical Engineers, the Institution of Civil Engineers, the Institution of Structural Engineers and the South African Institution of Civil Engineering

HEALTH AND SAFETY BRIEFING NOTE LAUNCHED

EAP and the Institution of Civil Engineers (ICE) have recently published a briefing note that provides practical advice on the use of procurement procedures to improve the health and safety of construction workers. There are up to 60 000 fatal accidents a year on construction sites around the world. Many more workers suffer from work-related injuries and occupational diseases. The report points out that the main causes of death and injury are understood and preventable.

A number of international agencies have been working to improve health and safety in the workplace but, until now, the use of procurement procedures has received very little attention. The briefing note explains how health and safety should be addressed at each stage of the procurement cycle and is aimed at two groups:

- Clients of the construction industry in developing countries who want to ensure a good standard of health and safety on one or more projects in which they are involved
- Financiers of infrastructure construction in developing countries, notably Multilateral Development Banks (MDBs), bilateral and multilateral donors and some private banks, who need to adhere to the “socially responsible” standards of their organisation

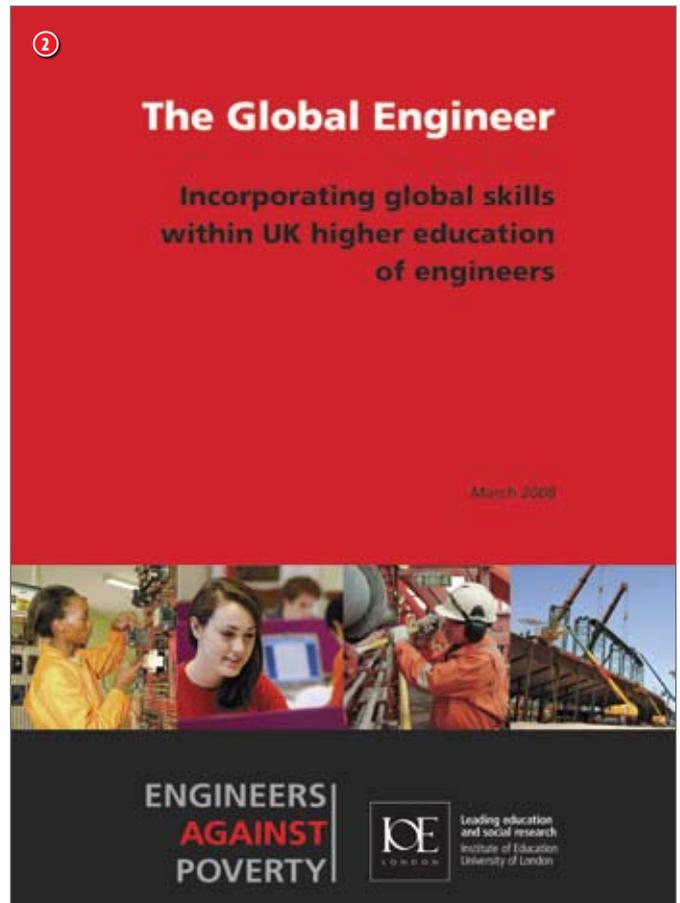
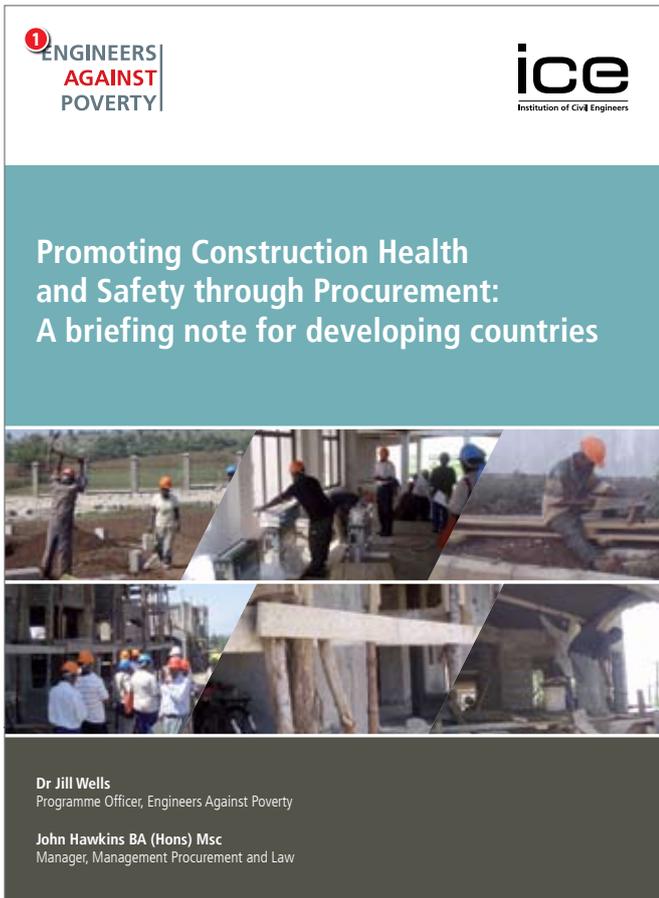
(The report is available at www.engineersagainstpoverity.org/_db/_documents/EAP-ICE_HS_Briefing_Note.pdf)

ASPIRE SOFTWARE LAUNCHED

EAP and ARUP have launched ASPIRE, a software-based tool for assessing the sustainability and poverty-reduction performance of infrastructure projects in low-income and middle-income countries. ASPIRE is the result of a two-year collaboration between EAP and ARUP to provide a much-needed tool to integrate sustainability and poverty reduction into a comprehensive appraisal framework.

ASPIRE is a software-based tool for assessing the sustainability of infrastructure projects, which recognises poverty reduction as an overarching objective. It provides a holistic appraisal framework encompassing the four key dimensions of environment, society, economics and institutions. Within each of the four dimensions a number of key themes (either four or six) have been identified under which indicators are grouped:

- **Environment** is considered in terms of enhancing and minimising impacts on natural assets: air, land, water, biodiversity and materials. Energy is included as a sixth theme recognising the increasing importance of renewable energy sources and energy efficiency.
- **Society** is considered in terms of four themes representing assets required to meet needs equitably, unlock human potential and alleviate poverty through access to services, public health, culture and stakeholder participation. Two further themes – vulnerability and population – include issues such as conflict, exposure to natural hazards and displacement.
- **Economics** encompasses four themes which contribute to economic vitality: project viability long term, macro-economic effects (such as inflation and competition), livelihood opportunity and equity of economic opportunity.
- **Institutions** includes four themes which consider the capacity and effectiveness of the institutional environment to support



the delivery of infrastructure that contributes to sustainable development: policy, governance, skills and reporting. ASPIRE is available on a free trial basis and can be purchased at highly subsidised rates by non-profit organisations. (It can be downloaded from www.oasys-software.com/products/sustainability/aspire/)

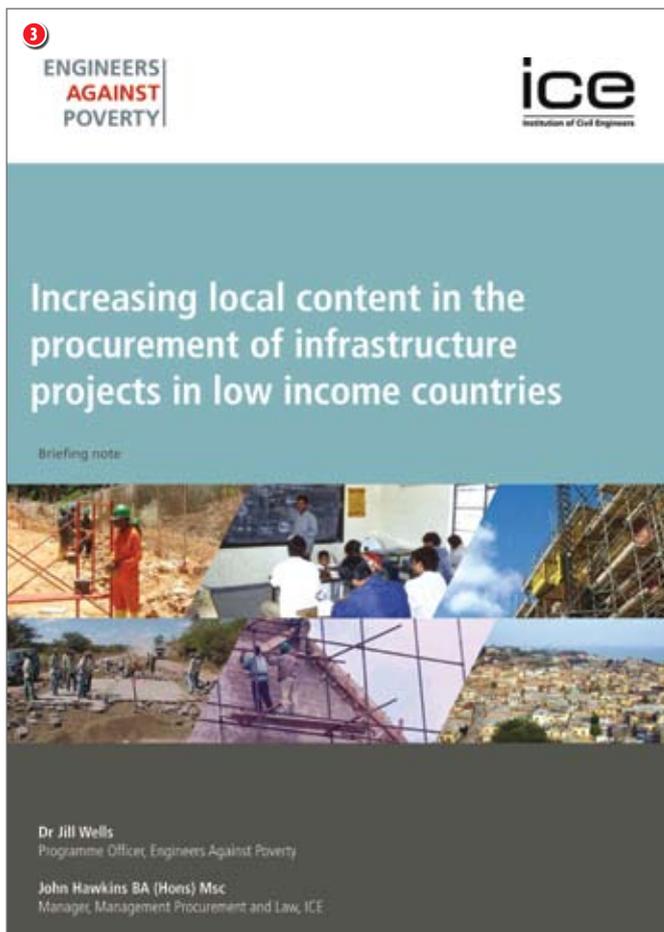
INCORPORATING A GLOBAL DIMENSION INTO ENGINEERING EDUCATION

Engineering is a global industry undergoing a period of unprecedented change. The future of engineering (and the world economy in general) is being framed by global forces which transcend national boundaries, such as the impacts of globalisation, rapid technology advances, climate change and inequality. It follows that engineering higher education

① and ② and ③ (overleaf) Recent EAP publications as discussed in this article

needs to strive constantly to keep pace with these advances and, in particular, with the contribution of engineering to these global opportunities and challenges. Higher education needs to prepare engineers of the future with the skills and know-how they will need to manage rapid change, uncertainty and complexity. Key here is the ability to tailor engineering solutions to the local social, economic, political, cultural and environmental context, and to understand the impact of local action on the wider world.

In March 2008 EAP published *The Global Engineer*, incorporating global skills within UK higher education of engineers. This publication is aimed primarily at the engineering sector



within higher education and outlines why and how universities can embed the global dimension and development education principles within the courses they run for engineering students. (Copies of this publication can be downloaded from www.engineersagainstopoverty.org/_db/_documents/WEBGlobalEngineer_Linked_Aug_08_Update.pdf)

EAP has now launched a new project that will work with seven UK-based higher education institutions (HEIs) to help them incorporate global issues – such as sustainability, poverty reduction and climate change – into the teaching of students. This is a high-level strategic partnership with the responsibility, expertise and influence necessary to bring about a step-change in the way that global issues are dealt with in engineering education.

