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Mary Molefe and Sakina Mukandawire work at SAICE National Office. They are charming and friendly, and reliable like clockwork. It is their pride to keep our offices clean and impressive. I have had the privilege of Mary and Sakina joining me for an exclusive meeting with the Public Protector recently. It made my heart dance to see how well they represented SAICE when they addressed Advocate Thuli Madonsela. Mary, in a moment of inspiration, thanked this TIME magazine world leader for being a role model and the moral conscience of the country (Adv Madonsela was included in TIME magazine’s 2014 list of “The 100 Most Influential People”). The ladies celebrated with the exchange of gifts and photographs. Both Mary and Sakina have subsequently expressed interest in pursuing studies in law.

Fridah Mahlangu is another role model and champion. She has progressed from an obscure office administration officer into a leader in SAICE’s Career Guidance Department. Last year Fridah did some business for SAICE in Durban – it was the first time that Fridah travelled by aeroplane and it was the first time she felt the cool touch of the ocean surf on her feet. In 2015, she received her driver’s licence, bought her first car, and also enrolled her beautiful daughter at Stellenbosch University to study for a degree in food technology.

Is South Africa a better place than it was in the past? It’s a complex and integrated question loaded with perception and emotion. Well, it depends who’s answering the question. For Mary, Sakina and Fridah, and millions of low- or no-income people who are being buoyed into a distinct middle class, the sensation of freedom and equality has never been more tangible. For those whose privileges and positions of power have been reconstructed, bitter waters flow where once sweet waters poured out.

In my opinion, this is the same for engineering businesses. Is civil engineering business currently profitable, and what about the future for consulting and contracting? For multinational consulting and contracting companies it’s tough, and the future is bleak in South Africa. The mega companies’ business models, and their magnitude, are simply incongruent with local policy and the national development needs of the country. But our international seducers knew very well the projected state of the civil engineering and construction environment when they set up shop in South Africa. I am not convinced the bosses in the UK, USA and Australia are in panic mode yet.

The new entrants and small- and medium-sized companies are thriving in the current South African climate. In my engagements with the small- and medium-sized companies, they are extremely busy. While the mega companies are closing offices nationwide, and retrenching staff, these companies are opening offices and employing staff. How the tables have turned, and are turning. I commend our government for progressively achieving this outcome. Individuals, who in our recent history could only dream of qualifications and entrepreneurship, are now owning and managing successful engineering businesses. I recently attended a ten-year celebration of such a company. The New South Africa felt palpable there.

The Civilization Congress 2016 is upon us – we are in interesting times. I have now officially been at SAICE for five years (since October 2010). After five years of purposeful discovery, I have embarked again on a personal mission to rediscover my own purpose, while I am assessing potential enhancements for the direction of SAICE. Civilization, if you recall, is “the engineers’ revolution which is firstly an introspective conversion, where we abandon pessimism and distrust, and then regenerate ourselves to becoming a creative and intelligent part of the solution.”

In keeping with this rhythm an expected outcome is that everyone is required to reinvent themselves, to be creative and come up with bright, unusual ideas. The large multinationals are predestined to aggressively and competitively launch into Africa, while the new entrants and small- and medium-sized companies are required to professionalise, become reliable, offer top-quality service, and align themselves to the developmental needs of the local and SADC markets.

As an aside, in my glass ball I see tremendous opportunity for graduate engineers to dominate the space.

So, is there commercial benefit and merit in the future of the civil engineering and construction business in South Africa? It depends who’s answering the question.
ON THE COVER
Mercedes-Benz quality and reliability neatly packaged into trucks that offer maximum uptime, meaning that trucks spend as much time as possible getting the job done right on site, particularly under the high workload conditions associated with large-scale earthwork tenders.

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ON THE COVER

Renico Plant Hire relies on Mercedes-Benz tip-top tippers

ONE OF RENICO PLANT Hire’s pay-off lines – the right equipment, at the right time, at the right price – perfectly embodies why it is widely regarded as one of the leading plant hire companies in the country.

To cope with this demand, not only reliable and competent people are required, but also reliable earthmoving machines and trucks. The fleet consists of over 300 pieces of large earthmoving equipment and tipper trucks that are deployed on various sites on the Reef, and are also now operating in at least four other provinces around the country at any given time.

Sites include large-scale shopping centres and office developments, casino developments, highway upgrades, mining, and various other building projects. Large contracts are also undertaken, particularly by the Quarrying and Crushing Division, which was established in 2007. The crushers and screens have played an important role in the development of sections of national highways and in the on-site conversion of waste materials from large demolition projects into reusable aggregates, making a vital recycling contribution to the environment. It is evident that without their various items of equipment, including vehicles, Renico would not be at the top of their game.

“Renico Plant Hire has been using Mercedes-Benz trucks since its inception in 1998. This was solidified in 2012 when Nico Kriek from Sandown Motors formed what has become a strong bond with us,” says Renico Group’s Managing Director Nico Louw.

“In our line of business, we not only need reliable people, but also earthmoving machines and trucks that never tire, and that is why we look to Mercedes-Benz trucks to do what others cannot. Needless to say, it did not take much convincing for us to purchase 32 of Mercedes-Benz’s 2628/33 AXOR 2 tippers recently,” Louw adds.

The 2628/33 chassis cabs are fitted with MBC 10 m³ tipper bodies, and their reliability enables Renico to efficiently attend to the high workload associated with having been awarded a number of large-scale earthwork tenders.
“Renico values the various relationships that we have nurtured over the last few years. Naturally, Mercedes-Benz is one of our most important ones, as these vehicles allow us to continue being the best at what we do.

“In addition, our other partners have found them extremely easy to customise. MBC has been building tipper and other trucks (including water tankers) for us since 2002, and our partners smile each time we bring a Mercedes-Benz truck to them, as they know exactly what to expect – quality,” says Louw.

Renico Plant Hire continues to grow in Gauteng, as is evidenced by the large-scale tenders and contracts awarded to the company. With the company’s recent acquisition of two Mercedes-Benz 2628/33 AXOR 2 chassis cabs, with brick truck bodies manufactured by MBC, and fitted with Palfinger cranes, the company’s use of these chassis cabs has now been extended beyond tipper trucks.

Mercedes-Benz trucks are known for offering operators maximum uptime, and for Renico this means their vehicles spend as much time as possible getting the job done right on site.

“All our equipment undergoes maintenance on a regular basis within our well-equipped and well-staffed workshop. They are all run through a comprehensive checking process before being sent out to our customers, or to be used on site for contract work, thus ensuring minimum downtime.

“As a company that hires out equipment, we cannot afford to have a fleet that will let us down, which is why we chose to go with Mercedes-Benz trucks. We know that when they are hired out to various customers, they will render a most satisfactory service. That makes our customers come back to us over and over,” Louw concludes.
May you encounter peace, relaxation and soul

WHAT CAN BE SAID about a year with such dynamics, travel, new friendships, gifts, team building and knowledge sharing? The Institution is certainly not in turmoil; in fact, it is in a state of growth, change and renewed spirit. Perhaps this is a reflection of certain parts of our industry. Whilst some would disagree, saying that we are in a down cycle, even a depressed cycle, others, particularly in the SMME segment, are busy. What then constitutes such a difference? Is it government’s approach towards promoting the small and medium business market by providing focused opportunities, or is it simply the market forces that dictate the pricing that small to medium companies can absorb? I believe it’s a combination of both, with additional macro forces at play. Whatever the case, there are always swings and roundabouts, and I am confident, in striving for excellence, that we shall create an improved industry and that there is willingness to ensure it happens.

Experiencing the openness, hospitality, acknowledgement, interest and warmth from the branches, divisions, committees and panels during my visits throughout this year is difficult to describe. Certainly, there are challenges, and there are concerns, but has this dampened the spirit of the civil engineer? Far from it! In fact, the energy and the passion exuberating from the youth in general, and from young engineers in particular, are so positive that one feels inspired to continue serving industry and society.

My message to the youth is: Be brave, disrupt and use your recently gained knowledge in technology and innovation to make a change.

To the maturing engineers: Although we are in the minority, we have to provide the bridge between the acquiring young mind and the staid ways of the seniors.

To the senior engineers: Please continue providing guidance, and sharing your knowledge and immense experience, as it is your work over many years that makes South Africa such a great country.

There are simply too many people to thank personally in my incredible journey this year, so I would like to express heartfelt thanks to one of our young engineers, Nkosinathi Mthethwa, for the portrait he spent hours sketching. This has found a proud place in my home.

Lastly, for those taking a break and who are travelling – travel safely and may you reach your destination with the same vigour that is exercised upon departure, and return refreshed. For those staying at home, I hope there are not too many chores to keep you busy. Whatever your creed or religion, may you find and encounter peace, relaxation and soul during this festive season.
SUSTAINABLE DEVELOPMENT needs to achieve a balance between economic, environmental and social objectives for both present and future generations. However, some of these objectives may dominate (to the neglect of the others) when there are several ‘stakeholders’ with diverse and inherently conflicting values and goals.

The social, economic and environmental health of a nation depends on the efficient and reliable operation of its economic, social and environmental structure. These networks are interdependent, dynamic and complex; and they evolve over time in response to policy and investment by adjusting to altering demands. In an ideal world, decisions should be made to improve the welfare of all the people, while also ensuring a sustainable future. However, where multiple stakeholders with too few engineers participate in the decision-making processes, these conflicting objectives are more difficult to achieve.

As engineers in influential positions are being replaced by non-technically focused individuals, the problem-solving abilities which are unique to engineers’ way of thinking, as well as their inherent ability to analyse trends in planning for the future, are being lost within political decision-making processes. Engineers’ increasing loss of influence in the political decision-making arena, i.e. the arena that governs and impacts sustainable development for both the present and future generations, is cause for concern. The loss of engineers in leading positions also has a direct impact on the transfer of technical knowledge and experience-based skills to the future generation of engineers through mentorship and training. The loss of engineers, with the resulting loss of role models and mentors, is dimming the silver lining on the future of young engineers in this country.

Our future, our inheritance, is being mismanaged and corrupted. Methods of procurement, supply chain rules, a decline in value of quality and cost-effectiveness, a lack of funding for necessary training, and peers entering business too early driven by greed – these are just some of the contributing factors narrowing the horizon of opportunities and stunting our industry’s full potential.

The progressive, unchecked decline of our industry is spoiling our opportunity to enhance the development of our country. Instead, much of our careers may be spent fixing our declining industry, and tending to the backlog of missing and poorly maintained infrastructure and supply chain processes. My outlook on the future of my career in this country may be grim, and at times I may question my commitment to stay, but we are never without hope.

As young engineers it is now time to take a stand, as it is now more than ever that our voices can and must be heard. How can we come together today to save our tomorrow? What steps can we take to ensure the promise in our future, as leading engineers contributing to the development of South Africa? There is a need to protect not only the influence of engineers in political decision-making processes, but also their knowledge as a technical asset in a developing country such as South Africa, so as to ensure sustainable development for both present and future generations.
The South African economy
not a pretty picture

THE SOUTH AFRICAN economy is a small ‘open’ economy, and inevitably international developments will affect the local economy – good and bad. Currently international trends have a mostly undesirable effect on the local economy, but more concerning is that it seems as if we are doing our best to exacerbate a deteriorating situation.

Two major international developments are currently at play.

The American interest rate cycle has clearly turned, and a number of interest rate increases can be expected from the Federal Reserve over the next two years. The effect thereof is that the US dollar keeps on appreciating in value, pushing everything measured in dollars down.

Emerging currencies, like the rand, are knocked to record lows, resulting in an increase in inflationary pressures in these countries and forcing emerging market countries to up their own rates to prevent inflation getting out of hand. Unfortunately higher short rates also affect economic performance and will, in the case of South Africa, dampen weak economic growth even further.

A stronger US dollar also depresses commodity prices. This could be good for oil importing countries, like South Africa, but bad for commodity exporting countries, also like South Africa. Two previous commodity ‘cycles’ were mostly wasted by South Africa because of policy uncertainty and labour disputes, and even if commodity prices should suddenly roar back to life, South Africa will be inadequately positioned to capitalise thereon.

The second negative international trend is that world economic growth seems to be slowing. China, Europe, other emerging market countries, and even the rest of Africa seem to be losing momentum. Inevitably, slower growth in the economies of our trading partners will negatively affect South Africa’s economic performance.

Apart from the two factors mentioned above, a number of other international trends are also pointing to international headwinds – rising political tensions in just about all the traditional flashpoints (plus a few more), major demographic changes occurring worldwide, and an apparent shift in global policies to a more interventionist approach, of which the Piketty phenomenon is just one example.

In this world of uncertainty South Africa has to navigate its policies and take account of local obstacles. And as we all know, our local obstacles are in essence very weak economic growth,
which results in poverty, unemployment and other socio-economic aggregates which are unfavourable. Unfortunately our policy options and the quality of our political leadership often disappoint and regularly aggravate a deteriorating situation.

Reasons for misplaced policies and destructive ideologies within the ruling coalition can mostly be found in the structure and history of our ruling ‘tripl-partite’ coalition. The ANC, initially a ‘liberation’ organisation which turned itself into a typical liberalist political party after 1994, again changed itself into something else during the Zuma tenure. This time, however, the nature of the ANC is unclear, and significant policy contradictions and the quality of leadership have become the symbol of our ruling party.

Additionally, the past few years also saw a devastation of state-owned enterprises, as well as attacks on democratic institutions like private property rights, the public protector, government being in contempt of court, and many more examples. Under such weak leadership the default decision was to increase state spending on current expenditure, especially on the wage bill of the civil service.

An unsustainable increase in the public sector’s wage bill was also accelerated by the fact that one of the other partners of the tripartite alliance, Cosatu, mostly represents civil servants, leading to the intolerable situation where the civil service governs the civil service with government.

In the meantime the SACP’s ideological dominance remains the basis of the alliance’s philosophy. This includes a Leninist approach to government, which explains cadre deployment and the drive to control all levers of power in the country.

Predictably, a deteriorating global economy coupled with weak and ideologically confused local leadership in an environment of poverty, unemployment and strained labour relations, business confidence is at worrying lows. This leads to low levels of investment and eventually lower growth.

And economic growth is the one variable that can solve most of our evils. Not only will economic growth lower poverty and unemployment, supporting most variables that are considered valuable, but the size of the economy is also important in calculating a number of matrixes.

State debt, the fiscal and current account deficits as a percentage of GDP are examples of three important variables that determine a country’s economic health. Not only is our economy expanding at a very slow rate, but rising state debt levels, relative to the size of the economy, will soon reach levels which will be considered as unsustainable by international rating agencies. Downgrades will be the result.

The South African economy finds itself in a very uncomfortable position. A weak international economic environment is aggravated by weak local leadership and disruptive policies. Confidence levels are dangerously low and weak economic growth seems to be unavoidable.

Sure, we still have very effective, well run, well integrated and very liquid financial markets. Sure, many institutions remain untarnished, like the Reserve Bank. Sure, we are part of Africa, the emerging markets and BRICs. But it could have been so much different with better leadership!

And now it seems as if we could also have a leadership battle developing, which will only add to the uncertainties …

The South African economy finds itself in a very uncomfortable position. A weak international economic environment is aggravated by weak local leadership and disruptive policies. Confidence levels are dangerously low and weak economic growth seems to be unavoidable.
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The past year ended up being a tough year for our industry, resulting from low demand levels and the resultant over-provision of productive capacity. Several sub-sectors within the industry had to implement severe cost-cutting measures, including the retrenchment of scarce and valuable experienced engineering staff. The fact that a number of the substantial South African construction industry players have managed to exceed the average industry profitability levels, in spite of relatively low market volumes and depressed market prices, can be credited to the dedication, hard work and commitment of local management and staff to the maintenance of high resource-utilisation levels.

However, in evaluating our South African business on its own, it is clear that our businesses in many other emerging economies across the globe are currently achieving both higher profitability levels and higher returns on investment. In a globalised world, where both professionals and investment capital are highly mobile, the current unattractiveness of our local construction industry represents twin potential threats to the growth of local engineering enterprises, i.e. the loss of scarce-skilled local human resources and the loss of potential investment.

The positives of substantial project wins are often negated by slow and non-payment by public sector clients, something which adds an additional burden on all businesses operating in this highly-competitive, low-margin market. The inefficiency and delay of public project procurement processes, and the repeated delays in the commencement of many major projects, add to reduced national productivity and efficiency. Such project delays are often major contributors to the loss of employment opportunities in our industry, an industry with substantial employment growth potential.

Macro-economic factors all point to a slow local economic recovery, and companies in our sector will therefore have to continue tightening their belts, both in order to remain attractive investment vehicles in a globalised world, and in acting in the best interest of all industry stakeholders.

The export of infrastructure services to the high-growth and under-provided African continent presents new challenges and new opportunities for economic growth. The demographic drivers in Africa (age distribution, education levels, growing middle class, mass urbanisation, etc), as well as the massive scale of under-developed mineral resources, will continue being the force behind substantial GDP and infrastructure market growth for many years to come. The weakness of the Rand furthermore improves our market competitiveness, and therefore our ability to enter new markets or expand our presence in existing international markets, thereby reducing our dependency on a weak or cyclical local market. The ability to competitively export services to advanced economies furthermore provides our skilled experienced engineers with opportunities to work on technically challenging projects in other interesting parts of the world.

My vision for our industry and our country is for attitudes to change so that we can grow meaningful economic partnerships between all stakeholders, thereby generating economic growth, attract fixed capital investment and develop the capacity of all our people so that we can meaningfully fight our real problems of poverty and unemployment.

Dr Thomas Marshall
Chief Operating Officer
African Division
SMEC International
Tom.Marshall@smec.com

In a globalised world, where both professionals and investment capital are highly mobile, the current unattractiveness of our local construction industry represents twin potential threats to the growth of local engineering enterprises, i.e. the loss of scarce-skilled local human resources and the loss of potential investment.
A year of introspection

“A challenging year” is how Richard Vries, Group CEO of GIBB, described the past year for South Africa’s largest black-owned engineering and architecture firm in an exclusive interview conducted for our magazine by Rowan Sewchurran.

IT WAS ONLY LAST year that the 950-employee strong, multi-disciplinary firm announced its R1 billion turnover milestone, having acquired one of the country’s largest architectural firms, SVA International.

But, indicative of continued sluggish market conditions, GIBB finds itself having to adapt very quickly to remain ahead of the pack in a space largely dominated by multi-national competitors.

Richard Vries is confident, however, that the firm, with its long history of impressive growth, has the ‘DNA’ to be responsive and agile in this environment. A mixed bag of both external and internal challenges required the firm to accelerate its response to these challenges.

Some of the market challenges include what Richard refers to as our ‘new reality’.

“Our ‘new reality’ is one where investment in infrastructure remains muted, with fierce competition and pricing observed in the sector, the growing presence of large multi-nationals in South Africa and Africa, project initiation and development cycles being much longer than necessary, and a lack of skills in core categories remaining a challenge.”

Added to this are other macro factors which have resulted in a sluggish economy. “These are high electricity prices, low commodity prices, labour unrest and increasing interest rates. These factors have impacted all businesses and are not unique to the engineering consulting sector.”

The challenge that most probably has the biggest impact on the industry is the long project initiation and development cycles, where the time between the tender stage and the actual award and starting dates of projects is affected by procurement delays.

“This not only complicates resource planning on the part of all the industry players, but also delays service delivery. If we are to address the many service delivery challenges in our country, then this is definitely an area that should receive the highest attention from decision-makers.

“The introduction of the Office of the Chief Procurement Officer is therefore a step in the right direction. Although many are swift to place all blame with government, I believe that this initiative shows a reluctance to accept the ‘new reality’.

“An analysis of government expenditure shows continued growth in investment in infrastructure in the public sector on a year-on-year basis. Public sector infrastructure spend is continuing to grow faster than private sector investment, although perceptions remain that public sector spend could be better if some of the internal capacity and procurement challenges are dealt with.”

GIBB has a wide African continent footprint and, according to Richard, this year’s challenges were compounded by the fact that some of the large African markets like Nigeria (where the firm has been delivering on large infrastructure projects since 2009) experienced big cuts in infrastructure spend, also due to increasing competition in the home market. “We were severely affected by the fact that large projects in countries like Botswana, Nigeria and Zambia were being delayed primarily as a result of funding constraints.”

To respond to these challenges, Richard and his team resolved to streamline the business from the inside.

“If this is our new reality, how do we respond as a company in the short, medium and long term?” is the question that GIBB asked itself.

Short-term measures included paying immediate attention to cost reduction measures, which, according to Richard, is “a big challenge when the largest
expenditure of a professional services firm is employee costs in a market with scarce skills and a talent war. “The firm therefore focused on better controls on discretionary spend. However, our biggest area of improvement was to enhance how we deliver our projects. “These are factors within our control, and the firm has done well to achieve its savings target and to introduce an extensive change in our project delivery model. There is something to be said about the dangers of complacency through this experience.” The project delivery model, as part of the short- and medium-term response plans, allowed GIBB to introduce Project Management as a stand-alone service offering to existing and new clients. This required the development of a comprehensive Project Management capability (incorrectly assumed as a given for engineering firms). This included the development of new procedures, systems, tools and skills for the firm. GIBB is becoming a more streamlined operation and, given the firm’s remarkable track record (GIBB turns 60 years old next year), there is no doubt in Richard’s mind that the firm will respond to the challenge, and will respond well. In implementing the change, Richard introduced the Business and Operation Excellence (B&OE) Department responsible for the roll-out of the change management aspects of this large complex change initiative that had to take place within a short period of time. The transition took place within a period of five months. “Our B&OE Department’s mandate is to develop and deliver in a systematic way GIBB’s operational and strategic initiatives, operating models, processes and systems to improve the firm’s performance and increase shareholder value. “Continuous improvement is crucial for sustained growth, and our B&OE has a committed workforce of talented individuals who support business excellence at GIBB. Here we look at every facet of our business to consider how we can do things smarter.” According to Richard, a traditional oversight in the industry is to assume that all good engineers are good project managers. “Each ought to be left to his/her own strengths, and this is how GIBB plans on taking our business forward.” GIBB’s determined expansion into the rest of Africa has not come without its own challenges. Africa is incorrectly viewed by many as a homogenous continent where the rules and ease of doing business are mistakenly viewed as the same. “Rather,” says Richard, “it is a question of each to its own, and each with its own challenges.” GIBB has responded to the challenges of doing business in Africa by adopting a new strategy that allows a ‘hub strategy approach’ and much clearer focus of the opportunities being sought. As part of the ‘hub strategy’ and adapting to local market conditions, GIBB joined forces with long established Nigerian consultancy firm Popham Walter Odukote (PWO), which has been delivering world-class architectural, engineering and project management services to their clients for more than fourteen years in Nigeria. “Nigeria is dynamic, and it would be foolish to write off a country that has shown such remarkable growth over a short time. There can be no doubt that Nigeria exemplifies ‘Africa Rising’. There will be challenges, but we must learn how to adapt to the markets in the rest of Africa.” In addition to the hub strategy, the firm also developed GIBB Capital as a business unit in the company, focused on creating its own engineering, project management and architectural (through SVA) opportunities. This includes project identification, packaging and delivery by bringing together various skills, including project finance, legal and engineering skills, and then working with both South African and other multi-national EPC contractors in order to deliver a ‘total solution’ to clients. According to Richard, Africa presents many opportunities, but the companies who will succeed over time are those with the ability to translate these opportunities into fully funded projects. Also on the positive side, GIBB is working on several large to mega projects that are sure to keep the firm busy well into the new year and beyond. One such mega project that will keep the firm occupied over the next five years is the Sedibeng Regional Sewer Scheme where GIBB’s responsibilities include the provision of bulk sanitation infrastructure in the Sedibeng District Municipality. This is a mega project that will not only improve access to sanitation to the people in the Vaal area, but will also unlock much needed economic development in the area. GIBB is also assisting with the rehabilitation of 250 km of the Sena Railway line linking Malawi to Mozambique, which is drawing to a close at the end of the year. Another mega project is the Port of Ngqura development, where GIBB was appointed as part of a joint venture to build a manganese export terminal for Transnet. The first manganese export from Ngqura is expected in 2019. Trying times these may be, but GIBB has not deviated from its growth objectives, of which acquisitions, among other strategies, is an example. GIBB recently announced the acquisition of respected environmental services consultancy, Strategic Environmental Focus (SEF). “The combined firms have resulted in a fully integrated environmental team, with more than 60 staff members in the environmental division, thereby making GIBB’s environmental team the largest of its kind in the engineering consulting sector in South Africa,” Richard says. GIBB is now able to position the broader group to deliver world-class environmental solutions using professional environmental specialists, auditors, green design experts and specialists with sufficient capacity to develop a customised, comprehensive and complete range of solutions for clients. When asked how he intends taking GIBB into the future, Richard replied: “We are working on our next five-year strategy. However, a pillar of success in any consulting business is to ensure that you continue to attract and retain the best people talent. GIBB has done exceptionally well in this dimension over the last few years, and this aspect will continue to feature strongly in our strategic planning processes.” Notably, GIBB secured top honours in the Corporate Category of the SA Productivity National Awards this year – further evidence of the firm’s pedigree. “At GIBB, we pride ourselves on engineering excellence, and it is always a privilege to be acknowledged for these efforts. Last year we also secured the South African Professional Services Award (SAPSA) for Engineering Firm of the Year, and we appreciate that recognition. “GIBB has clearly demonstrated that adversity can also present opportunities for learning and improving,” Richard concludes.
OVERVIEW
This is a personal point of view by a practising geotechnical engineer of developments over the past few years and the challenges we face in the year to come. This perspective concentrates on the state of the industry from a technical rather than economic/commercial perspective.

Geotechnical engineering in South Africa has a proud heritage, and there is an enormous depth of both knowledge and experience in the industry. Although we have much to be proud of, there is a trend of decreasing standards in geotechnical investigation, design and construction practices. This article explores some of the reasons for this decline and what needs to be done to rectify the situation.

THE HEYDAYS
The author’s career as a geotechnical engineer started in the mid-1970s in what was probably one of the most exciting times to enter the profession. Pioneers in the field, such as Jennings, Brink, Williams, Blight, Parry-Davies and Braatvedt were at the peak of their careers. The mining industry was booming, and new power stations, roads and dams were being constructed. Entire towns, such as Vanderbijlpark and Secunda were being created on the back of new industrial development. A number of geotechnical consulting units had been established, either as independent practices or as specialist divisions in the larger consulting firms. Similarly, there was a core of geotechnical contractors with true pioneering spirit.

The CSIR was actively engaged in research into road construction, foundations and mining. New understanding was emerging of the behaviour of problem soils, the advent of the desktop computer allowed the use of more sophisticated design methods, bigger and better construction equipment was being imported or constructed locally, and world-leading techniques such as high-capacity re-injectable ground anchors were being developed and tested.

One of the features of the geotechnical ‘market’ in those days was the trust that existed between clients, consultants and contractors. Tendering for consulting work was the exception rather than the rule, and many contracts were negotiated on the basis of the skill and experience of a particular contractor or consultant. Budgets for geotechnical investigations were based on what was needed to provide the geotechnical data required for the proper design and execution of the work.

What a time for a young person to enter the industry!

THE WHEAT AND THE TARES
Having been nurtured and grown in such promising ground, it is thought-provoking to take a look at the current state of the geotechnical industry in South Africa.

The geotechnical fraternity in South Africa can take pride in its achievements. We have developed the capability to construct 30 m deep basements in ‘soft’ soils in built-up areas (see Photo 1), to build high-speed railway lines over some of the most treacherous dolomites in the country, to jack four-lane freeways below operating railway lines and to tunnel below the entrance channel to one of our busiest ports. We have also made significant advances in the overlap between mining and geotechnical engineering, including 3D slope stability modelling, innovative advances in pre-sinking and decline tunnelling, and the application of critical state soil mechanics to problems of mine waste disposal.

