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Ongoing construction at Northlands Deco Park runs in parallel with preparations for the launch of new industrial projects. To fast-track project completion at Deco Park, Northlands recently expanded its earthmoving capabilities with the addition in January 2015 of a Cat TH414C telehandler, supplied and supported by Southern African Cat dealer, Barloworld Equipment.

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# EDITOR'S COMMENT



**For the six years that I have been editor of *Construction World* I have been attending the Consulting Engineers South Africa's (CESA) annual media briefing. It is during these briefings that the current president of CESA gives his theme for the year, while reflecting on what was achieved in the preceding year.**



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The tone of these briefings has ranged from extremely positive (2009 and 2010) and the (increasingly) less than optimistic briefings post the massive local construction boom and the simultaneous world economic crisis.

Over the years the messages of these briefings have escalated in urgency: the country is faced with severe social, political and economic difficulties. Hand-in-hand with these is the urgent need for infrastructure development. It is a vicious cycle though: you cannot alleviate unemployment without huge infrastructure projects and correct skills, while the correct education levels are needed to support these sustained infrastructure projects.

The current CESA president, Abe Thela presented his theme for 2015 recently: 'Meeting socio-economic challenges through sustained infrastructure investment' focuses on the role infrastructure plays in socio-economic development. He believes that increased investment in infrastructure will lead to improved skills development.

## The reality

The quality of education for poor black South Africans is substandard. South Africa fares appallingly in maths and science – and without these subjects the training of engineers and related disciplines cannot happen.

The matter is exacerbated by the unemployment rate of 25,4%. Infrastructure development can go a long way in bringing this figure down, but one needs a generation that is equipped with the correct skills to achieve this. Thela says that this actually puts an entire generation at risk; that it contributes to the socio-political disorder and puts even more strain on SA's already limited financial resources. All in all it arrests any kind of economic growth.

## The ultimate goal: increasing infrastructure investment

The National Development Plan states that 30% of SA's GDP need to be spent on infrastructure development if it is going to make

any meaningful contribution in the eradication of unemployment/poverty. Coupled with this is an ideal annual growth rate of 5 – 7%. Both will halve the unemployment rate. The reality is that only 22,3% of GDP is spent on infrastructure and the country is not even achieving a 3% growth rate. These facts re-emphasise the need for a dramatic increase in infrastructure development. Thela indicates that this can only be achieved by leveraging private sector resources (thus an increase in public private partnerships), and addressing the inefficiencies in the procurement system (eradicating the lack of planning, inappropriate procurement approaches, better project management capacity, increasing skills and eradicating corruption). These will increase SA'S credit rating which has been downgraded by various rating agencies.

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### PUBLISHED MONTHLY BY

Crown Publications cc  
P O Box 140  
BEDFORDVIEW, 2008  
Tel: 27 11-622-4770 • Fax: 27 11-615-6108

### PRINTED BY

Tandym Cape



**TOTAL CIRCULATION:**  
(Fourth Quarter '14)  
**4 710**

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# Pioneering excellence in **RISK MANAGEMENT**

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Aurecon South Africa's operational and project risk management team recently won the award for 'Best Risk Consultancy' at the 2014 annual Institute of Risk Management South Africa (IRMSA) Awards. At the same event in 2013, Aurecon was also the category winner in the 'Environmental Initiative' category and runner-up in the 'Mining, Resources, Construction, Engineering and Related Services' category.



**Simon van Wyk, an expert in risk management at Aurecon.**

> “These achievements highlight Aurecon’s aptitude for providing in-depth solutions to the complex project risks that our clients face,” says Simon van Wyk, an expert in risk management at Aurecon, who is also an Associate Member of IRMSA, a Corporate Member of the Disaster Management Institute of Southern Africa (DMISA), as well as a Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP).

“While many companies understand that risk management brings value to a project, there’s often still a learning curve that needs to be overcome in order to get everyone on board with understanding the objectives and the true value add – especially the vital importance of including risk management during the design and execution phases of a project,” believes Van Wyk.

## **A holistic understanding**

There are a number of risks, including disaster risk, financial risk, environmental risk and operational risk, that need to be assessed and managed before a project can commence, and none of these risks should be viewed in a ‘silo’.

Several of Aurecon’s clients have been factoring risk assessment and management into their project costs during the concept phase of projects for many years, so working with these types of ‘risk mature’ clients gives risk consultants the advantage of not having to justify methodologies and what might appear to be ‘over-analysis’ of project risks. With clients who haven’t always been working with risk management consultants, tools and processes before, however, the risk assessment process is not always the easiest learning curve.

The nature of risk management is in-depth analysis to inform decision-making and ensuring the client understand that the outputs of these robust and detailed analysis methodologies are paramount.

“We align our risk management solutions with international best practices and, while some clients have embraced risk management as a part of their project design, there are still many clients who require additional edification in order to fully understand the value that risk management brings to a project – particularly large projects. There are a number of risk assessment methodologies available in the market, but determining the most appropriate methodology can be a complex process in itself,” explains Van Wyk.

Ultimately, it is imperative to use the correct application of risk management commensurate with the context and nature of the project to ensure the value added is immediate and accurate. Aurecon uses several methodologies and tools that are globally accepted to assess and evaluate potential risks.

“Ideally, all clients would appreciate the necessity of including risk assessment and management plans during the design phase of a project. Not only does this make a risk management consultant’s job easier, but it provides clients with the tools, insights and contingency plans they need to gain maximum benefit from our services,” adds Van Wyk.

## Risk management in an ever-changing environment

An additional challenge is providing a comprehensive risk management solution to clients who operate in an ever-changing

economic environment. Van Wyk explains that the complexity of large projects has skyrocketed over the past few years, leading Aurecon’s team to find ways of continually applying and adapting international best practices to new challenges that confront its clients.

“Many of our clients operate in environments that change at a quick pace and one of the key challenges that a risk management solution needs to address is the level of uncertainty that clients face. One of the core benefits of investing in risk management is that it brings forward a more accurate view on the level of uncertainty at a given time, which means decision-making is made easier in light of the information gleaned through robust assessment and evaluation,” says Van Wyk.

## Clarifying expectations and meeting clients’ needs

Aurecon’s unique approach to risk management ensures that cutting-edge solutions are applied to each client’s project. Besides using the latest tools and techniques, successful risk management solutions are ensured through the thorough analysis of each project’s risk management needs, as well as making sure that a client’s exposure to various risks are fully understood right from the outset of a project.

“Our initial sessions with our clients lay the vital foundation that is needed for successful risk management projects,” comments Van Wyk. “During this session, we are able to wrap our heads around what a client needs, clarify their expectations and match innovative risk management methodologies to their project. In order to close the

gap between differing levels of risk maturity, we use international best practices coupled with building a solid relationship, based on understanding the client’s expectations, to ensure service delivery is appropriate to the nature and scale of the project.”

## No longer a ‘nice to have’

Instead of seeing risk management as a ‘nice to have’ on projects, an increasing number of clients realise that not only their projects, but their entire business philosophy, needs to be risk averse. In light of this, businesses are adopting a risk-centric business philosophy which entails proactive measures to harness opportunities through sound principles of risk management.

“Instead of hoping for the best, leading companies know that they need to measure their risks in each phase of the project life cycle. This type of preparation leads to progressive and informed decision-making,” adds Van Wyk.

As a company, Aurecon is exposed to some of the largest projects in the world, providing the experience that is needed to bring exceptional and complex lessons learned to new projects and teams. While the latest methodologies, models and tools are important, it is the intellectual property, engineering excellence and understanding of operational and project risk management that sets the company apart as leading risk consultants.

“All of the standards, systems and techniques can be in place, but without the years of experience in risk management, none of these will add the kind of value that a client needs from an internationally leading risk management team. Partnering with an experienced risk consultant is key to ensuring a project succeeds,” concludes Van Wyk. <

## TOP GLOBAL AWARDS

**Pilot Crushtec International’s reputation as a world-class supplier of crushing and screening equipment received a global endorsement recently when the company was honoured at Sandvik Mobiles’ 2014 Distributor Awards.**

> The Jet Park-based business was judged to be the top performer in two categories. Firstly, it was recognised as Sandvik’s best distributor in terms of marketing support and, secondly, for a remarkable aftermarket sales performance in 2014.

Pilot Crushtec International has achieved this recognition, whilst still being a relative newcomer to marketing Sandvik products. CEO Sandro Scherf concluded the distribution agreement with Sandvik as recently as October 2012, and his company’s performance was judged against stiff opposition in the form of nearly 75 other distributors from almost 50 countries around the globe.

The panel of judges, drawn from Sandvik management, praised the South African company for its approach to promoting Sandvik mobile products and for its effective use of social media channels.

Special mention was made of the success Pilot Crushtec International has achieved in endowing Sandvik with a vibrant media personality in both local and international publications as well as on the company’s website.

The prize for best aftermarket sales performance was particularly noteworthy as it was based on sales volumes, something Sandvik regards as especially significant in view of the relatively short time in which the two companies have worked together.

During the course of the ceremony held at Northern Ireland’s prestigious Slieve Russell Hotel, Sandvik Mobile’s global sales director, Eugene Lyons, described the association between the two organisations: “We share a very open and honest relationship with a mutual focus on the needs of the end-user. Pilot Crushtec International’s marketing in this industry is truly world-class and is an example to all other dealers on how they, themselves, should market.” &



**Sandro Scherf (RIGHT), CEO of Pilot Crushtec International, accepting the award for Best Marketing Support from Eugene Lyons, global sales director, Sandvik Mobiles.**

# The way forward ON WASTE

The purpose of the National Environmental Management Waste Act 2008 (NEMWA), is to reform the law regulating waste management, in order to protect public health and the environment.