The project is funded by a grant from the UK Department for International Development and will be of three years' duration, running from July 2009 to June 2012. It will be implemented by EAP in association with the Engineering Subject Centre, the Engineering Council UK, the Development Education Research Centre of the Institute of Education and the Engineering Professors' Council. The participating HEIs are: University of Liverpool, Cardiff University, Queens University Belfast, University of Derby, University of Leeds, Northumbria University and University of Plymouth.

EAP HOSTS COMMONWEALTH PROFESSIONAL FELLOWSHIP

EAP is hosting Eng Julius Kabyemera, President of the Institution of Engineers, Tanzania, as part of a Professional Fellowship sponsored by the Commonwealth Scholarship Commission. While in the UK, Eng Kabyemera will be meeting with a range of organisations to discuss issues including engineering education, professional registration and health and safety.

BRIEFING NOTE ON INCREASING LOCAL CONTENT IN INFRASTRUCTURE PROCUREMENT

Much of the funding invested in infrastructure construction in low-income countries does not benefit contractors, suppliers and workers from those countries. Increasing the input of local labour, goods and services (local content) could make a major contribution to economic growth and the achievement of the Millennium Development Goals. This briefing note aims to:

- show policy-makers that expanding the local content of infrastructure projects is an achievable objective with real long-term benefits
- provide practical guidance on how to do this in practice.

The briefing note is divided into two parts. In Part 1 the authors show that the procurement process can serve as a powerful tool to promote local content in infrastructure construction. However, a number of challenges are identified, notably the preference of clients' donors, engineers and the business community for expensive, high-tech and large-scale projects which are not within the capability of the local industry, as well as the failure of international agencies to balance objectives. In Part II, some suggestions are made for overcoming the challenges and promoting local content through minor changes to procurement at each stage of the project cycle.

(This briefing note can be downloaded from www.engineersagainstopoverty.org/_db/_documents/Local_content_briefing_note.pdf) □



On the fringes of mediation, arbitration and adjudication

Pierre Stoffberg reminisces about the last 15 odd years during which time he has been handling mediation and arbitration for SAICE. The Institution would like to take this opportunity to thank Pierre for the invaluable work he has done over the years, and Johann du Plessis for agreeing to take over the task

WHEN DR BINGLE KRUGER, one of the directors of BKS, became President of SAICE in 1995, he was soon a very busy man, for in the same year his chief adjutant, Johan du Plessis, served as President of SAACE (South African Association of Consulting Engineers). To relieve the time pressures somewhat Bingle asked me to assist him with the nomination of mediators or arbitrators in terms of the General Conditions of Contract that were commonly in use at that time. (In this article I am using the term “arbitrator”, but it also covers the functions of mediator and adjudicator as the case may be.)

I had retired only two years previously and Bingle thought I had nothing to do, and that I had the whole day to do it in. Owing to my background in construction, I knew what he wanted, although he was mistaken about my daily activities. Just a brief word of advice to those who have recently retired: if

you planned on a peaceful phasing out, you should be careful of taking on a job that at first glance seems a simple one.

I was quite well acquainted with the General Conditions of Contract and therefore thought that I could fairly easily fit Bingle’s request into my peaceful daily routine. After all, everyone knows that a mediator is a person who gets on easily with others, can see another person’s point of view and is highly capable of bringing a party around to another point of view. However, an arbitrator is a horse of a different colour, so to speak. This is someone with a legal background, who won’t stand any nonsense, and who is something between a judge of the High Court on the point of passing the death sentence and a cantankerous debt collector, but is nevertheless an expert in the civil engineering industry. (The adjudicator has only recently appeared on the scene.)

Our agreement was that I would sum up the points of view of the two parties in the dispute and would recommend to Bingle a suitable person to mediate or arbitrate the dispute, giving him my reasons for choosing this person – all on no more than a single page. He would then consider my report and decide whether or not to accept my recommendation.

This meant that I had to consult with the two parties in the dispute, listen to their reasons for the dispute (there were often widely differing points of view), and distil the essence of the

In about 450 BC the laws of the Romans were etched on copper plate and these form the basis of South Africa's judicial system, namely Roman-Dutch law. In one of the earliest references to disputes, it is stated that when agreement has been reached, the parties must abide by it. Around 2 000 years ago, specific and precise conditions were laid down in Roman law with regard to arbitration; most of these were adopted by the Netherlands and in this way they became a part of our judicial system

problem. Then I had to choose a person from the President's list of mediators and arbitrators whom I thought was best suited for the job. All went apparently well, so that after Bingle's term of office had expired, I was asked to continue with these activities.

One rainy day when I was on holiday at the coast I picked up a collection of Langenhoven's works and read a piece he had written that was so remarkably appropriate to our practice at SAICE that I would like to quote it here. In his introduction to the essay, Langenhoven says that arbitration was a matter of daily importance in his district, Oudtshoorn, apparently relating mostly to water issues, but what he wrote in 1906 is, with a few minor adjustments, still as valid today as it was more than a century ago.

He begins "*dit nederige blaadjie*" (this humble deliberation), as he calls the essay, by dedicating it to "*elk arbiter die met een rein geweten van zijn gegeven uitspraken kan zeggen*" (to every arbitrator who, with a clear conscience, can say of his award): "*Ik bekleede mij met gerechtigheid, en zij bekleedde mij: Mijn oordeel was als een mantel en vorstelijke hoed. Den blinden was ik tot oogen, en den kreupelen was ik tot voeten. Ik was den nooddriftigen een vader; en het geschi, dat ik niet wist, dat onderzocht ik.*"

(Freely translated:

I donned the clothes of justice, and that enveloped me:
My judgement was like a cloak and lordly hat.
I was eyes to the blind and feet to the crippled.
To those in need I was like a father and I saw; what I did not know, I investigated.)

He continues: Where the people live in a state of "*wilde onbeschaafdheid... maak hij gebruik van een simpele, maar onverstandige manier om geschillen en disputen uit den weg te ruimen. Als twee personen tot onenigheid geraken, grypt elk van hen een klip of een stuk hout, en die sterkste man wint*" (.... wild incivility, they resort to a simple but injudicious way of clearing up differences and disputes. If two persons cannot reach agreement, each one seizes a stone or a piece of wood and the strongest man wins) in this process of dispute resolution. "*Hij is zijn eigen rechter, dan en spreekt en voert zijn eigen vonnis uit; gewoonlijk het doodsvonnis. Deze manier van procederen is heel eenvoudig, maar de gerechtigheid word er niet door bevorderd.*" (Each man is his own judge and pronounces and carries out his own sentence, usually the death sentence. This manner of proceeding is perfectly simple, but it does not further the ends of justice.) Now Langenhoven broadens the parties to the dispute

by pointing out that when governments or other powers become involved in a difference of opinion, "*de klip een bom is geworden en het stuk hout een bayonet. Het vonnis is nog de dood omdat er geen zwaarder kan uitgevonden worden*" (the rock becomes a bomb and the piece of wood a bayonet. The sentence is still death because there is no more severe sentence). (C J Langenhoven, *Collected Works*, Part 16, pp 69–70)

In about 450 BC the laws of the Romans were etched on copper plate and these form the basis of South Africa's judicial system, namely Roman-Dutch law. In one of the earliest references to disputes, it is stated that when agreement has been reached, the parties must abide by it. Around 2 000 years ago, specific and precise conditions were laid down in Roman law with regard to arbitration; most of these were adopted by the Netherlands and in this way they became a part of our judicial system. An important aspect was (and is) that no appeal to an arbitrator to put aside his award is allowed, except in certain exceptional cases, such as when the arbitrator:

- has committed fraud
- has accepted payment, apart from that to which he is entitled in terms of the agreement between him and the parties in the dispute
- hears arguments in the absence of one of the parties
- is clearly not acting in good faith.

As soon as the arbitrator has delivered his award, his task is complete and no changes can be made to it. (In our country arbitration is regulated by the Arbitration Act, No 42 of 1965.)

However, these days to resolve a difference of opinion in our working environment the parties can agree contractually in the General Conditions of Contract (GCC) either to bring a court case against the opposing party or to request a mediator or adjudicator to settle the matter, and if the mediation is not successful, to arbitrate the matter. The arbitrator then takes the place of a judge, with, *inter alia*, two important differences – firstly, that no appeal can be made against the arbitrator's award, and secondly, that an arbitrator's work is private, in contrast to that of a judge whose hearing must specifically take place in public.

I saw my task in relatively simple terms:

- Phone each of the parties and distil the essence of the dispute as it appears from the conversation(s).
- Choose an arbitrator (or mediator or adjudicator as the case requires).
- Indicate why I think that he will be the best person to bring the dispute to a successful resolution.

It was simple until I had phoned the second or third arbitrator to determine his availability for arbitration. "Yes, I'd like to do it because so-and-so is my brother-in-law!" End of the simplicity of the task.

The detailed work follows a logical sequence:

1. Obtain the facts of the dispute and put them down on paper.
2. Choose an arbitrator from the President's list.
3. Ask each party whether they have a legal objection to the person. If so, start again at point 2. (Unfortunately, sometimes the person I have selected says that he would be willing to undertake the task, but if his opinion as a mediator or the award that he gives as an arbitrator is not in his employer's favour, he will not get any more work from that government body. This is the hard reality and is obviously an extremely deplorable state of affairs.)

4. "No, no objection, but why not the person that I suggested?"
I often hear. In such a case a long explanation is usually required to stress the necessity for impartiality.
5. As soon as a mediator or arbitrator has been decided on, I have to establish whether the person is willing to accept the task.
6. If not, I start again at number 2.
7. Once a suitable person has declared himself willing, I draw up a draft letter from the President to the arbitrator to inform him officially of his nomination.
8. I draft the letter in such a way that it also serves as a notice to the two parties in the dispute of the method of dispute resolution that must be followed.
9. In the letter I also give the names, addresses, telephone and fax numbers of the disputees' contact persons. Unfortunately, it happens disturbingly often that one of the parties is represented by a firm of lawyers.
10. Lastly, I fax the letter to Dawn Hermanus at SAICE National Office, who corrects any mistakes in spelling and grammar and ensures that the typing looks professional, fit to appear above the signature of the President. That brings my task to an end.

As an aside – point 9 sounds fairly simple, but finding the correct contact details is often a frustrating exercise. And if you do not have the right sort of legal enterprise profile when phoning the company or government body, you're probably not going to be successful. You may, for example, be faced with a JV of two other JVs, which means that you have to phone around more to find the person's telephone number, and when you then succeed in contacting him or her, especially in the case of a government entity, the person might say that he or she is not authorised to make any decision!