On the institutional side, the South African Geotechnical Division of SAICE is by far the largest and most active African Member Society of the
International Society for Soil Mechanics and Geotechnical Engineering, and contributes actively to the ISSMGE’s technical committees. Although the CSIR is no longer at the forefront of geotechnical research, a number of our universities run world-class research programmes in mining, geotechnical and pavement/railtrack engineering, using state-of-the-art equipment, such as the largest geotechnical centrifuge in the southern hemisphere (Photo 2).

However, we also have cause for introspection and self-admonishment. Over the past few years there have been instances of instability of entire hill slopes in prestigious residential areas, unacceptable damage to development surrounding basement excavations, and incorrect assessment of founding requirements for multi-billion-rand commercial developments. These problems are not simply confined to mega projects which may pose new and increased challenges. At the other end of the size scale, an unacceptable number of sub-economic housing developments are suffering damage due to inadequate foundations. Basic structures such as block retaining walls collapse on a regular basis, to the extent that the Engineering Council of South Africa has identified block walls as problem structures.

ENGINEERING – A COMMODITY OR A SKILL?

There can be little doubt that engineering is increasingly being regarded as a commodity that can be purchased in the market place. There is also a perception that, because engineering services are provided by professionals, these services come with some sort of a warranty of quality, sufficiency and fitness for purpose, backed by the insurance cover carried by the service provider.

This may seem to be a cynical point of view. Maybe not. How else would we find ourselves in a situation where the amount of money allocated to the geotechnical investigation for a new house is less than the cost of bedroom curtains? How else would multi-million-rand commercial building projects be put out to tender on the basis of geotechnical investigations that ignore the requirements of the codes and fail to provide quantitative estimates of even the most basic design parameters?
The problem is not unique to geotechnical investigations; it extends to design and construction as well.

One of the biggest challenges faced by the industry at present is a failure by those procuring geotechnical services to adequately specify the product required, and the inability to distinguish between good and bad advice. This goes hand-in-hand with the problem of persons within the industry who are willing to disregard not only the dictates of good practice, but are also willing to ignore existing standards.

To illustrate this point, let’s consider the case of a house on expansive soils. In the 1980s, a significant amount of research was done on methods of predicting heave movements of expansive soils and the design of raft foundations (Williams et al 1985). We realised the benefits of moving beyond the simple ‘Van der Merwe’ method of estimating heave (Van der Merwe 1964), and started measuring soil suctions and other parameters that would allow better predictions to be made over the full depth of the expansive soil profile. House foundations and superstructures were designed for mutual compatibility. Today, due in part to the requirements of the National Home Builders Registration Council, the investigation has been reduced to ticking one of four categories for expansive soils on a form and selecting the corresponding foundation type from a table. In most instances the full thickness of the expansive profile is not determined and few, if any, laboratory tests are undertaken. As a result, no sensible estimation of heave is possible, even using the Van der Merwe method. If raft foundations are to be used, the basic parameters required for rational design are not known, and many designers design by experience rather than by calculation. We seem to have turned our back on everything that we had learnt by the 1980s. The result of this approach is shown in Photo 3.

A further example, at rather a different scale, is the investigation for basement excavations in our metropolitan areas. These basements, and the structures to be erected in them, are becoming more challenging by the day. Requirements for site investigations and the design of basement excavation were clearly spelt out in the SAICE lateral support code (SAICE 1989). This code includes recommendations for the extent of the investigation (in terms of area and depth) and the testing required to provide the design parameters needed to assess the support requirements. Despite this, one will frequently find work of this nature being put out to tender on the basis of an investigation carried out using only augered trial holes, many of which fail to reach the base of the proposed excavation due to collapse, water ingress or limitations on reach. Rotary core drilling and laboratory testing are regarded by project planners as an unnecessary expense.

The folly of this approach was clearly illustrated by two recent basement excavations in Sandton. In the first instance, the lateral support installed over the upper portion of the face was based on an assumed depth of rock. When the excavation reached this depth, no rock was present and subsequent drilling revealed soils extending to the full depth of the excavation. As a result, the excavation had to be partially backfilled and additional support installed. The movements of the surrounding ground were up to four times the maximum movements permitted by the code. The second was an excavation for a multi-billion-rand project where, on the basis of the investigation, founding was assumed to be on competent rock. As it transpired when founding level was reached at the bottom of a 15 m deep basement, the granites were more deeply weathered than was thought and were extensively intruded by even more deeply weathered diabase. The result was that individual bases had to be over-excavated by as much as 5 m and backfilled with mass concrete at significant cost to the project in terms of time and money.

Lack of adequate site investigation data is limiting the extent to which we as South African designers can benefit from advancements in analytical methods. It does not help if we have the latest in 3D, non-linear, coupled-consolidation, etc, analysis capabilities if we have to assume the input parameters.

The problem is not that we are ignorant of what is required. It is more that we are ignoring the requirements, even when they are laid down in nationally recognised standards.

WHAT SHOULD BE DONE?

As we look forward into 2016, and the years beyond, what should we as the geotechnical industry be doing about this situation? We could be cynical and say that the unscrupulous operators will be removed from the market place by the sheer weight of claims against them for failure to exercise skill, care and diligence. However, it is well known that, although there is never enough money to do the job correctly in the first place, there is always enough to blame someone else when the job goes wrong. All too often it is the designer or the contractor who made use of the inadequate data provided in the tender who lands up carrying the can on the flimsy pretext that they should have requested further information or satisfied themselves of the site conditions before submitting their bid. In a sense there is a ‘disconnect’ between the persons responsible for the inadequacy of the data and those held contractually liable for the consequences.

In today’s ‘thin markets’, it is unlikely that contractors or designers will serve as the ‘conscience’ of the industry by refusing to tender on projects where the data provided is inadequate. To do so would simply open the door for less principled competitors. The author’s practice has long since realised that there are certain markets that it cannot compete in because the cost of performing the scope of investigation required by the codes is more than the market will bear.
In the author’s opinion, there are three things that need to be done, namely education, regulation and peer review.

**Education**

The education that is envisaged is not so much in the form of teaching, but the provision of information. The SAICE Geotechnical Division needs to compile a list of requirements for site investigations, firstly as required by legislation, and secondly as set out in codes and standards. This information needs to be distributed to those responsible for the specification and procurement of geotechnical investigations and the regulators who approve developments. Target audiences include project managers, structural engineers, local authorities, government departments and regulatory bodies such as the NHBRC (National Homebuilders Registration Council).

It is, however, not sufficient to simply make fellow professionals aware of the requirements; we also need to provide them with the means to specify these requirements when compiling enquiry documents. Here it would be worthwhile to consider a set of ‘minimum requirement’ specifications for various types of projects, tailored to South African conditions. We already have two examples of where such requirements are yielding the desired result. The first is the Minimum Requirements for Waste Disposal by Landfill, issued by the then Department of Water Affairs and Forestry (DWAF 1998). The second is SANS 1936 which sets out requirements for development of dolomite land compiled jointly by the Council for Geoscience, Departments of Public Works and Water Affairs, and members of the profession (SANS 1936:2012).

**Regulation**

The regulation envisaged here includes both the application of existing regulations and possible modifications to the regulations.

In terms of existing legislation, both the NHBRC and the local authority exercise control over new development. Before any residential development can take place, the development needs to be enrolled with the NHBRC’s warranty scheme. This requires that the soil conditions on the site are classified into one or more standard categories. Too often this amounts to ‘ticking a box’ without the required justification. The NHBRC should lay down firm rules for the extent of investigation required and the assessment of results before they accept the soil classification of a site, particularly for sites on highly problematic soils. The word would quickly get out that, unless you comply with the rules, your project will not be enrolled. The same applies with other types of development at local authority level where, rather than simply requiring the submission of an A19 form appointing a competent person and drawings, they should require that person to submit copies of their geotechnical reports.

In terms of modifications to existing regulations, one of the things that mitigates against adequate site investigations of residential developments is the cost of carrying out sufficient investigation on each individual stand to justify the soil classification of the site as indicated above. Very often the site classification is carried out by the structural engineer and the fee for this service amounts to a few hundred rand. Low as this is, it is a significant amount for the prospective home owner to pay, particularly in the case of sub-economic housing. Typically the fee charged is less than the cost of even the most basic of soil classification tests. In the author’s opinion it would be preferable for the classification of stands to be undertaken at township development stage when professional geotechnical engineers or engineering geologists are involved. As the technical standards required to implement this already exist (SANS 634: 2012), it would simply be a matter of shifting the timing of the classification of individual stands from the time of NHBRC enrolment to the time of proclamation of the township. This would also place the burden of both cost and responsibility on the shoulders of those seeking to profit from township development rather than on the prospective home owner.

An example of where current regulatory provisions are working well is once again with the development of dolomite land. The NHBRC requires that all applications for enrolment of properties on dolomite land are approved by the Council for Geoscience, and many of the local authorities have similar provisions in place for other types of development. In this way, the Council for Geoscience ensures compliance with acceptable investigation and development practices.

**Peer review**

On most international projects, the geotechnical investigations and designs are independently reviewed. This review is either undertaken by an in-house department of the client, by the insurer or by the funding agency. This tendency appears to be spreading to major South African projects as well.

For example, it is becoming commonplace nowadays for the owners of properties adjacent to proposed basement excavations to set conditions for granting of permission for the installation of lateral support elements below their properties. These include an independent review of the design and monitoring of the excavation, at the expense of the developer. Even individual developers are now calling for independent review of design-and-construct proposals before or after award of the contract.

**CONCLUSION**

Using simple means, it is possible for the geotechnical fraternity to make a difference to the quality of future geotechnical work in the country and, in so doing, to assist fellow professionals in industry. All it requires is the ability to discern where intervention would be most effective, and individuals willing to give of their time.

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CONSULTING ENGINEERS SOUTH AFRICA (CESA) has about 537 member firms, employing some 24,366 personnel. CESA’s Biannual Economic Capacity Survey (BECS) for January to June 2015, released recently, indicates that fee earnings increased by around 1.2%, against an expected decrease of between 3% and 5%.

Some of the larger firms did better than expected, although several firms still reported negative growth in the first six months of the year. This follows a marginal contraction of 0.7% and an increase of 6% in the previous two surveys. Respondents expect earnings to fall by between 2% and 3% in nominal terms during the last six months of 2015.

Considering trends in industry indicators, as reported by responding firms, it is likely that earnings have reached an upper turning point with a softer growth outlook in the medium term.

These trends are encouraging, especially regarding growth in profitability and staff employment within member firms.

However, we believe that the trends would be better if more projects are brought on stream by the government, which will accelerate infrastructure delivery, reduce unemployment and provide much needed training and experience that our graduates desperately need.

PROFITABILITY AND LATE PAYMENTS

Profitability unexpectedly improved to an average of 14.4% from 12.2% and 13.7% in the previous two surveys.

The average profit margin for larger firms recovered to 9.4% in the first six months of 2015, from 4.3% in the previous survey (December 2014). Medium-size firms managed to maintain profit margins at around 14%, while smaller firms reported a drop to 13.1% from 19% in the previous survey.

In line with the previous survey, the majority of firms expect margins to weaken – the percentage of those that expect receding profits increased from 54% in the previous survey to 63% in the current survey. This is a significant increase and clearly points to an industry under higher levels of financial distress.

The majority of larger firms (80%) are unsatisfied with prevailing margins, compared with only 16% of medium firms reporting unsatisfactory levels. The net percentage satisfaction rate remains deep in negative territory.

Payment remains a serious issue, having a broad-based effect on firms operating in the industry. The percentage of fees outstanding for longer than 90 days as a percentage of total estimated income (including late payments) nonetheless increased only marginally to 24.5% from 24% in the previous survey. This ratio is, however, still higher when compared to the 17.4% in the June 2014 survey.

It is estimated that a total of around R5.8 billion in earnings is currently outstanding after the 90-day period.

EMPLOYMENT

Employment improved in the first six months of 2015, up by 4%, supported by a 6% increase as reported by larger firms. This follows three consecutive survey periods of contraction. Compared to the same period last year, employment is estimated to have increased by around 2% to an estimated 23,838.

The number of firms looking for engineers increased to just under 70% from 48% and 82% in the previous two surveys.
It would seem there is increased demand for technologists and other technical staff, where 68% and 51% of respondents reported the desire to increase staff. This is well above the average over the last four surveys of 34% and 18% respectively.

A total of 67% of firms reported difficulties in recruiting male engineers and 80% reported problems recruiting female engineers. These rates are also higher than in the previous survey. A higher percentage, between 87% and 90%, reported difficulties in recruiting previously disadvantaged male and/or female engineers. It would seem the issue of recruiting female engineers is becoming more profound, while bursaries are still mainly in favour of male recipients.

**UTILISATION**

Capacity utilisation of technical staff has shown very little movement over the last few surveys, but is showing some tendency to slow, and averaged 87% in the June 2015 survey, down from 90% in the previous survey.

Since 2009, the majority of respondents largely expect utilisation rates to remain unchanged, and although there was an increase in the number of firms that expected levels to improve between 2010 and 2011, this position has reversed, with currently only 23% expecting higher utilisation rates in the next six months, relatively on par with the 21% in the previous survey. The trend line remains on a downward trajectory.

**COMPETITION IN TENDERING**

Competition in tendering generally eases during a time when the availability of work increases, and intensifies during periods of work shortages. An easing of competition will generally lead to an increase in prices, while price inflation is capped during periods of work shortages, due to the fact that an increasing number of firms tender on the same project. The tendering process is costly and time-consuming, and higher levels of competition significantly increase the risk for the engineering firm.

Firms continue to mostly report keen to fierce competition, but did report some level of moderation from a peak of 96% in June 2013 to 85% by December 2014. This is still above the average of around 80% reported during 2007 to 2008. Furthermore, since 2010, between 50% and 70% of firms reported competition as fierce. This in itself suggests much tougher working conditions, and supports the trend by firms to discount more aggressively. On average, 55% of firms reported fierce competition, from 53% in the previous (December 2014) survey.

There is a clear correlation between the level of discounting and competition. As competition started to intensify after 2009, the propensity to discount also started to accelerate. The average discounting rate accelerated in the last two surveys to 25.8% in December 2014 and 25.2% in the June 2015 survey, which is the highest level since the inception of this particular question in the survey (June 2007). Stronger competition generally leads to higher levels of discounting. Discounted rates are benchmarked against the ECSA guideline fee scales.

By comparison, larger firms tend to discount more aggressively, although the average rate moderated to 34% in the June 2015 survey, from an average of 40% in the previous two surveys. About 63% of larger firms reported fierce competition, the highest amongst all firm groups, and on par with the previous survey.

Medium-size firms discounted at an average rate of 24.6%, moderately lower than the 27.7% reported in the December 2014 survey, against 39% who reported fierce competition.

**CHALLENGES**

Some of the challenges include:

- Regulation issues, including the procurement of consulting engineering services, remain one of the biggest challenges faced by the industry. Procurement is currently based on price and broad-based black economic empowerment points, with functionality or quality having a minimum threshold, thus being largely price driven. This is affecting tender prices, as firms sometimes tender below cost in view of the diminished availability of projects.
- Unrealistic tendering fees remain a concern for members, while the extended time it takes to finalise a proposal is affecting profitability in the industry. The quality of technical personnel is argued by some firms to have deteriorated, putting greater risk on the built environment sector. Skills shortage is regarded as one the most significant institutional challenges faced by the private and the public sector. CESA has offered their services to government to procure and implement projects.
- Fraud and corruption are affecting the ethos of our society, with a lot of talk and little action accompanying the growing evidence of corruption. CESA is aware that members are under pressure from contractors and corrupt officials to certify payment for work not completed. This is regarded as an extremely serious matter, and CESA will be relentless in holding those in power accountable.
- Unlocking greater private sector participation is seen as a critical element to fast-track delivery, which will support engineering fees, and as such engineering development in the industry. Private sector participation in this context refers to involvement on a more technical level (and not as a client) to improve municipal capacity and efficiency. Government must create an environment for the private sector so that it can play a much bigger role in infrastructure delivery. Many of the projects highlighted in the National Development Plan can be carried out by the private sector through public-private partnerships.

Considering trends in industry indicators, as reported by responding firms, it is likely that earnings have reached an upper turning point with a softer growth outlook in the medium term. These trends are encouraging, especially regarding growth in profitability and staff employment within member firms. However, we believe that the trends would be better if more projects are brought on stream by the government, which will accelerate infrastructure delivery, reduce unemployment and provide much needed training and experience that our graduates desperately need.
THE SOUTHERN AFRICA READYMIX ASSOCIATION (SARMA) is predicting a slow but steady recovery in the construction industry over the next five years, with gradually returning business confidence driving new investments in the industry and its key suppliers.

As the largest supplier of materials for construction projects, the readymix concrete industry is seeing increasingly more investment in the market in anticipation of more buoyant and profitable times in future. Large cement suppliers have already made acquisitions of some of the major readymix companies, and talks are afoot of more possible acquisitions and mergers at the top end of the market.

The reasons for the shift in optimism are based on a number of positive factors that are seeping into the market in the form of a rising number of plans being passed and easier access to mortgage bonds. In addition, the allure of government’s R800-billion infrastructure investment plans for the period up to 2020, and its promise to build 1.5 million RDP houses by the same period (at a cost of over R30 billion per annum), is proving to be a big incentive for investment in the building materials industry.

INVESTMENT RETURNING
According to a report compiled by BMI earlier this year on behalf of SARMA and the closely allied Aggregate and Sand Producers Association of Southern Africa (ASPASA), tough market conditions since the worldwide recession have led to under-utilisation of manufacturers’ capacity. In addition it has stifled investment in the construction and related industries, which led to some stagnation of the readymix concrete industry.

South Africa’s slow recovery has also resulted in the large construction companies sourcing up to 60% of their revenue abroad. The poor viability of transporting heavy building materials over long distances has resulted in a lack of investment from these firms, which in turn has dampened growth to an extent.

Positive growth signs and returning investment are, however, bringing back a more positive sentiment to the market. Simultaneously the increasing demand is also leading to a large number of new operators establishing themselves in the sector, effectively absorbing any real growth that the established players would have otherwise enjoyed.

TRENDING UPWARDS
These signs of renewed growth are indeed positive, but are expected to be slow and measured, at least for the next two years. Some negative factors, including electricity shortages and low demand globally for commodities, may slow growth and have a negative effect on business sentiments locally.

However, the positives outweigh the negatives, and stability in interest rates and rising house prices all tend towards supporting growth. Residential building plans passed are particularly encouraging, especially in the affordable housing market, while retail centre construction is also growing at a good rate.

One of the positive outcomes of the recent recession is the trend for businesses to return to quality and the specification of quality-produced materials. There is increased cooperation between professional bodies who are working towards the specification of accredited-only building materials to be used on site to avoid failures and possible disaster in the event of structural collapse.

Companies can no longer afford the risk of buying unregulated products, and as a result a number of large consulting engineering firms, contractors, municipalities and industry bodies are adding clauses specifying that only accredited materials may be used on their sites. This is obviously good news for members of SARMA and ASPASA who should gradually win back ground lost to start-up operators undercutting prices and engaging in other forms of unprofessional conduct.

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INTRODUCTION

Roy McLintock says that decentralising operations has been key in the efficient running of Franki Africa. “Each of Franki’s divisions, big businesses in their own right, is run autonomously by experienced and highly competent managers, and, of course, with them it’s business as usual. From a central management point of view Errol is an ideal replacement for me. Apart from his immense experience in the field, he and I share the same fundamental views in terms of how a business should be managed.”

Errol Braithwaite is “delighted to be back” after having previously been at Franki from 1996 to 2000 as a senior design engineer. He says Franki Africa is stronger, more focused and better equipped in skills and machinery than when he left in 2000. “I appreciate the informal yet disciplined management style which shuns micromanagement and espouses the adage empowerment with accountability, a concept which says it all.”

Errol is aware that he takes over the reins at Franki at a difficult time in the global economy in particular. “The reality is that the local construction industry is facing challenges on every front — the slow rollout of state investment expected under the National Development Plan has coincided with a nadir in the economy, a weakening exchange rate and a slump in the global commodity cycle. This has put enormous pressure on the construction sector and on the economy as a whole. For us it is fortunate that the private sector has been spending money on commercial developments, especially in Sandton and Cape Town, as this has kept us busy for the past year or so.”

But, while recognising the stiff challenges ahead, Errol is in no way pessimistic about the future. “Firstly we are now part of the Keller Group, the world’s largest independent geotechnical engineering contractor. This means we have access to a range of technology, information and skills which not only enables us to offer cost-effective alternatives using state-of-the-art technology, but also puts us in a unique position in our industry throughout Africa.

“Secondly, even though we expect the local economy to take some time to correct itself, the rest of sub-Saharan Africa has enormous potential, and we are well placed to build on the expertise and experience we have already demonstrated in many regions.

“The fact is that Franki has done the hard yards since the mid-1990s in terms of learning to compete successfully outside of South Africa. This is no easy feat, especially in regions where the logistical challenges associated with the movement of large and specialised machines are acute; not to mention exchange rate and legislative pitfalls, as well as security and disease concerns.”

He adds that Franki is well represented on the continent, with its African footprint currently in Mauritius, Angola, Ghana, Mozambique, Tanzania, Uganda and all the SADC countries. “We hope to build on this footprint wherever sustainable opportunities arise. Indeed, the Keller/Franki partnership enables us to bring best practices in health and safety, quality, environmental management and
technology to the table, and this, combined with Franki’s experience in Africa, leaves no doubt that cross-border work will contribute significantly to Franki’s future bottom line.”

This is not just pie-in-the-sky thinking. There are many examples over the years of Franki’s landmark geological work in Africa where it has provided innovative and cost-effective engineering solutions for a vast range of challenging geological conditions. These include near-shore marine works, deep excavations, lateral support, piled foundations, ground improvement and pipe jacking. According to Errol, Franki’s wide product range and in-house design capability offer compelling options for engineers and developers, and invariably result in appropriate and economical engineering solutions for every contract.

Meanwhile back at home Franki continues to lead the specialist geological contracting sector – recently it has received widespread commendation for its lateral support work on several large basements in Sandton. Notable amongst these are the basements for Discovery, Ernst & Young, Sasol, Webber Wentzel and Old Mutual.

DISCOVERY

“While this is certainly one of the largest ever basements in this country’s history, it is definitely the largest ever for Franki,” says Franki’s Technical Executive, Gavin Byrne. “The vast scale of the project is brought into clear perspective on the realisation that the excavation required 110 000 x 10 m³ truck trips (there and back) to dispose of the soil. Given that the site is in one of the busiest traffic areas in all of Africa, it is no wonder that this element of the contract was crucial to the overall ‘critical path’.”

Gavin explains that the available geological information showed that the site was underlain by a granite bedrock at an average depth of about 15 m below natural ground level. “We decided on a well-established solution for this project – soldier piles drilled to bedrock with ground anchors over the upper circa 15 m, and rock bolts and shotcrete below the pile-toe level within the granitic bedrock zone of the excavation.”

The project commenced with the installation of 216 soldier piles of 600 mm diameter down to bedrock approximately 15 m to 18 m deep. The excavation followed in bench heights of about 2 m around the perimeter, with the ground anchors and gunite facing being installed from the benches.

Complex geological conditions necessitated additional geological investigation of the site, which revealed a very complex diabase dyke along most of the Rivonia Road boundary and a deeper weathering of the granite bedrock in the area surrounding the intrusion. This resulted in the provision of additional anchor force than had been initially planned, with the corresponding reduction in the rock excavation and blasting requirements.

Gavin says that perhaps the biggest challenges for Franki was the doubling of the anchor forces required to provide satisfactory stability to the excavation face, and limiting the movements of the sites surrounding the excavation face. “This process required sophisticated and complex finite-element calculations to model the behaviour of the excavation as construction proceeded.”

ERNST & YOUNG

On this project, Franki’s scope of works included 130 000 m³ of excavation, 5 600 m² of lateral support (consisting of soldier piles, gunite arches, strand anchors and rock bolts), and thirty structural piles of between 900 mm and 1 350 mm diameters.

One of the challenges on this project was the discovery of a diabase dyke on Rivonia Road (as with the Discovery site), which necessitated a re-design with three additional rows of strand anchors. Another challenge was the close proximity of the Alexander Forbes building and the midblock connector road between it and the Ernst & Young building, necessitating Franki to install ‘dead-man’ anchors. “This solution allowed the proposed wedge of soil between the two developments to be kept in place, while we continued with excavation for the new Ernst & Young basement. Basically we installed the anchors from the Ernst & Young basement through the soil into the Alexander Forbes basement and tied these two basement
walls together, which required precision drilling,” explains Franki’s Senior Contracts Manager, Paulo Alves.

SASOL
According to Paulo, the Sasol building is not just another building. “The building has a massive footprint of about 6 500 m² and a floor area of 67 000 m² in total.”
The scope of works included 170 000 m³ of excavation, 6 600 m² of lateral support and 85 structural piles, as well as the diversion of existing stormwater and sewerage lines that ran through the site.
“Our main challenge on this job was the programme – seven months from start to finish, which is a massive achievement.”

WEBBER WENTZEL
The scope of works on this project included 60 000 m³ of excavation to a depth ranging between 8 m and 14 m, and a total lateral support area of 2 900 m².
Paulo says this was an exceptionally challenging job. “Of the total excavation of 60 000 m³, no less than 20 000 m³ comprised extremely hard blue granitic rock. This is very hard material which required extensive drilling and blasting.
“This was also a tight job with respect to time, but, in spite of the challenges, the contract started in June 2013 and was completed by mid-November 2013 – a notable achievement.

OLD MUTUAL
This turned out to be one of Franki Africa’s most challenging projects in the area. The two main problems, apart from the area’s perennial diabase dyke, were the presence of the Gautrain tunnel, which runs directly under the site, and the integration of the adjoining Sandown Mews development.
The Gautrain tunnel necessitated a technically demanding approach for the excavation and ‘expected’ rock profile works directly over its tunnel alignment along the entire Rivonia Road face. No blasting was permitted in this region and there were some anxious moments during the installation of the soldier piles. As it turned out, the soldier piles were installed deeper than the final excavation level, thereby providing the first signs that rock might not be present over the Gautrain alignment. “This proved to be the case,” says Paulo, “with numerous benefits accruing to the client with respect to the management of the risk in this area.”
He adds that even when blasting in areas not directly over the Gautrain tunnel, extreme caution had to be exercised. This was achieved by constant physical monitoring of all blasting vibrations in the tunnel.
“In terms of the Sandton Mews three-level basement – which also had soldier piles and anchors as a lateral support solution – while we were able to remove the piles, and did so, our overall solution had to include the geotechnical ‘marriage’ of the two sites, i.e. the physical integration of the Sandown Mews site into the Old Mutual foundations.”

CONCLUSION
Errol Braithwaite says that a glance at these various projects, home and abroad, indicates the world-class expertise in the Franki stable. “In addition to its traditional strengths, following its acquisition by Keller, Franki has access to state-of-the-art expertise and new technologies from anywhere in the world. In short, Franki is as strong as ever and I look forward to helping ensure that we continue with this momentum in the coming years. I’d particularly like to thank Roy McLintock for his invaluable contribution, not only to Franki, but to the industry as a whole and to wish him all the very best in his retirement.”

Basement for the new Old Mutual building on the corner of West Street and Rivonia Road in Sandton
Is there a reason for South Africa to have a positive outlook towards 2020?

INTRODUCTION

Over two years ago I wrote an article titled, *Infrastructure Finance – an Alternative*, suggesting a different funding approach post the financial crisis experienced a number of years before. So what has changed since then, and is there still scope to deliver on “government’s big drive to implement 18 Strategic Integrated Projects (SIPs), clustering more than 150 smaller infrastructure projects, with an estimated R4 trillion expenditure”? (Pautz 2013)

Infrastructure spending is considered to be one of the major catalysts of economic growth, development and economic activity. It can be regarded as a mechanism to generate employment opportunities for millions of unskilled, semi-skilled and skilled workers.