> Among the wide-ranging topics that NEMWA addresses is the establishment of a national waste information system and provision for the licensing and control of waste management activities. While society increasingly recognises the importance of promoting recovery, recycling and reuse in sustainable development, this has to be balanced against potential health issues.

The National Waste Management: Amendment Bill, which was approved by Parliament on 28 February 2014, seeks to address some of the challenges of waste management by amending the definitions of 'waste', 'reuse' and 'recovery' to provide more clarity and certainty. While the Bill is still a 'work in progress', it is a significant step forward. Recognition is being given to waste that is being put to beneficial use, although the proposed regulations are still struggling to adequately address situations where material reverts to being waste, or a portion of it was never recovered and used for a value adding purpose.



**Professor Richard Kruger, president of the SA Coal Ash Association.**

## The case for fly ash

An important debate in the building materials industry is whether fly ash should be classified as a 'waste', and whether it should be regarded as hazardous. It would seem to be totally unwarranted to classify it as 'waste' when Ash Resources, South Africa's leading manufacturer and supplier of fly ash products, pioneered the recycling of a material that was originally considered a waste product of the Eskom coal-fired power stations. For over 30 years, the company has been processing it into value-added cementitious building materials for the local cement and concrete industries.

Ash Resources has also developed fine fly ash inert fillers for plastics and rubber products, while the company's ongoing research is opening up an exciting range of applications in mining and waste management. Today, the local demand for processed fly ash products exceeds 2 million tons a year.

The company operates five plants that receive the raw fly ash through direct links to Eskom's coal-fired power stations and process it into fit-for purpose products, which are sold in compliance with technical specifications SANS 50450 and SANS 197. Fly ash is virtually zero carbon rated and its development by Ash Resources is playing an important 'green engineering' role in South Africa's cementitious building materials by reducing process and energy input, carbon dioxide (CO<sub>2</sub>) emissions and reducing the consumption of non-renewable natural resources. During the last 10 years, the use of Ash Resources' products by the local cement, readymix and construction industries has saved over 17,5 million tons of greenhouse gas emissions.

However, the coal-fired power stations are continuing to dispose of a significant amount of ash material on landfill sites, which would logically be classified as 'waste'.

## The health issue

"South Africa is taking a different approach to categorising fly ash," comments Professor Richard Kruger, President of the SA Coal Ash Association. While obviously benefiting from monitoring the overseas regulatory developments, the Department of Environmental Affairs is not trying to emulate Europe or the USA. In the USA, fly ash was never referred to as 'waste' but rather as a 'by-product' in



**Ash Resources MD, Tshepiso Dumasi.**

their Resource Conservation Recovery Act and the main concern is whether a material is hazardous or not. In Europe, the implementation of the Waste Framework Directive and compliance with the European Chemical Agency's REACH criteria facilitates the categorisation of fly ash as a by-product. NEMWA excludes this option but includes the possibility of exemption for fly ash."

The trace element content of South African fly ash differs from that in the northern hemisphere and the concentrations of many of the toxic elements (e.g. arsenic) are much lower than their counterparts elsewhere in the world.

## The next step

The National Waste Management: Amendment Bill makes provision in Section 74 for the Minister to exempt or exclude any waste stream or portion of a waste stream from the definition of 'waste'. This would seem to be a logical approach to classifying South Africa's vitally important processed fly ash. "The Amendment Bill is definitely a step in the right direction," says Professor Kruger. "But I believe it could still be made clearer. The Bill will now be presented to the National Council of Provinces and we await any new developments."

## The role of Ash Resources

"Ash Resources contributes immensely to the country through reduction of carbon dioxide emissions and other greenhouse gases," comments Ash Resources MD, Tshepiso Dumasi. "Most importantly, the company is positively contributing to the country's National Development Plan through employment. However, this can be accelerated if processed fly ash is exempted from NEMWA as a hazardous waste". <





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# MBA MARKETING CAMPAIGN

**Master Builders Association (MBA) North has embarked on a new intensive marketing campaign aimed at persuading the consumer to entrust building and related work only to Master Builders.**

> Mohau Mphomela, executive director of MBA North, says the Association has found that many newer members tend to resign membership within a year or two, after insufficient new work had materialised despite being a registered member of MBA North, and therefore entitled to call themselves a Master Builder. "It was clear that for newer members to see direct and tangible income benefits from MBA membership, the consumer had to be targeted and convinced of the merits of dealing only with our members. This will hopefully produce the income injection new and long-standing MBA North members are seeking. We have therefore allocated the first-ever MBA North Consumer Budget to reach the consumer in Gauteng, North-West, Limpopo and Mpumalanga, the other provinces under our jurisdiction," he explained.

Palesa Khambi, MBA North marketing manager, will drive the full-scale marketing campaign which will involve all sectors of the consumer and provincial media, radio and television, social electronic media, as well as having a presence at appropriate mass consumer exhibitions, such as the Rand Show.

Mphomela said in endorsing the skills, workmanship and trustworthiness of members to consumers, MBA North would have to use every means at its disposal to ensure that people who entrusted work to members become completely satisfied customers, with the potential to 'spread the word' and also provide positive formal referrals. "MBA North will call on its Good Practice/Disciplinary Committee to mediate in possible consumer disputes that require more than routine handling by our Association's Legal Department. We envisage action by this special Committee to be required when, for example, a member regularly causes consumer complaints or commits a major, incontestable building error. Several past presidents of MBA North serve on this vastly experienced committee," he explained. ■

**Mohau Mphomela, executive director of Master Builders Association (MBA) North, has announced that MBA North has launched a new, intensive marketing campaign.**



# HOPE FOR THE FUTURE

**Master Builders South Africa (MBSA) has welcomed the unexpectedly high levels of building industry confidence reflected in the FNB/BER Building Confidence Index for the final quarter of 2014, and says it augurs well for an improved 2015 for the beleaguered building sector.**

> The FNB/BER Building Confidence Index, released on 1 December showed the highest level of confidence among building industry players since the beginning of 2008 and, according to the Index, confirmed that the building sector was now in the midst of a revival. The Index jumped up 15 points during the past quarter with main contractors' confidence 13 index points higher, and subcontractors' confidence up by three index points.

Tumi Dlamini, executive director of MBSA, says the confident outlook of contractors approached for the final quarter of 2015 Index showed that, although the industry still faced formidable challenges, the small reprieve experienced in the third quarter of the Index was gaining momentum. "There is now certainly potential for a much improved 2015. With this indication of higher hopes for the future, we expect that 2015 could be a turnaround year for the industry with an increase in building activities around the country. MBSA is also further encouraged by the fact that renewed confidence is now permeating across the rest of the building value chain, with the subcon-

tractors' confidence also having risen. Retailers have also benefitted from this recovery."

Dlamini said for an industry that had traded under extremely difficult conditions in 2014, with low margins and significantly decreased building activities throughout the country, the Index's findings came at an opportune time just before the industry's end-of-year shutdown.

"Based on the urgency that we have seen from government to deliver the long-awaited infrastructural projects from its budget allocation of R847-billion, MBSA fervently hopes that 2015 will be the year in which this growth momentum for the industry is carried through. A re-energised and focused commitment by government to deliver on these vital infrastructure projects will augment the gains now reported in this Index.

"MBSA believes that the recovery is sustainable and that the building and construction industry will in 2015 realise its potential to create and maintain increased levels of employment, and continue to play a significant role in the economy of South Africa," Dlamini concludes. ■

# NEW EXECUTIVE DIRECTOR

**Allen Bodill has been named as the new executive director of the Master Builders Association of the Western Cape (MBAWC), effective from 1 March 2015.**

> He replaces Rob Johnson, who passed away suddenly last year. According to Willem Vorster, who has been serving as the MBAWC's acting executive director while a permanent replacement was sought, "Bodill brings with him a wealth of experience and expertise in the industry and will greatly assist our association in achieving new strengths in the coming years."

Vorster continues, "He was selected for his extensive experience in the domestic, commercial, industrial and public sectors of the Cape Peninsula construction industry. He is also a highly competent strategic leader, who is adept at financial and budget management, human resource and stakeholder relationship management, labour relations and collective bargaining. He is also well-versed in construction dispute-resolution and adjudication, resource and procurement management, as well as organisational marketing. In addition, Allen is knowledgeable about dealing with construction contractual and legal issues."

In 2010 Bodill was elected as president of the MBAWC, a position for which he was re-elected the following year. During his presidency he enjoyed extensive interaction with

Master Builders South Africa and amplified his experience of engaging with national suppliers and organs of the State.

He is registered with the South African Council for The Project and Construction Management Professions (SACPCMP), The Engineering Council of South Africa (ECSA), The National Home Builders Registration Council (NHBRC), and serves on the Council of the Building Industry Bargaining Council (BIBC). In addition, Bodill is a member of the Institute of Certificated Mechanical and Electrical Engineers of South Africa (ICMEESA), and an associate member of the South African Institute of Mechanical Engineers (SAIMEchE). ■

**Allen Bodill, executive director of the MBAWC.**



## 2014 KAAP AGRICULTURE AWARDS' SUPPLIER OF THE YEAR

South African cement supplier, PPC was awarded Supplier of the Year in the Hardware & Building Materials category at the recent Kaap Agri Awards held in Cape Town.

> Kaap Agri is a retail services group which supplies a variety of products and services to the agricultural sector, as well as the general public. They have 167 outlets in over 88 locations throughout South Africa.

The awards are held annually to distinguish top performing suppliers. "In line with our company culture, we reward our top achievers and show our gratitude for their contribution to making us meaningful to our customers," says Hennie Smith, general manager: supply chain at the Kaap Agri Group.

A unique rating system is used, whereby each branch independently rates their suppliers, per category, on a scorecard.