The histogram on page 46 gives an idea of the number of disputes that the President has had to deal with over the years.

Remember, these disputes were referred to the President where the two parties could not reach an agreement themselves about a mediator, arbitrator or adjudicator and therefore do not give an accurate picture of the total number of disputes in the civil engineering profession.

The 1994 SAICE President, Brian Bruce, wrote an article in our magazine which is surely still worth reading. The title of the article was "Dispute resolution – wish or promise?" (*Civil Engineering*, Vol 2, No 12, 1994, p 3) I hope the following extract will rouse your interest sufficiently for you to read the full article:

"Perhaps the most frustrating task that falls to the President during the year of office is the obligation imposed by the Institution-approved [i.e. SAICE] General Conditions of Contract to select or nominate both mediators and arbitrators in the resolution of disputes... 20 years of involvement in contracting and I still find it difficult to believe that Contractor and Employer are that remote from one another that many are unable to reach agreement on the choice of a third party to help them resolve their differences... The majority of these contracts are relatively small and many are between new contractors and employers with limited experience of each other or the document itself... Of particular concern is the increasing involvement of the legal profession, particularly by Employers and as early as the process of mediation. The President, it seems, is increasingly forced to deal

with his obligation under threat of legal action rather than in the interests of civil engineering.”

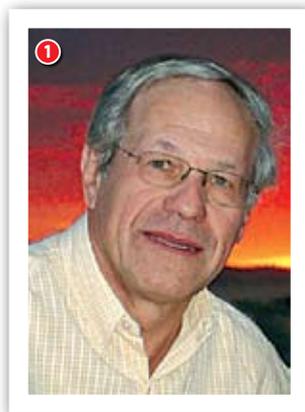
Wise words from a wise man.

Of course one would expect changes to have occurred over a period of 15 years. For example, in the “good” times when work was plentiful it was sometimes difficult to get an arbitrator who was willing to settle a smallish dispute. The most suitable people were mostly too busy with their usual work to accept another time-consuming task. Another aspect was the vehement resistance to any form of dispute resolution from government or semi-government circles as expressed by the spokesperson, often someone who clearly had a strong legal background but insufficient knowledge of the GCC. Despite my plea that they should read the relevant paragraphs in the contract documents signed by their employers, they still argued “we do not wish to go to arbitration”. In such cases I simply left it to the arbitrator to weigh up the arguments and reach a decision.

A matter that SAICE should pay attention to is to recommend to its members who wish to be listed on the President’s panel of arbitrators and adjudicators (but not necessarily mediators) that they should acquire some legal knowledge, e.g. to do a course or two in arbitration – most disputes that are referred to the President deal with some legal point in the contract documents. It appears that most quality problems are resolved on site.

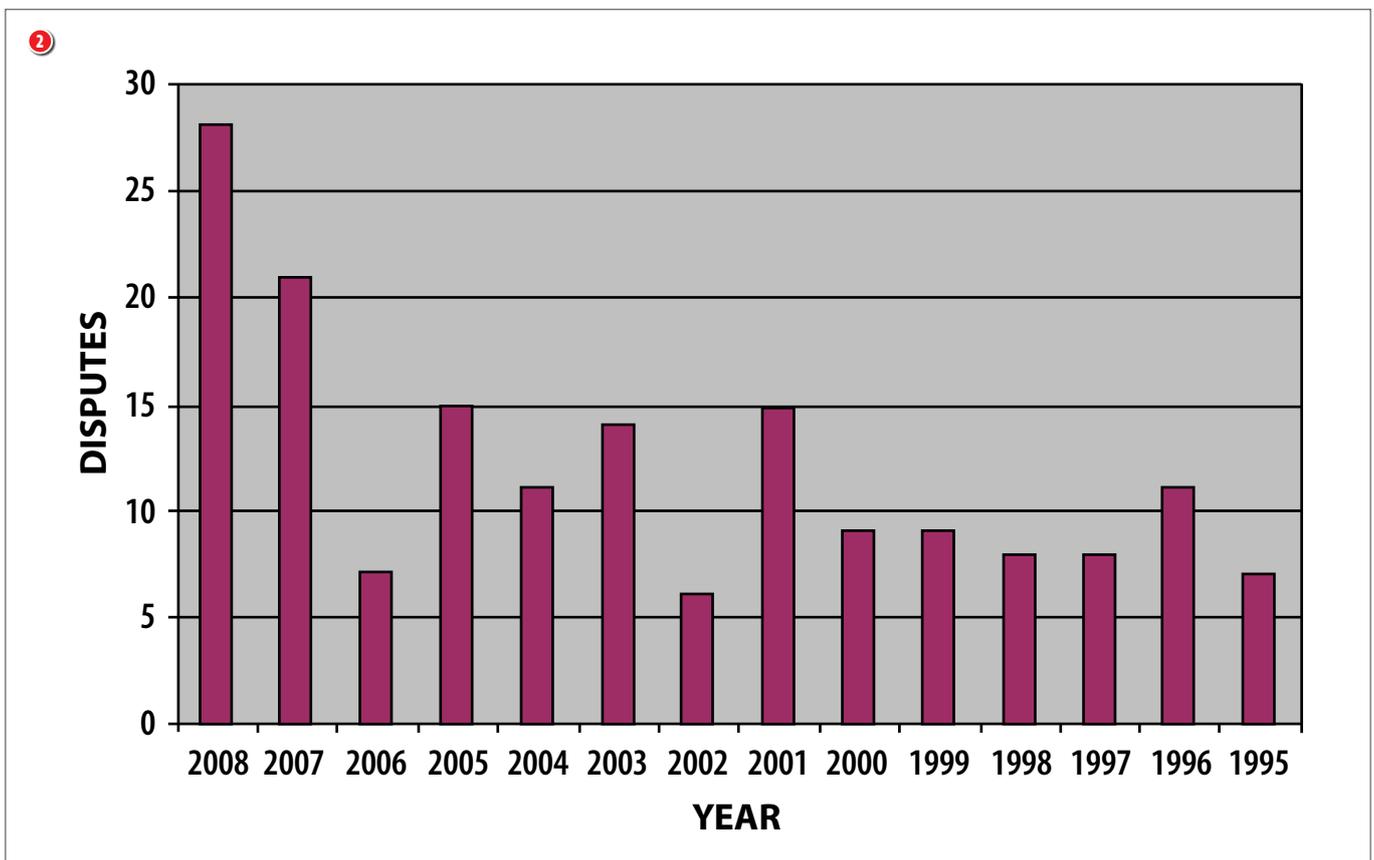
What’s more, the ladies are noticeably absent from the President’s list, and that in the year when we have a lady President! I really hope that after her period of office, our current President will add her name to the list along with those of other efficient and experienced SAICE lady members. *(This article was prepared towards the end of 2009 when Prof Elsabé Kearsley was still President of SAICE. Ed.)*

Fifteen years is about the half-life of an active engineer and so the irresistible siren song of the Lorelei has tempted me into true



1 Johann du Plessis,
johanndp5@gmail.com

2 histogram of the number of disputes that the President has had to deal with over the years



retirement. But who, I wondered, would be willing to take over this task? It needs a friendly, conscientious person, with wide experience in our profession, precise in his work, and who “has nothing to do and the whole day to do it in” – Johann du Plessis. Many thanks, Johann, for being prepared to take over the job, and I hope that you will also find it an interesting and rewarding experience.

So far the present, but what about the future? Our Arbitration Act, promulgated in 1965, needs updating to cope with disputes involving the complexities of modern day construction disputes. But it is even more important to get our act together (no pun intended) as far as dispute resolution between large international investors are concerned so as to encourage increased international investment. A recent newspaper report warned that the lack of a modern international arbitration act is tempting international investment to shy away from us by the absence of a rigorous platform for the resolution of disputes. A case in point is the dispute mentioned by a newspaper between the American telecommunication group Telcordia and Telkom. Apparently Telkom signed a software contract with Telcordia in 1999 from which a dispute involving about \$130 m arose. The arbitration was overturned by our courts, the appeal court agreed with the arbitrator and the matter is now being arbitrated again, due to start sometime in 2010, more than 10 years after the dispute first came to light.

Although a draft international act incorporating the UNICITRAL model (United Nations International Commission on Trade Law, of which South Africa is a member) was approved

Fifteen years is about the half-life of an active engineer and so the irresistible siren song of the Lorelei has tempted me into true retirement. But who, I wondered, would be willing to take over this task? It needs a friendly, conscientious person, with wide experience in our profession, precise in his work, and who “has nothing to do and the whole day to do it in”

by the South African law commission some ten years ago, political considerations have caused it to be withheld from promulgation, possibly because it was revised by the UN in 2006. As a result large investors probably shy away from us and rather invest in those countries where the local laws do not, by the absence of a rigorous international arbitration environment, interfere with their disputes. Foreign investors favour arbitration according to international rules so that the real possibility of interminable delays of court actions are eliminated, and the dispute resolution is private. The cherry on the top would be to exclude any possibility of interference by local courts in the resolution of international disputes settled by an international arbitration act.

The ideal thus would be to upgrade our own arbitration act but, in addition, to have an international arbitration act based on proven international dispute resolution through arbitration. □



MARKET PERSPECTIVE

Revenue management – the smarter business approach

Smart municipalities manage their 'own revenue' effectively to deliver sustainable services and infrastructure

THE FINANCIAL POSITION of most of South Africa's 283 municipalities is dire. According to the National Treasury, 239 of these currently face a combined debt burden of R53,3 billion. Surely this is an indication of a pervasive inability at local authority level to deal effectively with financial challenges?

The total debt owed to these local authorities escalated by ±11% or approximately R5 billion over the last year alone. This means that many of them are kept afloat by government grants and other external funding assistance.

Why have municipalities been struggling for so long to deal with these challenges and how can they overcome them? We know that most municipalities are faced with a plethora of revenue-related problems. It seems that the main reasons for this untenable situation relate to legacies of the past, such as the abject poverty that led to a culture of non-payment and the loss of skills and operational capacity. Generic challenges, such as poor data integrity in municipal systems, ineffective indigent management, the inability to maintain infrastructure properly for service delivery, and a serious lack of financial and management proficiency, have added to the burden.