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Figure 1: Africa – real GDP growth

Source: National Statistics, BMI

Figure 2: A new record high JSE All Share Index in 2015

Source: National Statistics, BMI
Building roads, railways, ports and power plants could yet be one way of powering a global recovery.

There are a number of challenges facing the current South African outlook, but none so large that they are not insurmountable. What these challenges are, coupled with current global and domestic trends, will be highlighted in somewhat more detail further on in this article. Not all is as bleak as some make it out to be, and with some careful planning and appropriate and decisive decision-making, South Africa could once again appear as the land of opportunity, with a thriving economy, with infrastructure and construction sectors leading the way.

CURRENT SA OUTLOOK

There is a lot of negative sentiment regarding the future of South Africa, and perhaps some of it is justifiable. Certainly South Africa is experiencing a low GDP, but in the context of the global picture, it is definitely not the lowest, and growth is not negative. South Africa is in fact still growing, granted not at the rates everyone would like, but the future forecast, although slightly flat, is still good (Figure 1). The positive aspirations of the continent to grow at a rate greater than 5%, together with the growing trade between South Africa and its neighbouring countries, bode well for the future.

Across the country load-shedding has been experienced by all sectors, companies, citizens and industry. There is no doubt that this has cost the economy and has stifled growth, but as Medupi and the committed renewable energy programme start to provide the much needed power generation, so, too, the necessity for load-shedding will diminish. The anticipated infrastructure spending backlog is estimated to be R4 trillion over the next 15 years, with R850 billion planned infrastructure spend over the next three years. Clearly something needs to be done to not only close this widening gap, but to halt the increasing deficit and accelerate spend to meet this backlog.

Currently water restrictions or water-shedding are sliding across the country as South Africa experiences record-breaking temperatures and exceptionally low rainfall in certain parts of the country. Desperate pleas from the agricultural communities and pray-for-rain calls are occupying the media headlines, with society getting angry at the inept management of proper maintenance and planning in the water sector.

The rise in protests by citizens about increasing taxation and perceived limited value in return, together with increased labour strikes, does not paint a rosy picture. On the contrary, it paints a picture of unrest, disillusionment, and political uncertainty and instability, which impacts negatively on South Africa’s ratings, as reported by the ever watchful (and sometimes despised) ratings agencies.

HOWEVER, South Africa has several very good and strong characteristics and trends, so certainly not all is lost. A significant amount of progress has been made over the past 20 years, since our first democratic elections in 1994. The JSE ALL Share Index has increased tenfold as a result of a rampant property market, healthy economic growth and stagnant inflation, resulting in many South Africans being better off (Pautz 2015). Figures 2 and 3 illustrate the positive outcomes of a record high level of the JSE ALL Share Index, and the declining PPI and CPI respectively.

Currently South Africa has maintained its investment grade rating and is making inroads towards the achievement of the National Development Goals. There has been significant infrastructure investment to date, and further infrastructure is planned in key sectors such a Transport, Power, Water and ICT (Information and Communication Technologies). The PICC (Presidential Infrastructure Coordinating Commission) monitors 44% of the state infrastructure projects on a quarterly basis, focusing on the 18 SIPs. At present approximately R24 billion is spent on a quarterly basis creating 145 000 job opportunities. With this kind of progress and increased progress, the next five years will paint a different landscape within the infrastructure and construction sectors.
WHY INVESTING IN INFRASTRUCTURE IS IMPORTANT

A number of arguments can be made for investing in infrastructure:

■ It promotes positive economic growth.
■ It boosts aggregated demand through expenditure during construction.
■ It serves as an enabler for poverty reduction and employment creation.
■ It enables developing countries to achieve suitable growth and development.

Infrastructure is a story of evolution. It drives social change and economic development. It enables us to renew our public services and physical surroundings. It allows societies, economies, companies and individuals the opportunity to live to their full potential. (Foresight 2015)

The construction sector, with an annual compounded growth rate of 12.5%, has had the fastest GDP growth by sector between 2000 and 2014 (Figure 4). The compounded amount of R19.0 billion invested in 2000 increased to R230.8 billion in 2014. The same sector accounted for the fastest growth in operating surplus (profit) growth between the same years of 14.2% (CAGR, i.e. Compound Annual Growth Rate). The compound amount of R10.9 billion in profits (2000) increased to R79.9 billion (2014).

In 2000, construction works accounted for 13% of total investment in the domestic economy, while in 2014 it accounted for 30%. Most of the investment (2000–2014) was led by the private sector (21.9%), with public sector (18.0%) following close behind. The private-sector-led investment was due to improved business confidence, with accelerated infrastructure investment guaranteeing a higher longer-run growth trajectory for the economy.

The construction sector is the most developed construction market in Africa, second to Nigeria. Although the growth in South Africa’s construction industry faces many challenges due to ongoing strikes, power outages and macro-economic pressure, the infrastructure competitiveness index moved up from 66 in 2013/14 to 60 in 2014/15 out of 144 countries (also refer to Figures 5 and 5a for further strong competitiveness strengths). The construction industry experienced a year-on-year growth from 2.7% in 2014 to 3.4% in 2015 (R150 billion), with a slight year-on-year decline in the infrastructure industry from 4.7% in 2014 to 4.5% in 2015 (R75 billion) (BMI 2015). However, both the construction and infrastructure sectors contributed to the GDP growth and employment, with construction sector employment increasing from 1 199 000 (January 2014) to 1 322 000 (January 2015) (Stats SA 2015).

| South Africa’s highest-ranked competitiveness indicators (selection out of 144 countries) |
| Regulation of securities exchange | 1 |
| Auditing & reporting standards | 1 |
| Efficacy of corporate boards | 3 |
| Soundness of banks | 6 |
| Availability of financial services | 6 |
| Efficiency of legal framework | 9 |
| Strength of investor protection | 10 |
| Quality of air transport infrastructure | 11 |
| Quality of management schools | 24 |
| Domestic market size | 24 |

Source: WEF, SAICE (Roelof Botha)

Figure 5: South Africa’s competitive strengths

Figure 5a: Sub-Saharan Africa’s Infrastructure Risk/Reward Index, Q4 2015

| Source: BMI, KPMG calculations |

Regional Average
Sudan & South Sudan
Zimbabwe
Gabon
Ethiopia
Cote d’Ivoire
Mozambique
Angola
Uganda
Cameroon
Tanzania
Ghana
Kenya
Nigeria
Zambia
Namibia
South Africa
Botswana

Scores out of 100, 100 being the best
Sectors and Developments

The following section deals with potential opportunities and the anticipated capital investment in various sectors. The average percentage (over the 2015–2020 period) of total infrastructure investment in key areas is in the transportation sector at 54% and in energy and utilities at 46% (BMI 2015). Within the transportation sector, there will be major investments in railways, ports and pipelines by the state-owned company, Transnet, with the bulk of that (50%) in the railway sector. It is further anticipated that the private sector will contribute to 26% of the capital needed for government’s railway expansion programme, with the public sector raising the remaining 74%. Figure 6 illustrates the anticipated capital investment split between the various sub-sectors within the transportation sector, and the energy and utilities sector.

Moving slightly broader, to the SADC region, there are a number of projects in various stages of development contained in the SADC Regional Integrated Development Masterplan (RIDMP). Of these, the transportation sector makes up the bulk of the projects (see Figure 7 and Table 1). The sub-Saharan Africa project backlog is in excess of USD550 billion, with the vast majority stuck in the pre-tender phases. Unlocking this project pipeline is one of the biggest constraints to continued growth and development in the region. Increased political stability, enhanced regulatory reform and improved governance will lead to unlocking some of these projects and bring them to market.

Energy

The southern African energy landscape is undergoing very dynamic changes. As a result the large-scale state-owned utilities (e.g. Eskom) are facing many challenges. Both government and the private sector are consistently looking for ways to reduce the energy constraints through demand-side management, new generation and energy efficiency. In southern Africa there is a large focus on renewable energy, which should hopefully filter into other infrastructure sectors, attracting further investments. Leading the way will be regional pension funds (e.g. SA’s Public Investment Corporation), local infrastructure funds (e.g. Harith General Partners) and those supported by development capital (e.g. Emerging Africa Infrastructure Fund, Eiser Infra Fund).

And beyond 2020

Based on the Integrated Resource Plan (IRP) a further 41 GW of new electricity generating capacity is envisaged – through Eskom new build, refurbishment of existing plants, and the IPP programme (excluding replacement of decommissioned plants). This will take South Africa’s total electricity generation capacity to 81 GW by 2030. Some of the key objectives of the IRP include:

- Diversifying the coal-driven power mix
- Increasing generation through domestic and regional IPPs
- Incorporating multiple energy sources, such as renewables and nuclear power.

In the short term, coal will remain key in the generation mix, but both Eskom and IPPs will focus on utilising alternate energy sources going forward.

Eskom’s New Build Programme comprises a number of projects, including Medupi (4 788 MW), Kusile (4 800 MW), Ingula Pumped Storage (1 332 MW), Sere Wind Farm (100 MW) and Concentration Solar Power (100 MW). Eskom is expected to spend R213 billion to strengthen and develop the transmission network between 2016 and 2025. Eskom further expects to have 53 600 MW on the grid by 2025, compared to 45 000 MW currently. In addition, Eskom is looking at developing a 1 500 MW solar park in the Northern Cape. The R3.5 billion Dedisa Peaking Power Project (335 MW) in the Coega Industrial Development Zone has started operating. The sister plant, Avon (685 MW) located north of Durban is expected to come on line in April 2016.

In order to meet the IRP’s envisaged 2030 energy mix, the Department of Energy (DoE), through its IPP Office, has since 2011 run numerous IPP procurement programmes. These include:

- The Small Projects IPP Procurement Programme (SP-IPPPP) was launched by the IPP Office to procure 100 MW and open up the Renewable IPP market to SMEs who would otherwise not be able to participate in the programmes. This programme is
It is a state-of-the-art mass rapid rail link providing a safe, reliable, expedient transportation solution in Gauteng.

- First phase linking OR Tambo International Airport and Sandton was completed on time for the FIFA 2010 World Cup event. Second phase linking City of Tshwane with City of Johannesburg was operational in June 2012.
- There has been exceptional growth, with passenger demand exceeding expectation during peak periods.
- 114 000 jobs were created during the development period, with 1 800 direct and sustained jobs created during the operating period.
- Up to the end of 2014 approximately R20 billion provincial contribution to GDP with increased government revenue of R5 billion and a flow of R2 billion received by lower-income households.
- There is an additional rolling stock procurement and network extension feasibility study in progress.

**Gautrain**

- R123 billion investment in approximately 7 000 passenger trains. This is the first new rolling stock acquisition since the early 1980s.
- Gibela is the party to manufacture the rolling stock, with the first 20-train set arriving from Brazil and the remainder manufactured locally under one 10-year contract. There is also a 19-year maintenance contract. Both contracts could perhaps be doubled in the future.
- There is a skill and technology transfer programme, with ten South African engineers participating in an 18-month training programme.
- There are also major station, depot and related infrastructure upgrades under way.

**Passenger Rail Agency of South Africa (PRASA)**

- GMA intends acquiring additional rolling stock (estimated 48 coaches) to the tune of approximately R3 billion to meet demand expectations. These trains will be phased in over three years from 2019.
- Feasibility study for at least two to three extension routes will be close to completion in 2016, with procurement expected to begin towards the end of 2016. Construction is expected to start in 2020.
- For every R1 capital investment spend by GMA, R0.73 contributes to the Gauteng economy and R0.18 to government revenue.
- Expansion routes will result in five jobs for every R1 million spent during construction and significant poverty alleviation, with 17% of additional household income flowing to lower-income households.
- This further provides more transport options to the general public.

**Transnet Freight Rail (TFR)**

- Transnet increased its seven-year capital investment programme by 7% to R333.6 billion for investments in rail, ports and pipeline infrastructure.
- Currently 1 064 locomotive acquisition programmes under way, with contracts awarded to four major international manufacturers (CNR, CSR, GE and Bombardier). Transaction value of R50 bn, 92% of funding has been secured.
- Strict local content requirements – with a minimum of 40% per contract, winning bidders exceeded this at 55–60%.
- Shareholding in local manufacturing entities include women, workers and a community trust.
- 994 locomotives to be produced locally at Transnet’s Koedoespoort and Durban facilities.
- 95 electric locomotives have been delivered in March 2015 and are in operation. This delivery saw skills upliftment of 190 people, trained in China, and lead to 260 people being employed in the assembly line.

- Approximately 3 600 trains will be delivered averaging 30 per month from 2016.
- All trains to be assembled in Dunnottar by Gibela Rail Transportation Company.
- Contract stipulates a minimum local content of 65%.
- Approximately 65 000 direct, indirect and induced jobs will be created over the full programme, of which 21 000 will be skilled.
- Approximately R1.8 billion is earmarked for skills development, development of rail sector enterprises and community programmes.
- This safe, reliable and mass transit modality will significantly reduce traffic congestion on highways.

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**Table 1: Transportation forms the bulk of the SADC Regional Integrated Development Projects**

<table>
<thead>
<tr>
<th>Project</th>
<th>Current status</th>
<th>Towards 2020</th>
</tr>
</thead>
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<td>Gautrain</td>
<td>- It is a state-of-the-art mass rapid rail link providing a safe, reliable, expedient transportation solution in Gauteng. - First phase linking OR Tambo International Airport and Sandton was completed on time for the FIFA 2010 World Cup event. Second phase linking City of Tshwane with City of Johannesburg was operational in June 2012. - There has been exceptional growth, with passenger demand exceeding expectation during peak periods. - 114 000 jobs were created during the development period, with 1 800 direct and sustained jobs created during the operating period. - Up to the end of 2014 approximately R20 billion provincial contribution to GDP with increased government revenue of R5 billion and a flow of R2 billion received by lower-income households. - There is an additional rolling stock procurement and network extension feasibility study in progress.</td>
<td>- GMA intends acquiring additional rolling stock (estimated 48 coaches) to the tune of approximately R3 billion to meet demand expectations. These trains will be phased in over three years from 2019. - Feasibility study for at least two to three extension routes will be close to completion in 2016, with procurement expected to begin towards the end of 2016. Construction is expected to start in 2020. - For every R1 capital investment spend by GMA, R0.73 contributes to the Gauteng economy and R0.18 to government revenue. - Expansion routes will result in five jobs for every R1 million spent during construction and significant poverty alleviation, with 17% of additional household income flowing to lower-income households. - This further provides more transport options to the general public.</td>
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<td>- All locomotives to be delivered by 2018. - Creation of 30 000 jobs and export capability for locomotives. - Reliable service, meeting of key goal to shift freight vehicles off the road. - Lower road maintenance owing to a reduction in heavy vehicle road usage. - By 2018/2019 more than 350.3 million tons of cargo per year will be railed. - There will be a positive impact on overall GDP.</td>
</tr>
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</table>
output and possible co-production of useful thermal energy.

The Renewable Energy IPP Procurement Programme (RE-IPPPP) has run successfully since 2011, with more than 37 of the 92 awarded projects already connected to the grid. More than 6 000 MW have already been procured in this programme, and an additional 6 300 MW may be determined for this programme.

The Coal Baseload IPP Procurement Programme (CB-IPPPP) intends to procure 2 500 MW (likely to be 3 500 MW), and issued its first Request for Proposal in December 2014, with the bid submission date set for November 2015.

The Gas IPP Procurement Programme (Gas-IPPPP) is in development and the IPP office has issued a Request for Information to the market, informing the market of the structuring of the procurement process. An initial determination of 3 126 MW has been allocated.

Table 1 continued

<table>
<thead>
<tr>
<th>Project</th>
<th>Current status</th>
<th>Towards 2020</th>
</tr>
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<tbody>
<tr>
<td>Transnet Pipeline</td>
<td>Multi-products pipeline transporting refined products from Durban to Johannesburg is expected to be completed in March 2018. The new 555 km pipeline will replace the 49-year-old Durban to Johannesburg pipeline.</td>
<td>It is estimated that fuel tankers will be reduced by as much as 60% in current terms.</td>
</tr>
<tr>
<td></td>
<td>The pipeline will be able to transport 93 and 95 grade unleaded petrol, low-sulphur diesel and ultra-low-sulphur diesel, as well as jet fuel, and will have a 70-year design life. Due to cost escalations, total project cost is estimated at R25.3 bn.</td>
<td>With the introduction of the new pipeline, there will be a reduction in road congestion, carbon emissions and maintenance costs.</td>
</tr>
<tr>
<td></td>
<td>Replacement of the older pipeline and ensuring security of fuel supply to inland areas.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Employment of more than 12 000 people during construction, with more than 2 100 people coming from nine magisterial districts.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Local employees made up 80% of the workforce, trained in transportable skills.</td>
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</table>

Airports Company South Africa (ACSA)

- World-class international airports which obtained a SAICE Infrastructure Report Card rating of B+ in 2011 (IRC 2011).
- Approximately R5.2 bn capital spend for infrastructure expansion was brought forward to accommodate the FIFA 2010 World Cup.
- All three major airports provide significant employment.
- Majority of investment to be spent on upgrading domestic and international terminals at Cape Town International Airport.
- Expansion to be completed over the next three years.
- R7.7 bn additional investment completed in upgrading of airports.
- Tourism is a significant contributor to job creation, with airport infrastructure being a prerequisite to growing tourism. South Africa continues to significantly grow its tourism numbers.
- Estimated one job created for every 12 tourists; approximately 1 100 jobs created following the establishment of a new scheduled international route.
- The new infrastructure promotes regional and global integration.

Table 2: Energy landscape for southern Africa

<table>
<thead>
<tr>
<th>Current challenges</th>
<th>Towards 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>The majority of the power infrastructure is ageing infrastructure, with limited design life.</td>
<td>It is anticipated that, through the sustainable world-class IPP programme, there will be in excess of 10 GW for renewables, of which almost 100% will be in operation.</td>
</tr>
<tr>
<td>Lack of maintenance has exasperated the situation, with Eskom’s generating capability obtaining a C+, Eskom’s transmission a B- and its distribution network a D (IRC 2011).</td>
<td>3.5 GW for coal baseload with the first 2 GW in operation (or close to it).</td>
</tr>
<tr>
<td>There has been a long delay in building any new plants or distribution networks.</td>
<td>2.5 GW for gas power with half in operation.</td>
</tr>
<tr>
<td>However, over 1 million households have electricity connections since 1994, servicing more communities.</td>
<td>Medupi fully operational and Kusile approximately 30% in operation.</td>
</tr>
<tr>
<td>Load-shedding has had a significant negative impact on the economy.</td>
<td>No more load-shedding.</td>
</tr>
<tr>
<td>Lack of quality feedstock has increased the woes of Eskom providing reliable power at a cost-effective pricing.</td>
<td>Well-balanced Integrated Resource Plan and installed energy mix, with concise and decisive information on the nuclear build programme.</td>
</tr>
<tr>
<td></td>
<td>Further up-skilling of local work force.</td>
</tr>
<tr>
<td></td>
<td>Localised supply chain.</td>
</tr>
</tbody>
</table>
Key factors of these programmes are localisation of the supply chain, creation of industry hubs around project sites, increased community involvement, local ownership and skills transfer.

**WATER**

The Lesotho Highlands Development Agency and TCTA are developing the funding strategy and project implementation steps for Phase 2 of the Lesotho Highlands Water Project. In 2012, a R25 billion guarantee was approved by the Minister of Finance for this project. Initial implementation contracts are expected to be awarded by the end of 2015, with project completion by 2020. A regional bulk infrastructure grant of R15.1 billion to fund 60 large and 148 small projects over the MTEF period has been approved. This grant will also fund 76 regional bulk water schemes to be completed by 2018. A total of approximately R25 billion is to be invested in water resources projects (i.e. dams, canals, pipelines), with project completion dates ranging from 2015 to 2022. An approximate 8 500 sustainable jobs are to be created from water resource projects currently under way. Some current water resource projects have been detailed in Table 3.

### Table 3: Investment into some current water projects

<table>
<thead>
<tr>
<th>Project name</th>
<th>Project cost (ZAR billion)</th>
<th>Project description</th>
<th>Estimated number of jobs to be created</th>
</tr>
</thead>
</table>
| Mzimvubu Water Project 2014–2020                  | Total: 12.45               | The Mzimvubu Water Project aims to develop a conjunctive scheme comprising two multi-purpose dams and associated bulk water distribution infrastructure for domestic and irrigation water supply, as well as hydropower generation. The project is intended to stimulate socio-economic development in the area and the Eastern Cape Province as a whole. Funding options to bridge the funding deficit are currently being explored.                                                                                     | During construction: 5 500  
During operation: 3 700                  |
| Olifants-Doom River Water Resources Project:      | 2.7                        | Raising of existing full supply level by 13 metres to provide additional water to supply full existing allocation, establish emerging farmers and address dam safety aspects.                                                                                                                                                                                                                                                                         | 560                                   |
| Raising of Clanwilliam Dam 2015–2018              |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Mokolo and Crocodile Water Augmentation Project – | 1.9                        | Water augmentation project to supply raw water demands in the Waterberg area to Eskom, Exxaro and Lephalale Municipality for expected domestic growth. This project will use the Mokolo Dam as the source, and it will deliver 30 million cubic metres of water at completion.                                                                                                                                                                                                                                           | 683                                   |
| Phase 1 2009–2018                                 |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

The international award of the Square Kilometre Array (SKA) Project, shared between South Africa and Australia, will keep the international media focused on the development. The scale of the SKA represents a huge leap forward in both engineering and research and development towards building and delivering a radio telescope, and will deliver a correspondingly transformational increase in science capability when operational. Construction of the SKA is expected to begin in 2017, and upon completion in 2024, the SKA dishes will generate 10 times the current global internet traffic, generating raw data every day to fill 15 million 64 GB iPods.

Winning the mega astronomy infrastructure bid is expected to result in investment in Africa of about $2 billion (South African Government 2015) in the continent during construction, and $200 million per annum over a 20–30 year period. It will boost the development of high-level skills and cutting-edge technology infrastructure, and should drive the development of internet connectivity in both rural and urban areas in Africa. A World Bank study concluded that every 10% increase in bandwidth connectivity for developing countries produces 1.3% growth in gross domestic product (GDP) of the host country. The SKA will attract the world’s best engineers and

**INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT)**

Nationwide internet access in 2013 showed a low connectivity of 33.7%. Private sector investment for urban and corporate networks, coupled with government funds for township and rural access, government entities, schools and health facilities will assist in achieving the goal of 90% affordable (2.5% or less of monthly income) coverage by 2020. Further progress will be made towards achieving the SA Connect targets by 2030. Telkom is planning to service one million households with its fibre-optic infrastructure within the next three years. Phase 1 of the digital development plan connecting schools and government institutions is in the construction phase, with project cost budgeted at R6.7 billion. A business case is being developed for the Gauteng ICT Park to attract both foreign and domestic investment to a dedicated industrial park through provision of world-class economic infrastructure and facilities. There is a large focus on the roll-out of broadband in most major centres in South Africa. A number of fibre-optic cable developments are under way – some of the projects and operators are listed in Table 4.

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scientists to work in Africa, and will provide unrivalled opportunities for scientists and engineers from African countries to engage with transformational science and cutting-edge instrumentation, and to collaborate in joint projects with the most renowned universities and research institutions in the world (South African Government 2015). The location of the SKA in Africa will go beyond socio-economic development, and will strengthen confidence and self-belief.

**FINAL THOUGHTS**

The construction and infrastructure sectors of South Africa for the next five years look good. Significant capital expenditure is predicted by the large SOCs, namely Transnet, Eskom, SANRAL, PRASA and ACSA. The National Development Plan (NDP) has been adopted as the guide towards infrastructure development, and, coupled with the promulgation of the Infrastructure Development Act and overseen by the PICC, provides the necessary guidance to infrastructure expansion and development. Port and rail investments will continue to dominate the transport sector due to increased mining investment in iron ore and coal commodities, whilst improved energy stability, increased energy efficiency and advanced communication networks will provide opportunities for increased investor confidence.

The material base of society determines the shape of its culture, not the other way around. This material base is nothing less than the underlying infrastructure – both economic and social. Thus, the importance of the state, companies and citizens playing a role to shape this culture, will determine whether we thrive or struggle. And at present there are many indicators pointing in the right direction to shape a bright culture.

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**Table 4: Some of the fibre-optic cable developments under way**

<table>
<thead>
<tr>
<th>Operator/Project</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limpopo Broadband Network</td>
<td>The Limpopo broadband feasibility study is in progress and is expected to be completed in the second quarter of 2016. Total capacity in the Northern Ring to be boosted by 200%. Project is expected to create between 17 000 to 45 000 additional sustainable job opportunities, and facilitate the attraction of national and multi-national companies supporting local entrepreneurs.</td>
</tr>
<tr>
<td>Link Africa, Frogfoot Networks</td>
<td>Constantia Fibre Initiative announced that fibre connections would be made available to all 3 500 households in Constantia, Cape Town, in 2015. The operators plan to complete the deployment by 25 December 2015.</td>
</tr>
<tr>
<td>Vox Telecom</td>
<td>Vox Telecom’s shareholders reserved their decision to sell the company, and will instead invest in a five-year fibre-optic strategy. Vox will deploy its fibre networks in key districts of Johannesburg, Durban and Cape Town, and later in Bloemfontein, Port Elizabeth and Polokwane. Vox plans to work with open access players such as Vutam and Dark Fibre Africa (DFA) to deploy its network.</td>
</tr>
<tr>
<td>Vodacom</td>
<td>Vodacom awarded Alcatel-Lucent a contract to deploy a gigabit passive optical networking solution reaching 150 000 homes and 150 000 businesses across Johannesburg, Pretoria, Cape Town and Durban by 2018. Vodacom had earlier stated it planned to spend ZAR400-500 million on fibre roll-outs.</td>
</tr>
</tbody>
</table>
Why should business continue to invest in SA?

In a recent speech in Cape Town, former president of South Africa, FW de Klerk, spoke about why business should continue to invest in South Africa, saying that there are several reasons for confidence, despite the country’s travails. The article below is a summary of that speech, reproduced here with the kind permission of the FW de Klerk Foundation.

INTRODUCTION
South Africa has not been doing well on the investment front. Since 2007, Australia has attracted more than eight times as much Foreign Direct Investment (FDI) as South Africa, and Chile, with a smaller economy, has received more than three times as much as us. This is despite the fact that South Africa has by far the greatest mineral resources in the world.

At the same time, South Africans have been rapidly increasing their investments in other countries. In the past three years there was an outflow of R216 billion – only R26 billion less than the FDI inflow during this period. According to UNCTAD’s (United Nations Conference on Trade and Development) 2015 World Investment Report, our outward FDI stock of US$134 billion is rapidly catching up with our inward stock of US$145 billion.

So why is business not continuing to invest in South Africa?

According to global consulting firm AT Kearney, the main reason is that capital is being redirected to developed markets, as investors move away from emerging markets towards safer destinations for better returns.

In South Africa’s case investors have also been influenced by negative perceptions arising from low economic growth, down-grading by ratings agencies and Eskom’s inability to generate sufficient electricity. Investors also require regulatory certainty and an open investment environment.

South Africa has been sending all the wrong messages to potential investors – particularly with regard to property rights:

- Three years ago South Africa unilaterally terminated its bilateral investment treaties with a number of European countries.
- A raft of legislation that is trundling its way through Parliament threatens to dilute the property rights of South Africans and foreigners alike.
- Investors are subject to South Africa’s transformation laws that will continue to ratchet up the percentage of investments that must be owned by designated South Africans. Companies will also have to appoint key personnel on the basis of demographics and will be pressured into buying goods and services, not on the basis of price and quality, but from BBBEE compliant suppliers. Apart from the threat to property rights, foreign and local investors must also take into consideration South Africa’s fractious labour market – with the worst employer/employee relationships in the world.