This scorecard comprises 15 performance elements, with Ethics, Relationships, Business Impact, Marketing and Competitiveness being key elements. The scores are consolidated with staff in the branches, who deal with customers

on a daily basis, making the final decisions. The top 33 suppliers are then invited to the awards ceremony, with three finalists per category.

"PPC is a fantastic supplier," says Smit. "They set the standard for walking the extra mile with us, and what makes them so special is the PPC team.

"They are relationship-builders and understand the art of nurturing great relationships – both with our valued customers, as well as our team. PPC's quality focus is superb and proves that the South African market loves quality embedded in integrity."

Michael Erasmus, area manager: retail and country districts for PPC commented: "Our relationship with Kaap Agri is a journey. When we travel together, the road becomes easier. With Kaap Agri as a 'partner' in our business, we know that customers should be better off as a result of our existence." ■



LEFT: Clint Wicomb (PPC general manager: sales & marketing coastal) and Sean Walsh (MD: Kaap Agri).

## REINFORCING A CULTURE OF SAFETY

The Scaw Metals Group (Scaw), a niche South African steel manufacturer, is continuing on its journey toward a zero injury culture, with all employees being made aware that they each play a role in making a difference resulting from a shared understanding and dedication to working safely.

> Scaw believes that all employees should be able to return home fit and well at the end of each work day armed with knowledge to educate their families and communities regarding safety, health, and environmental issues.

As a manufacturer of value-added steel products from steel scrap and directly reduced iron, Scaw is active in one of the world's most sustainable industries. It procures and processes its own steel scrap requirements and recycles significant volumes of steel in its steelmaking operations.

"At Scaw we continuously drive our safety, health, and environment management programs. As an organisation it is imperative for sustainable business performance and improvement", asserts Jurgen Theiss, head of safety, health and environment for Scaw Group.

The group is mindful of the impact of global warming and the pressing need to conserve finite resources. It strives to improve the efficiencies and hence maximise the use of the resources it uses to manufacture its range of steel products.

With a strong and culturally diverse team of talented, enthusiastic individuals, nothing is more important to Scaw, its operations, and the safety management teams than the sustain-

ability of Scaw's businesses and the safety and wellbeing of its workers.

"Scaw has adopted standards to ensure that minimum standards are maintained throughout the group, as any one injury or fatality is one too many. We remain committed to reducing work-related injury, and death, while also providing respectful support and care – with an acceptance of and responsibility for the premise that all injuries and occupational illnesses are preventable. This applied as we improve work conditions and safety," says Theiss.

Scaw attributes regular spot checks and accessibility to health care facilities among other tactics with having led to many positive behavioral changes in its employees. Examples include closer attention regarding correct personal protective gear, workers being more aware of their surroundings, moving and standing machinery, and the use of equipment.

Theiss continues, "We have put quite a lot of pressure on everyone but this persistence has benefited everyone by minimising risk and reducing accidents.

To have achieved such an impressive safety performance is further demonstration of the commitment of our employees and contractors and their willingness to work with us for the benefit of everyone." ■

Staff and contractor training workshops and presentations have also contributed to greater awareness and survey participation - allowing for an exchange of views and discussions on the solutions to potential safety challenges, problems or concerns.

"Our accomplishments in compliance to our own and regulated safety standards are encouraging, and we intend to do better still," concludes Theiss. ■

### Scaw Metals Group

Scaw is a South Africa mini mill producing highly specialised and critical consumable components for the mining, rail, power, offshore oil and gas, construction, commercial and other industrial sectors. The business operates through four product focused business units with facilities in South Africa. Grinding Media produces high chrome and forged grinding media. Wire Rod Products produces steel wire rope, chain, wire and strand and other related products for mining, industrial, construction and offshore oil drilling applications. Cast Products designs and produces a variety of cast steel products for the mining, metal processing, power generation and railway industries. Rolled Products is a manufacturer of low and high carbon long steel products.

# SOLAR PLANT AUDIT

ACWA Power Solafrica's new Bokpoort Concentrating Solar Power (CSP) plant is not only being built to harness solar power to supply into Eskom's grid to assist in alleviating the country's power crisis, but will also satisfy one of the National Development Plan's most crucial agendas – job creation in an area that sorely needs it.

**>** Royal HaskoningDHV was appointed in 2010 to carry out the Environmental Impact Assessment (EIA) for the R5-billion ACWA Power Solafrica Bokpoort Concentrated Solar Power Plant situated at Bokpoort, which is 25 km north of Groblershoop in the Northern Cape. In addition to this, Royal HaskoningDHV was also appointed to carry out two Basic Assessment Processes for the water supply pipeline from the Orange River.

The position of the first abstraction point was deemed to be unsuitable due to the Orange River's flood patterns necessitating the design of a second abstraction point, as well as 3 km pipeline extension. In 2013 Royal HaskoningDHV was appointed as the Environmental Control Officer (ECO) at the start of project construction which culminates in December 2015.

The approved EIA is for a 75 MW CSP Power Plant and currently a 50 MW plant is being constructed utilising parabolic trough technology which is the more suitable CSP technology option for the environment, especially avifauna.

Malcolm Roods, market segment leader, environmental services at Royal HaskoningDHV states, "When applying for an EIA it is important to ensure that the application is

for a large enough area; as well as that the maximum capacity together with all relevant EIA listed activities are applied for". This allows for phased development should it be opted, like with the Bokpoort development where another 25 MW generating capacity can be added at a later stage. Having as much detailed engineering information as possible is crucial to inform the EIA process. He goes on to say that it is also important to listen to local knowledge. The EIA took just 11 months, with the recent basic assessment process taking only four months. Roods believes that these good timeframes was only achieved with the help of the National Department of Environmental Affairs who assisted in achieving a much faster turnaround time, and that they should be commended. It is also important to involve all the relevant and affected stakeholders during the public participation process, like in this case Transnet, Eskom, etc.

Elton Julies, HSEQ Manager ACWA Power Africa Holdings, states, "Bokpoort is different from other solar projects in that we can generate electricity from the solar power system during the night. We have 9,3 hours of storage capacity suitable for base load generation. "The heat from the huge salt storage tanks is used to generate electricity for up to 9,3 hours during the night".

## Challenges

Some of the project challenges include a 25 km dirt road to the site that is subject to increased traffic volumes during construction. By far the greatest challenge is waste management, both hazardous and general waste during construction, exacerbated by the fact that site location is very remote and considering that the Northern Cape has very limited licensed waste sites.

Acting as environmental control officer for the project, Roods, states, "The main purpose of the monthly compliance audits is to ensure that all relevant environmental conditions prescribed in the project Environmental Authorisations (EA) and approved Environmental Management Plan (EMP) & Programmes (EMPRs) have been appropriately and adequately considered by ACWA

## ACWA Power

ACWA Power Africa Holdings is a division of ACWA Power International which is a lead developer, owner and operator of independent water and power projects structured on a concession or utility outsourcing contract model. ACWA Power International has also developed and will operate a 160 MW sister solar power plant to Bokpoort, in Morocco and are in the process of constructing a 300 MW coal fired power plant in Mozambique.

Power Africa and its contractors during the construction phase". Roods goes on to state, "ACWA Power are achieving a monthly compliance of above 90% which is highly commendable considering the remote location of the site".

Julies states, "ACWA Power Africa Holdings has a strong commitment to the environment with our zero harm policy in terms of Health, Safety and the Environmental compliance on all our facilities. External audits are carried out on all our facilities in compliance with World Bank IFC guidelines and standards, ensuring international compliance".

During the construction phase of Bokpoort ACWA Power has allocated R5-million into local community development projects for the. Kheis Municipality. This includes business skills development; the provision of solar lighting system; a water reticulation project; and the upgrading of the high school computer laboratory including the provision of internet access. Julies says, "As part of our social responsibility programme we recently donated 100 indigenous trees to schools and the community in the area. In addition to this ACWA Power has established an aloe nursery as part of a relocation programme for those aloes that have been removed from the project site.

Royal HaskoningDHV, leaders in Environmental Services, carried out the first 100 MW solar EIA in the country for Eskom, in which they assessed three farms in the Northern Cape with Bokpoort being one of them. The company, in conjunction with Solafrica was also the first to undertake a water use license for a development of this nature, during which wet cooling was authorised by the Department of Water and Sanitation (DWS). Going forward however, dry cooling is seen by the DWS as the preferred method of cooling as it is less water intensive, and is in line with their water saving initiatives. **<**



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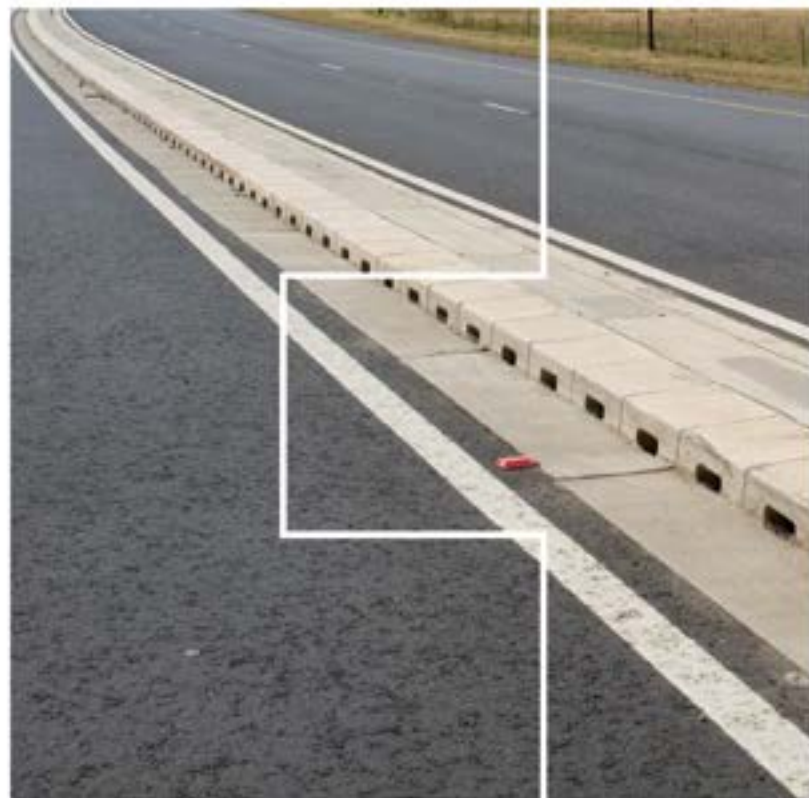
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# BARRIERS

## to implementing the smart grid in SA?



A smart grid facilitates the efficient, intelligent use of available energy and can achieve significant energy savings. This is of course of tremendous benefit to South Africa which is experiencing a dire energy crisis. There are however certain barriers to implementing a smart grid in the country.