Consumers who tap into the electricity and water grid illegally, and the deficiency of existing credit control measures also exacerbate the cash-flow problems.

The reality is that municipal debt is growing year by year, and the dependence on government bail-outs and borrowings continues. This includes the money needed to maintain existing assets – R1,25 billion a year more than the municipalities' annually generated income – and impacts directly on their ability to deliver sustainable services. Recent spates of public, and at times violent, protests against non-delivery seem to be adding impetus to, rather than reversing, the downward spiral.

Local authorities are starting to realise that the reasons for non-delivery referred to above, as well as corruption and poor governance, are why they have reached a point where the situation has become almost unmanageable. Surely, the time is long past for acknowledging that 'more of the same' will not provide any sustainable solutions, and that the need for

decisive action to find smarter solutions and innovative ways of overcoming financial ineptitude to improve cash flow is no longer debatable?

But let us not look only at the problems, for that often makes it difficult to find solutions.

To my mind, the reasons for the current situation are less important than the failure within municipal structures to understand the link between revenue management and sustainable service delivery.

Revenue management, credit control and debt collection are integral to sustainable infrastructure development and infrastructure asset management.

Frequent interaction with many municipalities has made it abundantly clear that those willing to focus on 'thinking smarter' to gain control over their own revenue generation can stop the downward cycle and start converting debt into infrastructure. Debt collection alone will not address these challenges – a holistic revenue management approach must be followed for solutions to become sustainable.

Models for such corrective interventions do exist. An example is the BIGEN AFRICA/ZMS municipal revenue management model, developed specifically for municipalities in South Africa. The differentiating factor is a focus on both revenue management and infrastructure development. The approach is implemented through:

- A revenue management software tool developed specifically for municipalities in South Africa
- Working inside the municipality and 'shoulder-to-shoulder' with municipal staff
- Training municipal staff and providing scholarships to create capacity, enabling the municipality to continue with the corrective implementation after the intervention comes to an end
- Creating awareness in local communities through campaigns and regular meetings with ward councillors and other role players
- Combining credit control, debt collection, legal issues, indigent management, query management and data cleansing activities into a single, well-managed operational process.

Tackling pervasive problems head-on can fast-track the overall improvement process and, if sustained, will result in long-term benefits. This includes:

- Preventing municipal debt from growing in the first place

The commission structure and cash model differ for every municipality and depend on the municipality's demographic and economic profile. According to this profile, a percentage commission from the benefits generated and/or a fixed fee is negotiated upfront. The intervention process also helps municipalities to find sources of additional revenue, such as identifying the areas where they are providing services but not rendering accounts. This has proved to be a significant source of additional income in a number of municipalities where the smart thinking approach has been implemented

- Instilling financial discipline with the requisite checks and balances
- Ensuring that the right people with the right skills are deployed where they are most effective
- Using the corrective intervention to transfer the skills required to sustain implementation
- Ceasing to blame affirmative action for capacity woes and dealing upfront with the lack of will to take action.

Can municipalities afford such a 'rescue' package? In effect, the intervention can be virtually cost-free. Commission is normally paid on revenue generated as a result of the implementation of the management model, such as improved cash flow and income from accounts in arrears.

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As I see it, the big picture is about ensuring that municipalities can deliver effectively against their mandates, in a sustained manner, supported by sound financial systems and efficient management. In the short term, however, it is clear that the choices they make now, as individual authorities, will affect their future and the quality of life of South Africa's civil society at large.

Results from the implementation of the BIGEN AFRICA/ZMS municipal revenue management model include:

- increase in payment rates
- reduction in outstanding debt
- increase in creditworthiness
- increase in number of municipal accounts rendered
- policy changes to enable best practices
- effective credit control
- in-service training of municipal staff
- confidence in the use of software tools to sustain implementation
- cost saving due to streamlined processes
- job creation in communities by using local labour and skills

BIGEN AFRICA's track record

The experience and knowledge of our Revenue Management team have added significant value to many municipalities. Recent projects include:

- Financial administration and revenue collection assessments for the Lepelle-Nkumpi, Aganang, Blouberg and Molemole Local Municipalities in the Capricorn district of South Africa.
- Financial viability assessments for the Ndlambe, Ga-Segonyana, Overstrand, Kouga/Koukama and Ilembe Municipalities. The focus of this joint DWAF and dplg (now DWA and CoGTA) project was on providing communities with free basic water and securing private sector financing for major water infrastructure developments. Extensive remedial work was needed.
- Revenue enhancement, credit control and debt collection, through ZMS Management Solutions, to the George, Newcastle, Matlosana, Naledi, Makhado, Hibiscus, Umtshezi and Umkhanyakude Municipalities. □

CMA INVITES ENTRIES FOR ITS 13TH AWARDS FOR EXCELLENCE COMPETITION

THE CONCRETE MANUFACTURERS Association (CMA) will be holding its 13th Awards for Excellence competition in 2010. The competition is open to all architects, engineers, manufacturers, developers, contractors or users involved in precast concrete projects and is not limited to CMA member companies.

CMA director John Cairns says that the purpose of the awards is to recognise excellence in the aesthetic, engineering and creative use of concrete-manufactured products, and to honour those involved in the application of these products either through design or construction, or both.

"The event presents an outstanding opportunity for southern African designers and project developers to establish themselves as trendsetters in various related disciplines and to gain national recognition for their achievements," says Cairns.

Entries to this biennial event may be submitted by individuals, partnerships or companies in the following categories:

- Concrete Block Paving
- Concrete Roof Tiles
- Concrete Masonry
- Concrete Retaining Block Walls
- Suspended Concrete Floor Slabs
- Infrastructural Products

These categories contain several subcategories, which are broken down on the entry form. The first four listed above include a Vintage sub-category for projects completed ten or more years ago.

"This category was introduced in 2000 and is growing in popularity. It proves that concrete products are not only durable, but also retain their aesthetic appeal over the long term," says Cairns.

Apart from the Vintage entries, only projects that have been completed since 1 January 2008 qualify for entry.

Cairns adds that awards are made on a regional and national basis. "Regions include KwaZulu-Natal, Eastern Cape, Western Cape and Inland. Coastal-based regional awards will be made to winning sub-category entries at regional ceremonies held in Durban, Port Alfred and Cape Town.

"National awards are made to the winning entry of each sub-category. These awards, as well as the inland regional awards and the four CMA floating trophies, are presented at a gala awards banquet, which will take place in October 2010 in Gauteng.

"The most prestigious awards comprise four floating trophies sponsored by international pigment manufacturer Cathay Industries. These will be awarded to the overall national winners in the Masonry, Paving, Roof Tiles and Other Concrete Products categories," explains Cairns.

He says that the competition standards are high, and if not met in any of the categories, the CMA reserves the right to withhold an award in that category.

Entry forms are available from the CMA website at www.cma.org.za and the closing date for entry submissions is 31 May 2010.

► INFO

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AFRISAM ADVERTISING KEEPS CLEAN WATER FLOWING

ACCESS TO CLEAN DRINKING water is imperative for human survival, but more than one billion people worldwide do not have access to clean water. Poverty-stricken communities fall victim to water-related diseases, taking the lives of 6 000 people a day worldwide and causing 80 percent of all sickness in the world.

The drinking water crisis falls especially hard on women and girls. Millions of children, mostly

girls, miss school because they must walk as far as 10 km each day to fetch water and care for relatives who have fallen ill from the use of dirty water. Many also miss school because they are too sick themselves to attend classes and study.

In many communities the water that people need in fact exists. However, it is located deep underground where it is impossible to reach without a well and pump. All this can change with the innovative and sustainable PlayPump® water system.

How does the PlayPump® water system work?

The PlayPump® water system is a children's merry-go-round attached to a water pump. As children play and spin, clean water gets pulled up from underground into the 2 500-litre storage tank, standing seven metres above the ground.

A simple turn of the tap pours the water out, making it easily accessible for both adults and children. Excessive water is diverted from the storage tank back down into the borehole. If someone wants water while the children are not playing, an adult can easily spin the merry-go-round by hand.

Providing a clean water solution, PlayPump® systems are usually installed near schools or in the middle of rural communities in Africa where sanitation is poor. Benefits of the PlayPump® water system are threefold - providing access to clean, safe drinking water; reducing barriers to education; and promoting valued play and interpersonal skills amongst the youth.

With more than 1 200 PlayPump® systems already installed in rural parts of South Africa, Mozambique, Lesotho, Swaziland and Zambia, the power of children's play is bringing clean water to approximately two million people.

① As children play and spin on the merry-go-round, clean water gets pulled up from underground into the 2 500-litre storage tank



By 2010, the combined efforts of PlayPumps International, and the international organisations or individuals that fund the set-up of the PlayPump® systems, aim to have installed 4 000 pumps in 10 countries in Sub-Saharan Africa, bringing clean drinking water to up to 10 million people. Expansion over the next few years will bring PlayPump® systems to Ethiopia, Kenya, Malawi, Tanzania, and Uganda.

AfriSam's contribution to improving the lives of millions

In addition to providing easy access to drinking water, one of the best parts of the system is that it pays for itself. All four sides of the storage tank carry billboards for advertisements. Space is rented to different companies, provided that two of these spaces are reserved for positive social and educational messages, such as the importance of washing hands, and HIV/AIDS awareness.

If a pump breaks, the money from this advertising pays for any repairs. AfriSam will be using the advertising space on 20 of these sites around South Africa (Eastern Cape, KwaZulu-Natal, Limpopo, Northern Province, North West) to communicate a social, as well as a corporate, message, and assist PlayPumps International in making a difference to rural communities in Sub-Saharan Africa.

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CONCRETE ROOF TILES – THE MOST ECONOMICAL AND BEST-LOOKING ROOFING MATERIAL

CONCRETE ROOF TILES are still the most cost-effective roofing material for roofs built with trusses. This observation is based on an updated survey coordinated on behalf of the

1 The timber framework of a typical example of the CMA roof system is subjected to stringent load testing prior to receiving Agrément certificate No 2003/302

2 The Golf Course Ext Development, an affordable housing initiative adjacent to the King Williams Town Golf Course in the Eastern Cape, is the first housing project in which the recently introduced CMA roofing system was used

Concrete Manufacturers Association (CMA) by roofing specialist Victor Booth Pr Eng, an independent consulting engineer.

Last conducted in 2007, the survey uses data gathered in August 2009 from several sources. It focused on three building models, a 57 m² floor area house, a 134 m² house and a 1 158 m² commercial building. The results of each have been published by the CMA in three leaflets, one for each model.