WHY INVEST IN SOUTH AFRICA?

Why then should anyone want to continue to invest in South Africa? There are seven reasons:

1. **We have an excellent private sector.**
   South Africa does very well in a number of the categories assessed by the World Economic Forum in its Global Competitiveness Reports:
   - The regulation of our security exchanges and our reporting standards are the best in the world.
   - Our banks are the second soundest in the world and our corporate boards are the second most efficacious. Our financial services and protection of minority shareholders are third best in the world, and our ability to finance local equity is the fourth best internationally.
   - South Africa is also in the top 20% in the world in respect of its legal rights index, investor protection, the quality of its management schools, reliance on professional management, the efficacy of its legal dispute settlement system, and the size of its domestic market and university-driven innovation.
   - We have companies that can compete with the best in the world.
   - We have the ability to manage large-scale projects – as was illustrated by the enormous success of the 2010 FIFA World Cup.

2. **We have a large and as yet underdeveloped domestic market.**
   As more and more South Africans move up the ladder of economic development they will provide a domestic market that has the potential to grow at high rates for many decades.

3. **South Africa is one of the principal gateways to Africa – one of the world’s fastest-growing regions.**

4. **South Africa is about to embark on an enormous infrastructure expansion programme**
that will require investment of more than US$500 billion during the next 15 years.

5. We have enormous untapped potential as a tourist destination.
   Cape Town is regularly cited as one of the top destinations in the world. We have a vibrant, multicultural population, excellent theatre and music – and some really great restaurants.

6. We have the most abundant mineral resources in the world.
   If we can adopt more investor-friendly policies there is no reason why they should not continue to provide an engine for growth for many decades to come.

7. Our problems and challenges.
   Finally, one of our greatest national assets may – ironically – turn out to be our problems and challenges. They say that Australia’s greatest problem is that it does not have any great problems. No one can say that about us. South Africans have no room for complacency. We can never rest on our laurels and we have shown that we have the ability to overcome much more serious challenges than those that confront us now.

OTHER REASONS FOR CONFIDENCE

■ Our excellent Constitution, which does not devolve absolute power on Parliament and on the Executive. It provides them with all the power they need to rule, but requires them to do so within the reasonable constraints established by the Bill of Rights.
■ The discipline imposed by globalisation. Any government action that deviates too significantly from international norms of democratic and economic governance will be severely punished by markets and international opinion.
■ The enormous advantage on ‘the battlefield of ideas’ of those who support pragmatic constitutional and economic approaches. Ideological approaches – like apartheid, the National Democratic Revolution and communism – simply do not work.
■ Finally, widespread support for the Constitution. Politicians, journalists, businessmen and religious leaders from all our population groups are in the vanguard of those who support the Constitution. They know that it is the best guarantee for the continuation of freedom, reconciliation and national unity – and they also know that it advocates transformation.

CONCLUSION
FW de Klerk concluded his speech with the following advice:

“Invest in this country – it has enormous potential and is the gateway to one of the fastest growing regions in the world.

“Invest in the South African people – we have one of the most cosmopolitan populations in the world, enriched by a great diversity of cultures.

“Invest in our Constitution. Dedicate yourself to making your contribution to its vision of human dignity, of the achievement of equality and of the advancement of human rights and freedom for all South Africans.”

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INTRODUCTION
The CMP (Construction Management Programme) was again hosted at Stellenbosch University during the winter of 2015. The CMP is a prestigious, intensive four-week programme for middle managers operational in the development of civil infrastructure. The course is supported by several academic institutions, and is held annually over four weeks during the winter vacation. Typically 40 delegates attend the course annually, with backgrounds in construction (70%), consulting (10%) and client or owner organisations (20%). Since its inception in 1976, more than 1 000 delegates have attended the course, many of whom now occupy executive positions in large companies (until 2007 the course was offered every second year only).

CMP THEME
The CMP management annually choose a theme for the programme, which is used as a basis for assignments, deliberations and discussions. It serves the purpose to focus the delegates on a real industry problem, but has the added benefit that experienced industry professionals debate a current problem, thus serving as a think tank to find industry solutions.

In 2013 the theme for the first time addressed the National Development Plan (NDP), and for the two subsequent years the NDP was at the base of the identified themes:

■ 2013: Bridging gaps constraining successful National Development Plan execution
■ 2014: Leadership towards implementing the National Development Plan

Theme 2013
In 2013 the delegates identified the following 12 gap categories (shortcomings) through a synthesis of building on newly acquired knowledge and their own experience from working in the industry:

■ Fragmentation in the industry and related sectors
■ Lack of finances
■ Lack of suitable procurement models
■ Not capitalising on existing infrastructure
■ No sustainable flow of work
■ Leadership gap at many levels
Gap between unions and industry
Corruption
Distraction of local firms into Africa
Inferior education and lowering of standards, also resulting lack of capacity
Lack of holistic development of rural areas
Poor selling of the industry.

The following three-tiered strategy was then suggested for execution of the NDP:

**Initiative 1** consists of an all-inclusive effort where all parties need to collaborate to find a way to implement the NDP. This would include government, labour unions, construction industry, business, society and any other stakeholder. The general feeling was, however, that there is much work to be done to obtain buy-in from all these stakeholders, and that it may take considerable time before implementation is realised. This process is presumably under way, under jurisdiction of EPC (Engineering, Procurement, Construction – a form of contracting arrangement), but little is known or has been accomplished as far as the CMP is aware.

**Initiative 2** consists of an initiative where the construction industry takes the lead to identify projects, find finances, obtain the construction industry takes the lead and coordinate the initiative.

**Initiative 3** is a result of the other two initiatives, and cannot stand on its own. It consists of a strategy which is necessary to manage and coordinate the concurrent activities of Initiatives 1 and 2, to ensure that the initiative and drive from Initiative 2 is consolidated with buy-in from all stakeholders (Initiative 1).

**Theme 2014**
The delegates identified the current status of the industry as follows:
- Status 1: Innovative tools and methods are available to address industry problems; these include procurement processes and financial models.
- Status 2: There are huge problems in the industry with limited collaboration and trust amongst all role players.
- Status 3: Government and public authorities have frameworks and initiatives in place, but these do not seem to realise.

CMP 2014 identified areas where leadership would be needed, the most important of all probably being the need for an umbrella body which could coordinate the execution and management of NDP projects.

It was recognised that the NDP foresees such a function, but industry role-players did not see the activity or results from such an organisation on the ground.

**Theme 2015**
In 2015 delegates identified aspects of an ideal future construction industry. These are shown in Table 1. These aspects were considered to be relevant and to be addressed to enable successful execution of future mega projects. It can be seen that Initiative 1 correlates with the identified need for an effective umbrella body, also considered the most important aspect of 2014.

**CONCLUSIVE OVERVIEW**
The CMP has since 2013 addressed the National Development Plan in its annual themes. Shortcomings of the construction industry have been identified which prevent an effective execution of the vision. In reaction, a three-tiered approach has been proposed as a solution to bridge the shortcomings.

In addition, the CMP identified aspects of an ideal future construction industry, which would result in effective execution and roll-out of projects by the construction industry in realising the NDP. These items need to be carefully addressed and managed.

The most important of the items identified is the need for an effective umbrella body that would coordinate and manage projects. In addition, an entity including all role players would be required for each project. The Presidential Infrastructure Coordinating Committee (PICC) was identified as being responsible for the Strategic Integrated Projects (SIPS). Although responsible persons have been appointed for all SIPS, the feedback from CMP delegates is that limited knowledge of this is evident within the industry.

<table>
<thead>
<tr>
<th>No</th>
<th>Aspect</th>
<th>Current status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>One project body made up of government, construction leaders and consultants to execute projects</td>
<td>The Infrastructure Act of 2014 was identified as addressing this concern, but limited action was seen on the ground, although chairpersons have been appointed for the SIPS.</td>
</tr>
<tr>
<td>2</td>
<td>Procurement models to allow for involvement by all parties to a project, transformation, BBEEE</td>
<td>Lack of knowledge on available models, lack of collaboration.</td>
</tr>
<tr>
<td>3</td>
<td>Trust relationships, long term</td>
<td>No trust in the industry.</td>
</tr>
<tr>
<td>4</td>
<td>Safety legislation, impact, review</td>
<td>Too restrictive, over-indulgence.</td>
</tr>
<tr>
<td>5</td>
<td>Skills at all levels, including project management and planning skills</td>
<td>Amongst some: Very low, poor, limited experience, loss of skills, low fees (not all). Nevertheless some pockets of excellence.</td>
</tr>
<tr>
<td>6</td>
<td>Funding</td>
<td>Limited, not released, limited investment (uncertainty in the market).</td>
</tr>
<tr>
<td>7</td>
<td>Ethics, corruption free, trust, transparency, ownership</td>
<td>Perception is low to poor. Reality: ethical to very ethical (?) in larger organisations.</td>
</tr>
<tr>
<td>8</td>
<td>Informed politicians and government, informed communities</td>
<td>Low.</td>
</tr>
<tr>
<td>9</td>
<td>Labour, resources, legislation</td>
<td>Volatile, perception is low.</td>
</tr>
<tr>
<td>10</td>
<td>Environmental requirements</td>
<td>Red tape, restrictive, takes long.</td>
</tr>
</tbody>
</table>
BCCEI achieves major milestones

Nick Faasen
General Secretary BCCEI
gs@bccei.co.za

LANDMARK ACHIEVEMENT
The major milestones achieved in the last twelve months by the Bargaining Council for the Civil Engineering Industry (BCCEI) should not only be seen as ground-breaking in terms of a bargaining council, but should also be recognised for the benefits that the civil engineering sector will see, both in the short and long term.

One of the most significant milestones for the BCCEI was that this was the first large industry that settled its national wage negotiation without having any work stoppages or strikes. This is a landmark achievement in the civil engineering industry, especially for such a young bargaining council.

If one considers that this was only the second time that national wage negotiations were done under the auspices of the BCCEI, the achievement becomes all the more significant.

The conclusion and signing this year of a three-year national wage agreement for the civil engineering sector is critical, as it creates stability and peace at a time when the industry needs it most.

It also gives contractors a better platform from which to tender, as they know what the wage bill will be for the next three years. Removing the uncertainty around increases allows for accurate budgeting and tendering, and gives employees greater stability, as they are assured of annual increases for the next three years.

That the Council achieved this is testament to the level of maturity displayed by the team of negotiators, and the assistance of brilliant facilitators. Sound facilitation, coupled with level-headed negotiators, is a major advantage, especially when dealing with sensitive issues such as deadlocks and strikes which affect an entire industry. Although a dispute was declared in June 2015, such was the commitment of all parties that negotiations continued through the conciliation process.

That we now have a three-year national wage agreement will help us to focus on other critical outstanding issues, such as high unemployment levels.

PROACTIVE APPROACH
A proactive approach has characterised the BCCEI journey since it was registered in December 2012 and officially started operating in June 2013. After the first round of the 2013 national wage negotiations, the BCCEI, in collaboration with the CCMA (Commission for Conciliation, Mediation and Arbitration), introduced a training programme for all negotiators.

Negotiations are often influenced by the underlying attitude towards the process itself, and for this reason it was considered necessary to provide access to
information which would better inform all parties about the principles of negotiation and the process, as well as allow individuals to develop their depth of understanding and skills set around this.

In addition, it also created an appropriate intervention platform for all parties to express themselves in an environment which is removed from the negotiation arena. This is critical, as it allows the development of relationships from a health perspective, with honest transparent conversations forming a crucial part of the process. If parties do not have a platform such as this where they can openly discuss matters of mutual interest, it is not possible to build on and strengthen the relationships for the next round of negotiations.

Determined not to rest on its laurels, the BCCEI is taking training a step further and will be partnering with the International Labour Organisation (ILO) to facilitate further development of all parties. This collaborative training programme will ensure upskilling on a wider platform. The BCCEI will also continue to facilitate other forums in which all parties will participate.

AGREEMENTS AND ACCREDITATION

Another important milestone for the BCCEI is the extension of their collective agreements to non-parties. This is important, as there are a number of councils that have not managed to get their agreements extended to non-parties in line with the regulations being put forward in terms of Section 32 of the Labour Relations Act. The BCCEI achieved this because all parties in the civil engineering industry are sufficiently represented.

The accreditation of the BCCEI earlier in the year by the CCMA to handle all disputes for the civil engineering sector is another breakthrough that will be beneficial to all stakeholders in the industry. It is significant for the following two reasons:

Companies that are not members of the employer organisation SAFCEC (South African Forum of Civil Engineering Contractors) or employees who are not members of BCAWU (Building, Construction and Allied Workers Union) or NUM (National Union of Mineworkers), but fall within the civil engineering industry, will now derive the same advantages as those companies and employees who are members of these entities.

Apart from the obvious time-saving benefits, as disputes no longer need to be referred to the CCMA, all parties will now be able to access a panel of qualified professional commissioners with industry-specific experience through the BCCEI.

This is very important, as these commissioners have an intimate understanding of the complexity of the issues common to the civil engineering industry, and are able to take all factors into account. The civil engineering industry is a mature sector and very specialised, which means it is essential that qualified and skilled commissioners oversee or hear a dispute. An example would be limited duration contracts of employment, which can be a very complex matter, especially in the civil engineering environment, if not understood. Having commissioners experienced in the industry sectors means that awards are of a high standard.

BCCEI DISPUTE RESOLUTION CENTRE

The BCCEI’s Dispute Resolution Centre has been operational since April this year, with the majority of cases being heard at the Bedfordview facility, which has custom-built hearing rooms with state-of-the-art equipment for recording of all arbitrations. Copies of these recordings are available to parties in the dispute at a nominal cost. To ensure further ease of use, all the Labour Relations Act (LRA) statutory forms and the Council’s rules are available on the BCCEI website for access by parties when referring a dispute.

The Council is currently experimenting with alternative dispute resolution measures in that commissioners are assisting parties through telephonc dispute resolution. This is a new innovative initiative by the BCCEI and has been put in place to assist parties with potentially frivolous dispute referrals. It will reduce time wastage for both parties, with the dispute being heard via teleconference by a qualified commissioner, and with the same quality standards.

ROAD SHOWS

The BCCEI is determined to raise the level of interaction between itself and the civil engineering industry, and during the first quarter of 2015 a road show was taken to all provinces in the country. This was done predominantly to address issues such as medical aid, provident fund and death benefits available through the BCCEI collective agreements.

A second road show was done in the last quarter of the year and its purpose was to address people on the changes to the LRA and the effect this will have on employers and employees. The opportunity was also used to introduce the industry to the BCCEI Dispute Resolution Centre.

LOOKING TO THE FUTURE

Looking to the future, the BCCEI will be opening offices in Cape Town and Durban during the first quarter of 2016, with the aim of providing a high level of service in these two major centres and putting dedicated BCCEI people in place to liaise with all parties, thereby providing an enhanced service. These offices will include dispute resolution centres staffed by competent qualified commissioners. Offices will also be established in Port Elizabeth and Bloemfontein in due course.

The BCCEI constitution is also under discussion with all parties, and it will be refined to comply with the latest legislation, a process that is being facilitated by the BCCEI’s attorneys.

An official application was received by the BCCEI from AMCU to become a party of the Council and a signatory to all Council collective agreements. The union’s membership verification is currently in progress.

With regard to changes within the civil engineering sector, what is most apparent is that the role-players have changed. Traditionally there were two distinct parties involved in civil engineering projects – organised business and organised labour – but now local communities have become involved as a third party. Contractors have to employ from within the local communities where projects are being undertaken. This workforce, however, is largely unskilled and these individuals are not unionised, which further complicates matters. This third role-player is largely impacting the cost factor, as contracts now need to take the training and upskilling time factor into account, and when costing/quotting on contracts, companies also need to consider these factors.

The BCCEI has certainly contributed meaningfully to the civil engineering industry sector this year, and will continue along this route into the future.
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FOCUS ON SAICE NETWORKING

1 - The world according to SAICE

Introduction

THE NOVEMBER 2014 edition of our magazine was the sixth attempt at presenting the formidable network of engineering bodies that SAICE liaises with on behalf of its members. Again the response from our readers was so encouraging that we decided to continue publishing an updated version every year. For this year we have updated the information where necessary, and where possible, and retained the list of all the tertiary institutions in South Africa where civil engineering can be studied (this list seems to be popular with our readers).

As time goes by more and more bodies and affiliations will be added to the different sections, and we also invite readers to let us know of relevant bodies that we might have overlooked.

The feedback from our readers so far seems to indicate that the network section is a handy reference document, which is understandable, considering that SAICE continually liaises, networks and affiliates with many groupings across a broad engineering and related playing field.

There are many reasons why SAICE interacts with these related bodies. As the voice of the civil engineering profession in South Africa, the Institution has a responsibility not only to represent the interests of every one of its approximately 11 000 members, but also to promote the value that civil engineering adds to the economy and the smooth running of the country, and thereby to the daily lives of communities and individual citizens.

Explaining to our colleagues and fellow citizens what SAICE and the profession stand for is no simple task. Creating a network involves hours and days and weeks, even years, of liaising, and of building trust and credibility. Fortunately engineers are passionate about what they do, and this enthusiasm goes a long way towards getting the message across, but it nevertheless remains a complex task.

One could summarise the reasons why such interaction is so valuable:

■ An understanding of the role of the civil engineering profession promotes informed decision-making at all levels of interaction. To mention but one example – informed decision-making facilitates effective service delivery at local government level.

■ Knowledge and insight gained through interaction encourage appropriate membership groupings, and eventual professional registration for individuals, which have long-term positive effects for the engineering profession in particular, and for the country and its citizens in general.

■ Meaningful interaction results in the integration of effort and the alignment of objectives, which in turn broaden the skills and knowledge base, facilitating capacity building, again with obvious benefits to the country as a whole.

■ Interaction on an international level exposes the Institution to global thinking, while at the same time offering SAICE the opportunity to contribute to the global debate. It also ensures that our members are enabled to practise engineering across a wide front, thereby gaining valuable experience that can be ploughed back into our own country and our own continent. What should also not be underestimated is that our African experience furnishes us with extremely valuable knowledge that we can share with and contribute towards other African countries and other developing countries elsewhere in the world. The value of our contribution, however, goes beyond developing countries and is highly appreciated in developed countries with similar problems and challenges.

The bodies that SAICE networks with can be grouped into:

■ Statutory bodies and associated structures (see page 42)
■ Discipline-specific bodies (see page 50)
■ International bodies (see page 61)
■ Tertiary institutions (see page 68)

There are overlaps in this method of grouping, but for the sake of clarity the various bodies will be discussed under these headings.

This set of articles attempts to describe and illustrate the scope of SAICE’s network. We have gone to great lengths to ensure that the information presented here is as accurate as possible. However, should any inaccuracies have slipped through, we apologise for those.
### BODIES DISCUSSED IN NETWORKING ARTICLES

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<td>American Society of Civil Engineers</td>
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<td>ASOCSA</td>
<td>Association of Schools of Construction of Southern Africa</td>
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<td>Aggregate and Sand Producers Association of Southern Africa</td>
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<td>Built Environment Professions Export Council</td>
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<td>Construction Industry Development Board</td>
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<tr>
<td>CI O B</td>
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From planning, architecture and design, to construction management, operations and maintenance, we contribute to every phase of the complete project lifecycle.

We do all this through the combined capabilities of our people around the globe as we strive to positively impact lives, transform communities and make the world a better place.

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THE ENGINEERING profession approached government in the 1960s to request legislation to regulate the profession. The result was that the South African Council for Professional Engineers (SACPE) was established in 1969. Although this structure served the profession very well, it became clear that the changing world and the changing political dispensation in South Africa would necessitate substantial modifications. In 1992 SAICE approached SACPE to suggest a way forward in the new democratic dispensation that would be coming about in 1994. The main thrust was to ensure that South African engineering education and professional status would be recognised in subsequent years.

The Institution of Civil Engineers UK (ICE) was extremely helpful, and a delegation visited South Africa to facilitate understanding of the international professional engineering world of that time. ICE indicated that they would be willing to sign reciprocity agreements with SACPE if South Africa would accept the standards and models that they were using in the UK. SAICE took the lead in providing input, and by the year 2000 a brand-new, modern set of Acts was promulgated, which enabled South African built environment professionals to be compared to and compete with the best in the world.

In the process two new additions also came about. In the first place an overarching Council for the Built Environment was established, and in the second place a new profession saw the light, namely that of the Project Managers and the Construction Project Managers.

CBE – THE OVERARCHING STATUTORY COUNCIL

The Council for the Built Environment (CBE) is the umbrella body for the six statutory councils for professionals discussed below. The Act according to which the CBE came into being (Act No 43 of 2000) mandates the Council to, among other tasks:

- Ensure uniform implementation of mandated policy amongst the six councils that regulate the various built environment professions.
- Advise government on issues relating to the built environment.
Based on relevant research, knowledge and information:

- Support government’s National Development Plan, specifically in the infrastructure delivery program.
- Drive transformation by prioritising skills development and equity implementation in the built environment.
- Act as an appeal body on matters of law regulating the built environment professions.
- Promote and protect the interest of the public by supporting work by the appropriately registered persons.

**THE SIX STATUTORY COUNCILS FOR PROFESSIONALS**

The six statutory councils listed below were established through Acts of Parliament to regulate the various built environment professions. Generally speaking, the main statutory function of each of these Councils is to protect the public by effectively controlling the education and practising standards of the particular profession that it represents. Hence these Councils all have Codes of Conduct that registered persons have to abide by.

In this article all six statutory councils are discussed, with emphasis on those that have particular significance to the civil engineering profession.

**ECSA (Engineering Council of South Africa)**

ECSA regulates the entire engineering profession, including civil engineering, mechanical engineering, electrical engineering, industrial engineering and related engineering disciplines. ECSA’s vision is to ensure that South Africa enjoys all the benefits of a strong, competent, growing, sustainable and representative engineering profession able to provide all the expertise necessary for the socio-economic needs of the country, and to exert a positive influence in South Africa. Consequently, ECSA is the only body in South Africa that is authorised to register engineering professionals and bestow the use of engineering titles on persons who have met the requisite professional registration criteria. Three Fellows of SAICE have so far served as presidents of ECSA.

**SACPCMP (South African Council for the Project and Construction Management Professions)**

In order to protect public interest and advance construction and project management education, the SACPCMP provides professional certification, registration and regulation of project and construction management professionals. The SACPCMP was established by Section 2 of the Project and Construction Management Act of 2000 (Act No 48 of 2000).

The SACPCMP is mandated by this Act to, among other tasks:

- keep a national register of registered professionals and candidates in Construction Management and Construction Project Management
- identify the type of project and construction work which may be performed by registered persons
- conduct accreditation visits to tertiary institutions that offer Construction Management and Construction Project Management
- consult with the South African Qualifications Authority (SAQA) and Voluntary Associations to determine competency standards for the purpose of registration
- investigate charges of improper conduct by registered persons.

**SACLAP (South African Council for the Landscape Architectural Profession)**

SACLAP evolved from the Board of Control for Landscape Architects which had functioned under the previous Council of Architects (now SACAP – see aforementioned). It performs functions similar to those of SACAP, but with a specific focus on landscape architectural professionals. Registering categories are: Professional Landscape Architects, Professional Landscape Technologists, Professional Landscape Technicians, and Professional Landscape Assistants.

**SACAP (South African Council for the Architectural Profession)**

SACAP’s mission is to ensure excellence in performance and service delivery and to foster collaborative relationships with role players in order to:

- be responsive to the needs of the public
- maintain a quality and sustainable skills base in the profession
- ensure good governance which results in a positive impact on built environment practice
- grow the information and knowledge hub
- promote transformation and diversity within the built environment.

Through the Act, SACAP is mandated to:

- keep and maintain a national register of professional and candidate categories of registration
- accredit higher learning institutions offering architectural qualifications
- investigate complaints and violations of the Code of Professional Conduct by registered persons
- facilitate renewal of registrations through Continuing Professional Development (CPD)
- provide professional fees guidelines
- identify the scope of work and competencies of each of the categories of registration.

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- identify the scope of work and competencies of each of the categories of registration.
ASSOCIATED STATUTORY BODIES

The statutory bodies discussed below were also established through Acts of Parliament. These bodies regulate and guide various construction and related engineering activities. This list includes only some of the associated statutory bodies related closely to the civil engineering profession.

**CETA (Construction Education and Training Authority)**

CETA, which was established through the Skills Development Act of 1998 to develop and improve the skills of the South African workforce, is accredited by the South African Qualifications Authority (SAQA). CETA’s prime objective is to influence training and skills development in the construction sector by initiating skills development projects and learnerships which will empower construction workers with skills recognised by the National Qualifications Framework (NQF). CETA does not do any training itself, but accredits and monitors the delivery of training by accredited training providers. CETA also ensures that people who have acquired construction skills, but who do not have the necessary qualification, are included in the Recognition of Prior Learning assessment process.

**CIDB (Construction Industry Development Board)**

The CIDB was established by Act No 38 of 2000 to provide leadership to stakeholders and to stimulate sustainable growth, reform and improvement of the construction sector for effective delivery and the industry’s enhanced role in the country’s economy.

The Board of the CIDB comprises private and public sector individuals appointed by the Minister of Public Works on the strength of their industry knowledge and expertise. Board members represent the following sectors:

- public and private sector clients
- public entities
- contractor and employer associations
- professions
- financial institutions
- materials suppliers
- organised labour
- academic institutions.

Board members are non-executive and rely on the executive capacity of the CIDB to implement the Board’s mandate, which include the following:

- the establishment of a national register of contractors and construction projects to systematically regulate, monitor and promote the performance of the construction industry for sustainable growth, delivery and empowerment
- the improvement of the uniform application of procurement policy throughout all spheres of government
- the improvement of performance and best practice by public and private sector clients, contractors and other participants in the construction delivery process
- the promotion of sustainable participation by the emerging sector.

**SACQSP (South African Council for the Quantity Surveying Profession)**

The SACQSP came into being through Act 49 of 2000. Broadly speaking, quantity surveyors are the financial consultants of the construction industry whose training and experience qualify them to advise on budgeting, costs and contractual arrangements and to prepare contract documents, from concept to completion. They act in liaison with architects, consulting engineers and contractors to safeguard the client’s interests. The Council performs similar functions to those of the aforementioned councils, obviously with its focus on the quantity surveying profession.

**SACPVP (South African Council for the Property Valuers Profession)**

The SACPVP registers persons operating in the property valuers profession according to the Property Valuers Profession Act 47 of 2000. Generally speaking this Council’s function and modus operandi are the same as those of the aforementioned five statutory councils. Registering categories are: Professional Valuers, Professional Associated Valuers, Single Residential Property Assessors, and Candidate Valuers.

**Vacant Voluntary Associations associated with Statutory Councils**

Each of the aforementioned six statutory councils has jurisdiction over groupings of voluntary associations that fall within its frame of reference. Those voluntary associations with which SAICE has closest ties, and which are recognised by and fall under ECSA’s jurisdiction, are listed below. These associations are covered in more detail in the section dealing with discipline-specific bodies (page 50).