➤ “A smart grid can be defined as an evolved grid system which has been expanded through the addition of intelligence that manages electricity demand in a sustainable, reliable and economic manner,” explains Jaco Cronje, operations director for EES Africa. “The smart grid allows the integration of all types of power generation, including renewables. Smart grids are an integral part of smart cities.”

EES is an ISO 9001:2008 certified company providing management, engineering and auditing services to a range of industries throughout Africa. It specialises in the integration of multiple system infrastructure including ICT, data centres, audio visual, life safety, security and building automation systems.

12

### The current grid

The grid was originally designed for the supply of low-cost abundant energy sourced far away from where it was required by consumers. Renewable energy like solar and wind, then started to contribute to the grid. This however did not make the grid a smart grid but a grid with some green energy suppliers.

“Today a smart meter is used to provide information and enable customer control and knowledge of energy usage. This type of data allows the energy consumer to know the amount of electricity being used, when it is used and by which appliance. The smart grid brings about a whole new industry of technology, intelligence and efficiencies previously unknown,” says Cronje.

This year Johannesburg CityPower announced the roll-out of 55 000 smart metres. It should be noted that the smart meter is only one constituent, albeit a vital constituent, of the smart grid.

### Barriers to implementing a smart grid

“In discussing the barriers to implementing a smart grid it is important to note that we are not building a smart grid or smart city from the ground up in South Africa,” Cronje states. “We have inherited cities and a grid that we need to morph into the most sustainable solution.”

#### The major barriers are:

- Public perception needs to be managed. Contrary to what a large percentage of the public appear to believe, smart meters and smart grids do not lead to increased energy costs. It has been unfortunate that the roll out of this key component has coincided with electricity increases.
- Financing can present challenges. It should be remembered though that this presents opportunities for venture capitalists to embrace the developing smart grid and capitalise on opportunities that did not exist before.

- Policies, regulations and the roadmap of the smart grid need to be clearly communicated. Some cities in South Africa have found this to be a challenge and therefore embarked on a process of rolling out with little communications. Other cities have really embraced the opportunity and are leading by example.
- Data privacy and cyber security need to be taken into account. Information obtained by the smart meter provides any marketer with valuable insight into consumers, without the consumers explicitly allowing such information to be made available. A further risk is that such data would need to be secured through various levels of barriers from hackers and fraudulent activities.
- Regulations and frameworks can stifle the market, and this can be prohibitive as it may stifle ingenuity which is needed for the smart grid to grow in its early stages. Once the early stages have been implemented it is then appropriate for the different vendors and mechanisms to interoperate.
- In designing and implementing smart grids, energy industry players need to ensure both products and installation techniques are of adequate quality to ensure the solution outlasts the deployment period.
- Connectivity requirements must be met so that data can be obtained and made available for use. Connectivity can be achieved through various technical mechanisms.
- Skills shortages can be a problem as the creation of the smart grid and smart cities is a reasonably new initiative.

### Key solutions

What then are the solutions needed to competently prepare for what the future holds? Complete stakeholder buy-in is essential for the successful roll-out of smart grids in South Africa. Integral to this is connectivity and communication between all industry players.

#### The industry players are:

- Government;
- Utilities, which are Eskom and Independent Power Producers (IPPs);
- Vendors, which are Eskom and municipalities; and
- Consumers or the end users.

Regulations need to be put into practice to encourage this behavior: ingenuity in the early phases followed by ongoing implementation in accordance with specific processes and protocol.

Cronje also advises that roll-out plans should consider a staggered approach. “Residential, small business and industrial implementation should be segmented, starting in the residential market, and then moving into business and finally industry. This allows large amounts of data to be processed without influencing the industrial energy consumers.”

Financial solutions are of course critical. The National Empowerment Fund is leading this space through its support for venture capitalists. A ‘Pull vs Push’ paradigm should be adhered to. All stakeholders should be ‘pulled’ to smart grids and smart cities, as opposed to punitive legislation being used. Offer the carrot not the stick.

“Finally, smart data management is non-negotiable,” Cronje emphasises. “It is this intelligence that facilitates the real benefit of the smart grid. Smart data management informs industry players what the viable procedures and trends are that should be followed, resulting in optimum efficiency in energy management. ◀

# A 'WATER-WISE' SA INDUSTRY

Water is a vital, but scarce resources in South Africa and with decreasing water quality and available freshwater resources almost fully-utilised, industry is compelled to make careful water management a priority.

Leading environmental solutions company I-CAT continues to contribute to the development of South Africa's water-efficient economy through its development of products and services assisting industry in water effluent management – states I-CAT technical manager Morné van Wyk.

"Although we specialise in the mining and heavy industries, we can assist wherever there is a problem or shortage. I-CAT offers complete world-class solutions packages – from consulting, system design, manufacturing, installation and commissioning – to maintenance and training," he explains.

While I-CAT focuses on ensuring water reuse in industrial processes, Van Wyk indicates that the company's function is not limited to this. "Most industries wish to comply with their water license and waste management plans. That being said, we sometimes have to clean the water up to a discharge standard, so that they can discharge safely into the environment without harm and penalties."

Extending its reach into Africa, I-CAT recently completed a commission by First Quantum Minerals to design, manufacture

and install 10 drinking water plants for the Kansanshi copper mine in Zambia. "The main challenges going into any foreign country will always be logistics, but we have well-established offices in the area, which made the logistics a lot easier," Van Wyk continues.

To increase the uptake of its offerings, I-CAT simplifies solutions and reduces costs through constant innovation. Van Wyk adds that the company is committed on constantly researching and developing new technologies in order to remain highly-competitive in a challenging industry.



Before (left) and after.



I-CAT simplifies solutions and reduces costs through constant innovation.



Mobile filtration system.

"On a local level, I-CAT is currently undertaking extensive research and development into an evaporation process for the brine generated by industrial waste water cleansing. Our industries rely heavily on our resources and it's their responsibility to find alternatives.

We are quickly running out of useable resources and the country, economy and people won't be able to provide or survive if water conservation is not made the number one priority and responsibility," he concludes.

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178	Reporting	07/06/12 6:3
77	Asset Off	07/06/12 6:3
1,429	Reporting	07/06/12 6:3
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# Design for SOLAR ENERGY

By John Hope-Bailie, a director of power provisioning specialist, Powermode.

Globally, the move towards the construction of green or sustainable buildings is gaining momentum. The term refers to an environmentally responsible structure that is resource efficient. The concept encompasses all stages of the building's life-cycle, from siting to design, construction, operation, maintenance, renovation and demolition.

## Background

This requires close co-operation between the design team, the architects, engineers, and the client at all project stages.

One of the objectives demanded by many supporters of modern, sustainable buildings is carbon neutrality. Carbon neutral buildings are engineered to release no greenhouse gases at all or to balance the emissions they produce using trade-offs.

These emissions usually come from electricity consumption, the burning of fossil fuels, on-site waste water treatment and a range of other processes that might be performed in the building. Key to reducing emissions is the use of renewable energy resources, of which one of the most popular and prolific is solar power.

Solar power is a clean sustainable energy technology drawing on the planet's most plentiful and widely distributed renewable energy source – the sun.

Emerging green building design practices accept solar power as an ideal complement to the classical building design goals of economy, utility, durability and comfort.

## Embracing solar power

Today, designers and architects are looking beyond the now traditional solar-powered hot water geysers – which remain important elements in solar-powered buildings – to embrace the full extent of solar photovoltaic (PV) power generation.

Solar PV installations convert solar radiation into direct electricity current using semiconductors that exhibit a photovoltaic effect. Solar PV panels or modules are composed of a number of solar cells which transform sunlight into electricity

without the need for moving parts or environmental emissions.

## How solar PV system works

In a solar PV system the PV modules are connected to create an array, either in series or in parallel configurations depending on specific voltage and current requirements. Combiner boxes are used to combine the inputs from multiple strings of modules into one output circuit.

An important component of any array is the inverter which converts the DC current from the PV modules into an alternating current (AC) that can connect seamlessly to a building's conventional electricity wiring circuits.

In a grid-tied installation (where the solar circuitry is linked to the utility company's grid, for example) the inverter is also tasked with sensing the utility power frequency and must synchronise the PV-produced power to this frequency.

When utility power fails (due to a power outage) the inverter will automatically stop producing AC power to prevent 'islanding' or putting power back into the national grid when workers might assume the system is de-energised. This safety feature is built into all grid-tied inverters.

## Optimising electrical infrastructure

One of the benefits of designing a green building from the outset is the optimisations that can be made in the electrical infrastructure. Essential and non-essential circuitry (from a solar perspective) can be designed

and then installed at the construction phase in a simplified process, compared to a retro-fit. No 'chopping and hacking' required.