CMA director John Cairns said the survey assessed completed roofs built with trusses which allow for the inclusion of ceilings and underlays, and in each case concrete-tiled roofs proved the most cost-effective material.

"An increasing number of low-cost housing developments are using roofs built with trusses as they have better insulation and aesthetic properties and ultimately make for much sounder long-term investments," observes Cairns.

Factors such as floor area, roof area, pitch and truss spacing, among others, as well as cost factors such as truss and timber sundries, roof erection, roofing material and fixing,

were taken into account. Prices were based on complete roof structures – however, fascia boards and gutters were omitted from the survey because these are optional items which make no difference to the costing. Likewise no provision was made for underlay, membrane or ceiling construction.

Cairns says the figures represent a 'snapshot' in time and that price fluctuations of materials and labour will vary from product to product as time passes.

Certain assumptions were made to simplify the costing model for these buildings. For instance, while some housing developments comprise many units and developers/contractors can negotiate special project discounts, the majority of builders construct one-off projects and are therefore obliged to source roofing materials from their local suppliers at less advantageous prices.

The survey takes the following into account:

- Roof truss prices are based on standard industry pricing practice.
- All costs are based on August 2009 figures.



- Labour costs for the erection of the timber structures and the fixing of the roof covering material are included in the cost comparison.
- General sundries exclude fascia boards and barge boards.
- The cost of gable masonry has been excluded as it is constant for all roofs.
- The rates exclude VAT.
- Waste is included in all calculations.

The updated survey focuses on two models for concrete-tiled roofing in the 57 m² house category, one using a conventional concrete-tiled roof, and the other a roof using the CMA roofing system. The latter, which has been awarded an Agrément certificate, was introduced in 2005 to make the concrete-tiled roof even more affordable, and the results of the current survey confirm this.

The R/m² cost for a concrete-tiled roof using the CMA roofing system at R186 is 8% lower than the cost of corrugated-iron sheeting at R202, whereas the R/m² cost for a house using conventional timber trusses with concrete roof tiles is 1,5% less than the cost of corrugated-iron sheeting. Furthermore, when one takes into account maintenance costs over the lifespan of both products, concrete roof tiles, which require little or no maintenance, are likely to outperform corrugated-iron sheeting.

Other materials such as pre-painted IBR metal sheeting, corrugated-fibre cement sheeting, and pressed-metal tiles were also included in the 57 m² house comparison. It revealed that the CMA roofing system costs 26% less than the R234/m² of pre-painted IBR metal sheeting, 36% less than the R253/m² of corrugated-fibre cement, and 43% less than pressed metal tiles at R267/m².

Pre-painted metal sheeting, pressed metal tiles, natural slate and fibre-cement slate were the materials selected for comparison with the through-colour concrete roof tiles used on the 134 m² house and the 1 158 m² commercial building.

The concrete roof tile cost of R249/m² on the house was 4,5% lower than the R260/m² of pre-painted IBR sheeting on the same structure. Concrete roof tiles cost 18,5% less than the R295/m² of pressed metal tiles, 75% less than the R437/m² of natural slate, and 82% less than the R454/m² of fibre-cement roofing.

The R300/m² concrete roof tiling cost for the office building was just under the R305/m² for pre-painted IBR sheeting and close on 10% lower than the R329/m² cost of pressed metal tiles. It was also 64% lower than the R492/m² of natural slate and 67% lower than the cost of a fibre-cement slate roof, which came in at R502/m².

Certain assumptions were made to simplify the costing model for the commercial building. For instance, a floor area of 1 158 m² was chosen arbitrarily and has no special significance other than being fairly representative of architectural practice. The roofs were all pitched at 26° as it was felt that in most circumstances this would be an architectural design feature of the building.

Cairns says the survey clearly demonstrates that property developers can have the best of both worlds for roofs built with trusses – attractive roofs which enhance the value of properties at the most cost-effective prices. This is especially so at the lower end of the market.

► LEAFLETS ARE AVAILABLE AT NO CHARGE
FROM THE CMA:

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FIRST COMMERCIAL SOLAR-DRIVEN AIR-CONDITIONING SYSTEM IN SA

IT IS AN INTERESTING paradox of South Africa's sunny climate that the very source of heat, which necessitates cooling in buildings, can in turn be utilised to cool these same buildings. An exciting showcase project to prove the efficacy, efficiency and economic viability of commercial solar-driven air-conditioning systems has been implemented in Pretoria. Utilising absorption chiller technology, the project aims to define a new method of cooling buildings in southern Africa.

Voltas Technologies is the South African importer and distributor of the absorption water chillers produced by the Japanese multinational, Yazaki, a world leader in the absorption industry. The Johannesburg-based company specialises in solar technology products and solutions and offers a large range of quality renewable energy products through its comprehensive southern Africa dealer and installer network. In terms of its expertise, knowledge base and world-class product range the company is ideally positioned to offer optimal and cost-effective solar and green building technology solutions to the local market.



1

1 Showcase installation of the 'First Solar Thermal Driven Chilled Water System' on the roof of the Moot Hospital in Pretoria

Solar thermal energy has perhaps the greatest potential of all solutions to transform global energy issues, as it is a highly efficient renewable energy source for heating and cooling. During 2008, according to the European Solar Thermal Industry Federation (ESTIF), despite the economic downturn, solar thermal heating and cooling solutions gained significant market share in an increasing number of countries around the world.

The industry is forecast to grow rapidly in the coming years as policy-makers push renewable energies up the agenda and developers realise that initial costs will be offset by significant savings in the medium to long-term. In South Africa, developers are finding that electricity permissions and allowances are becoming more difficult to obtain and many are exploring solar and eco-friendly technology options as a solution to this problem. To further develop the quest for sustainability, the Green Building Council of South Africa has developed its own Green Star rating based on the Australian model which augers well for alternative energy solutions in South Africa.

Although technology utilising free solar energy to power air conditioning systems

was available in South Africa, Cristian Cernat, CEO of Voltas Technologies, was faced with several challenges which included the structural limitations of existing buildings and the need to prove that absorption chiller technology was ideal in the South African context.

"It was clear that the only way forward would be a showcase installation which could prove to the market that absorption technology is a reliable, efficient and cost-effective solution for the South African air-conditioning market."

After months of negotiations with different entities trying to find a host for the showcase plant, Cernat approached a long-time client, Netcare Hospitals Pty Ltd. "Thanks to the commitment of Peter Schilder, Group Technical Manager, and Eddie Herrmann, Regional Technical Manager, Netcare Hospitals agreed to provide Voltas Technologies with sufficient roof space and the opportunity to install and operate the system in parallel with the existing air conditioning plant at Moot Hospital, one of their facilities in Pretoria," explains Cernat.

"In order to demonstrate the economics and the operating characteristics of absorption cooling systems in South African conditions, Voltas Technologies, in partnership with several reputable solar installers, installed the solar chiller plant. The plant, known as the 'First Solar Thermal Driven

Chilled Water System' is a first in southern Africa. This showcase project has a 35 kW cooling capacity, based on the Yazaki WFC 10 chiller, and a number of solar collectors for a heat source on the roof of the Netcare facility. The installation will produce chilled water, the cooling agent utilised in the building's air conditioning system, by deploying a thermally driven absorption cycle based chiller unit in lieu of an electrically driven compression chiller. Thus, solar thermal energy can be used to efficiently cool in summer, and heat domestic hot water and buildings in winter."

The aim of the two-phase project is (a) to prove the technology to the local market, (b) to establish the relationship between the kW cooling and the area of the solar collector field required in South African conditions to power the chiller, and (c) to optimise the heat storage solution in order to ensure a consistent and constant hot water temperature supply to the chiller.

Cernat says that the installation will be completed in two different phases: Phase One – the installation of an absorption based system, 35 kW nominal cooling capacity complete with a dual storage system and full monitoring, and a web accessible bms system; and Phase Two – the upgrading of the system to 200 kW nominal cooling capacity. Phase One is now complete – the system is up and running and online. Once

conclusive data has been collected and the heat source/cooling ratio confirmed, the project will move forward to Phase Two.

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MUNITECH ESTABLISHES SPECIALIST LEAK DETECTION DEPARTMENT

MUNITECH, WHICH FOCUSES on municipal operations and maintenance management, has recently established a specialist leak detection department in response to heightened awareness of water loss management in South Africa.

"Increasing pressure on water resources has resulted in water loss management assuming a critical role in how each municipality manages its water reticulation systems," says

1 *Siyabonga Sithole from Munitech using an electronic listening stick to identify leak noises on submerged pipes*

George Iliev of Munitech, part of the B&A Group. "Careful planning of leak detection sweeps, together with accurate management of field data resulting from these sweeps, is critical. Managing a leak from detection, through the repair process, to quality control of the repair, is key to a successful water loss management programme."

The location of underground leaks is an exacting process, which requires professionally trained, motivated and well equipped staff to execute each task effectively.

Munitech has initiated an innovative GIS-based management system for leak detection and repair. By using GIS to manage the process, a strong platform from which to analyse data obtained during subsequent sweeps of an area, has been established.

Active leak detection encompasses activities ranging from walking the reticulation lines and observing visible leaks, to the deployment of sophisticated acoustic sensing equipment that 'listens' for leak noises on submerged pipes.

Munitech has recently completed a contract for leak detection and repair services in the southern operational area of eThek-wini. Field teams, who had undertaken numerous leak detection sweeps of rural, peri-urban, suburban and industrial areas, have contributed to a reduction in real loss as part of eThek-wini's Non-Revenue Water Reduction Programme.

Active leak detection and the repair of aging infrastructure are pivotal components of water loss management.

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THE RED BOOK NOW AVAILABLE ON CSIR WEBSITE

THE RED BOOK (Guidelines for Human Settlement Planning and Design), compiled under the patronage of the Department of Housing by the CSIR, provides performance-based guidelines for informed decision-making. The purpose is essentially to indicate the qualities that should be sought in South African settlements, and to provide practical guidance on how these qualities can be achieved. Its purpose is not merely to assist professionals in producing efficiently serviced "townships", but rather to create sustainable and vibrant human settlements.