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<thead>
<tr>
<th>Institution</th>
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<td>Institution of Municipal Engineering of Southern Africa</td>
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<td>CESA</td>
<td>Consulting Engineers South Africa</td>
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<td>SAFCEC</td>
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<td>South African Institution of Mechanical Engineering</td>
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<td>South African Institute of Electrical Engineers</td>
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<td>WISA</td>
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<td>SARF</td>
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<td>SASTT</td>
<td>South African Society for Trenchless Technology</td>
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<td>SAIE</td>
<td>Southern African Institute for Industrial Engineering</td>
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<td>SAIMM</td>
<td>Southern African Institute of Mining and Metallurgy</td>
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<td>ITC</td>
<td>Institute of Timber Construction</td>
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<td>NSBE</td>
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<td>SAIAE</td>
<td>South African Institute of Agricultural Engineers</td>
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<td>SAID</td>
<td>South African Institute of Draughting</td>
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<td>SAIW</td>
<td>South African Institute of Welding</td>
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concluding cooperative agreements with state organs whose activities may impact on railway safety, in order to prevent duplication, and improve efficiency
promoting the harmonising of the South African railway safety regime with the objectives and requirements for safe railway operations of the Southern African Development Community (SADC).

SABS (South African Bureau of Standards)
SABS was established through the Standards Act No 24 of 1945. The Act has passed through many amendments, and SABS is currently governed by the Standards Act 8 of 2008 that took effect simultaneously with the NRCS Act (see next entry) on 1 September 2008. SABS is the national institution for the promotion and maintenance of standardisation and quality regarding commodities and the rendering of services.

The main functions of SABS, from an engineering perspective, include the following:
facilitating the preparation of national standards (SANS, i.e. SA National Standards) through a consensus process within various specific technical committees made up of industry representatives and technical experts
providing information on the national standards of other countries
providing information on international standards.

SABS aligns its activities with seven different industry sectors (chemicals, electrotechnical, food and health, mechanical and materials, mining and minerals, services, and transportation), which each house the full range of SABS services, such as standards, testing and certification. Representatives from the different engineering disciplines serve on the various technical committees within these SABS industry sectors.
SACNASP (South African Council for Natural Scientific Professions)

SACNASP is the legislated regulatory body for natural science practitioners in South Africa. The natural sciences encompass a wide range of scientific fields covering all of the basic sciences and many of their applied derivatives.

Its mission is to establish, direct, sustain and ensure a high level of professionalism and ethical conscience amongst its scientists. Their conduct should be internationally acceptable and in the broad interest of the community, as outlined in the SACNASP Code of Conduct. SACNASP’s main objectives are to:

- Promote the practice of the natural science professions in South Africa.
- Ensure and administer the mandatory registration of natural scientists as required in terms of the Natural Scientific Professions Act of 2003.
- Exercise control over the standard of conduct of professional natural scientists.
- Monitor the standard of education and training of natural scientists.
- Set standards for the recognition of education and training of natural scientists.
- Ensure that prospective registrants meet the educational standards required for registration.

GOVERNMENT AND OTHER STRUCTURES ASSOCIATED WITH THE BUILT ENVIRONMENT

SAICE has a unique position in the sense that it represents individual members of the civil engineering profession whilst many other bodies represent a focused vocational or industry-specific sector and often have only company membership. This means that SAICE is seen mostly as an organisation that has a broad and independent constituency and can operate from a particular viewpoint and/or independent basis. This aspect is highly valued.

In order to promote the profession, create understanding and facilitate credible and trustworthy relationships and support systems, SAICE has since 1994 engaged extensively with government structures on a scale that has never been seen before in the long history of the Institution. Regular meetings with Ministers and Departments have been a feature of the SAICE annual calendar since the middle 1990s. SAICE liaises mainly with the following government departments:

- Department of Public Works
- Department of Cooperative Governance and Traditional Affairs (previously the Department of Provincial and Local Government)
- Department of Transport
- Department of Water Affairs
- Department of Water and Sanitation
- Department of Environmental Affairs
- Department of Trade and Industry
- Department of Human Settlements (previously the Department of Housing)
- Department of Basic Education
- Department of Higher Education and Training
- Department of Science and Technology

SAICE representatives have also made meaningful presentations to the Portfolio Committees of a number of these government departments, not only to explain the contribution that the civil engineering profession can make, but also to alert the various Committees to the current state of conditions within those particular government sectors, as seen from an engineering perspective. SAICE’s liaison with government departments is of extreme importance to the future of the profession and the country alike.

NPC (National Planning Commission of South Africa)

The NPC is tasked with developing a vision for South Africa in 2030 and a road map to take the country there. The commission is chaired by Cyril Ramaphosa, with Jeffrey Radebe as deputy. Two SAICE Fellows – past president Trueman Goba, and Prof Mike Muller – were appointed as commissioners to offer insight on the engineering challenges facing the country and to guide the development of solutions.

HRDCSA (Human Resource Development Council of South Africa)

The HRDCSA is a national, multi-tiered and multi-stakeholder advisory body under the leadership and stewardship of the office of the Deputy President of South Africa. It is managed by the Ministry of Higher Education and Training. The multi-sectoral advisory HRDCSA was established in March 2010. Membership is based on a five-year tenure and it is represented by a number of Government Ministers as well as senior business leaders, organised labour and representatives from academia and civil society who serve on the HRD Council.

One of the Council’s key responsibilities is to build the human resource development base required to ensure a prosperous and inclusive South African society and economy. Focusing on the development of strategy and the creation of a platform where social partners can engage to find ways to address bottlenecks in the development of human resources and skills in South Africa. In essence, it must ensure that all relevant policies, programmes, projects, interventions and strategies are streamlined and optimised to support overall government objectives rather than merely sectoral imperatives.

The HRDCSA is supported by a Technical Working Group (TWG), which is co-chaired by business and labour. It emulates the Council’s structure, but is supported by a team of experts consisting of Technical Task Teams that are appointed on an issues basis to provide expert input in respect of all matters pertaining to human resources.

Nine Technical Task Teams have been established and form the pillars of the HRDCSA plans, to drive forward the work of the five-point plan.

The HRDCSA Secretariat provides strategic, technical, administrative and logistic support, and assumes responsibility for, among other aspects, management of the multi-sectoral response to human resource development matters and of the allocated funds designated to
fulfil HRDCSA’s functions in terms of the multi-sectoral HRD implementation plan.

The HRD Provincial Coordination Forum was established with the mandate of creating a link between the HRDCSA and activities at provincial level. It encourages provinces to form their own HRD Councils in the Premiers’ offices in view of the fact that all provinces have their own unique human resource issues.

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**CSIR (Council for Scientific and Industrial Research)**

The CSIR regards infrastructure and the entire built environment as crucial to the development of South Africa, which will help with poverty alleviation. SAICE reported in its 2011 Infrastructure Report Card that serious problems are experienced with South African infrastructure, particularly in the areas of health infrastructure, water infrastructure and sanitation, as well as secondary and tertiary roads.

These problems are due to a number of factors, including constrained funding to manage, plan, design, construct and maintain the infrastructure assets; a shortage of skilled resources; and a lack of appropriate technological solutions for the problems experienced. The importance of infrastructure is recognised by government, as is evident in the investment of more than R800 billion (government only) into infrastructure such as roads, energy generation, water infrastructure and public buildings over the next number of years.

The CSIR reports under the Department of Science and Technology (DST), through which a parliamentary grant is provided to the CSIR. This comprises about 30% of its income, with the rest earned in collaborative R&D efforts with other appropriate government departments and the private sector, as well as work with international partners.

The CSIR has a strong focus on and experts in the built environment field, collaborating with multidisciplinary colleagues within and outside the organisation. The broad areas that are addressed by built environment experts at the CSIR are:

- Building science and technology (building materials, construction industry innovation, and architectural engineering including public facilities such as schools and health facilities)
- Hydraulic infrastructure engineering (coastal engineering and port infrastructure, water supply and wastewater treatment infrastructure)
- Spatial planning and systems (urban dynamics modelling and integrated planning, housing options and urban development, land and housing market analysis, environmental criminology, and statistical and systems modelling)
- Transport infrastructure engineering (pavement design and construction, accelerated pavement testing, and advanced materials development and testing)
- Transport systems and operations (transport economics, transport infrastructure management systems, public transport system design, logistics system analysis and supply chain engineering).

Given South Africa’s unique built environment, the country cannot simply import technologies from abroad and expect them to solve our problems. The CSIR views the character of the built environment (such as urban, peri-urban and rural areas) as distinct on account of, for instance, the apartheid legacy, our specific conditions in terms of climate, geographical location and geology, availability and nature of materials, and our African heritage.

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**Agrément South Africa**

Agrément South Africa is an independent and internationally recognised technical assessment organisation. It was established in 1969 and operates under a ministerial delegation of authority from the Minister of Public Works. The organisation is managed by and located at the Council for Scientific and Industrial Research (CSIR) in Pretoria. The organisation establishes performance criteria and assesses the fitness-for-purpose of innovative and non-standard construction products and systems. Agrément certification, which lists uses and conditions where necessary, offers assurance to specifiers including engineers, regulators, financial institutions and end users of fitness-for-purpose and quality assurance, thereby facilitating the introduction of new products into the market. Certification is also deemed-to-satisfy the requirements of the National Building Regulations. The organisation is a founder member of the World Federation of Technical Assessment Organisations.

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**IDT (Independent Development Trust)**

As one of the country’s leading development agencies, the primary function of the IDT is to add value to the national development agenda of government. It does this through its business model that is grounded in the delivery of innovative and sustainable development programmes that will make a measurable difference to the levels of poverty and underdevelopment. The IDT works and interfaces with government and communities to alleviate and eradicate inter-generational poverty, provide social infrastructure, meet empowerment targets, create employment opportunities and build capacity in core areas. Generally the IDT works in rural areas, especially those characterised by high levels of poverty and unemployment. A key challenge, due to decades of under-development, remains the high levels of poverty, especially amongst women and the youth. The IDT has made a strategic shift to ensure that all development initiatives cater for women and their beneficiaries, and has women organisations as primary target groups.

**IDT**

IDT, PO Box 73000, Lynnwood Ridge, 0040

T: 012 845 2000

E: info@idt.org.za

W: www.idt.org.za

Glenwood Office Park, cnr Oberon & Sprite St, Faerie Glen, Pretoria

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**DBSA (Development Bank of Southern Africa)**

The DBSA is one of the leading Development Financial Institutions
(DFIs) in South Africa, and indeed in southern Africa. The DBSA provides financing, project preparation and implementation support in South Africa and the rest of the African continent to improve the quality of life of people in support of economic growth and regional integration. The DBSA is integrated across product markets, sectors and clients, and delivers synchronised infrastructure solutions.

The DBSA, wholly owned by the government of South Africa, is one of several development finance institutions in South Africa and southern Africa. Its vision is for a prosperous and integrated region, progressively free of poverty and dependency.

Its mission is to advance the development impact in the region by expanding access to development finance and effectively integrating and implementing sustainable development solutions. Its values are:
- High performance
- Shared vision
- Integrity
- Innovation
- Service orientation.

DBSA

DBSA, PO Box 1234, Halfway House, 1685
T: 011 313 3911
E: webmaster@dbsa.org, W: www.dbsa.org
Headway Hill, 1258 Lever Road, Midrand

BEPEC (Built Environment Professions Export Council)

BEPEC is a not-for-profit membership-based organisation in a Public Private Partnership (PPP) with the Department of Trade and Industry (DTI), and which supports built environment companies to export their professional services into Africa and beyond.

BEPEC offers a one-stop-shop for international clients who are in the market to employ South African built environment professionals.

BEPEC membership is currently conditional on membership of one of five supporting bodies or Voluntary Associations: Consulting Engineers South Africa (CESA), Association of South African Quantity Surveyors (ASAQS), South African Institute of Architects (SAIA), Association of Construction Project Managers (ACPM), and Institute for Landscape Architecture in South Africa (ILASA).

BEPEC is also looking to broaden its membership base to include other professional services companies/bodies related to the built environment.

BEPEC’s main value proposition to its members is to facilitate exposure and access on an on-going basis to relevant and strategic projects and project opportunities in Africa, as well as to the project funding programmes of the major Development Finance Institutions (DFIs). Supporting initiatives to this value proposition include: facilitation of market access, early intelligence on projects and project opportunities, networking capability, formation of engineering and technology grouping of export councils, PPP between the DTI and export councils, missions/pavilions/trade fairs, “show me the money” project workshops, creation of business facilitation agencies, removal of trade barriers, and a north–south corridor platform for public and private sector collaboration in respect of projects along this development corridor.

BEPEC

BEPEC, No 7, First Street, Menlo Park
T: 012 362 0522
E: info@bepec.co.za
W: www.bepec.co.za

AfDB (African Development Bank)

The African Development Bank is a regional multilateral development bank, engaged in promoting the economic development and social progress of its regional member countries (RMCs), thus contributing to poverty reduction. As the continent’s premier development finance institution offering a knowledge and research centre, it is the preeminent voice for African development issues. The bank mobilises and allocates resources for investment in RMCs, and provides policy advice and technical assistance to support development efforts.

AfDB

African Development Bank,
339 Witch-Hazel Avenue, Highveld
Ext 78, Centurion, 0144
T: 012 003 6900, W: www.afdb.org

WORLD BANK

The World Bank provides financial and technical assistance to developing countries for capital programmes and development through policy advice, research and analysis, and technical assistance. Its main goal is to reduce poverty.

The World Bank Group comprises the following five institutions managed by their member countries:
- International Development Association (IDA)
- International Bank for Reconstruction and Development (IBRD)
- International Finance Corporation (IFC)
- Multilateral Investment Guarantee Agency (MIGA)
- International Centre for Settlement of Investment Disputes (ICSID).

These support a wide array of investments in areas such as education, health, public administration, infrastructure, financial and private sector development, agriculture, and environmental and natural resource management.

WORLD BANK

The World Bank, PO Box 12629, Hatfield, 0028
T: 012 742 3100, W: www.worldbank.org
442 Rodericks Street, Lynnwood Road, Tshwane, 0081

SANRAL (South African National Roads Agency Limited)

SANRAL is registered in terms of the Companies Act as an independent statutory company, belonging to the South African government and represented by the Minister of Transport. SANRAL’s mandate is to maintain, develop and manage the national road network of South Africa. Prime examples of SANRAL’s execution of this mandate is the Maputo Development Corridor, and the extensive Gauteng Freeway Improvement Project.

SANRAL

SANRAL, PO Box 415, Pretoria, 0001
T: 012 844 8000, F: 012 844 8200
E: info@nra.co.za, W: www.nra.co.za
48 Tambotie Avenue, Val de Grace, Pretoria

CREDITS

We acknowledge with appreciation that some of the information in this article was taken from the websites of the various bodies discussed. Please see the contact details underneath each body for the relevant website address. We also acknowledge with thanks the assistance received from senior staff members of these bodies.
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Discipline-specific bodies

This article concentrates on a number of discipline-specific bodies that SAICE liaises with, including the discipline-specific voluntary associations that were listed on page 44.

SAICE (South African Institution of Civil Engineering)
WE PLACE OURSELVES in this group of bodies for the sake of completeness, and also for the benefit of those readers who are not familiar with our Institution and would like to read about us in context. SAICE, whose forerunner was established in 1903, represents the civil engineering profession in South Africa, and is a voluntary association with approximately 11 000 members. The Institution provides technical leadership in support and enhancement of poverty alleviation, sustainable development, and the development and maintenance of infrastructure. Its specialist divisions include water engineering, transportation engineering, railway and harbour engineering, marine engineering, geotechnical engineering, structural engineering, environmental engineering, municipal engineering, information technology, and project and construction management. SAICE has a worldwide liaison network and links with many international bodies. There are also numerous local and international bodies that are specifically associated with our various technical divisions, such as the Geosynthetics Interest Group of South Africa (GIGSA), the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), the Institute of Waste Management of Southern Africa (IWMSA), the International Commission on Large Dams (ICOLD), and so forth. More information on these bodies is available via our technical divisions, but we also expand on these and similar bodies in this edition.

SAICE also distributes the GCC 2015 (General Conditions of Contract), and acts as agent for books from Thomas Telford and ASCE (American Society of Civil Engineers).

SAI MechE (South African Institution of Mechanical Engineering)
SAI MechE, which was established in 1892, is the senior body representing the discipline of mechanical engineering in South Africa. It covers all fields of application as diverse as automobile, energy generation, process engineering, heavy manufacture, design, management, research, mining and education. SAI MechE is a voluntary association of mechanical engineers, technologists and technicians who have access to various grades of membership and the associated benefits. The SAI MechE objectives are:
- to serve the needs and interests of its members
- to advance the science, art and practice of mechanical engineering
- to promote and maintain high standards in the profession of mechanical engineering.
SAIMECH

SAIMECH, PO Box 511, Bruma, 2026
T: 011 615 5660, F: 011 388 5356
E: info@saiemeche.org.za, W: www.saiemeche.org.za

SAAMechE, the Institute and thereby enhancing higher grades of membership within and international organisations.

SAAMechE, formed in 1909, has grown to approximately 7 000 members. Members are professionally engaged in the full range of engineering activities, including academic research, manufacturing, electronics, telecommunications, measurement and control, mining and power infrastructural services.

An SAIEE member makes meaningful contributions to the quality of life in communities and to the steady advancement of technology. Their efforts are acknowledged and world-renowned.

The SAIEE contributes to the common interests and welfare of the whole engineering fraternity through close cooperation with the Engineering Council of South Africa (ECSA).

SAIEE strives to be a leading and respected learned society of electrical engineers through:

promoting electrical science and its applications for the benefit of its members and the southern African community

close contact with appropriate national and international organisations

recognising achievement by advancement of individual members to higher grades of membership within the Institute and thereby enhancing the status of their profession, and

being apolitical and non-discriminatory.

All members are required to uphold the dignity of the profession of electrical engineering. Its members must conduct themselves in a strictly fiduciary manner towards their client, employer, fellow member or other with whom they may be connected, and consistent with the established traditions of the Institute.

SAIEE

SAIEE, PO Box 751253, Gardenvue, 2047
T: 011 487 3003, F: 011 487 3002
E: info@saiee.org.za, W: www.saiee.org.za
SAIEE House, 18A Gill Street, Observatory, Johannesburg

SAIEE (South African Institute of Electrical Engineers)

SAIEE is a vibrant, learned society, representing and promoting industrial engineering in southern Africa. Modern industrial engineering is concerned with the integration of resources and processes into cohesive strategies, structures and systems for the effective and efficient production of quality goods and services. It draws upon specialised knowledge and skills in the mathematical, physical, behavioural, economical and management sciences, and fuses them with principles and methods of engineering analyses and design to find optimal and practical solutions which contribute to the success and prosperity of an industrial undertaking, thereby making a fundamental contribution to the creation of wealth.

SAIEE

SAIEE, PO Box 96002, Waterkloof, 0145
T: 012 420 6478, F: 086 697 5976
E: admin@saiee.co.za, W: www.saiee.co.za

SAIE (South African Institute of Architects)

SAIA and its regional institutes are committed to maintaining the highest standards of professionalism, integrity and competence in architecture.

Members of the Institute, as defined in the Constitution, are required to:

continuously enhance their professional skills

ensure that their work promotes sustainable development goals to the benefit of the South African community and the natural environment

improve the standards of health and safety for the protection and welfare of all members of society. Members of the Institute, registered as professional architects, subscribe to a Code of Ethics with established principles which remain core as members conduct their business.

To continually elevate the architectural profession and support members as they strive to attain the highest standards of workmanship, SAIA ensures they are educated and trained appropriately, equipping them to provide leadership and critical judgement, while also exercising their specialist knowledge, skills and aptitude for the betterment of design and development in the built environment.

SAIA

SAIA, Private Bag X10063, Randburg, 2125
T: 011 782 1315, F: 011 782 8771
E: admin@saia.org.za, W: www.saia.org.za

SAIA (South African Institute of Architects)

SAIEG is a national voluntary group which represents natural scientists practising in the field of engineering and environmental geology. It has gained recognition as a Natural Scientific Association from the South African Council for Natural Scientific Professions (SACNASP). Its aims include:

The promotion and advancement of the profession of engineering geology

The promotion of education in geology and engineering geology

The adherence to the principles of integrated environmental management

The adherence to the principles of sustainable development.

SAIEG

SAIEG, PO Box 1603, Houghton, 2041
T: 011 483 1861, F: 086 653 7108
E: secretariat@saieg.co.za, W: www.saieg.co.za

GIGSA (Geosynthetics Interest Group of South Africa)

GIGSA is a non-profit organisation dedicated to the scientific and engineering development of geosynthetics and associated technologies in South Africa.

GIGSA was founded in 1994 by a group of suppliers, installers, consultants, a regulator and an academic at the Faculty of Engineering of the University of the Witwatersrand. The founding of GIGSA coincided with the publication of the first edition of the Minimum Requirements Series by the then Department of Water Affairs and Forestry. The intention of the Minimum Requirements was to regulate waste management as a whole, but also waste disposal by landfill in South Africa, which made the use of geomembranes mandatory. This reinforced the need for an organisation like GIGSA, as geosynthetics were, at that time, largely unknown construction materials.

GIGSA was furthermore founded as the South African Chapter of the International Geosynthetics Society (IGS). The IGS was established in 1984.
with, in broad terms, the same objectives as GIGSA. The IGS became the first non-founding member of the Federation of Geo-Engineering Societies (FedIGS) in 2011. The founding members of the FedIGS are the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), the International Society of Rock Mechanics (ISRM) and the International Association for Engineering Geology and the Environment (IAEG). The aim of the FedIGS is to facilitate collaboration and provide means of structured and formal communication between the organisations.

GIGSA is actively involved in the development of geosynthetics specifications within the working groups of the SABS sub-committee on geosynthetics, with the ultimate goal to provide a complete set of national standards. This will aid in standardising the specification and use of geosynthetics in South Africa. Given that the use of geosynthetics is likely to increase significantly with the promulgation of the National Standard for Disposal of Waste to Landfill, such standardisation will be beneficial to clients, engineers, suppliers and installers involved in geosynthetics projects.

CESA (Consulting Engineers South Africa)

CESA is a voluntary association representing consulting engineering firms of all disciplines. It is also a member of the International Federation of Consulting Engineers (FIDIC). CESA promotes the business interests of some 537 firms which employ in excess of 24 366 staff members and which approximate a fee income of R24 billion. The association therefore represents considerable capacity and probably accounts for 80% of the consulting engineering sector in South Africa. It promotes the interests of its members and their clients by (amongst other things):

- Publishing documents relevant to the profession
- Acting as agent for FIDIC publications
- Providing advisory notes and guidelines on professional practice matters
- Organising relevant seminars, workshops and conventions.

IPET (Institute of Professional Engineering Technologists)

IPET strives to improve the image and status of professional engineering technologists of all disciplines by representing them, and promoting matters affecting them, on a national and international basis. IPET determines the standards for the registration and education of professional engineering technologists through its representation at the Engineering Council of South Africa, consulting with and providing ECSA with information and advice on all matters affecting engineering technologists. IPET members get a discount on their ECSA registration fee higher than their annual IPET membership fee.

IPET promotes the education and training of engineering technologists through liaison with educational institutions and employers, and encourages continuing professional development amongst its members. It promotes and rewards academic achievement among BTech students of all engineering disciplines by annually awarding IPET medals to the highest academic achievers at all the universities of technology in South Africa, also encouraging gender equity with special medals for the highest achieving female students.

Because IPET strives towards a unified engineering profession, the Institute actively pursues communication and liaison with other societies who have engineering technologists amongst their members. IPET is the home for professional engineering technologists of all engineering disciplines in South Africa.

SAAE (South African Academy of Engineering)

The South African Academy of Engineering is a non-profit, independent institution which promotes excellence in the science and application of engineering for the benefit of the South African nation. The Academy comprises South Africa’s most eminent engineers of all disciplines, and related professionals with proven ability and achievement, and draws on their wealth of knowledge and experience to achieve the Academy’s main objective – providing expert advice on matters pertaining to global competitiveness and quality of life for the nation. Election to the Academy is by invitation. The activities of the Academy include:

- Providing a forum for discussions on issues relevant to the formulation of public policies for engineering-based activities
- Organising projects, symposia, meetings and discussions to make best possible use of the multi-professional expertise of its Fellows in support of national goals
- Promoting the innovative application of engineering in South Africa to improve the quality of life of its people
- Promoting the recruitment, education and training development of engineering and technical persons from previously disadvantaged groups to increase the technological base of the nation
- Enhancing excellence and innovation in the South African industry by participating in the Annual Technology Top 100 President’s Awards
- Establishing and maintaining relations with overseas engineering academies and the International Council of Academies of Engineering and Technological Sciences (CAETS).
SABTACO (South African Black Technical and Allied Careers Organisation)

SABTACO was founded in 1990 and has grown into a body currently representing thousands of members (students, graduates, practitioners, technicians) country-wide in the built environment, engineering and science disciplines. SABTACO’s vision is to be a leader in advocating and ensuring the advancement of black professionals in the built environment and allied fields, and the optimal realisation of the skills potential in South Africa. It is therefore the mission of SABTACO to:

- Lead the transformation of the built environment and related technical fields in such a manner as to reflect the commitments of the relevant charters and the BBBEE codes
- Facilitate the creation of an environment that is conducive to the development of science and engineering skills in the historically disadvantaged communities
- Increase the level of participation of black professionals and service providers in the mainstream economy.

NSBE (National Society of Black Engineers of South Africa)

The NSBE is a voluntary organisation which was established to ensure full participation of black engineers in the mainstream economy, and its wealth creation and distribution within South Africa. Its purpose is to transform the professional engineering sector by promoting the profession amongst the black people of South Africa by recruiting aspiring and prospective people into the profession and retaining them in the industry.

The NSBE boasts a membership base of over 1 000 qualified black engineers (Africans, Indians and Coloureds), and has student chapters at various institutions of higher learning and at some affiliated companies nationally. Through its collective orientation and national footprint, the NSBE seeks to continuously identify programmes aimed at achieving its mandate and objectives, through which it partners with various spheres of government, parastatals and the private sector. Its mission involves:

- Promoting public awareness of engineering and the opportunities for black people in the profession
- Striving to increase the number of black students studying engineering at both undergraduate and postgraduate levels
- Functioning as a representative and supportive body on issues and developments that affect the careers of black engineers.

NSBE, PO Box 591, Parkland, 2121
T: 011 463 1222, F: 011 706 5354
E: admin@nsbe.org.za, W: www.nsbe.org.za
C/o M&D Construction, No 1 Somerset Office Park, 5 Libertas Road, Bryanston

TCI (The Concrete Institute)

The Concrete Institute is a technical support organisation that provides professional technical solutions through advice, education, information, publications, and regulatory and consulting services to all interested in concrete in South Africa.

The Concrete Institute intends playing a role in bringing together under one roof all the concrete-related industry bodies, in providing a concrete reference laboratory for the benefit of the construction industry and enabling faster delivery of infrastructure projects at all levels – municipal, provincial and national.

As the central authoritative organisation for the South African concrete industry, TCI aims to assist anyone involved in design and construction to realise the full potential of concrete.

Information Centre

TCI’s Information Centre, based in Midrand, Gauteng, serves all South Africans wherever and whenever, through its user-friendly online catalogue. This valuable, unique and extensive collection of more than 100 000 items unlocks a world of information about cement and concrete. The Information Centre provides free enquiry, lending and online request services and sells technical publica-

School of Concrete Technology

The School of Concrete Technology offers training countrywide and has a portfolio of courses covering all aspects of concrete technology and practice. With more than 19 scheduled courses and three internationally recognised courses on offer, anyone from site staff to experienced Concrete Technologists can find the right course to enhance their knowledge and skills. In addition, special on-site or tailor-made courses can be arranged.

The Institute is also involved at tertiary level with departments of civil engineering throughout South Africa through research funding and lectures.

Specialist technical services

The Concrete Institute offers a free advisory service for general concrete technology queries. A consultancy service focused on concrete and related issues is offered, including on-site investigation, trouble shooting and reporting. The technical team is available for consultation on construction sites anywhere in southern Africa.

The Institute oversees the review of existing concrete-related standards and the introduction of new standards where necessary.

The Concrete Institute is proudly supported by AfriSam, Lafarge and Sephaku.