For example, burglar alarms, outside lighting and key main lights inside the building can be treated as essential and given priority, while swimming pool pumps, air conditioning and similar systems can be treated as non-essential. This becomes a key exercise, especially if battery backup and storage is to be included in the design.

In the domestic area, for example, the solar PV-based house will have a number of special design features, including non-electrically-powered ovens and hobs, solar powered swimming pool pumps (set up to run during the day to minimise storage demands), LED lights and a lack of under-floor heating – the planning and simplification of which ahead of construction will minimise costs.

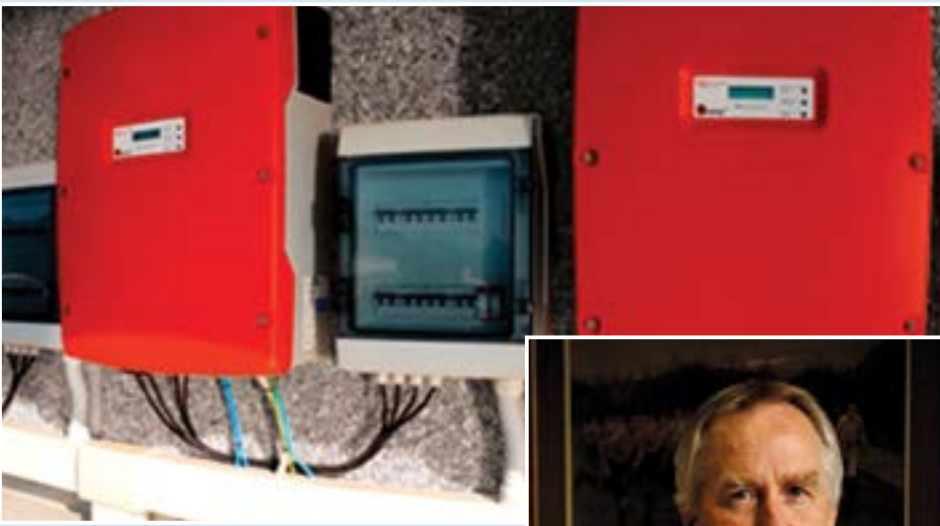
## Energy efficient guidelines

Despite any official encouragement or support for solar installations in South Africa, many architects are beginning to design buildings following energy efficiency guidelines. These include creating structures that readily integrate solar PV panels and systems, rather than fitting them 'as an after-thought' to existing structures.

The efficiency and reliability of solar installations including PV modules, inverters and batteries can be substantially improved in residential, commercial and industrial buildings by their architects' early 'buy-in' to solar technology.

Before setting out to design a 'solar-friendly' building, it is important for archi-





**ABOVE: SMA solar PV inverters (Powermode is the official distributor for SMA in South Africa).**

**RIGHT: John Hope-Bailie, Powermode.**



pects as well as the contractor, engineers, electricians, roofers and other installers associated with the project to have a clear understanding of the responsibilities of each party in the building process.

They also need to have specific details of the energy yield objectives associated with the project. These usually include goals for the reduction of grid-linked energy consumption to a point approaching zero with a view to ultimately generating more energy than the building uses so that in future – should the law ever permit it via a feed-in tariff (FIT) or similar scheme – the surplus can be sold to the electricity company.

## Determining project objectives

The main starting point is to determine the maximum power that is required to be generated. Power is related to size and the designer has thus to allow for a certain number of solar PV modules to achieve a given energy output. Will there enough surface area available to install a given size PV array?

## Optimising the solar window

To maximise the power output from a solar PV array – to optimise sunshine all year round – particular attention should be paid to its orientation and to that of the building to which it mounts.

Solar arrays should be orientated towards 'the solar window' to achieve the maximum amount of solar radiation available at any site at any time. The solar window represents the range of sun paths for a specific latitude between the winter

and summer solstices. The closer an array surface faces the sun throughout every day and over a year (without being shaded), the more energy the system will produce – and the more cost effective it becomes compared to other power sources.

The ideal orientation of a solar array is defined by two angles. The array azimuth angle is the angle it should face based on a compass heading. North in the southern hemisphere, for example. A south-facing array could lose as much as 40% of its efficiency. That said, the perfect angle for South African installations – per rule-of-thumb – is a few degrees east of north.

The tilt angle is the angle between the array surface and the horizontal plane. Generally, the higher the site latitude, the greater the optimal tilt angle to maximise solar energy gain.

If optimal gain is expected in cloudless winter days (such as found in Johannesburg, for example), the optimal tilt angle will be slightly more than the local latitude, say between 25 and 27 degrees.

On the other hand, if optimal gain is in the spring and summer months (in winter rainfall areas such as the Western Cape) then the optimal angle would be slightly less than the local latitude. In Cape Town, for instance, this would be slightly more than its latitude of 34 degrees. As you move towards the equator, the angles become flatter.

Very precise measurements can be made using industry-developed algorithms available from solar PV specialists.

## Integrating solar panels

The integration of solar PV panels can be done with a view to optimising the aesthetics of a


structure for a more cosmetically-pleasing result. Many examples exist of the 'ex post facto' connection of PV panels resulting in a distinct lack of aesthetic integrity. A good guideline is that the colour and texture of the solar PV system should be consistent with all other materials with which it is associated.

Taking the concept a step further, the entire appearance of the building should be consistent with the PV system used. In a traditional building, for example, a tile-type solar PV system will often be more visually appealing than large modules which, on the other hand, may well suit a modern, high-tech construction.

Integrating PV systems into roofing structures is better done at the design phase when the slope of the roof can be angled optimally and attention can be paid to the strength of supporting structures. Ideally the roof should accommodate an additional loading of 20 to 25 kilogrammes per square metre to adequately and safely support PV panels.

Some roof coverings are better suited to the mounting of PV systems than others. This is particularly true when water proofing has to be taken into account. In commercial and industrial buildings, solar PV modules can form part of the watertight skin.

Dubbed building-integrated photovoltaics (BIPV), these modules are formed from materials that can replace conventional building materials in parts of the building envelope such as the roof, skylights, façades, sunshades, louvers and canopies.

These panels are available from a number of specialist manufacturers, although there is a price premium which has possibly limited their uptake – to date – in South Africa. 

*Before setting out to design a 'solar-friendly' building, it is important for architects as well as the contractor, engineers, electricians, roofers and other installers associated with the project to have a clear understanding of the responsibilities of each party in the building process.*



**Integrating solar panels into the design of a building.**

Nonetheless, the advantage of BIPV systems over more common non-integrated alternatives is that the initial cost can be offset by reducing the amount spent on building materials and labour that would normally be used to construct the part of the building that the BIPV modules replace.

BIPV modules should be situated towards the north side of the main building. Siting is obviously best confirmed at the design phase which should also address any shading obstacles (neighbouring buildings and trees, for example) that might prejudice the final installation.

There is a logical combination between shading a building in summer and producing electricity at the same time. Architects who recognise this have produced examples of BIPV shading systems for entrance protection, and many analogous systems for similar applications.

PV systems can also be part of the thermal envelope of a building. One of the by-products of solar energy production is heat radiating from the back of the solar cells which can be channelled and put to good use for winter heating, particularly if provision is made at the design phase.

While the use of solar energy during daylight hours is becoming more cost-efficient as electricity prices climb – with paybacks for a complete installation of between three to four years – its use during the hours of darkness (or on cloudy days) presents a number of challenges.

Assuming excess solar energy is not returned to the national grid (unapproved as yet in South Africa) it can be stored on-site in battery packs to obviate loss.

While a simple procedure, this tends



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to be one of the more costly elements of a comprehensive solution. This is because solar PV systems require more robust deep-cycle batteries which have a different physical construction for longevity compared to conventional automotive batteries because of the nature of the charging and discharge profile.

**Retro-fitting batteries**

Retro-fitting batteries to a solar installation is not as straightforward as it may appear. Ideally batteries should be stored in an outdoor-facing, well-ventilated battery enclosure and not simply placed haphazardly in the building. So energy storage is best addressed at the design and implementation stage.

**Towards incentives**

With the expected mushrooming of the

industry once incentives become available to consumers, perhaps there is a challenge for South Africa's training institutions to establish some sort of formal installers' accreditation or certification programme to help newcomers to this fledgling industry gain knowledge and experience.

There is also a challenge for law-makers to mandate distinct electric circuitry specifications for solar PV installations which should incorporate safety elements such as accessible isolation switches which can be thrown by anyone in the event of faults.


Solar PV technology is seen an ideal hedge against electricity price rises which seem inevitable in South Africa. There remain countless new ways for solar PV to be developed and optimised.

Many are sure to lead to new architectural concepts, many in combination with other types of renewable energy resources, going forward. <



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# FIRST HIGH-RISE for development

Atterbury Property has confirmed it will develop the new head office of PwC at Waterfall City, Midrand, which will be an iconic 26 storey building and the first high-rise within the booming precinct.

**>** This follows the signing of a lease agreement between PwC and Attacq on 15 January 2015 confirming the development of new headquarters for the leading accounting and professional services firm at Waterfall City.

The R1,5-billion high-rise building, comprising 40 000 m<sup>2</sup> of modern offices, is designed to house 3 500 PwC employees in an efficient, optimally designed workplace. It will be developed in a prime location overlooking the Waterfall City Park and 127 000 m<sup>2</sup> Mall of Africa super-regional shopping centre, which are under development and set to open in 2016.

Attacq Waterfall Investment Company (AWIC) holds the development rights to the prestigious Waterfall City, and is 100% owned by JSE-listed Attacq. Atterbury Property Developments is responsible for coordinating this commercial real estate project for and on behalf of AWIC.