The Red Book consists of two volumes: Volume 1 focuses primarily on planning issues and Volume 2 on engineering services. These volumes can be downloaded from the following websites:

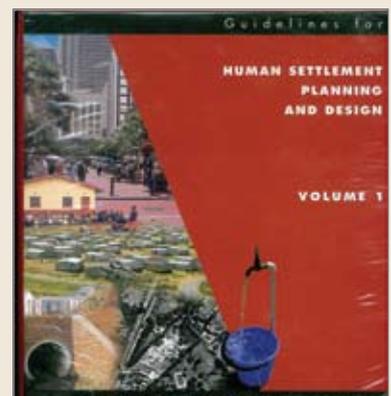
www.csir.co.za/Built_Environment/RedBook/volume1.html

www.csir.co.za/Built_Environment/RedBook/volume2.html

The document is also available on CD at a cost of R150 including VAT and postage.

► ORDERS

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TRANSNET PORT TERMINALS PLACES BUSINESS WITH LOCAL MACHINERY MANUFACTURER

IT WAS A CASE OF "local is lekker" when Transnet Port Terminals (TPT) chose local heavy machinery manufacturer, Desmond Equipment SA, to supply a R1,1 million front-end loader for the Agriport terminal in Durban.

The Dezzi 2300 articulated front-end loader with 5 m³ bucket was delivered to the terminal recently, and will be used at Agriport's new 80 000 ton bulk warehouse.

The new warehouse will be used for the storage of soya meal, most of which enters the country via Durban. It is expected to be operational early in 2010.

Ernest Bell, Commercial Specialist in TPT's Procurement Department, said the supplier's delivery within tight deadlines bore testimony

1 In the 80 000 ton soya meal warehouse currently under construction (left to right): Antonio Chessa of G Liviero & Sons (prime contractors); Cliff Eland, Project Manager for PD Naidoo & Associates (project managers); Robert Teale, TPT Project Manager; Bill Barrett, Director of Civil Engineering for PD Naidoo & Associates and Wolfgang Bohm, Site Contractor for PD Naidoo & Associates

2 Aboard the new Dezzi 2300 front-end loader (left to right): Siphon Dube, Fleet Manager of TPT's Agriport; Harry Dickinson, Project Manager for TPT; Ron Stroebel of Desmond Equipment SA; Robert Teale of TPT, Ernest Bell of TPT and Desmond Gutzeit of Desmond Equipment SA

to the capacity of local manufacturers. "Our technical managers have already visited the manufacturing plant on two separate occasions and have confirmed that the quality of the equipment meets Transnet's standards," said Bell.

Based in Port Shepstone, Desmond Equipment SA has been in operation for over 30 years, manufacturing and supplying a variety of earthmoving equipment to the southern African construction, mining, quarrying, forestry, sugar, industrial and harbour bulk handling markets.

The Dezzi range of equipment launched in 1995 now includes articulated dump trucks, haulers, trailers, water trucks, graders and front-end loaders.

Robert Teale, Project Manager at TPT, said the establishment of the bulk warehouse formed part of several investments aimed at realising capacity and generating new business at the Agriport terminal. These include the establishment of bio-directional conveyor routes enabling TPT to load and offload at the same berth, extension of the rail structure, and investment in a new pneumatic ship unloader to offload wheat.

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SAICE AND PROFESSIONAL NEWS

Candidate Academy to be launched

The civil engineering industry is launching an ambitious programme in 2010 to roll back two decades of declining investment in the training of newly-qualified engineers, technicians and technologists – and to rebuild the skills foundation of this vital sector. SAICE and CESA (Consulting Engineers South Africa) will shortly be launching the Candidate Academy to support graduates on their road to registration with ECSA

FOR MANY YEARS, South Africa has been failing its engineering graduates by paying too little attention to their professional development once they enter the job market with a degree or diploma.

“The fact is that graduates are generally not career-ready when they complete their tertiary education – and this is the current norm,” says Allyson Lawless, MD of SAICE Professional Development and Projects, who is driving the establishment of the Candidate Academy. “They need concerted and on-going training in the workplace to become competent professionals, able to earn their registration with the Engineering Council of South Africa (ECSA). For many years this training and development has simply not been taking place to anywhere near the extent required.”

DANGEROUS DECLINE

There has been a slow decline in the number of civil engineering professionals since the infrastructure development heydays of the 1960s and 1970s. South Africa is not unique in this situation, according to Allyson. In the developing world, lack of engineering capacity is also hampering development.

The decline in graduate readiness is also a trend which is evident worldwide, with a publication from the London-based Institution of Civil Engineers (ICE) declaring that graduates are “less prepared to cope with pressures and crises endemic in today’s workplace” due to the changes in education over the years.

“Young graduates are not being given adequate training and support to be able

to register with ECSA,” says Allyson. She highlights the importance of graduates being taken through the full 'project cycle' (see Figure 1) – covering all the technical activities involved in civil engineering projects from engineering and re-engineering, through construction, to operations and maintenance.

FULL EXPOSURE

“In practice this means that graduates must be transferred from department to department, or from function to function in an organisation, and be given sufficient support to learn,” explains Allyson. “If necessary, secondment must be reintroduced to ensure that all graduates gain experience in design and implementation”

An indicator that this is not happening is that it now takes young graduates much longer to achieve their ECSA registration – thereby seriously impeding their potential development and contribution to their companies and to economic development as a whole. While it was previously the norm to register after three to four years of solid workplace exposure, only about a quarter of today's graduates achieve professional status by the time they are 30 years old. Says the ICE publication: “If the gap between formal education and the requirements of the profession has increased, then there is more training needed in the workplace.”

Employers face serious challenges in providing adequate training, due to the high level of demands to deliver at the current level of economic development, the lack of funding to employ dedicated mentors and the lack of staff in the middle category or age group who would normally provide mentorship and coaching of young graduates.

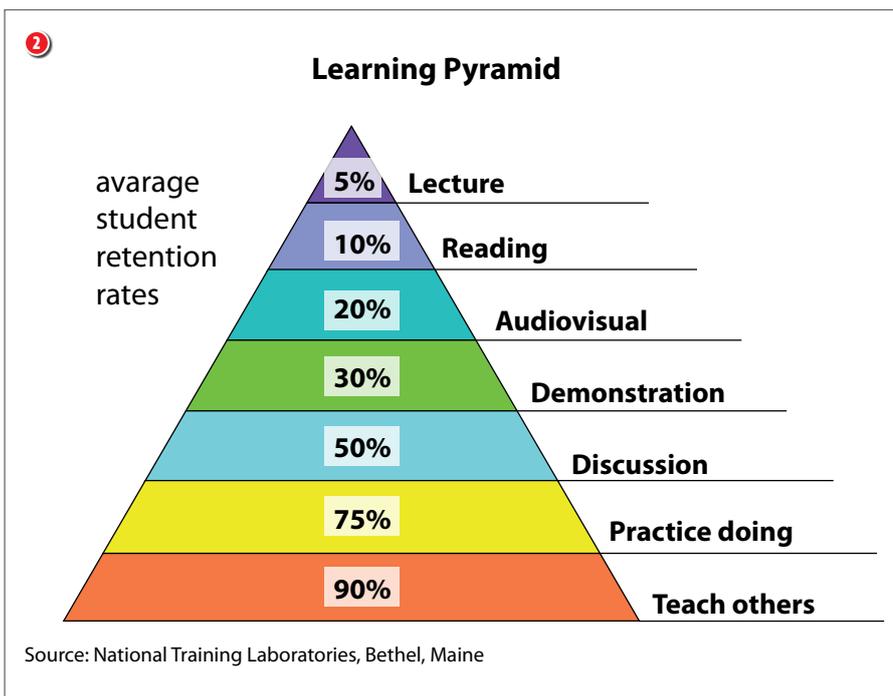
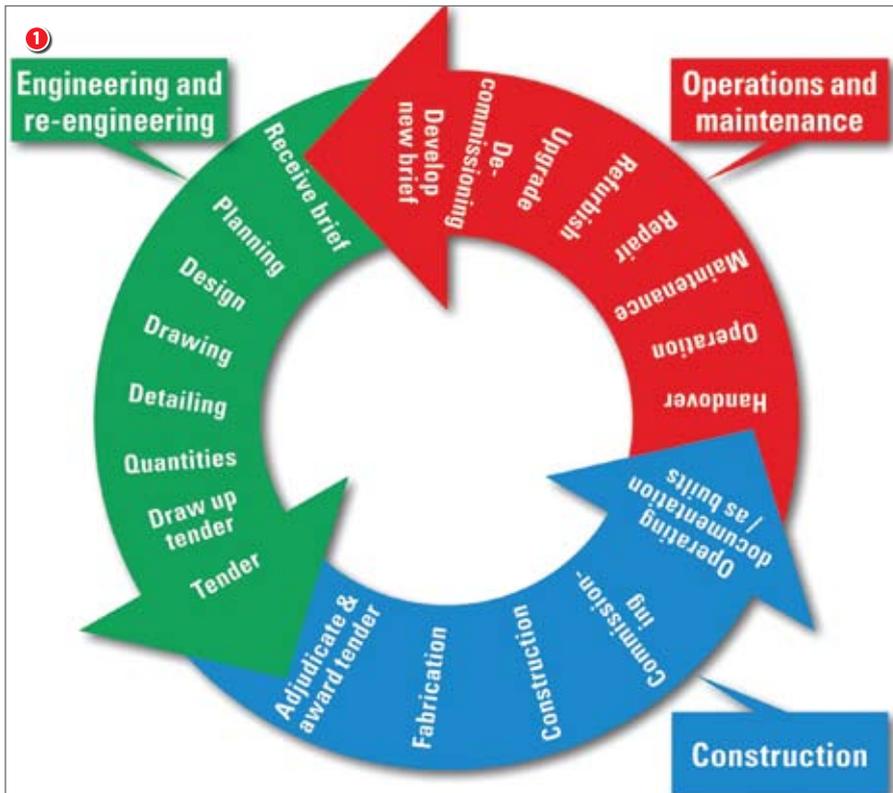
Sadly, production staff are generally too busy to spend adequate time with young graduates to transfer skills and are often frustrated with their inability to apply the theory they have been taught. Many write off these young people, declaring “I can do it quicker myself”, forgetting the time that was invested in them by senior staff when they were juniors. Addressing the gap between theory and application is to be the focus of the Candidate Academy.