SAFCEC

SAFCEC, PO Box 644, Bedfordview, 2008
T: 011 409 0900
E: admin@safcec.org.za, W: www.safcec.org.za
3rd Floor, SAFCEC House, 12 Skeen Boulevard, Bedfordview

MBSA (Master Builders South Africa)

The MBSA is a national organisation speaking on behalf of its members, which are the various Master Builder Associations and Affiliate members. The MBSA operates as a federation of registered employer organisations, representing contractors and employers in the building industry.

MBSA

MBSA, PO Box 1619, Halfway House, 1685
T: 011 205 9000, F: 011 315 1644
E: info@mbsa.org.za, W: www.mbsa.org.za
No 1, Second Road, Randjespark, Midrand

SABTACO

SABTACO, PO Box 30960, Braamfontein, 2017
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E: sabtaco1@iafrica.com, W: www.sabtaco.org
87 De Korte Street, 9th Floor, Room 901,
Braamfontein, Johannesburg
**CMA (Concrete Manufacturers Association)**
The CMA is the primary representative of the precast concrete industry. Now in its 44th year, it initiates standards in close cooperation with the SABS Standards Division and collaborates with its members in developing new products and services. The CMA’s promotional activities target architects, engineers, developers, contractors and property owners, and the pooled knowledge and expertise of its members foster an environment which encourages the development of innovative, environmentally- and community-friendly products.

The Association’s prime focus is on ensuring that its members’ products are applied correctly. A CMA mark serves as a guarantee of quality and the CMA takes responsibility should a problem arise.

Members are encouraged to hold accredited product certification, such as the relevant SANS standard, or to manufacture to specifications laid down by the CMA. Should a problem arise, the CMA will carry out an investigation, and, if the product does not conform to the required standard, the member company is obliged to rectify the situation.

Down the years the CMA has published numerous manuals, brochures and audio visuals on the practical application of precast concrete, and this material is available at a nominal charge. It also runs refresher courses and holds seminars to introduce new technology and methodology, often featuring overseas experts.

**CSSA (Concrete Society of Southern Africa NPC)**
The CSSA, a voluntary association recognised by ECSA, promotes excellence and innovation in the use of concrete and related products and services. The Association also provides a forum for networking and technology transfer between its members and international affiliates. It hosts the well-known Fulton Awards every second year to reward excellence in concrete construction.

**ASPASA (Aggregate and Sand Producers Association of Southern Africa)**
ASPASA is a voluntary producers association that helps to improve the quality of aggregates produced by its member companies for construction projects around the country, building our country one stone at a time, so to speak.

ASPASA’s role is critical considering that almost every structure made by man relies on aggregates for strength and stability. Construction aggregates are in fact the primary ingredients of all concrete structures and foundations (80% of concrete is aggregate), as well as being the single most important ingredient used to build roads (94% of a road is aggregate).

Aggregates and sands used in construction projects are naturally occurring minerals that are mined by a specialised sector of the mining industry in South Africa mainly from quarries. Government strictly regulates sand and aggregate quarries due to the importance of obtaining a reliable supply of quality materials. It also aims to ensure that the minerals and materials are removed in a manner that is sustainable and protects the rights of workers, as well as the environment and surrounding communities.

ASPASA’s focus remains largely on creating an environment that is fair and equitable, and gives their members space to manoeuvre and make a good living. On the other hand ASPASA requires its members to comply with all relevant legislation, as well as to uphold the strictest standards in quality, health, safety and environmental issues. Annual audits are in place to assist members to achieve set requirements, and also to ensure that they comply with the relevant legislation.

The quarries represented by ASPASA (around 130) work closely with the government and with the Chamber of Mines, and are able to give input on a wide spectrum of legislation that affects the industry, including input on critical issues surrounding the environment, and health and safety matters.

These important issues are represented through expert committees with senior and knowledgeable specialists serving to give informed input on all matters. Through these committees programmes are developed to assist the industry to meet development objectives and improve the overall standards on member mines.

**WISA (Water Institute of Southern Africa)**
WISA keeps its members informed about the latest national and international developments in water technology and research, and provides a forum for the exchange of information and views to improve water resource management in South Africa.

**SEWPACKSA (Small Wastewater Treatment Works Suppliers Association)**
SEWPACKSA was established in 2010 and its main objectives are:

- To provide a unified non-governmental representative body of suppliers of package plants in the country to create a sustainable and self-regulated industry.
- To create a sustainable, self-regulated package plant industry that can treat wastewater on site in remote areas, or where authorities do not provide sewer connections, or where additional capacity to the wastewater treatment facilities of various government bodies is required, whilst complying
with legislative requirements for discharged water quality.

To enable the supply of compliant package plants and management services of such package plants on the basis of best corporate governance practice and a code of ethics as adopted by the Association.

SEWPACKSA
Contact: Debbie Besseling (PR and Administration)
T: 084 371 7190, E: liaison@sewpacksa.co.za
W: www.sewpacksa.co.za
15 William Nicol Drive, Fourways, Johannesburg

SANCOLD (South African National Committee on Large Dams)
SANCOLD was established in 1965 to represent South Africa on the International Commission on Large Dams (ICOLD). Since then it has broadened its activities to create and promote an awareness and understanding amongst South Africans of the role of dams in the beneficial and sustainable development of South Africa's water resources. Its primary technical role is to advance the knowledge and skills relating to the science and art of the planning, design, construction, management, operation, maintenance, rehabilitation and decommissioning of dams amongst its members in a safe, financially sound, ecologically and socially sustainable manner. SANCOLD provides forums for local and regional interaction between interested participants in the dam industry. SAICE has one of the four reserved positions on SANCOLD's Management Committee. SANCOLD is also hosting the ICOLD Annual Meeting in May 2016 in South Africa where over 1 200 international delegates are expected to attend (see www.icold2016.org).

SANCOLD
SANCOLD, 158 High St, Ashlea Gardens, Pretoria, 0081
T: 012 460 9100, E: secretary@sancold.org.za
W: www.sancold.org.za

SAIMM (Southern African Institute of Mining and Metallurgy)
After 121 years the SAIMM continues to serve its members. This learned society started in 1894, a few years after the invention of the cyanide process had saved the gold mining industry in South Africa – the previously used technology of gravity separation could not economically recover gold from the fine-grained ores of the Transvaal gold fields. The Institute’s Journal recorded this process and other major developments in the industry, and has disseminated the Institute’s knowledge ever since.

SAIMM is a professional institute with local and international links aimed at assisting members to source news and views about technological developments in the mining, metallurgical and related sectors, as well as embracing a professional code of ethics. SAIMM also attempts to fulfil what it sees as its obligations to the various communities and the environment in terms of the SAIMM Charter. In addition, the Institute is active in bringing together the mining and metallurgical fraternity in terms of research, shared experiences, education, personnel and students.

SAIMM
SAIMM, PO Box 61127, Marshalltown, 2107
T: 011 834 1273, F: 011 838 5923
E: sam@saimm.co.za, W: www.saimm.co.za
5th Floor, Chamber of Mines Building, Hollard Street, Marshalltown, Johannesburg

SANCOT (South African National Committee on Tunnelling)
SANCOT is a division within the South African Institute of Mining and Metallurgy (SAIMM). Members of the Committee collate information on both civil and mining tunnelling. SANCOT was originally established as a result of the extensive infrastructure developments during the late 1960s, such as the Orange River Project and the Hex River Valley Tunnel. SANCOT was also a founding member of the International Tunnelling Association. Due to the decrease in tunnelling in South Africa from around 2003, SANCOT reformed first into a committee of the SAIMM, and later into the current division within the SAIMM.

SANCOT
SANCOT, c/o SAIMM, PO Box 61127, Marshalltown, 2107
T: 011 834 1273/7, F: 011 838 5923
E: julie@saimm.co.za, W: www.saimm.co.za/sancot
5th Floor, Chamber of Mines Bldg, 5 Hollard Street, cnr Sauer & Marshall Streets, Johannesburg

SAIPMA (Southern African Paint Manufacturers Association)
SAIPMA, established more than 70 years ago, has as its objective the promotion of the coatings industry as a responsible supplier of products and services beneficial to the country. SAIPMA’s manufacturing members produce more than 90% of the volume of paints and coatings manufactured in South Africa. In its quest to remove all harmful leaded paint from South Africa, SAIPMA is now also attracting an increasing number of retailers and contractors as members. The Association, through its training arm, SA Paint Industry Training Institute (SAPITI), provides a wide range of paint technology courses.

SAIPMA
SAIPMA, Private Bag X68, Halfway House, 1685
T: 011 314 4021, F: 086 550 7495
E: admin@saipma.org.za, W: www.saipma.org.za
18 Gazelle Avenue, Corporate Park, Midrand

SAISC (Southern African Institute of Steel Construction)
The main aim of SAISC is to promote the effective use of steel in construction, thereby contributing to the development of the steel construction industry in South Africa. For more than 50 years now the Institute has been involved in education, industry development, market development, sponsoring research, export promotion and disseminating information. As a centre of knowledge it is the principal source of advice on all aspects of the use of steel in construction.

The Institute has added a number of associations in the last two years. The objective is to provide focused organisations which attend to members’ specific technical needs as cost-effectively as possible. The added focus and membership allows
the Institute to tackle common and cross-cutting issues as a collective with a much stronger (single) voice.

Of late the Institute has found itself in the position of being involved in and looking after the interests of a larger portion of the industry due to the challenges being faced by all. It is the Institute’s view that providing a larger offering across the industry can benefit both the industry and SAISC members going forward.

SEIFSA (Steel and Engineering Industries Federation of Southern Africa)

SEIFSA is a national employer federation representing the metal and engineering industry, and acts as the umbrella body for 27 leading independent employer associations in this diverse field. For more than 70 years, SEIFSA has provided active support for employer associations and lobbied for policies that have improved the business environment in which its members operate.

SEIFSA is the recognised voice of the metals and engineering industry, and its management team represents employers’ associations, and a number of organisations that are critical to the success of the industry. Through its membership of these national bodies, SEIFSA has over the years strived to positively influence legislation and policy affecting labour relations, skills development, and economic and trade matters.

At industry level, SEIFSA negotiates collective agreements covering wages and conditions of employment with the trade unions. The federation also represents employers on the boards of the Engineering Industries Pension Fund, the Metal Industries Provident Fund, the Metal and Engineering Industries Permanent Disability Scheme, the Metal and Engineering Industries Bargaining Council Sick Pay Fund, the Metal and Engineering Industries Bargaining Council and the Manufacturing, Engineering and Related Services SETA (merSETA).

As one of the largest and most influential employer federations in South Africa, SEIFSA has a combined membership of almost 2 000 companies employing over 210 000 workers.

SEIFSA is a non-profit-making body that supports its member associations with products and services offered by its four specialist divisions, namely: Economic and Commercial; Safety and Health; Environment and Quality; Legal and Industrial Relations; and Skills Development and Human Capital. The range of services and products includes advice, assistance, consultancy (covering labour legislation, dispute resolution, employment conditions, health and safety, broad-based black economic empowerment, contract price adjustment and skills development), publications, training courses, seminars and conferences.

The state-of-the-art SEIFSA Training Centre (established in 1982) is geared to provide apprenticeships in ten key trades for a career in the sector, and offers basic, intermediate and advanced training in both apprenticeships, and learnerships, as well as up-skilling of artisans. Apprenticeships include electricians, fitters and turners, instrument mechanics, boilermakers, welders, millwrights, toolmakers, fitters and turners, to name a few.

Awarded the best practice artisan training programme in the country, the SEIFSA Training Centre is fully accredited by merSETA, CHIETA and EWSETA. The SEIFSA Training Centre is capacitated to accommodate more than 250 apprentices at each intake.

SEIFSA continues to support this vital training need and provides 10 bursaries each year to applicants from disadvantaged communities. Intake dates for 2016 are on 5 January, 29 March, 21 June and 13 September respectively.

ITC (Institute of Timber Construction)

The ITC-SA was established more than 40 years ago to regulate the engineered timber roof structure industry, and to provide design, manufacturing, erection, inspection and certification for compliance with inter alia SANS 10400 and SANS 10082 where engineering rational designs are applicable.

The ITC-SA is a South African Qualifications Authority (SAQA) accredited professional body with a professional membership, and therefore has to comply with the requirements as set out in the National Qualifications Framework Act. The ITC-SA is also a recognised Voluntary Association in terms of the Engineering Profession Act, 2000.

During 2014, the Institute of Timber Frame Builders was incorporated into the ITC-SA to ensure a better and more uniform representation of the timber engineered practitioners in the built environment. ITC-SAs service offerings include:

- Ensuring SAQA professional recognition for ITC-SA members, and developing criteria that will enable professional registration.
- Interacting with statutory bodies like the NHBRC and the National Regulator for Compulsory Specifications.
- Reviewing best international practice in the field of timber engineering to develop reliable codes of practice and material specifications that will guide timber engineering in South Africa.
- Through the ITC-SA Technical Engineering Advisory Committee research and update the bracing and connection rules for timber engineering and disseminate the information to the ITC-SA members and industry users.
- Encouraging the removal of barriers for the acceptance of timber structures by local authorities, government agencies, lending institutions and professional groups.
- Working with the timber industry to establish the availability of appropriate grades, sizes and quality timber that will ensure safe and economical engineered timber structures.
- Providing the expertise to answer technical enquiries effectively and investigate problems impartially, or to act on complaints from consumers in an unbiased and fair manner.
- Auditing its members annually for the awarding of a Certificate of Competence to those companies which design, manufacture, supply and erect engineered timber structures.

ITC

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T: 011 974 1061, F: 011 392 6155
E: enquiries@itc-sa.org, W: www.itc-sa.org
SAFCA Building, 6 Hulley Road, Isando

SAISC, PO Box 291724, Melville, 2109
E: info@saisc.co.za, W: www.saisc.co.za
T: 011 726 6111, F: 011 482 9644

SEIFSA, PO Box 1338, Johannesburg, 2000
T: 011 298 9400, F: 011 298 9500
E: info@seifsa.co.za, W: www.seifsa.co.za

SAISC, PO Box 291724, Melville, 2109
E: info@saisc.co.za, W: www.saisc.co.za
1st Floor Block C, 43 Empire Road, Parktown West, Johannesburg

ITC, PO Box 686, Isando, 1600
T: 011 974 1061, F: 011 392 6155
E: enquiries@itc-sa.org, W: www.itc-sa.org
SAFCA Building, 6 Hulley Road, Isando
**IMESA (Institute of Municipal Engineering of Southern Africa)**

IMESA is a voluntary association of engineering professionals and associates who aim to better the quality of life of all citizens through infrastructure engineering excellence at local government level. IMESA also advises municipal councils on municipal engineering matters and serves the broader community through representation on various bodies where it provides input from the municipal engineer’s perspective.

**IMESA**
IMESA, PO Box 2190, Westville, 3630
T: 031 266 3263, F: 031 266 5094
E: admin@imesa.org.za, W: www.imesa.org.za
IMESA House, 2 Derby Place, Westville

**SASTT (South African Society for Trenchless Technology)**

Trenchless technology (TT) is technology for the servicing, rehabilitation and replacement of existing, and the construction of new, public utilities and other services underground without the digging of trenches. It also includes the development of all kinds of underground condition assessment and mapping techniques, tunnelling devices, specialist machinery, materials and equipment.

SASTT’s mission is to promote, from an ethical and neutral base, the use of trenchless technology for providing and maintaining underground services with a minimum of surface and environmental disruption. SASTT encourages its members to arrange their professional and business affairs in accordance with the objectives of SASTT’s mission statement and is aware of the necessity for maintaining a healthy environment while addressing the changing needs of the community. This is promoted by issuing press releases, arranging promotional activities, advising on available solutions, providing technical literature and supporting research for the benefit of the public, authorities, designers and specifiers, suppliers and contractors.

**SASTT**
SASTT, PO Box 13981, Sinoville, 0129
T: 012 567 4026, F: 086 668 4026
E: director@sastt.org.za, W: www.sastt.org.za

**IWMSA (The Institute of Waste Management of Southern Africa)**

IWMSA is a multi-disciplinary, non-profit association that is committed to supporting professional waste management practices. The organisation comprises voluntary members who promote environmentally acceptable, cost-effective and appropriate waste management practices. It strives towards protecting the environment and people of southern Africa from the adverse effects of poor waste management by supporting sustainable best practice environmental options.

The Institute contributes to the improvement of waste management standards and legislation, supports international, national and regional trends in best environmental practices, promotes the science and technology of waste management, and practices affordable, cost-effective waste management. Education and training in the realm of effective and efficient waste management is also a key focus for the IWMSA.

When the IWMSA was established over 30 years ago, it was the vision of the founders to provide South Africa with a clean and healthy environment. Today this vision is still at the core of the organisation.

**IWMSA**
IWMSA, PO Box 79, Allen’s Nek, 1737
T: 011 675 3462/4, F: 011 675 3465
E: info@iwmsa.co.za, W: www.iwmsa.co.za

**SABITA (Southern African Bitumen Association)**

SABITA is a non-profit organisation that represents producers and applicators of bituminous products, consulting engineers and educational institutions. SABITA promotes best practice in the use and application of bituminous materials, as well as in worker safety and environmental conservation. SABITA has an education and training role through the Asphalt Academy, and also liaises with government on the value of road provision and preservation.

**SABITA**
SABITA, Postnet Suite 56, Private Bag X21, Howard Place, 7450
T: 021 531 2718, F: 021 531 2606
E: info@sabita.co.za, W: www.sabita.co.za
5 Lonsdale, Lonsdale Way, Pinelands, Cape Town

**SARF (South African Road Federation)**

SARF is an organisation dedicated to the promotion of the road industry in South Africa through the dissemination of information, the promotion of sound policies and by education and training. As such it provides a representative forum for the provision and management of roads, and the road sector.

The Federation is a point of contact for South Africa’s various road industry sectors, and facilitates the distribution of expertise throughout the diverse disciplines, which impact and have application on the industry.

SARF is linked to the International Road Federation (IRF), and by liaising with this organisation’s programme centre in Washington, the latest developments in road technology, policy and management worldwide are made available to the local industry. SARF’s objectives include:

- The promotion of roads, road transportation and road safety
- The promotion of education and training to all those engaged in the road transportation industry
- The promotion of the economic, social and environmental benefits derived from developing and maintaining road networks, road transport systems and road traffic control
- Supporting and encouraging the design and construction of environmentally sound road networks and allied systems
- Disseminating information to members and other stakeholders
- Promoting an effective road transport policy at all levels of government
- Originating and promoting improvements in road transport policy
- Gaining support by cooperation with the IRF
- Advancing the southern African economy by means of a sound road transport industry
- Holding road-related seminars and conferences
- Providing SARF bursaries and administering IRF Fellowships
- Presenting courses that offer CPD points and which are ECSA-accredited.

**SARF**
SARF, PO Box 8379, Birchleigh, 1621
T: 011 394 5634/1459, F: 011 394 7934
E: operations@sarf.org.za, W: www.sarf.org.za
48 Gladiator Street, Rhodesfield, Kempton Park

**SARMA (Southern Africa Readymix Association)**

SARMA represents reputable readymix concrete companies and promotes readymix concrete in order to establish...
it as the preferred construction material. Established to regulate the readymix industry, SARMA aims to advance industry technology through research and participation, and develops industry standards that promote the use of readymix concrete.

The advent of readymix concrete several decades ago has transformed the construction industry, making widespread use of concrete more viable than ever before. Construction is easier and far faster now, with better quality, more workable concrete being available on site whenever and wherever it is needed. Construction firms have therefore become increasingly reliant on suppliers to provide concrete for everything from waterways, to roads and a wide variety of other construction projects.

All SARMA members are subject to stringent annual plant audits to ensure compliance with the SARMA Health and Safety, Quality and Environmental Standards. Considering the size and number of mixer trucks, road safety standards also form an integral part of the annual audits.

To counter unscrupulous producers who supply inferior quality readymix, engineers are urged to work with SARMA to formulate strategies which will ensure access to the highest quality concrete.

As yet there is nothing stopping construction firms from using non-SARMA accredited suppliers, but moves are afoot for the formulation of formal agreements which would specify that readymix concrete may only be supplied by companies accredited by SARMA.

SARMA
SARMA, PO Box 1983, Ruimsig, 1732
T: 011 791 3327, F: 086 647 7967
E: office@sarma.co.za, W: www.sarma.co.za
Unit 8 Coram Park, Ferero Road, Randpark Ridge

NSTF (National Science and Technology Forum)

The NSTF is a non-profit company that was established in 1995 with the cooperation of the Department of Science and Technology. Its membership consists of organisations, and it represents wide-ranging expertise and experience in the SET (Science, Engineering and Technology) and innovation community. SAICE has been a member for many years, and has been particularly active in ProSET, which was preceded by SETAG (Scientific, Engineering and Technological Societies and Allied Professions Group of South Africa) – SAICE chaired this group for a number of years.

The main aims of the NSTF are to deliberate and share information with the SET and innovation community and to provide a common platform to:
1. Influence the development and implementation of public SET and innovation policies.
2. Contribute towards the renewal of SET systems through youth interventions.
3. Celebrate, recognise and reward excellence within the SET sector.

The NSTF comprises the following sectors:
- Science councils and statutory bodies
- Small, medium and large business and state-owned enterprises
- Civil society and labour
- Higher education sector
- Government sector
- Professional bodies and learned societies

The professional bodies and learned societies are represented by ProSET (Professionals in Science, Engineering and Technology), a sector of the NSTF consisting of professional bodies and learned societies. ProSET represents more than 40 organisations, institutes and associations who themselves represent professionals in various specialised science, engineering and technology (SET) and innovation fields. Notable amongst the membership are professionals in various branches of engineering, as well as educators specialising in science, technology and mathematics education and research.

ProSET has a particular interest in the issues listed below, and engages in discussion and debate around these, playing a role by lobbying among stakeholders:
- Regulatory issues affecting professionals in SET, including the Green Building Environment
- Setting and maintaining standards of safety, health, environmental sustainability, and quality
- Opportunities for Research and Development and Innovation in industry
- Opportunities for support and funding of research in SET
- Career development and career paths for science/engineering graduates and professionals
- Accreditation of professionals – professional registration, including Codes of Ethics
- Encouraging mobility of professionals from other countries to study and work in South Africa and vice versa

The quality, accessibility and promotion of school-level education in Science, Technology, Engineering and Mathematics.

NSTF
NSTF Secretariat, PO Box 9823, Pretoria, 0001
T: 012 841 3987, F: 012 841 3025
E: enquiries@nstf.co.za, W: www.nstf.org.za
Room 5-140, Building 33, CSIR Campus,
Meiring Naude Road, Brummeria, Pretoria

PROTEC (Programme for Technological Careers)

PROTEC is a national, independent, non-profit educational service provider that was started in 1982, in Soweto, in order to help school learners from disadvantaged communities to prepare for and successfully embark on careers in science, engineering and technology. The early success of the project soon led to its expansion into a national programme, and by 1990 there were PROTEC programmes running in 26 disadvantaged communities throughout South Africa, providing supplementary education for Grades 10, 11 and 12 learners, as well as teacher training and curriculum support in the targeted subjects of Mathematics, Physical Sciences, English and World of Work (life orientation).

This model is unique in that it is made up of both learner and teacher development components, and also entails developing material for teaching and learning that is additional to what learners receive as textbooks at their schools. Through these efforts, more and more disadvantaged students are being adequately equipped to enter technological careers, thereby potentially easing the country’s skills shortage.

PROTEC is an active member of the National Science and Technology Forum (NSTF), and is also recognised as a UNESCO cooperating organisation.

PROTEC
PROTEC, PO Box 32767, Braamfontein, 2017
T: 011 339 1451, E: fannie@protec.org.za
W: www.protec.org.za
3rd Floor Forum III, 33 Hoofd Street, Braampark, Braamfontein, Johannesburg

ASOCSA (Association of Schools of Construction of Southern Africa)

ASOCSA was officially launched in 2006 at the culmination of the first Built Environment Conference which saw a
broad spectrum of South African and international construction industry stakeholders, including academics and practitioners, attend. The concept and launch of ASOCSA was supported by industry, demonstrated by substantial sponsorship from prominent stakeholders, such as Group 5, the Development Bank of Southern Africa (DBSA), PPC Cement, Peri Wiehan and the Council for the Built Environment (CBE).

ASOCSA is not the first attempt to form a body that addresses, inter alia, matters of construction education and training. In the days of the Building Industries Federation South Africa and the National Development Fund there were regular annual meetings of heads of departments that offered construction-related programmes. Recognising the two-tiered higher education sector in South Africa, there were separate meetings for universities and the former technikons. In the more recent past, the Chartered Institute of Building (Africa) initially convened annual educators’ forums that did not quite fulfil the same function as the previous forums. However, during 2005 the very first meeting of university heads of departments drawn from all higher education institutions in South Africa met for the very first time since the re-landscaping of the sector to discuss matters affecting construction, and particularly construction education in the country. This meeting was repeated in 2006 where the need was expressed for the establishment of a formal forum/association of universities to engage in discussion, debate, collaboration and promotion of matters of mutual interest.

ASOCSA aims to be the professional association for the development and advancement of construction education in southern Africa, where the sharing of ideas and knowledge inspires, guides and promotes excellence in curricula, teaching, research and service. To achieve this aim ASOCSA is partnering with the construction industry to find ways to effectively represent the interests of both construction academics and industry practitioners. ASOCSA will offer a variety of programmes and services designed to help its members serve their customers more effectively and succeed in an increasingly challenging environment of construction information management and technology. To this end ASOCSA provides a forum for the debate and discussion of issues of mutual interest to all industry stakeholders. For example, one of the tasks of ASOCSA will be supporting the development of curricula that address the needs of the construction sector in the southern African region.

With respect to the southern African region, ASOCSA is committed to the following:

- To be the custodian of construction-related higher education.
- To promote, facilitate, develop and monitor the relevance and quality of construction-related curricula, research and graduates in conjunction with higher education institutions, industry and government.
- To promote and facilitate the development of curricula for construction-related programmes.
- To facilitate accreditation of construction-related programmes.
- To hold an annual conference that acts as a forum for multidisciplinary interaction between academics and practitioners.
- To publish an accredited research-based journal and contribute to the built environment body of knowledge (BEBOK).
- To disseminate information dealing with construction education and related matters.
- To develop and maintain closer links with industry and government.
- To represent the collective views of its members.
- To liaise with other organisations and persons to promote the interests of its members.
- To promote and support relevant postgraduate research.
- To provide bursaries to postgraduate students in accordance with set criteria.

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The Journal of Construction is the official journal of ASOCSA, and the production and distribution of practice notes and technical papers is a further endeavour to grow the partnership between academia and industry.

The Association also convenes an annual conference where construction academics and practitioners can interact relative to practical experience and the findings of relevant research, and from 31 July–2 August 2016, ASOCSA’s 10th Built Environment Conference will take place in Nelson Mandela Bay with the theme The built environment: towards a renaissance.

ASOCSA
Ferdinand Fester (President)
T: 011 559 6050, E: ffester@uj.ac.za
W: www.asocsa.org

SAPI (South African Planning Institute)
SAPI is a recognised voluntary association which seeks to promote planning as a discipline, advance planning in society, and promote the interests of its members, who are persons engaged in the planning profession. It provides town and regional planners, and the planning profession with a profile, identity and voice in South Africa and internationally. It provides a platform for planners to share knowledge and debate critical issues affecting planning and development, and offers the opportunity for cooperation between planners and other disciplines to achieve an effective contribution to the wellbeing of society and the creation and shaping of transformed, sustainable settlements.

The Institute is made up of members from all regions of South Africa, and from all sectors, including all three spheres of government, private practitioners, academia, and civil society bodies. Members are served via regional branches and directly from the SAPI National Office.