Atterbury Property's director of commercial development, Jeanne Jordaan,

comments: "We are proud to work with PwC as the developer of its new head office which is set to become a landmark building for South African business in Attacq's pioneering Waterfall City."

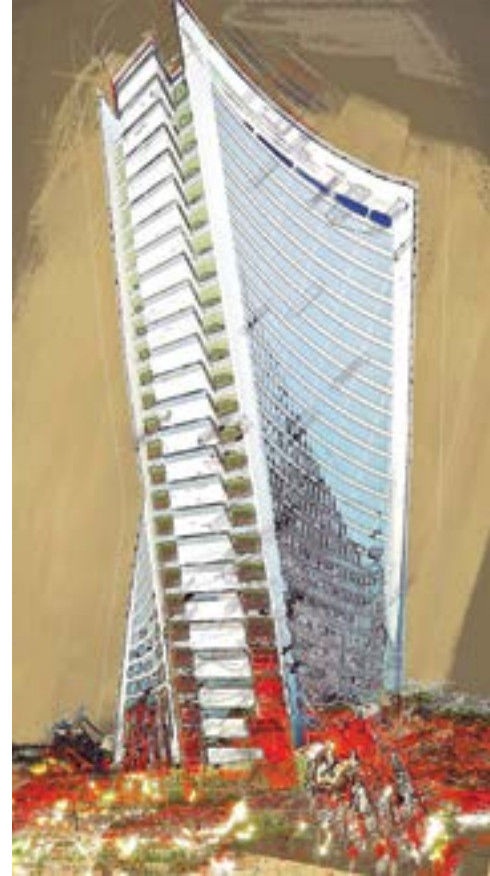
Earthworks for the new PwC building has already commenced and construction will begin in the first quarter of 2015. The project is expected to take 36 months and scheduled for completion in the beginning of 2018.

The PwC Tower is designed by LYT Architecture and will be constructed in phases due to the unique twist design of the structure. It gently twists through its height to frame the grand urban park which forms the green heart of Waterfall City. The building is also designed to conform to the internationally recognised LEED (Leadership in Energy and Environmental Design) silver standard.

Guy Steenekamp, a director at LYT Architecture comments: "The brief for the PwC Tower at Waterfall City called for an iconic building form that would be unique to the development and which would mark the property as a new top tier destination for business. Given the height of the building and that it is situated on a high point in Waterfall City, it will easily be the tallest structure on the corridor between the Sandton CBD and the Pretoria/Tshwane CBD. The PwC Tower will be visible from almost anywhere within a 30 km radius."

Adding to the tower's uniqueness is its positioning adjacent to the Waterfall City Park, which is set to be a lush and vibrant public green space in the tradition of world-class cities across the globe.

Jordaan explains: "It has been proved that responsive and meaningful open spaces



improve quality of life and adjoining property values. The Waterfall City Park has been designed around these principles."

Waterfall City Park will span 1,3 ha of beautiful green parkland and a link to Mall of Africa at its Town Square. Waterfall City Park is positioned atop five levels of super-basement, which are already under construction, and encircled by the bustling Waterfall City, with its mixed-use development including offices, as well as the mall itself.

"The park grounds are in the perfect position to provide well-designed social and recreation amenities in the heart of this modern hub – for city dwellers, office workers, residents and visitors alike." The attractive gardens provide a playground for a multitude of outdoor activities and recreation options and also include an intimate amphitheatre with an interactive fountain and stage area," adds Jordaan.

Waterfall City is South Africa's largest urban concept development, designed to provide everything expected of a world-class modern city, with all the conveniences of a leading-quality urban environment. It is strategically located between Midrand and Sandton, spanning land on both sides of the N1 highway from the Woodmead to Allandale interchanges.

In addition to PwC, the burgeoning Waterfall City continues to attract leading businesses including Servest and Colgate Palmolive, Cell C, Group Five, Altech, Digistics, Massbuild, Cipla, Golder & Associates, MB Technologies, Virgin Active, Premier Foods, Dräger S.A, Westcon Group, Novartis, Covidien, Cummins and Honda Motor SA. Atterbury has offices at Waterfall City and Attacq's head-office is also based there. Waterfall also features a Netcare Hospital. **<**



# OPPORTUNITIES for professionals THROUGHOUT AFRICA

Bringing together leading property practitioners, investors and academic experts from around the world and across the continent, the Royal Institution of Chartered Surveyors (RICS) has selected Africa, and more specifically South Africa, as the venue to hold its 2015 Summit. To be held in Johannesburg on 25 March 2015 this is only the fourth time RICS has held the global summit outside the UK – after China, India and Brazil.

**>** RICS is a global professional body that promotes and enforces the highest qualifications and standards in the areas of land, real estate, construction and infrastructure. As a public benefit organisation, it operates in all the world's major financial hubs in delivering international standards and policy influence. As a leader in these sectors, RICS Africa 2015 Summit will engage role players from across Africa's built environment to launch a discussion on vital aspects of Africa's economic growth and future success.

Commenting on the forthcoming conference, TC Chetty, RICS country manager for South Africa, says Africa's built environment is undergoing unprecedented change, with rapid urbanisation and populations in key cities projected to grow some 60 percent above 2010 levels. "Developments such as these bring increased opportunities not only for the commercial and residential property sectors, but also for professionals working throughout Africa. Our Africa Summit will provide a platform for debate and discussion on important aspects of the continent's property growth."

Forecasts by the International Monetary Fund reflect that GDP (gross domestic product) growth rates for some African countries are expected to exceed those of their developed counterparts. Indications are that Ethiopia, Ghana, Mozambique, Nigeria, Tanzania and Zambia anticipate growth rates of between five and seven percent.

According to Ernst & Young's report 'Africa by numbers 2013-14', African countries have experienced consistent and robust growth for over a decade, with the size of the continent's overall economy more than trebling since 2002; and the size of the sub-Saharan economy growing well over three-and-a-half-times.

This is despite the fact that half of the past decade has been marked by a deeply troubled economy. The report reiterates

the exciting opportunities for investment and growth in Africa, with Ernst & Young's 2013 'Africa attractiveness' report noting that foreign direct investment projects into sub-Saharan grew at a compound rate of 22,3% between 2007 and 2012.

Says Chetty: "Sub-Saharan Africa presents a huge area of opportunity where real estate and infrastructure investment needs to grow phenomenally to meet massive population needs. In many of the continent's capital cities, improved levels of FDI and a growing middle class has led to notably increased demand for residential, business and retail property.

"Growth in property markets across Africa will not just fuel a need for massive infrastructure investment but will also see a need for more professionals, skills and capacity to manage this growth. Naturally, while this presents a host of opportunities, it also presents a number of challenges for various markets across the continent – particularly in the property sector.

"While RICS has had a presence in South Africa for some years, we are now in the process of expanding our operations,

initially focusing on three key regional markets in sub-Saharan Africa, namely South Africa, Kenya and Ghana. The rationale is that South Africa is a strategic gateway for RICS' growing its activities in Africa; Kenya is rapidly becoming a strategic location for organisations wanting to establish a regional base in East Africa, while Ghana is our choice for a regional hub in West Africa.

"Due to the diversity of Africa's markets, needs and challenges, ours is a strategic approach of co-operation and building partnerships with national bodies and stakeholders. As a public benefit, professional body with global reach we are ideally placed to bring together stakeholders from around the world to share experiences and expertise, and to collaborate and learn. The Summit will also highlight the role development professionals can play in key African markets as the built environment evolves and expands."

Concludes Chetty: "There is no doubt that Africa would benefit enormously from a larger pool of built environment professionals. For example, if across Africa, measurement standards can be implemented in conjunction with ethical standards – and effectively and independently regulated, we believe we can help create market conditions in which investors, clients and the public as a whole have high confidence, and in which growth is sustainable.

"Our experience is that genuine collaboration between professional bodies from across all areas of the built environment and between national and international entities promises to bring significant economic dividends, which ultimately benefit society as a whole." **<**



TC Chetty, RICS country manager for South Africa.

## A HIGHLY COMPETITIVE YEAR

**“Expect massive competition in the scramble for good property and tenants,” says Izak Petersen, Dipula Income Fund CEO, of SA’s commercial property sector in 2015.**

> He foresees a year that will bring heaps of hard work for the sector, with only select opportunities of good assets available to the market.

“I fear that electricity issues are going to

frustrate and slow down business. Some property developments may have to be shelved due to a lack of electricity supply,” says Petersen. “However, you’re likely to see innovative solutions to get around this challenge.”

There will be relatively limited speculative development activity in the market.

Looking at positive drivers that may counter the slow economic growth and electricity supply challenges, Petersen points to falling oil prices as a bright spot that will provide some cushion for rising inflation, but cautions that the weak Rand will have somewhat of a counter effect. “We believe that rates will remain unchanged in the short term, which bodes well for property.”

Offices are likely to remain the weakest link for commercial property in 2015. “They already face oversupply issues with a lack of big users. Our tough economy also adds to the pressure on the sector due to the elasticity of demand and price sensitivity of its users – especially smaller and medium users,” says Petersen. He also warns most tenant-driven developments for big users, will result in increased vacancies as they vacant existing space.



**Izak Petersen, Dipula Income Fund CEO.**

Looking to other commercial property sectors Petersen believes retail and industrial property should hold up better. “We do not see either one shooting the lights out, and retail turnovers are likely to be under pressure with consumers remaining under strain.”

He adds: “Despite the challenges ahead, we still anticipate listed real estate to outperform bonds, cash and equities. We further expect to grow Dipula’s net income well in excess of inflation and grow our portfolio organically by executing our sizeable development and acquisition pipeline of more than R1-billion.”