GUIDED AND PRACTICAL

The Academy is to provide both structure and content for helping young graduates

1 The project cycle – skills to be acquired

2 The learning pyramid



to develop workplace competencies, building them from their theoretical training through the 'how' of engineering projects and processes. This training will be exercise-based, starting with a brief refresher on the topic and leading into a guided practical learning exercise or project – a very different approach from current highly theoretical or advanced courses, aimed at assisting experienced professionals earn CPD points.

"It is well known that we learn better by doing," says Allyson. Research shows that students retain little from lectures and only 10% of what they have read, increasing to 75% through the practice of 'doing' (see Figure 2).

To bridge the gap the Academy's interventions will be practical, hands-on and relevant to the workplace context. Moving away from the mode of 'passive reception', they will be involved in the 'active learning' of their trade, which cultivates wisdom and prepares them to be discerning, responsible and imaginative practitioners.

OFFERINGS

To provide useful interventions in line with the above strategies, the Academy will offer applied workshops and courses in particular areas of expertise. Of importance is the need to develop both technical and professional skills, both ranges of competencies being a requirement of ECSA and essential for long-term development as a professional. Recognising this, SAICE and CESA have joined forces to provide technical and professional practice training through the Education and Training Department of SAICE, and CESA's School of Consulting Engineers.

TECHNICAL APPLICATION

Technical training will focus on preparing basic plans, designs, documents and processes which are fundamental to developing an engineering career. Courses will not only include hands-on activities, but site visits, presentations from suppliers on the practical selection of materials, fittings, equipment etc, and best practice videos and discussions.

It is intended that this training will address all sectors, including consulting, contracting, suppliers and the public sector.

PROFESSIONAL PRACTICE

Technical training would be of little value if graduates do not understand the

context of the sector(s) in which they are working, including the legislation, financial, procurement, resources and management constraints that dictate how to roll out projects. Additional training that will be offered will bring graduates up to speed with today's tools of any profession, such as the effective use of MS Word, Excel, and Projects, and being able to prepare quality reports and documents that can sell their thoughts and cast their organisation in a good light. Courses aimed at graduates, focusing on these skills, will be offered to hone these skills from the outset.

WHEN TO ATTEND CANDIDATE ACADEMY COURSES

Given that the Candidate Academy courses are hands-on, they should only be attended immediately prior to the graduate commencing an appropriate project in the workplace. If graduates have detailed workplace training plans, it will be possible to plan attendance of these courses to coincide with the workplace activity. Before graduates attend courses, it is expected that supervisors brief them on their next project so that they can ask meaningful questions and ensure that they understand all processes before returning to the workplace.

NOTES TO SUPERVISORS AND MENTORS

Supervisors with the skills, experience and time to nurture young employees in an engineering firm have long been the mainstay of professional development in this sector. The role of the supervisor, who generally also acts as the coach, is crucial in giving direct supervision of a graduate employee's daily tasks. "The graduate will not progress unless his or her work is continuously evaluated, hence the supervisor becomes the coach and plays a very important role in developing the young protégé," says Allyson.

Equally important for a young trainee is a mentor – an experienced person (inside or outside the firm) who can give guidance and support on general career path planning, encourage self-development and self-sufficiency, and ensure that line managers play their part in motivating and nurturing graduates.

For graduates and employers to benefit from the training offered by the Candidate Academy, supervisors and mentors need to understand what has been covered in each of the courses and what the graduates

should be doing in the workplace to reinforce the learning experience. All Candidate Academy courses will include notes for supervisors and mentors to ensure that maximum benefit is derived from the training experience.

ASSIGNMENTS AND EXPANDED SUPERVISORY CAPACITY IN THE WORKPLACE

Assignments form an essential part of each course. In some cases graduates will commence assignments during the course, and in others will complete them in the workplace with the assistance of their supervisors, or an external supervisor accessed through the Candidate Academy, where internal capacity is not available.

The work will be assessed by the trainers, input offered and an advanced certificate will be issued, acknowledging that the graduate has completed a particular design, process or project successfully. Having completed a rudimentary design and a more detailed assignment, graduates should then be able to complete actual designs, processes or projects in the workplace with limited assistance from busy staff.

It is hoped that in developing the culture of offering increased supervisory inputs in the early stages of the graduate's career, senior practitioners within companies can be encouraged to stay on after retirement to take over this role from the external support being offered by the Candidate Academy. This will ensure a much broader and sustainable spread of skills transfer nationwide.

THE ROAD TO REGISTRATION

Whilst the ECSA outcomes and forms are published on their website for access by all, the 'how' of training graduates to achieve registration status is not that evident, and the management of the process is complex. A comprehensive package has been developed by the Candidate Academy to assist graduates and employers alike, including planning tools to make up a Workplace Training Plan – with digital enhancements to make the planning, tracking and reporting of activities easier to manage. Portfolio of Evidence files will also be available to offer safe and logical storage of all precious originals for future reference.

An important offering includes a suite of courses intended to equip and empower the key role players in the ECSA registration process being:

- graduates in the workplace
- supervisors/coaches who oversee the daily work of graduates
- industry mentors who help guide and plan the direction graduates should take as they begin their careers
- HR practitioners who take much of the responsibility for appropriate placement and care of graduates entering the world of work, and must keep records of their progress.

So important is this orientation that the first Candidate Academy courses will indeed be “The Road to Registration for civil engineering graduates”, to be held on 12 April 2010, and “The Road to Registration for supervisors/coaches, mentors and HR practitioners” on 13 April 2010. Both courses will be held at the SAICE National Office, and will also be rolled out nationwide.

■ A REGISTRATION ADVISORY PANEL

There are currently many graduates who have worked for several years and are competent, or almost competent to register, but have not yet prepared

their ECSA submissions. The Candidate Academy will offer advice to those in this position to assist them with the process of registration.

■ THE CONSTRUCTION CHARTER AND PRD

Of benefit to employers is that most activities offered by the Candidate Academy will contribute towards earning points in terms of the Construction Charter. Courses will attract points under the various skills categories and adopting the structured ‘Road to registration’ approach will earn points under the Mentorship Programme category. Not only will it be possible to earn points under skills development, but the concerted effort to develop young professionals will ensure that they are able to move from junior to middle management and ultimately senior management, allowing companies to score points under the employment equity heading as well.

The ECSA requirement for graduates to record post-graduation skills development on the Pre-registration Record of Development (PRD) form will also be met.

Of benefit to employers is that most activities offered by the Candidate Academy will contribute towards earning points in terms of the Construction Charter. Courses will attract points under the various skills categories and adopting the structured ‘Road to registration’ approach will earn points under the Mentorship Programme category

► MORE INFORMATION

For details of courses, activities and dates, please see the Candidate Academy icon on www.civils.org.za or www.cesa.co.za

or contact the following people:

Dawn Hermanus (SAICE)

011 805 5947

dhermanus@saice.org.za

Brenda Lacey-Smith (CESA)

011 463 2022

brenda@cesa.co.za

SAICE Past President turns 90



Eric Hall, the former City Engineer of Johannesburg turned 90 recently. Eric, who is an Honorary Fellow and a holder of the Institution’s Gold Medal Award, is the most senior Past President of the Institution, having been

President in 1973. Two Past Presidents, Alec Hay (1996), second from right, and Kevin Wall (2001), right, accompanied Dawie Botha, left, SAICE’s Executive Director, to congratulate Eric on reaching this milestone. With all having been

in local government, they spent an interesting morning with Eric and Jean swapping stories. In the past, when Eric was asked what he would have been had he not been a civil engineer, his response was “ashamed of myself!” □

News from the South African Academy of Engineering (SAAE)

SAAE MEMBERSHIP OF CAETS

After enjoying observer status at the international body CAETS (Council of Academies of Engineering and Technological Sciences) for a number of years, the Executive Committee of SAAE applied for membership of CAETS on 27 November 2008. In terms of the CAETS Constitution and Rules of Procedure, a delegation of two CAETS representatives visited South Africa in June 2009 to assess SAAE's application prior to it being submitted to the CAETS Board of Directors. Various current and past SAAE Executive Committee Members assisted the CAETS delegation to meet the stakeholders that they had selected. The CAETS Council Meeting on 17 July 2009 unanimously accepted SAAE as the 26th member Academy.

18TH CAETS CONVOCATION, CALGARY, CANADA, JULY 2009

The theme of the 18th CAETS Convocation was "Our Heritage of Natural Resources – Management and Sustainability". The contributions were arranged under the sub-themes Energy, Forests, Water Management and Mining and Minerals. SAAE President Bob Pullen, and Vice-President Prof Roelf Sandenbergh, represented SAAE and also presented papers. (All the papers and presentations delivered at the Convocation are available on internet under "CAETS Calgary 2009".) The Convocation was attended by approximately 120 delegates.

NEW FELLOWS ELECTED IN 2009

Prof Christiaan Aldrich

Department of Process Engineering, University of Stellenbosch

Malose Chaba

Executive for the engineering contracting cluster, Murray & Roberts

Dr John Cruise

Consulting Mining Engineer and CEO, John Cruise Mining Group

Simphiwe Duma

Chief Executive and Chief Engineer, Psidot Technology Holdings (Pty) Ltd

Prof Peter Dunaiski

Department Structural Engineering, University of Stellenbosch

Prof Madeleine du Toit

Head of Department of Materials Science and Metallurgical Engineering, University of Pretoria

Prof Jack Fletcher

Head of Department of Chemical Engineering, University of Cape Town

Prof Zvi Katz

Professor and Morris Gillman Chair in Manufacturing, University of Johannesburg

Prof Elizabeth Kearsley

Head of Department of Civil Engineering, University of Pretoria

Dr Hylton Macdonald

Group Risk Manager, Aveng Ltd

Prof Thokozani Majozi

Department of Chemical Engineering, University of Pretoria

Prof Petrie Meyer

Departmental Chairman, Department E&E Engineering, University of Stellenbosch

Dempsey Naidoo

Executive Chairman, PD Naidoo and Associates

Prof Willem Perold

Vice-Dean: Research, Faculty of Engineering, University of Stellenbosch

Prof Willem Steyn

Department E&E Engineering, University of Stellenbosch

Prof Jonathan Tapson

Department of Electrical Engineering, University of Cape Town

COOPERATION WITH ATSE (AUSTRALIAN ACADEMY OF TECHNOLOGICAL SCIENCES AND ENGINEERING)

The First Joint Science and Technology Committee Meeting between the South African Department of Science and Technology and the Australian Department of Innovation, Industry, Science and Research was held in Cape Town in February 2009. ATSE representatives were included in the Australian delegation. It was agreed that Australia and South Africa would hold joint research and policy workshops over the next two years. Energy was identified as a joint priority topic for attention.