SAPI
Private Bag X15, Halfway House, 1685
T: 011 655 7011, F: 086 514 9673
E: info@sapi.org.za, W: www.sapi.org.za
43 Birchwood Court, Montrose Street, Vorna Valley, Midrand

SAGI (South African Geomatics Institute)
SAGI is a voluntary organisation of geomaticians (surveyors and GIS practitioners) who focus on business aspects of the survey and mapping industry.

SAGI’s main purpose is to promote excellence and reliability in the geomatics profession, address matters of concern to clients and surveyors, and facilitate peer discipline in order to maintain high standards.

SAGI represents approximately 800 members spread across South Africa and some neighbouring countries. Membership of SAGI is restricted to those who are registered with PLATO.

The Institute represents cadastral practitioners, attend. The concept and launch of ASOCSA was supported by industry, demonstrated by substantial sponsorship from prominent stakeholders, such as Group 5, the Development Bank of Southern Africa (DBSA), PPC Cement, Peri Wiehan and the Council for the Built Environment (CBE).

ASOCSA is not the first attempt to form a body that addresses, inter alia, matters of construction education and training. In the days of the Building Industries Federation South Africa and the National Development Fund there were regular annual meetings of heads of departments that offered construction-related programmes. Recognising the two-tiered higher education sector in South Africa, there were separate meetings for universities and the former technikons. In the more recent past, the Chartered Institute of Building (Africa) initially convened annual educators’ forums that did not quite fulfil the same function as the previous forums. However, during 2005 the very first meeting of university heads of departments drawn from all higher education institutions in South Africa met for the very first time since the re-landscaping of the sector to discuss matters affecting construction, and particularly construction education in the country. This meeting was repeated in 2006 where the need was expressed for the establishment of a formal forum/association of universities to engage in discussion, debate, collaboration and promotion of matters of mutual interest.

ASOCSA aims to be the professional association for the development and advancement of construction education in southern Africa, where the sharing of ideas and knowledge inspires, guides and promotes excellence in curricula, teaching, research and service. To achieve this aim ASOCSA is partnering with the construction industry to find ways to effectively represent the interests of both construction academics and industry practitioners. ASOCSA will offer a variety of programmes and services designed to help its members serve their customers more effectively and succeed in an increasingly challenging environment of construction information management and technology. To this end ASOCSA provides a forum for the debate and discussion of issues of mutual interest to all industry stakeholders. For example, one of the tasks of ASOCSA will be supporting the development of curricula that address the needs of the construction sector in the southern African region.

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South Africa (ECSA). This is an achievement Council for the Architectural Profession as a Voluntary Association by both the SA profession is adhered to by its members within commerce, industry, and national and local government services.

The Institute undertakes to promote the career of draughting as a specialised occupation that may rightfully claim the privilege of professional status. It also endeavours to ensure that the integrity of draughting persons in all disciplines of technical drawing and design.

Its aims are to improve the status of its members within commerce, industry, and national and local government services.

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The Institute is proud to be recognised as a Voluntary Association by both the SA Council for the Architectural Profession (SACAP) and the Engineering Council of South Africa (ECSA). This is an achievement which has not been attained by any other Institute in South Africa.

The Department of Home Affairs also acknowledges the Institute as a Professional Accreditation Body.

SAID works in close liaison with technical and distance learning colleges, as well as private training providers in order to promote the standard of technical education in South Africa.

As drawing standards are of paramount importance to the Institute, it has had representation on the South African Qualifications Authority’s (SAQA) Consultative Panels and the Standard Generating Bodies (SGBs) in the fields of building construction, civil and generic manufacturing engineering and technology.

SAID (South African Institute of Draughting)

The South African Institute of Draughting is an independent, professional body which was established in 1953 with the objective of improving the academic and technical qualifications of draughts persons in all disciplines of technical drawing and design.

Its aims are to improve the status of its members within commerce, industry, and national and local government services.

The Institute undertakes to promote the career of draughting as a specialised occupation that may rightfully claim the privilege of professional status. It also endeavours to ensure that the integrity of draughting persons in all disciplines of technical drawing and design.

Its aims are to improve the status of its members within commerce, industry, and national and local government services.

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SAID

SAID, PO Box 4442, Durbanville, 7551
T: 021 975 5191, F: 086 579 1137
E: SAIDDraughting@global.co.za
W: www.draughting.co.za

SAIW (South African Institute of Welding)

SAIW is a non-profit technical organisation dedicated to furthering standards in welding fabrication and related technologies. Established in 1948, it is a founder member of the International Institute of Welding (IIW).

SAIW provides training programmes, consultancy and industry support services. Based in Johannesburg, with branches in Cape Town and Durban, it is active throughout southern Africa and also has experience further afield, predominantly in central Africa, the Indian Ocean Islands and the United Arab Emirates.

An Authorised National Body (ANB) of IIW since 2003, SAIW offers the full range of IIW qualifications – engineer, technologist, specialist, practitioner, welder and inspector. It also has strong affiliations with leading training organisations such as the universities of the Witwatersrand and Pretoria. An SAIW qualification has long been regarded as the industry standard in South Africa and also enjoys international recognition.

In 2008 SAIW became an IIW Authorised National Body for Company Certification (the first outside Europe), enabling implementation of the IIW Manufacturer Certification Scheme. In terms of the Scheme, welding and fabrication companies are certified for compliance to ISO 3834 (Quality Requirements for Welding).

SAIW also administers personnel certification programmes for a number of inspection activities, including non-destructive testing (NDT), and for South African regulatory categories of pressure vessel inspectors. Certification programmes are based on the ISO 17024 standard (General Requirements for Bodies Operating Certification of Persons) and is accredited for these activities by SANAS, a South African member of the International Accreditation Forum.

In 2005, SAIW formed SAIW Certification, a separate Section 21 not-for-profit company, to administer examinations and certification programmes. The separation of these activities is in line with international best practice.

Appointed a Regional Designated Centre for NDT by AFRA, the African Regional Cooperation Agreement affiliate of the International Atomic Energy Agency (IAEA), SAIW also conducts training for IAEA-funded fellows and takes a lead in regional scientific cooperation to promote self-sufficiency in the field of nuclear science and technology.

Other SAIW activities include hosting workshops, seminars and conferences, the latter including IIW regional assemblies.

SAIW

SAIW, PO Box 527, Crown Mines, 2025
T: 011 298 2100, F: 011 836 4132
E: reception@siaw.co.za, W: www.saiw.co.za
52 Western Boulevard, off Main Reef Road, Johannesburg

ACPM (Association of Construction Project Managers)

The ACPM is a voluntary association of specialist project management professionals working in the built environment. It has various categories of membership, with membership not automatically granted to applicants. The purpose of the ACPM is to define the service and performance levels expected from project managers and to recommend an appropriate fee scale.

ACPM

ACPM, PO Box 1143, Southdale, 2135
T: 011 022 7189, F: 011 604 2218
E: acpm@mweb.co.za, W: www.acpm.co.za

SAIAE (South African Institute of Agricultural Engineers)

SAIAE represents the discipline of agricultural engineering in South Africa and applies engineering science and technology to agricultural production and processing. Agricultural engineering combines the disciplines of mechanical, civil, electrical and chemical engineering principles with a knowledge of agricultural principles.

SAIAE

PO Box 912719, Silverton, 0127
T: 012 842 4043, F: 086 293 9918
E: boeboe@saili.co.za, W: www.saiae.co.za

CREDITS

We acknowledge with appreciation that some of the information in this article was taken from the websites of the various bodies discussed. Please see the contact details underneath each body for the relevant website address. We also acknowledge with thanks the assistance received from senior staff members or office bearers of these bodies.
INTRODUCTION
SAICE’s networking on an international level took off in 1994 during the ASCE (American Society of Civil Engineers) convention in Atlanta when a SAICE delegation was invited to attend the annual ASCE International Round Table. During that visit SAICE’s President and Executive Director at the time, Brian Bruce and Dawie Botha respectively, not only had the opportunity to network with engineering institutions from across the world, but for the first time ever they met African colleagues.

They returned inspired and eager to start an African Round Table, similar to the ASCE model. From this idea sprung the Africa Engineers Forum, which was eventually incorporated into the Federation of African Engineering Organisations (see p 63). During subsequent years ASCE and SAICE have liaised on various matters and have developed a strong and fruitful relationship that benefits both institutions.

Relationships with other international engineering bodies followed, to the extent that SAICE is today not only contributing meaningfully to the world engineering scene, but receiving international visitors on a regular basis, all to the benefit of SAICE’s members.

WFEO (World Federation of Engineering Organisations)
This multi-disciplinary engineering organisation was established in 1968 and was formed under the auspices of the United Nations Educational, Scientific and Cultural Organisation (UNESCO). A close relationship still exists. It currently represents engineering organisations from approximately 90 nations, and as such around 15 million engineers.

Over the past 10 years or so the WFEO has gained considerable acceptance and status, thereby facilitating as a strong and united voice for engineering. It promotes communication and cooperation, develops internationally agreed policies, and promotes interaction with the United Nations. It plays a major role in issues concerning sustainability and anti-corruption, and a series of committees have been addressing issues such as education and training, the environment, information technology, energy, capacity building and technology.

The WFEO membership includes National Members, in terms of which ECSA (Engineering Council of South Africa) represents the South African engineering profession, International Members, like the FAEO (Federation of African Engineering Organisations) that represent regional engineering groups, and Associate Members, who have no voting rights.

The 2015–2017 President of the WFEO is Eng Jorge Spitalnik. Yashin Brijmohan, Head of School: Engineering CoE Eskom Holdings SOC Ltd, chairs the WFEO Committee on Engineering Capacity Building (CECB).

SAICE contributed hugely to a guideline book and a compendium of programmes for capacity building, which were launched in October 2010 at the WFEO Executive Meeting in Buenos Aires, and distributed further during 2013/14 (available on the various websites of the WFEO family of organisations).

At the WFEO Convention in Geneva in September 2011, it was decided that ECSA would host the CECB workshop in South Africa for the next few years, with the assistance of SAICE – indeed a big scoop for the South African engineering community.
UNESCO was founded on 16 November 1945 and, in addition to dealing with the issues described in its name, sees itself as striving towards a higher purpose, namely “building peace in the minds of men”. After World War II this goal was obviously of great importance. UNESCO currently promotes cooperation among its 190-odd member nations by mainly focusing on respect, values and the dignity of each civilisation and culture. The organisation is actively pursuing the Millennium Development Goals by means of its strategic activities.

SAICE has been contracted several times by UNESCO to execute programmes in the form of workshops aimed at issues like “Engineers and the Alleviation of Poverty”. A further initiative concerns a feasibility study to ascertain whether a mini ‘Numbers and Needs’ study would be appropriate for selected African countries, following the example of the SAICE Numbers and Needs publication by Allyson Lawless and her team. This initiative has the support in principle of the South African Minister of Science and Technology, Naledi Pandor.

Rovani Sigamoney, Programme Specialist: UNESCO Engineering Initiative, has played a major role in facilitating interaction with SAICE. Prof Brian Figaji of South Africa has, in addition, been playing an important and valuable role as South Africa’s representative on the Executive Board of UNESCO.

The UNESCO Engineering Report, which was published in 2010, contains views from engineers in approximately 50 chapters. SAICE contributed to important sections of this publication.

The UNESCO Engineering Initiative was established to promote engineering education at secondary and tertiary education levels, and to highlight the roles and accomplishments of women and youth in engineering. It also emphasises the importance of renewable and alternative energies for sustainable engineering practices. By showcasing how the youth are taking on contemporary engineering challenges and how professional engineers are shattering gender-based stereotypes, the UNESCO Engineering Initiative hopes to inspire the next generation of engineers. As one of the oldest professions in the world, engineering is vital in addressing basic human needs, in alleviating poverty, in promoting secure and sustainable development, in responding to emergency situations, in reconstructing infrastructure, in bridging the knowledge divide and in promoting intercultural cooperation. Despite the social and economic importance of engineers, there is increasing concern that declining enrolment in engineering studies will have consequences for future development. The UNESCO Engineering Initiative is addressing this concern through its partnerships with various professional engineering (and engineering education) bodies, as well as with industry.

CEC (Commonwealth Engineers’ Council)

The CEC promotes cooperation among the engineering organisations situated in the former British colonies. It has recently been transformed into a virtual organisation that is facilitated by the provision of a secretariat by the ICE. ECSA is the South African member of the CEC and SAICE interacts with the CEC from time to time.

WCCE (World Council of Civil Engineers)

The WCCE was established in 2005. Prof José Medem, a former WFEO President, was one of the first presidents of the WCCE, and has visited South Africa on several occasions, building a lasting relationship with SAICE. The civil engineering profession represents around 50% of engineering professionals and plays a vital role in delivering essential services worldwide. The WCCE’s goal therefore is to address issues specifically related to civil engineering on a global scale.

FIDIC (International Federation of Consulting Engineers)

The members of FIDIC comprise consulting engineering organisations from various countries. FIDIC plays a leading role in addressing sustainability, organising anti-corruption campaigns, setting standards in consulting engineering, and interacting with the World Bank and other funding organisations and structures regarding procurement issues.

ICE (Institution of Civil Engineers)

ICE, the UK-based equivalent of SAICE, was established in 1818, and as such set the norm for learned societies in engineering. It currently has 80 000 members around the world. Since the early nineties ICE and SAICE have been cooperating on many issues.

The most important achievement to date has been that ICE facilitated international reciprocity agreements between itself, ECSA and SAICE, in terms of which South African civil engineering qualifications and professional status are recognised. ICE also facilitated the entry of ECSA into various international accords, including the Washington Accord and the Engineers Mobility Forum. Learned society activities between ICE and
SAICE are currently managed by means of an agreement of cooperation. Regular meetings between the two institutions, facilitated by the ICE-SA Division, form part of their annual activities, and on several occasions the Brunel lecture has been presented in South Africa.

ICE
One Great George Street, Westminster, London, SW1P 3AA, United Kingdom
T: 44 20 7222 7722
E: secretariat@ice.org.uk
W: www.ice.org.uk

IStructE (Institution of Structural Engineers)
IStructE was originally established in 1908 as the Concrete Institute. Its focus is primarily on structural engineering and public safety within the built environment. It has more than 27,000 members in 105 countries around the world. SAICE and IStructE cooperate by means of an agreement, and through the Joint Structural Division of SAICE. In addition, courtesy visits to the IStructE management in London by the SAICE CEO take place on an annual basis.

IStructE
47-58 Bastwick Street, EC1V 3PS London, United Kingdom
T: 44 20 7235 4535
E: mail@istructe.org
W: www.istructe.org

ASCE (American Society of Civil Engineers)
ASCE was founded in 1852 and currently has a membership of more than 150,000 worldwide. It is a typical learned society for civil engineering professionals. In 1994 ASCE was the first international organisation to offer SAICE an agreement of cooperation. Its International Round Table (IRT) has over the years provided SAICE with a valuable platform for communication and networking. SAICE has been attending these IRTs over many years and participated in several initiatives, including the ASCE Vision 2025 strategic planning exercise, where SAICE’s input was mainly in terms of sustainability and providing a developing world perspective. Currently a number of initiatives between SAICE and ASCE, like ExCEEd (Excellence in Civil Engineering Education), are either under discussion or envisaged.

At the 2015 ASCE annual convention in New York, the Agreement of Cooperation was renewed for a fifth term of four years. SAICE’s 2015 President attended ASCE’s 145th convention in New York during October 2015 where delegates could learn of and discuss the changes that are shaping the civil engineering profession worldwide.

ASCE
ASCE, 1801 Alexander Bell Drive, Reston, Virginia, VA 20191, USA
T: 1703 295 6300 / 800 548 2723 toll free
W: www.asce.org

FAEO (Federation of African Engineering Organisations) and SAFEFO (Southern African Federation of Engineering Organisations)
In order to achieve engineering excellence and to create a better quality of life for all in Africa, leaders and representatives of engineering institutions in Africa held a General Assembly on 8 May 2012 at the Kenyatta International Conference Centre, Nairobi, Kenya, and unanimously agreed to establish a central united home for African engineering organisations in solidarity under the name Federation of African Engineering Organisations (FAEO). The organisational model of FAEO comprises:

■ Central African Federation of Engineering Organisations (CAFEO)
■ Eastern African Federation of Engineering Organisations (EAFEO)
■ North African Federation of Engineering Organisations (NAFEO)
■ Southern African Federation of Engineering Organisations (SAFEFO)
■ West African Federation of Engineering Organisations (WAFEO).

These various regional groups will work under the FAEO, which will then represent Africa at the WFEO, AU and any relevant international organisation. SAFEFO represents southern Africa in COMESA, SADC, NEPAD and other regional bodies with engineering and sustainable development interests in southern Africa.

FAEO is therefore a young organisation and faces many challenges, but its members’ commitment and will to succeed are sure to let it grow into a strong and unifying organisation for all engineering practitioners in Africa.

Africa has huge economic potential, but it needs the necessary infrastructure to develop and sustain this potential. Infrastructure development should not only be inward-looking, but should be done on a regional basis, and eventually
on a continental basis. In unity is strength, and it is engineering practitioners who must make sure that we develop an integrated road network, rail network, power network and telecommunications network for the continent. One requirement for such integrated networks is that there are compatible standards and design codes. This will not be easy to achieve, as the countries in Africa have a legacy from many different countries in Europe, and it will be a challenging task to align these codes and standards with one another.

For this purpose we need wise engineering practitioners. During tertiary studies an engineer or technician acquires knowledge. Knowledge is information that is retained in the mind. Once working, an engineering practitioner gains the ability to apply the knowledge in practice, and thereby becomes competent to practise his/her profession. When experience is added to competence, then wisdom is achieved.

Training of engineering practitioners starts at school where they must gain sufficient competency in maths and physics to enter university. It then becomes necessary to ensure that the training at university is at a high level. However, all this knowledge comes to nothing if there is not a proper training and mentoring programme in place. The FAEO recognises that capacity building is the key to producing competent, experienced and wise engineering practitioners who will plan, design and build the required infrastructure that will make Africa great.

Engineering practitioners must conduct themselves with integrity and honesty. This is not always easy in an environment where corruption has become entrenched and almost institutionalised. Notwithstanding this unpalatable fact, it is only when engineering professionals stand together that this can be overcome. The FAEO stands for integrity, and expects all its members to adhere to honourable conduct.

The FAEO has an African vision and must therefore be above national and regional interests. The intention is to facilitate the establishment of an engineering corps that can truly serve the peoples of Africa.

SAFEO will promote and extend the exchange of technical, scientific and professional knowledge to better service the interests and welfare of engineering practitioners in member countries, as well as to encourage and support members to uphold and advance the integrity, honour and dignity of engineering in order to achieve the following outcomes:

- Excellence in engineering technology in Africa.
- Informed and intelligent decision-making about built environment infrastructure by all government structures and private sector entities, by utilising human capacity building orientation programmes and projects.
- A sufficient pool of competent professionals by and through:
  - offering and pursuing awareness and orientation programmes, projects and activities regarding the role of engineering and technology
  - promotion of interest in mathematics and science at higher grades in primary and secondary schools
  - offering career guidance programmes and activities
  - promoting consistent investment mechanisms for infrastructure, and promoting fair and reasonable remuneration for all engineering practitioners
  - facilitating mentorship
  - offering continued professional development opportunities.

- Sustainable professional frameworks and organisational structures in Africa by:
  - creating permanent facilities and administrative mechanisms to support the built environment profession’s activities and programmes.
  - An awareness relating to SAFEO activities in order to prepare the countries, their people and their decision-makers for the challenges of the future by:
  - utilising the opportunities offered to enhance the image and raise the public awareness about the role and value of engineering and industry in particular, and engineering and the built environment in general.

- Support the development of entrepreneurship in the engineering environment.

Dr Martin van Veelen is the immediate Past President of the Federation of African Engineering Organisations (FAEO). The FAEO has now been firmly established and is fully functional in Sub-Saharan Africa. Of the five regional bodies, only the Northern African Federation of Engineering Organisations has not been established yet. The other four are fully functional. The FAEO’s achievements so far are:

- The FAEO constitution has been accepted by all members.
- The SAFEO, WAFEO, EAFEO and CAFEO are well organised and are meeting regularly.
- There is good interaction between engineering bodies in Africa.
- The FAEO has a functional secretariat.
- The FAEO has become visible as an active organisation and is accepted as the organisation representing the engineering profession in Africa.

Dr van Veelen is now a member of the WFEO Strategic Planning Task Force. He is also a member of the group that assesses the functionality of the WFEO Standing Technical Committees.

The FAEO Executive has had ongoing discussions with the AU Commission for Human Resources, Science and Technology. For the first time the engineering practitioners in Africa now have a direct voice at the AU.

The FAEO is recognised by UNESCO as the representative body for engineering practitioners in Africa, and has become part of the African Engineering Initiative. The FAEO successfully participated in the first ever UNESCO Africa Engineering Week that was held in Johannesburg in 2014. Representatives from all four Sub-Saharan regions attended the conference and actively participated in the programme.

**FAEO**

FAEO, Suite 205, NEC Building, National Engineering Centre, Labour House Road, Abuja, Nigeria
T: 234 803 3345 810
E: info@faeo.org, W: www.faeo.org

**SAFEO MEMBER COUNTRIES**

**Botswana**
Botswana Institution of Engineers BIE
Oagile Kanyeto - President
T: 267 395 7665
E: info@bie.org.bw
W: www.bie.org.bw
Lesotho
Lesotho Association of Engineers LAE
Ben Rafoneke – President
E: lesothoengineers@gmail.com, T: 266 2232 5975
W: www.lae.co.ls

Malawi
Malawi Institution of Engineers MIE
Mrs Elnas Chimdima – Executive Secretary
E: mw.engineers@gmail.com, T: 265 1 871 615 / 265 999 417 609

Mauritius
Institution of Engineers Mauritius IEM
Mrs N Daby-Seesaram – President
Ghunshyam Parsan – Secretary
E: iem@intnet.mu, T: 230 467 7015
W: www.iemauritius.com

Mozambique
Ordem dos Engenheiros de Mocambique OrdEM
Eng Augusto de Sousa Fernando – President
Eng Abdul Razaque Fakir – Vice-President
T: 258 21 310 463 / 258 82 326 3740
Eunice Abreu – Secretary General
E: eumavoa@gmail.com
W: www.ordeng.org.mz

Namibia
Engineering Professions Association of Namibia EPA
Gunter Leicher – President
E: gleicher@knightpiesold.com, E: epa@iafricaonline.com.na
T: 264 61 223 009
Mr Al-Jaf Ako
T: 264 61 222 313, E: al-jafa@ra.org.na
W: www.engineers-namibia.org

Seychelles
Engineering Institution of Seychelles EIS
Contact to be re-established

South Africa
Engineering Council of South Africa ECSA
Sipho Madonsela – CEO
T: 27 11 607 9500
Jones Moloiusane – Chairperson of the IAC
E: moloiusanj@tut.ac.za
W: www.ecsa.co.za

Swaziland
Swaziland Association of Architects, Engineers & Surveyors SAAES
Rev Mcebo Sigudla – Chairman
E: mcebo@sptc.co.sz, E: info@saaes.org.sz
T: 268 7604 2161

Zambia
Engineering Institution of Zambia EIZ
Eng Henry Mwale – CEO & Registrar
E: eiz@eiz.org.zm
T: 260 211 256 205
W: www.eiz.org.zm

Zimbabwe
Engineering Council of Zimbabwe ECZ
Eng Ben Rafemoyo – CEO
E: engineering@ecz.co.zw
T: 263 04 227 188

EAP (Engineers Against Poverty)
EAP is a specialist NGO working in the field of engineering and development. SAICE signed a cooperation agreement with the EAP. Regular interaction therefore takes place between SAICE and EAP, and EAP takes part in a number of joint ventures where SAICE is represented.

EAP
Woolgate Exchange, 25 Basinghall Street, London EC2V 5HA, United Kingdom
T: 44 20 3206 0488, F: 44 20 3206 0401
E: info@engineersagainstpoverty.org, W: www.engineersagainstpoverty.org

RedR International
RedR was established in the UK in 1980 and its name refers to its mission, which essentially is to maintain a Register of Engineers for Disaster Relief and to provide training in this field.

RedR International
Lower Beer, Upplowman, Tiverton Ex16 7PF, United Kingdom
T: 44 1884 821 239
W: www.redr.org

RAE (Royal Academy of Engineering)
The Royal Academy of Engineering was established in 1976. On their website the RAE states that, “As Britain’s national academy for engineering, we bring together the country’s most eminent engineers from all disciplines to promote excellence in the science, art and practice of engineering. Our strategic priorities are to enhance the UK’s engineering capabilities, to celebrate excellence and inspire the next generation, and to lead debate by guiding informed thinking and influencing public policy.”

The RAE has strong links with the organised professions, including ICE and SAICE. Its links with SAICE enhance the RAE’s initiatives to facilitate the growth of professional engineering societies in Africa.

RAE
Royal Academy of Engineering,
3 Carlton House Terrace, London,
SW1Y 5DG, United Kingdom
T: 44 20 7766 0600
W: www.raeng.org.uk

IEI (Institution of Engineers India)
The IEI offers Life Institutional Membership to engineering-related organisations and individuals throughout India. Any public or local body, registered company, or individual may therefore become a member of the IEI. In September 2012, while attending the congress of the World Federation of Engineering
Organisations in Slovenia, SAICE and the IEI signed a Memorandum of Understanding, whereby both institutions confirmed their willingness to work together on international issues whenever deemed appropriate. Both organisations agree that this was an historic event and they look forward to a long and mutually beneficial association.

IEI
No 19, Chepauk 5 Swami, Sivananda Salai, Triplicane, Chennai, India
T: 91 44 6499 8729, E: intnl@ieindia.org
W: www.ieindia.org

CIB (International Council for Research and Innovation in Building and Construction)
The CIB was established in 1953 with the support of the United Nations as an Association to stimulate and facilitate international cooperation and information exchange between governmental research institutes in the building and construction industries, with an emphasis on those institutes engaged in technical fields of research. The CIB has since developed into a global network of over 5 000 experts from about 500 member organisations active in the research community, industry or education, who cooperate and exchange information in over 50 CIB Commissions and Task Groups covering all fields in building and construction-related research and innovation.

CIB members are universities, institutes, companies and organisations involved in building and construction research or in the transfer or application of the results of research. Member organisations usually appoint experts from their ranks to participate in CIB Commissions and Task Groups. An individual may also be a member and participate in a Commission or Task Group.

Members have immediate access to the world’s leading experts and expertise, and are facilitated to present and validate their own knowledge and technology. They are also offered opportunities for collaboration in international projects. In these, leading experts bring state-of-the-art technologies together in support of continuous improvements of building and construction systems, processes and technologies all over the world.

Currently, CIB member organisations include most of the major national building research institutes in the world, as well as many other types of organisations in the building and construction industry. While considerable attention is still given to technical topics, there are now also activities focused on topics such as organisation and management, economics of building, legal and procurement practices, architecture, urban planning and human aspects.

At present the CIB is the world’s foremost platform for international cooperation and information exchange in the area of building and construction research and innovation.

Recently, the CIB opened its sub-Saharan regional office in Cape Town under the joint leadership of Prof Theo Haupt and Ferdinand Fester.

CIB
Prof Theo Haupt: pinnacle.haupt@gmail.com
Ferdinand Fester: ffester@uj.ac.za
E: secretariat@cibworld.nl (CIB General Secretariat)
W: www.cibworld.nl

ISSMGE (International Society for Soil Mechanics and Geotechnical Engineering)
The ISSMGE is the pre-eminent professional body representing the interests and activities of engineers, academics and contractors all over the world who actively participate in geotechnical engineering.

The aim of the ISSMGE is the promotion of international cooperation amongst engineers and scientists for the advancement and dissemination of knowledge in the field of geotechnics, and its engineering and environmental applications.