Dipula Income Fund is a JSE-listed REIT with exceptional B-BBEE credentials. It is managed by its 100% black owned management company. Dipula originated from two majority black-owned property funds, Mergence Africa Property Fund and Dipula Property Fund. Management own a large stake in Dipula and are strategically aligned long-term investors in the fund.

Dipula’s diversified property portfolio comprises more than 180 retail, industrial and office properties countrywide. By gross lettable area (GLA), Dipula’s portfolio is mostly concentrated in South Africa’s economic hub of Gauteng. It is also weighted towards retail property, which comprises more than 50% of its portfolio.

## OVERPASS TO IMPROVE TRAFFIC FLOWS

**Driving through Midrand will soon be a whole lot easier thanks to a new R160-million highway overpass bridge being constructed by Waterfall City.**

> The new Bridal Veil Road Overpass Bridge is being developed by Atterbury Property Development and engineers, AECOM, for and on behalf of Attacq, exclusive holder of the development rights to the prestigious Waterfall City.

The major investment for this new overpass is part of the infrastructure development within Waterfall City, the largest ‘greenfield’ urban concept development in South Africa. Strategically located between Midrand and Sandton, Waterfall is positioned to become one of the strongest and most successful nodes in the country.

Situated south of the Allandale interchange and north of the Buccleuch interchange, the overpass will create a direct link between Midrand and Waterfall City, opening up an important route that will make travelling easier and faster for the growing number of people who live and work in this leading-edge Gauteng development node.

Atterbury Property Development director, Coenie Bezuidenhout, who is responsible for coordinating this immense commercial real estate project, comments on the new overpass bridge: “Waterfall is designed to be a modern city that really works for its residents and businesses and this includes providing excellent quality road infrastructure. With the construction of the Bridal Veil Overpass Bridge, these benefits will extend to everyone who uses the roads and highways in and around Midrand and Sandton.”

Bezuidenhout adds: “Besides providing another easy access point to Waterfall City, the new overpass bridge will help improve traffic flows in the Midrand area, taking strain off surrounding interchanges and making it easier to get around on Gauteng’s roads.”

The superstructure of the bridge will total a length of 115,8 metres and carry four lanes of traffic – two in each direction – a pedestrian walkway, a cycle track and a raised centre median, resulting in a width of 22,7 metres. It will also feature street lighting below and above the bridge, illuminating the N1 highway and Bridal Veil Road.

Construction began in November 2014, and the project will take 16 months to complete in March 2016. The development is being undertaken in strategic phases to minimise disruption to traffic on the N1 while the overpass bridge is being constructed.

“Waterfall City’s easy access from Gauteng’s transport network is an inherent advantage of Waterfall City and the new Bridal Veil Road Overpass Bridge is designed to enhance this,” says Bezuidenhout.

The Waterfall City development spans land on both sides of the N1 highway, from the Woodmead Interchange in the south through the bustling Buccleuch Interchange to the Allandale Interchange in the north, and spans from Modderfontein in the east to beyond Kyalami in the west. It enjoys superb access from Pretoria, Sandton and Johannesburg, and is closing the gap between northern Sandton and Midrand.

The new Bridal Veil Road Overpass bridge is scheduled to be complete on time for the launch of the iconic new 127 000 m<sup>2</sup> super-regional shopping centre, Mall of Africa, at Waterfall City, which will open in 2016.



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To fast-track project completion at Deco Park, Northlands recently expanded its earthmoving capabilities with the addition of a Cat TH414C telehandler.

# Northlands ramps up **MIXED-USE ROLL-OUT**

**O**ver the past 20 odd years, the built environment within Gauteng has experienced construction on a scale that is unprecedented, with extensive tracts of land progressively transformed into vibrant residential, commercial, and industrial space in key growth nodes that include Randburg, Midrand, and Sandton, creating niche opportunities for developers in a market where demand continues to outstrip supply in prime locations.

Northlands in North Riding, Randburg, is a classic example. Development first began in 1999 and construction continues to this day on a precinct that houses interconnecting industrial and commercial parks. Northlands Industrial Park, Deco Park, and Northlands Business Park form part of the Northlands precinct. So far more than 700 000 m<sup>2</sup> of building under roof has been completed.

“From the onset, our strategy at Northlands Business Park has been to offer the market something distinctive: an up-market development enclosed within secured perimeter boundaries featuring high-level security throughout,” explains Darin D’Oliveira, Pr Eng (Civil Engineering) and head of Northlands, a multi-faceted company with extensive mixed-use design and construction experience.

This includes cross-border projects in Mozambique where Northlands has developed two coastal boutique lodges in Inhambane province, namely the 19 room Castelo do Mar, completed over the past two years, and the 34 room Massinga Beach resort, commissioned in 2011. Massinga Beach is a nominee for the 2015 World Luxury Hotel Awards.

## Deco Park in Northlands

At Deco Park, Northlands is currently busy with a 40 000 m<sup>2</sup> extension, which commenced in 2013 for scheduled completion in August 2015. Industrial units in this phase range in size from 500 m<sup>2</sup> up to 1 200 m<sup>2</sup>, with one 5 000 m<sup>2</sup> building designed to meet the expansion requirements of an existing tenant. As on other developments, Northlands is the main contractor and deploys its own dedicated Cat® earthmoving and allied equipment fleet.

Committed to sustainable construction practices, the Deco Park extension places the environment first with a number of eco-friendly features. These include the installation of double-glazing (with a heat-treat seal on the outer glass), plus polystyrene insulation in the brick work. Polystyrene ISO board is also installed under the steel roof sheeting sections, which acts as an excellent thermal insulator.

These and other energy saving materials

significantly reduce the load on conventional HVAC (heating, ventilation and air-conditioning) systems, translating into measurable reductions in electricity consumption.

Additionally, the roofs on the Deco Park extension are all designed to carry solar panels. Existing developments like the neighbouring Northlands Corner site have been equipped with solar panelling, with R4-million spent there to date. “Solar power is the future and all new Northlands projects will be designed with this renewable energy source top-of-mind,” D’Oliveira stresses.

To fast-track project completion at Deco Park, Northlands recently expanded its earthmoving capabilities with the addition in January 2015 of a Cat TH414C telehandler, supplied and supported by Southern African Cat dealer, Barloworld Equipment.

“We needed a machine with excellent lift and reach capabilities for tasks ranging from water pipeline installation to delivering building materials to second and third storey structures. After extensive market research, the Cat TH414C, with its maximum lift height of 13,7 m and maximum forward reach of 9,2 m, proved to be the optimum choice and is now an indispensable part of our building team,” says Northlands contracts manager, Graham Bower.

The load capability at maximum height is 1 750 kg with the stabilisers up, and



*“... the Avianto precinct will be one of our most successful and definitive projects with the aim to take the entire development off the grid.”*



The Cat TH414C has a maximum lift height of 13,7 m and maximum forward reach of 9,2 m.

Ongoing construction at Northlands Deco Park runs in parallel with preparations for the launch of new industrial projects, as well as the current development of the multi-million Avianto mixed-use precinct.

3 000 kg with the stabilisers down. The load at maximum reach with the stabilisers up is 350 kg, and 1 150 kg with the stabilisers down.

In the meantime as work progresses at Deco Park, planning is under way on the roll-out of the Northlands Retail Park, a new commercial property that will be constructed on a 60 000 m<sup>2</sup> site bordering Malibongwe Drive, a strategic economic corridor that interconnects the Northern Suburbs and Randburg with Lanseria International Airport and the N14 highway.

“Aside from the location, the chief advantage of this type of development is that it enables businesses to centralise their operations by combining retail, office and storage space all under one roof at highly competitive rentals,” says D’Oliveira. Construction is expected to start during 2016.

## Avianto Estate in Muldersdrift

As these and other projects unfold, D’Oliveira’s most ambitious venture so far is already taking shape at their existing Avianto Estate in Muldersdrift, Gauteng, which is situated within the Kroomdraai Valley and adjoins the Cradle of Humankind World Heritage site.

The current site at Avianto features a four star hotel, a conference centre and wedding facility, and an interconnecting lifestyle

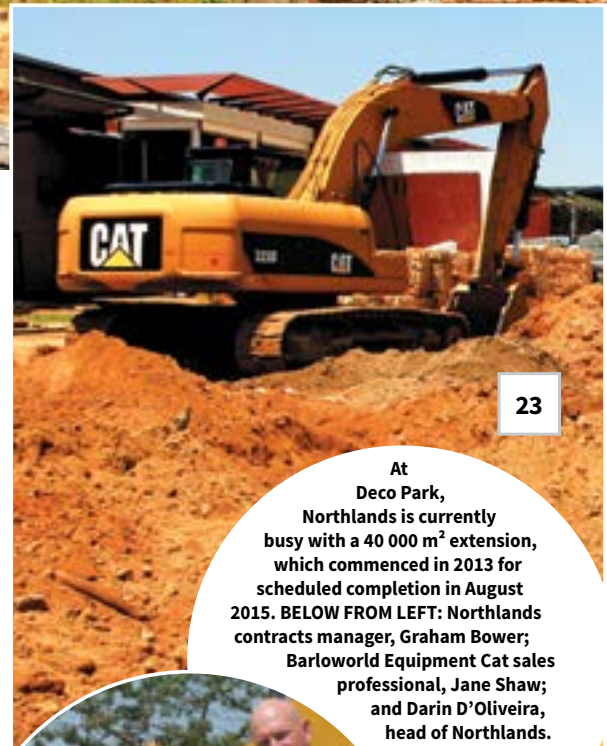
estate featuring upmarket residential homes.

“We have now secured an additional 3 000 000 m<sup>2</sup> of land surrounding the existing Avianto Estate, which is zoned for development. This new venture, with an anticipated project roll-out of around 10 years, will be a mixed-use precinct on a majestic scale,” D’Oliveira explains, “and is expected to unlock some R3,5-billion of future construction.”