Following on this SAAE was approached by ATSE with a proposal for a

Joint International Workshop in 2010 in South Africa. Both Australia and South Africa have a high proportion of their generating capacity based on fossil fuels, particularly coal-fired power stations, and are structured around large-scale, energy-intensive mining and primary minerals processing industries. Both countries are exploring alternative technologies that can reduce carbon emissions from stationary electrical power generation. The aim of the Joint Workshop, which is planned to take place in the first half of 2010, is to identify the key strategies that need to be deployed to accelerate the introduction of new technologies for energy generation.

ATSE invited SAAE to participate in the international workshop "Electricity Generation – Accelerating Technological Change" which was held in Melbourne from 31 March to 2 April 2009. SAAE was represented at this workshop by Fellow Adi Paterson who also presented a paper.

STUDY VISIT BY NIGERIAN ACADEMICS

SAAE was asked by the Department of Science and Technology to host a Nigerian delegation involved in a programme to revitalise the Nigerian science and innovation system. SAAE was identified by UNESCO as one of ten institutions in South Africa that could contribute to the work of the delegation comprising senior academics from the Obafemi Awolowo University, the University of Nigeria and the Ahmadu Bello University, accompanied by Mr Oyenyi Akande, a UNESCO Consultant.

The areas of study identified included university-level organisation of research and innovation, management of intellectual property rights, university/public technology incubators, science parks and the role of the state in promoting innovation partnerships between the universities and SMEs.

Fellows Liesbeth Botha and Coen Bester made themselves available, and under the chairmanship of President Bob Pullen, shared their knowledge and experience with the visitors.

► MORE INFORMATION

Bob Pullen – President SAAE
bobp@bks.co.za

SAICE Training Calendar 2010

Contact SAICE on telephone 011 805-5947/8

TOPIC	CPD No	Days	Feb	Mar	Apr	May	June	July	
BUSINESS/GENERAL									
Business Finances for Built Environment Professionals	SAICEfin08/00405/11	2		04 – 05 GAU		13 – 14 CT		29 – 30 BFN	
Handling Projects in a Consulting Engineer's Practice	SAICEproj08/00404/11	2	22 – 23 GAU			11 – 12 CT 25 – 26 PLZ		27 – 28 BFN	
Technical Report Writing	SAICEbus09/00427/12	2		17 – 18 GAU		5 – 6 DBN			
Project Management & MS Projects Hybrid Course	SAICEproj09/00586/12	2							
Tenders & Proposals	SAICEbus09/00598/12	2							
Position yourself as an impactful professional		1			15 GAU				
Project Management	SAICEbus07/00252/10	4		01 – 04 CT					
Finance for Non-Financial Managers	SAICEfin10/00638/13	2		23 – 24 GAU		20 – 21 CT			
RAILWAY & HARBOUR									
Bridge Maintenance	SAICErail09/00495/12	1	15 GAU			31 CT			
Basics of Track Engineering	SAICErail09/00496/12	2	16 – 17 GAU			01 – 02 CT			
PROJECT MANAGEMENT DIVISION									
GCC		2	TBA	TBA	TBA	TBA			
CONCRETE									
Reinforced Concrete Design to SANS 10100-1	SAICEstr09/00432/11	1			20 GAU	25 CT			
STRUCTURAL									
Structural Failures	SAICEstr09/00596/10	1			29 GAU	07 CT 14 DBN 21 ELS 28 PLZ			
Structural Steel Design Code to SANS 10162: 1-2005	SAICEstr09/00513/12	1			21 GAU	26 CT			
TRANSPORTATION									
Practical Geometric Design	SAICEtr07/00139/09	5	TBA	TBA	TBA	TBA	TBA	TBA	
WATER									
Coastal Engineering	SAICEwat09/00611/12	2							
Ridding Stormwater of Litter	SAICEwat08/00361/11	1							

CT = Cape Town // BFN = Bloemfontein // DBN = Durban // ELS = East London // GAU = Gauteng // GRJ = George // KIM = Kimberley //
// PLK = Polokwane // SCD = Secunda // RCB = Richards Bay

PLEASE NOTE THAT COURSE DATES ARE SUBJECT TO CHANGE

	Aug	Sept	Oct	Nov	Dec	PRESENTER	Reg fee	CONTACT
		09 – 10 DBN	14 – 15 CT	17 – 18 GAU		Wolf Weidemann	R4500 Member R5500 Non-Member	Dawn Hermanus dhermanus@saice.org.za
		07 – 08 DBN	12 – 13 CT	10 – 11 GAU		Wolf Weidemann	R4500 Member R5500 Non-Member	Dawn Hermanus dhermanus@saice.org.za
	16 – 17 CT	16 – 17 GAU		03 – 04 NLP		Karl Von Buddenbrock	R4500 Member R5500 Non-Member	Sharon Muger cpd.sharon@saice.org.za
		15 – 16 ELS 8 – 9 GAU		17 – 18 PLZ		Karl Von Buddenbrock	R4500 Member R5500 Non-Member	Sharon Muger cpd.sharon@saice.org.za
	18 – 19 GAU		20 – 21 KIM			Karl Von Buddenbrock	R4500 Member R5500 Non-Member	Dawn Hermanus dhermanus@saice.org.za
						Candice Tomlinson	R2200 Member R2700 Non-Member	Sharon Muger cpd.sharon@saice.org.za
			05 – 08 PLK			Karl Von Buddenbrock	R7700	Sharon Muger cpd.sharon@saice.org.za
		22 – 23 DBN/PMB				Re-engage	R4500 Member R5500 Non-Member	Dawn Hermanus dhermanus@saice.org.za
		13 PMB		23 GAU		Ed Elton	R2500 Member R3000 Non-Member	Dawn Hermanus dhermanus@saice.org.za
		14 – 15 PMB		24 – 25 GAU		Ed Elton	R4500 Member R5500 Non-Member	Dawn Hermanus dhermanus@saice.org.za
	TBA					Willie Claassen	R4500 Member R5500 Non-Member	Sharon Muger cpd.sharon@saice.org.za Dawn Hermanus dhermanus@saice.org.za
	10 GAU	21 ELS				Greg Parrott	R2300 Member R3300 Non-Member	Sharon Muger cpd.sharon@saice.org.za
						Tony Aimer	R2200 Member 2900 Non-Member	Sharon Muger cpd.sharon@saice.org.za
	11 GAU	22 ELS				Greg Parrott	R2450 Member R3300 Non-Member	Sharon Muger cpd.sharon@saice.org.za
	TBA	TBA	TBA	TBA	TBA	Tom M'Kune	R6500 Member R9000 Non-Member R5000 Students	Dawn Hermanus dhermanus@saice.org.za
			25 – 26 CPT	8 – 9 DBN		Keith Mackie	R4500 Member R5500 Non-Member	Sharon Muger cpd.sharon@saice.org.za
						Neil Armitage	R2200 Member R2600 Non-Member	Sharon Muger cpd.sharon@saice.org.za

MMA = Mmabatho // NLP = Nelspruit // PLZ = Port Elizabeth // WHK = Windhoek // PMB = Pietermaritzburg // RUS = Rustenburg

SAICE 2010 essay topics for professional registration

THE CURRENT PROCESS of registration with the Engineering Council of South Africa (ECSA) was implemented in January 1998. The ECSA "Discipline-Specific Guidelines for Civil Engineering" of February 2003, Clause 6.5, indicates that two essays will have to be written by candidates:

- The first essay will be on one of two technical subjects set by the reviewers in the context of the training report and the interview.
- The second essay will be on one of two topics selected by the interviewers from a list published in advance by the South African Institution of Civil Engineering (SAICE).

Guidance notes for the assessment of essays are set out in the Guidelines for Professional Registration of Civil Engineers, available from SAICE.

The topics for the second essay for 2010 are listed below, and have been approved by the Professional Advisory Committee on Civil Engineering at ECSA.

1. Referring to your own experience discuss the way in which the resources required for either a design project or a construction contract should be organised and managed in order to ensure that technical objectives are met and that work is completed on time and within budget.
2. Discuss the most significant influences, attitudes and strategic issues relevant to the total project cycle.
3. In projects for developing countries emphasis is often placed on the need for transfer of technology. How can this best be achieved in practice?
4. Discuss the importance of environmental regulations on the design, documentation, and construction of civil engineering projects. Use your own experiences to illustrate your argument.
5. Although failures may be a disaster for the individuals concerned, many have led to advances in theory, design and construction methods. Discuss how failures should be dealt with so as to ensure the maximum benefit to society and the engineering community.
6. Discuss the opportunities and threats inherent in industrial and infrastructure projects which impact on local communities and the role civil engineers can play in delivering value to society through their involvement in such projects. Use your own experience where appropriate.
7. Discuss the difference between 'Quality Control' and 'Quality Assurance'. Discuss the requirements for quality management by clients, designers and contractors, and their respective contributions to the success of a project.
8. Describe how you have implemented health and safety legislation on the projects you have worked on, and detail what opportunities you think there are for improving health and safety performance.
9. Discuss the principle of whole life asset management with specific respect to municipal infrastructure, using a single service to illustrate your argument.
10. Risk is inherent in most civil engineering work. Discuss the ways in which such risks can affect the employer and the contractor, and how they can influence the form of contract and the contract price.
11. "The estimation of costs of schemes and their budgetary control is one of the key functions of the engineer." Discuss how engineers should be trained to fulfil this function in design and construction.
12. Identify the areas in which disagreement between a Resident Engineer's staff and the Contractor's staff may develop. How can good relations be achieved between these parties? Illustrate where possible from your own experience.
13. Describe the authority of the Engineer to delegate decisions to the Engineer's Representative under the General Conditions of Contract (GCC) 2004. In what circumstances could an Engineer vary the level of delegation during the construction period?
14. Discuss how the application of ethics in civil engineering projects or contracts should be regulated in order to ensure that the negative impact of corruption and similar practices are eliminated or at least minimised.
15. Discuss the role that the civil engineering profession has to play with respect to poverty alleviation.
16. Discuss the impact the Environmental Conservation Act has on the planning, design and construction of a civil engineering project.
17. Discuss whether the civil engineer of the future should become more of a specialist or a generalist. □