The ISSMGE has 86 member societies worldwide representing 18 000 individual members. These include practising engineers, teachers, researchers, and equipment designers and manufacturers. The Society also has 23 corporate associates from industry.

The International Society is an affiliated member of the International Union of Geological Sciences (IUGS), which is itself a member of the International Council for Science.

Close relationships are maintained with ISSMGE sister societies, the International Society for Rock Mechanics (ISRM) and the International Association for Engineering Geology and the Environment (IAEG) via the Federation of International Geo-engineering Societies (FedIGS).

ISSMGE
ISSMGE, City University London,
Northampton Square,
London EC1V 0HB,
United Kingdom
T: 44 20 7040 8154
E: secretariat@issmge.org
W: www.issmge.org

CIOB (Chartered Institute of Building)
The CIOB is the world’s largest and most influential professional body for construction management and leadership. It has a Royal Charter to promote the science and practice of building and construction for the benefit of society, and has been doing that since 1834.

The CIOB accredits university degrees, educational courses and training, providing professional and vocational qualifications that are a mark of the highest levels of competence and professionalism, providing assurance to clients and other professionals who procure built environment assets.

CIOB members work worldwide in the development, conservation and improvement of the built environment.

CIOB
1 Arlington Square,
Downshire Way, Bracknell,
RG12 1WA, United Kingdom
T: 44 1344 630 700, F: 44 1344 306 430
E: reception@ciob.org.uk
W: www.ciob.org.uk

CREDITS
We acknowledge with appreciation that some of the information in this article was taken from the websites of the various bodies discussed. Please see the contact details underneath each body for the relevant website address.
5 – The world according to SAICE

Additional acronyms and abbreviations relevant to the engineering environment

(Also see pages 40 & 41)

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACSA</td>
<td>Airports Company South Africa</td>
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<tr>
<td>AsgISA</td>
<td>Accelerated and shared growth initiative for South Africa</td>
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<tr>
<td>BBBEE</td>
<td>Broad-Based Black Economic Empowerment</td>
</tr>
<tr>
<td>BCEA</td>
<td>Basic Conditions of Employment Act</td>
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<tr>
<td>BEE</td>
<td>Black Economic Empowerment</td>
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<tr>
<td>CAD</td>
<td>Computer Aided Design</td>
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<tr>
<td>CHE</td>
<td>Council on Higher Education</td>
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<tr>
<td>CIDB</td>
<td>Construction Industry Development Board</td>
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<tr>
<td>CIETS</td>
<td>Construction Industry Education and Training Services</td>
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<tr>
<td>CMIP</td>
<td>Consolidated Municipal Infrastructure Programme</td>
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<tr>
<td>CPD</td>
<td>Continuing Professional Development</td>
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<tr>
<td>DEA</td>
<td>Department of Environmental Affairs</td>
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<tr>
<td>DoE</td>
<td>Department of Education</td>
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<tr>
<td>DoT</td>
<td>Department of Transport</td>
</tr>
<tr>
<td>DPLG</td>
<td>Department of Provincial and Local Government (now the Department of Cooperative Governance and Traditional Affairs)</td>
</tr>
<tr>
<td>DST</td>
<td>Department of Science and Technology</td>
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<tr>
<td>DTI</td>
<td>Department of Trade and Industry</td>
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<tr>
<td>DWA</td>
<td>Department of Water Affairs</td>
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<tr>
<td>EMF</td>
<td>Engineers Mobility Forum</td>
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<tr>
<td>ENERGYS</td>
<td>Engineers Now Ensuring Rollout by Growing Young Skills</td>
</tr>
<tr>
<td>EPWP</td>
<td>Expanded Public Works Programme</td>
</tr>
<tr>
<td>ESKOM</td>
<td>Electricity Supply Commission</td>
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<tr>
<td>ETQA</td>
<td>Education and Training Quality Assurance</td>
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<tr>
<td>FET</td>
<td>Further Education and Training</td>
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<tr>
<td>GCC</td>
<td>Government Certificate of Competence</td>
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<tr>
<td>GIS</td>
<td>Geographic Information Systems</td>
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<tr>
<td>HEQC</td>
<td>Higher Education Quality Committee</td>
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<tr>
<td>HSRC</td>
<td>Human Sciences Research Council</td>
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<tr>
<td>IAM</td>
<td>Infrastructure Asset Management</td>
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<tr>
<td>IDoEW</td>
<td>Identification of Engineering Work</td>
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<tr>
<td>IDP</td>
<td>Integrated Development Plan</td>
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<tr>
<td>IDZ</td>
<td>Industrial Development Zone</td>
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<tr>
<td>ITS</td>
<td>Intelligent Transport Systems</td>
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<tr>
<td>JIPSA</td>
<td>Joint Initiative for Priority Skills Acquisition</td>
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<tr>
<td>JRA</td>
<td>Johannesburg Roads Agency</td>
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<tr>
<td>LGSETA</td>
<td>Local Government Sector Education and Training Authority</td>
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<tr>
<td>MDG</td>
<td>Milenium Development Goals</td>
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<tr>
<td>MIG</td>
<td>Municipal Infrastructure Grant</td>
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<tr>
<td>MIUI</td>
<td>Municipal Infrastructure Investment Unit</td>
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<tr>
<td>NABCAT</td>
<td>National Black Contractors and Allied Trades Forum</td>
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<tr>
<td>NEPAD</td>
<td>New Partnership for Africa’s Development</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
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<tr>
<td>NPA</td>
<td>National Ports Authority</td>
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<tr>
<td>NQF</td>
<td>National Qualifications Framework</td>
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<tr>
<td>NSFAS</td>
<td>National Student Financial Aid Scheme</td>
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<tr>
<td>O&amp;M</td>
<td>Operations and Maintenance</td>
</tr>
<tr>
<td>OHS</td>
<td>Occupational Health and Safety</td>
</tr>
<tr>
<td>PMSA</td>
<td>Project Management South Africa</td>
</tr>
<tr>
<td>PPP</td>
<td>Public Private Partnership</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>RDP</td>
<td>Reconstruction and Development Programme</td>
</tr>
<tr>
<td>SALGA</td>
<td>South African Local Government Association</td>
</tr>
<tr>
<td>SARTSM</td>
<td>South African Road Traffic Signs Manual</td>
</tr>
<tr>
<td>SAWIC</td>
<td>South African Women in Construction</td>
</tr>
<tr>
<td>SET</td>
<td>Science, Engineering and Technology</td>
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<tr>
<td>SETA</td>
<td>Sector Education and Training Authority</td>
</tr>
<tr>
<td>SMMEs</td>
<td>Small, Medium and Micro Enterprises</td>
</tr>
</tbody>
</table>
### Tertiary institutions where civil engineering can be studied

<table>
<thead>
<tr>
<th>INSTITUTION AND FACULTY</th>
<th>NAME OF DEPARTMENT</th>
<th>QUALIFICATIONS OFFERED</th>
<th>HEAD OF DEPARTMENT AND CONTACT DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EASTERN CAPE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nelson Mandela Metropolitan University  Faculty of Engineering, the Built Environment and Information Technology</td>
<td>Department of Civil Engineering  North Campus</td>
<td>National Diploma in Civil Engineering  BTech Degree in:  Transportation Engineering  Urban Engineering</td>
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<td>Central University of Technology, Free State  Faculty of Engineering and Information Technology</td>
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<td>University of Pretoria  Faculty of Engineering, Built Environment and Information Technology</td>
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| Durban University of Technology             | Department of Civil Engineering and Surveying   | National Diploma in Civil Engineering  
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DROUGHT-STRICKEN MINES CAN BENEFIT FROM WATER-WISE SOLUTIONS

SOUTH AFRICA IS in the grip of its worst drought in over 20 years, prompting many regional authorities to restrict water usage. The local mining industry, which is already under pressure from low commodity prices and labour unrest, will be further impacted in terms of profitability and productivity if water-saving initiatives are not adopted.

According to data released by the Department of Water Affairs on 2 November, the reserves of water storage facilities nationwide have dropped from 76.8% full in 2014, to just 65.3%. More worrying is the fact that the levels dropped from 66.2% full to 65.3% within the space of just one week.

The local mining industry consumes approximately 306 000 000 m³ of water per year, making up 3% of the country’s entire consumption of 10 200 000 000 m³ from all major dams. Although this is lower than the agricultural (67%), domestic (15%), services (7%) and manufacturing (5%) sectors, the industry can ill afford any wastage, from both an economic and environmental perspective.

South Africa’s platinum belt in the North West Province is experiencing water levels well below the national average, with water storage facilities only 53.2% full, down from 64.5% last year. Other mining regions, such as the Northern Cape, Mpumalanga and Gauteng, are not yet as hard hit, but are nevertheless experiencing significant drops in water storage compared to last year.

Lower rainfall increases the presence of dust, which undermines the health of workers, impacts negatively on the surrounding environment and substantially reduces the lifespan of machinery. Environmentally conscious mining operators are tackling this issue with dust-suppression solutions. However, water is often the main source, but water is severely limited in its effectiveness as a dust suppressant, as it draws on precious water supplies, just to evaporate quickly, with dust being released into the environment again.

I-CAT director Anton van der Merwe notes that the company can ensure efficient dust control and full environmental compliance with innovative and cost-effective products that assist with surface stabilisation, while ensuring a significant reduction in water usage. “Our flagship dust suppressant is RDC 20, a water-soluble anionic polyelectrolyte polymer exclusively developed in-house.”

RDC20 is a formulation of blended emulsified co-polymers and ionic modifiers. When sprayed onto the road surface, RDC 20 forms a durable cross-linked matrix that binds fine soil particles into larger heavier particles, which are less prone to becoming airborne. RDC 20 is used on temporary roads, as it is a cost-efficient means of improving road and dust conditions exponentially.

Van der Merwe says that I-CAT receives overwhelmingly positive feedback from mines where the product is being applied, especially where I-CAT is contracted to manage the dust control on mine roads. “The overall ambient dust at our largest operation in the Northern Cape has improved by more than 40%, when compared with the readings prior to I-CAT managing the secondary roads at the mine. This is an extraordinary achievement that would not be possible without RDC 20.”

Spillage and overfilling of water bowsers also pose a major challenge in the mining industry. Up to 10 000 litres/min of water spillage can be prevented on-site using I-CAT’s E-CAM system with integrated RFID, a cab-mounted, camera-based technology that assists water bowser operators to line up 85 000-litre water bowsers at filling points located across mine sites. This new technology ensures pinpoint alignment without the driver having to set foot outside the bowser, which reduces safety hazards related to the driver being outdoors. It substantially reduces the risk of spillage, leading to significant time, cost and water savings.

Although solutions such as these are now more important than ever, Van der Merwe stresses that I-CAT solutions ensure long-term sustainability long after droughts have passed. This is especially important for a country like South Africa, which experiences an average annual rainfall of 495 mm, well below the global average of 1 033 mm, according to the World Bank.

EDUCATING ROLE-PLAYERS IS KEY TO SUSTAINING SA’S GROUNDWATER

AS SOUTH AFRICA draws thirstily on its groundwater resources, it must urgently educate role-players that these are not infinite and that careful controls must follow the drilling of boreholes to make sure they last.

According to Gert Nel, principal hydrogeologist in SRK Consulting’s East London office, the current drought in many parts of the country has refocused attention on the frequent lack of monitoring of groundwater use.

“Underground aquifers are fed by rainwater, so droughts will impact on their...
abstraction capacity," says Nel. "We are also seeing more demand on groundwater as towns expand, higher levels of services are required and municipalities have to meet the demand."

South Africa developed a large number of well-fields in recent decades, but, according to Nel, we now face the danger of depleting them through careless use, unless water service providers, such as local and district municipalities, are provided with better information about the policies and practices that need to be applied and implemented.

"Each of the agencies in this field has a role to play, and consulting engineers and scientists like SRK are already making valuable technical contributions. But we can do more at a number of levels, such as raising awareness at district municipalities, and giving local municipalities practical training and ongoing mentoring."

Nel emphasises the need to roll out a scientific learning programme that relates directly to each town or region, so that it can be applied immediately in addressing local groundwater challenges.

"There are plenty of generic ‘groundwater training’ resources and documents available, but we need to move beyond the general to the specific, ensuring that role-players engage practically with their issues during these sessions and take back solutions they can implement with the help of mentors."

Nel believes that consulting engineers and scientists are ideally placed to adapt their training in this way, as they have on-the-ground experience and understanding of the problems that water managers face every day.

According to Nel, catchment management agencies (CMAs) are being established to pursue integrated water management within water management areas (WMAs) and coordinate functions of other institutions involved in water-related matters. However, it will take time for the CMAs to fully engage all groundwater users.

More urgent, however, is the position of the water services authorities (WSAs), typically the district municipalities, who oversee the work of water services providers (WSPs), typically local municipalities, in ensuring actual delivery of water services and maintenance of facilities.

Training should be tailored for each of these levels, as their needs are different. The district municipalities’ water planning personnel, for example, need to understand that groundwater must be monitored and managed, and that numerical models can be developed and predictions made about future borehole performance at current abstraction levels.

At local municipality level, the required focus is on how to physically monitor usage – using equipment such as flow meters and water-level meters – and how to manage groundwater contamination. The training can therefore include an assessment of municipal and private groundwater abstraction, identifying the various users so that the local authority can engage them in controlling usage. The location of possible contamination sources like refuse dumps, wastewater discharge, cemeteries and abattoirs can also be mapped.

"Water services authorities and providers receive funding from various sources, such as the Municipal Infrastructure Grant, to install the necessary water systems, but they are seldom equipped or funded to scientifically manage their groundwater sources," Nel explains. "The training content needs to be applied to their specific conditions, so that delegates can be assisted to develop a groundwater monitoring programme, and supported with mentoring to ensure ongoing implementation."

"The danger of continuing as we are," says Nel, "is that groundwater is being abstracted on a large scale and boreholes are inevitably drying up, leading to the unsustainable and expensive practice of simply drilling new holes."

"Those involved need to develop an understanding of water tables, groundwater recharge and related scientific issues, so that the ‘invisible’ world of groundwater can be revealed and managed to everyone’s long-term benefit."

Even where experts have been used to test boreholes, users sometimes mistakenly believe that the ‘recommended yield’ provided by the hydrogeologist can be applied for the lifespan of the borehole.

"This of course is not true," Nel concludes. "The recommended yield given by the hydrogeologist is the yield that can be used to put the system in operation, but the yield will have to be adjusted downwards when drought periods arrive. Similarly, the yield can be increased in times of above-average rainfall. Groundwater abstraction must be managed, as it is a resource dependent on rainfall and recharge."
NATIONAL TREASURY HAS issued an instruction in terms of the Public Finance Management Act (PFMA), and a circular in terms of the Municipal Finance Management Act (MFMA) linked to the implementation of a Standard for Infrastructure Procurement and Delivery Management. These documents have been issued as a follow-up to South Africa’s National Planning Commission’s National Development Plan 2030 (*Our future – make it work*), which proposed that the following five areas be focused on in designing a procurement system that is better able to deliver value for money, while minimising the scope for corruption:

(a) Differentiate between the different types of procurement which pose different challenges and require different skills sets.

(b) Adopt a strategic approach to procurement above the project level to balance competing objectives and priorities rather than viewing each project in isolation.

(c) Build relationships of trust and understanding with the private sector.

(d) Develop professional supply chain management capacity through training and accreditation.

(e) Incorporate oversight functions to assess value for money.

The Standard is also issued as a follow-up on the reforms proposed in National Treasury’s 2015 Public Sector Supply Chain Management Review.

Public procurement that is unrelated to infrastructure delivery typically relates to goods and services that are standard, well-defined and readily scoped and specified. Once purchased, goods invariably need to be taken into storage prior to being issued for use. Services most often involve routine, repetitive services with well-understood interim and final deliverables which do not require strategic inputs or require decisions to be made regarding the fitness for purpose of the service outputs.

In contrast, procurement relating to the provision of new infrastructure or the rehabilitation, refurbishment or alteration of existing infrastructure covers a wide and diverse range of goods and services, which are required to provide or alter the condition of moveable assets on a site. Accordingly, the procurement process for the delivery of infrastructure involves the initial and subsequent recurring updating of planning processes at a portfolio level flowing out of an assessment of public sector service delivery requirements or business needs. Thereafter it involves planning at a project level, and the procurement and management of a network of suppliers, including subcontractors, to produce a product on a site. There is no need to store and issue materials or equipment unless these are issued to employees responsible for the maintenance or operation of infrastructure, or are issued free of charge to contractors for incorporation into the works.

An urgent need was identified to separate supply chain management requirements for infrastructure delivery from those for general goods and services in order to improve project outcomes. The Office of the Chief Procurement Officer (OCPO) has, in consultation with the relevant stakeholders, and following the receipt of public comments and inputs from provincial treasuries and other stakeholders, developed and published the Standard for Infrastructure Procurement and Delivery Management. This Standard enables the separation of the supply chain management requirements for infrastructure delivery from those for general goods and services. (Infrastructure delivery is the combination of all planning, technical, administrative and managerial actions associated with the construction, supply, refurbishment, rehabilitation, alteration, maintenance, operation or disposal of infrastructure).

![Figure 1: Different types of procurement](image-url)
The Standard establishes a control framework for the planning, design and implementation of infrastructure projects and infrastructure procurement. It also establishes minimum requirements for infrastructure procurement and the management of the supply chain associated with infrastructure. It is applicable, with effect from 1 July 2016, to all organs of state which are subject to the Public Finance Management Act. It will become applicable to municipalities and municipal entities during their 2016/2017 financial year when their councils adopt new SCM policies which are aligned with a National Treasury Model SCM policy for Infrastructure Procurement and Delivery Management which requires the implementation of this Standard.

The Standard and the associated instruction (PFMA) and circular (MFMA) can be downloaded from:


**MFMA**: http://mfma.treasury.gov.za/Circulars/Pages/default.aspx (see MFMA circular no 77)
THIS YEAR SAW the road shows of the SAICE Young Members Panel take to the streets again in an effort to contribute to the education of final-year civil engineering students on matters affecting their engineering future. This year PPS, financial service provider for professionals, invested in this initiative by sponsoring three road shows, thereby assisting SAICE in its quest to inform students and help them on the road towards becoming well-rounded professionals.

The SAICE YMP road shows focus on final-year students at universities and universities of technology to inform them holistically of what awaits them after they graduate. Presentations by industry leaders include topics such as Furthering your Education, Professional Registration with ECSA, Branding Yourself and Early Career Experiences. The highlight of these road shows remains the ever popular Ethics and Anti-Corruption plays performed by students and some members of the local SAICE branches. These plays focus on the importance of professional and principled behaviour in the engineering industry.

Students were encouraged to participate in the fun-filled days and to grab the opportunity to chat with presenters from industry – all towards preparing themselves for a professional career.
The 2015 road shows were held at the Vaal University of Technology (VUT), the Walter Sisulu University (WSU) in East London, and the Nelson Mandela Metropolitan University (NMMU) in Port Elizabeth. At each venue the SAICE YMP and PPS put on a full-day show for the students. At all three of these events students were informed about SAICE and its role in the civil engineering profession as a voluntary association, while PPS told students about its products for graduates who had completed a four-year programme, also informing them that PPS is now extending its offering to allow students in three-year diploma programmes to sign up once they start with their BTech degrees.

These road shows, which the students thoroughly enjoyed, took considerable time and effort to coordinate, and we would like to thank those persons who really put a lot of time and effort into getting things together, particularly Fridah Mahlangu from National Office, who is the SAICE YMP coordinator and who organised all three road shows with the help of the local SAICE branches. A special word of thanks therefore also goes to the SAICE Vaal, Amathole and Algoa branches who, together with their student chapters, assisted the YMP in getting these successful shows on the road.
JAMES McKELVEY, a respected and internationally recognised tunnel design, construction and risk management expert, passed away suddenly on 20 July 2015, at the age of 60.

James earned his Bachelor’s degree in Civil Engineering from the University of Natal in 1976, whereafter he joined Murray & Roberts Roads and Earthworks, and began work on what would become numerous South African tunnelling projects.

In 1980 James joined Keeve Steyn Incorporated (Hatch Goba today), where he fell under the mentorship of another doyen of the South African tunnelling industry, the late Alec Wilson. James quickly moved through the ranks at Keeve Steyn, becoming a Director in 1993.

During his more than 20 years at KSI, he became recognised as one of the foremost tunnelling engineers in South Africa. He led the company’s tunnelling team and many major projects, such as the Inanda-Wiggins Tunnels and the Midmar Potable Water Tunnel, to name just two. He also spent two years in the late 1980s as the senior tunnel design engineer for the 45 km long Transfer Tunnel. In 1998, he took up the position of Chief Resident Engineer on the Matsoku Weir and Diversion Tunnel, followed by the same role on the 32 km Mohale Tunnel. Those three projects are part of the Lesotho Highlands Water Project, one of the largest water transfer programmes ever developed in Africa, and recognised as the Project of the Century by the South African Institution of Civil Engineering.

James was undoubtedly a man of intellect and integrity, and an expert in tunnel and underground works design and construction, but most importantly, he was a great guy and fun to work and socialise with. I could never persuade him away from tunnels to-wards the beauty of dam construction. When we stood at the crest of the Katse Dam spillway once, he looked down all 185 m of the dam and said, “Now I know why I’m a tunnelling engineer.”!!

In the early 2000s, after completion of the Mohale Tunnel, James decided to seek greener tunnelling pastures in the United States, and joined Black & Veatch in 2002 as a senior member of the company’s geo-engineering group. In 2003, he moved to Charleston, South Carolina, to lend his talents to a multi-phased wastewater tunnel replacement programme. An Associate Vice-President at Black & Veatch, James later began the company’s Tunnelling Centre of Excellence in Indianapolis before taking on the company’s Chief Tunnel Engineer role in 2013.

During his 13 years at Black & Veatch, James was engaged on many of the company’s large-diameter tunnel and pipeline projects throughout North America – in Indianapolis and Fort Wayne in Indiana; Louisville, Kentucky; Columbus, Ohio; Omaha, Nebraska; Las Vegas, Nevada; Washington, D.C.; and Toronto, Ontario, in Canada – in addition to his work in Charleston and many other locations.

James has left a lasting legacy by mentoring many professionals along the way, and he has also left an indelible mark on the industry as a tunnelling authority known for practical, insightful solutions to complex design and construction challenges. He served on both the Executive Council and the Organising Committee of the International Tunnelling and Underground Space Association (ITA), and he represented Black & Veatch as a sustaining member of the Underground Construction Association (UCA) of the Society for Mining, Metallurgy and Exploration (SME). Within the UCA, James served as a member of the George A Fox Organising Committee. He was also a member of the Organising Committee for the ITA-AITES World Tunnelling Conference 2016 to be held in San Francisco. James also formerly served on the ITA Executive Committee between 1997 and 2000, and as a member of the ITA working group on shotcrete, as a tutor of the ITA working group on contractual practice, chair of the South African National Committee on Tunnelling (SANCOT) from 2000 to 2002, and of SANCOT’s working group on shotcrete. He authored numerous papers and chapters of books, including a logistics chapter in Megaprojects: Challenges and Recommended Practices.

James McKelvey is survived by Jacqui, his wife of 12 years; children (and their spouses) Bianca and Greg, Monique and Kevin, Katherine and Mitch, Stuart and Andrea, and Ross; grandchildren Cameron and Jude; and a sister, Dianne.

May you rest in peace my colleague and friend – you will be sorely missed, but your legacy will live on.

Andy Griffiths
andy.griffiths@hatch.co.za
CLAUDE PIERRE MARAIS passed away in Pretoria on 20 July 2014 at the age of 83.

Claude was educated in Durban and was a keen sportsman, playing first team rugby, cricket and tennis at Glenwood High.

He graduated in Civil Engineering at the University of Natal (BSc Eng) in 1952 and was awarded a PhD (Eng) in 1981 by the same university. His engineering career included nine years of municipal engineering in East London and Vereeniging and 28 years of research with the CSIR (NIRR/NITRR & DRTT), joining the then Bituminous Binders Research Unit in 1962. His field of expertise was in road pavement engineering, particularly related to bituminous-treated materials.

Claude published extensively, both locally and overseas, and received the SAICE award for the best full-length paper presented during 1970, the prize for one of the best papers dealing with Research and Development published by SAICE during 1981 and 1986, and the SAICE award for Outstanding Achievement in Asphalt Pavement Technology in 1986, which was sponsored by CAPSA.

In addition to playing a leading role in the TRH series of national guide documents on primers, seals, asphalts, and materials in general, Claude is perhaps best known for his contributions to the design of seals, gap-graded asphalt surfacings and sand-asphalt bases, all of which were backed up by full-scale and small-scale road experiments, and which also led to some new test methods and/or requirements, such as ball penetration, air permeability and vane shear strength.

After retirement from the CSIR in 1990 as Head of the Bituminous Materials Group, he was employed as Technical Manager to Abecol from 1991 to 1992, and as Group Materials Engineer for COLAS from 1992 to 1993.

After his final retirement he kept busy with carpentry and reading geology, anthropology and archaeology, and being involved in community activities, which included organising the very popular bimonthly Padmakers’ Lunches for retired and semi-retired road engineers in the Pretoria Botanical Gardens.

Claude leaves his wife Jean and two daughters, Diana and Caryn, two grandchildren and one great-grandchild, and son-in-law Eugene van der Westhuizen.

Dr Frank Netterberg
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Letter

RUNNING DRY
(Civil Engineering September 2015 pp 25–26)

The above-mentioned article by Johann van Rensburg refers.

Whilst I totally agree that increasing fuel efficiency, electric vehicles, etc, will eventually influence the revenue from the fuel levy (a proxy for a road user charge) in SA, I wish to point out a slightly different perspective based on the numbers provided by the author.

In the full paper (delivered at SATC) it was shown that the fuel levy revenue increased from R14.8 billion in 2003 to R36.2 billion in 2012 (the budgeted value for 2015/16 is around R48 billion). The growth in revenue between 2003 and 2012, according to the author, is an average increase in nominal terms of 10.8% p.a. (10.4% p.a.)? If I use the Department of Statistics CPI – middle of 2003 = 60.5 and middle of 2012 = 97.8 (Dec 2012 = 100) – then the growth of the fuel levy revenue, in real terms, was 4.7% p.a. over the nine-year period (or 51% for the full period). This exceeds all three indicators in Figure 1 by some margin, namely growth in vehicle population, fuel sales and kilometres travelled. It also exceeds the real economic growth rate of SA over this period. Viewed from this angle, the Minister of Finance did an excellent job in taxing road users. It would in fact be interesting to see whether the growth in company tax, personal tax and VAT were below or higher than these values of nominal and real revenue growth.

The author has developed a productivity index (for the fuel levy) which is based on “additional vehicle kilometres travelled”, which he found to be decreasing between 2003 and 2012. The main reasons for this probably are the declining annual vehicle kilometres per vehicle (also in the full paper), as well as the improved fuel economy of vehicles, rather than the level of the fuel levy. It can be asked whether the level of the fuel levy contributed to the lower vehicle kilometres travelled per vehicle per annum.

So, while SA will in future have to consider new funding sources for road infrastructure, the presented data shows an extraordinary growth in revenue from the fuel levy. Current vehicle ownership of around 200 per 1 000 population can and should still grow if the value for fully developed countries of 800 per 1 000 population (USA) is considered. Electric vehicles are taking off slowly, so the fuel levy should remain an excellent (sustainable) revenue source (in SA) for the medium term.

Hein Stander Pr Eng
hein.stander@aecom.com
# SAICE Training Calendar 2016

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<th>Course Name</th>
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In-house courses are available. For SAICE in-house courses, please contact Cheryl-Lee Williams (cheryl-lee@saice.org.za) or Dawn Hermanus (dawn@saice.org.za) on 011 805 5947.

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