Central to the future precinct is the Maragon Private School at Avianto. Northlands completed the first phase at the end of 2014: a 4 000 m<sup>2</sup> school that caters for Grades 000-0 (pre-primary) and Grade 1 (the first year of primary education). Further phases will see the construction of an adjoining primary and high school.

As on other Northlands projects, Phase One at Maragon Avianto incorporates green building features that lower the carbon footprint, such as double-glazing, plus roof and wall insulation. On top of this is the incorporation of an innovative water-heated under-floor system throughout the school, which is believed to be the first school installation of its kind in South Africa.

D’Oliveira will develop Avianto in pockets, each phase with a maximum construction period of three years. This will include the building of a Frail Care hospital, a retirement estate, as well as office and commercial nodes. Zoning makes further provision for



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At Deco Park, Northlands is currently busy with a 40 000 m<sup>2</sup> extension, which commenced in 2013 for scheduled completion in August 2015. BELOW FROM LEFT: Northlands contracts manager, Graham Bower; Barloworld Equipment Cat sales professional, Jane Shaw; and Darin D’Oliveira, head of Northlands.



some 2 000 residential units, ranging from freehold stands to clusters and sectional title. Some 250 low-cost government grant houses will also be constructed at Avianto.

Adds D’Oliveira: “As a further advance on our mixed-use model, I’m confident that the Avianto precinct will be one of our most successful and definitive projects with the aim to take the entire development off the grid.”

# INNOVATIVE, INVISIBLE, INGENIOUS

Such was the quality of the steel structure at the Malapa Fossil excavation site, which was the overall winner and winner of the Association of Steel Tube and Pipe Manufacturers of South Africa's Tubular category at Steel awards 2014, that Steel Awards convenor, Spencer Erling, was prompted to say: "It is surely the first time since I have been managing the Steel Awards process that the overall winner has ticked so many boxes as to why this project represents excellence in the use of steel."

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## The reason for the project

In 2008, Professor Lee Berger of the University of Witwatersrand (Wits) was using Google Earth to look for possible fossil deposits in the Cradle of Humankind. What caught his eye was a near circular ring of trees, something that would indicate a possible cave entrance or potential fossil deposit.

While the full nature and extent of the dig have not yet been resolved, and might still take decades, what is known is that this is a significant find from a paleontological point of view. The site of Malapa has yielded two partial skeletons, a juvenile male and an adult female of a new species called *Australopithecus sediba*. While there are several other sediba individuals from the site there are also remains of the animals that occurred alongside these remarkable hominids.

From geological studies it is known that the cave roof (which has since eroded away) stood 30 – 50 m above the current deposit. Indicating that the hominids and animals collected in what is known as a 'death trap' situation. The animals would fall into the cave and then die on impact or not be able to get out, leaving behind full body remains.

What is also known is that the fossils have been reliably proven to be about two million years old.

## Initial difficulties

Built environment professionals are in some respects used to solving challenges that stand in the way of progress. And if ever a project presented obstacles to get underway this surely must rate among the toughest.

The Cradle of Humankind is a World UNESCO heritage site. Before anything can be done in the area permission must be obtained from SAHRA (South African Heritages Resource Association).

Even for something as important as this dig is, permission to disturb the ground needs to be obtained. Any development whether it is a farmhouse for a farm owner or a temporary cover over the dig needs a permit.

The farm upon which the site is located is privately owned. Wits needed to put a land owner agreement into place which provided access to the researchers as well as permission to erect a structure to protect the site itself. In this respect the landowners have been great supporters of the work being done at the Malapa site.

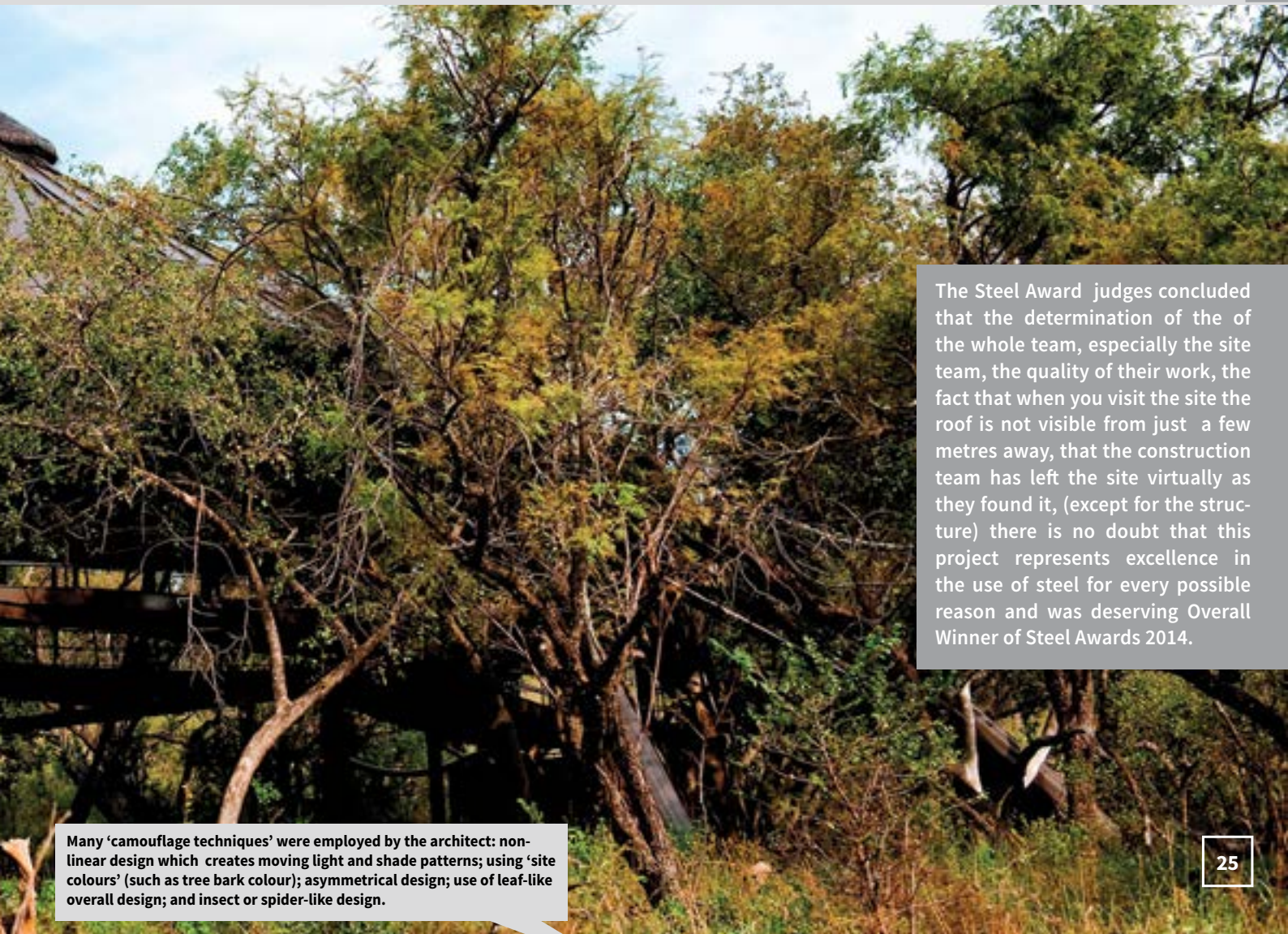
## Design

Architect Krynaauw Nel says: "If we want to work with the environment, let it teach us its lessons. Bio-mimicry is the process of design where forms and processes found in nature serve as a design model. The design is inspired by natural site forms: leaves, insects and spiders and particularly by the *Sediba* fossils first discovered i.e. the clavicle and scapula.

"Our proposed structure was to have no concrete footings (due to possible fossils in the ground), and removable, should it ever be required – leaving minimal traces. It was clear that some steel structures would be the answer. Tubular steel and bone motifs seemed an obvious match and circular sections could be curved to deal with site restrictions.

"Particularly challenging was that final rock positions for the leg footings would only be identified during construction, prompting a solution in which legs could pivot and even 'bend' to accommodate these positions. This was a special solution that proved useful during construction."

The main structural element is the oval curved space-frame or 'Toblerone' truss onto which the roof is constructed and from which



The Steel Award judges concluded that the determination of the of the whole team, especially the site team, the quality of their work, the fact that when you visit the site the roof is not visible from just a few metres away, that the construction team has left the site virtually as they found it, (except for the structure) there is no doubt that this project represents excellence in the use of steel for every possible reason and was deserving Overall Winner of Steel Awards 2014.

Many 'camouflage techniques' were employed by the architect: non-linear design which creates moving light and shade patterns; using 'site colours' (such as tree bark colour); asymmetrical design; use of leaf-like overall design; and insect or spider-like design.

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two other elements are suspended: the visitors' viewing platform and the manual crane hoist with capacity 1 metric ton.

"The incorporation of the hoist into the structure makes the structure part building part machine," adds Nel.

In terms of environmental sensitivity, client and architect agreed that achieving 'an invisible building' from the outside with 'maximum impact on the interior' would be desirable. Many 'camouflage techniques' were then employed by the architect such as: non-linear design, creating moving light and shade patterns; using 'site colours' (such as tree bark colour); asymmetrical design, use of leaf-like overall design, and insect or spider-like design.

To both reduce maintenance and prevent elements leaching into the site (which could contaminate samples) non-corrosive materials such as aluminium and fiber cement panels had to be used. The apex of the roof is lifted off the rest of the roof, ensuring escape of the hot air at the highest point and increasing ventilation – this prevents head build-up in the dome.

The site is remote and with no provided services. Natural light is enhanced and stormwater is harvested for use in excavation activities. ➔

The design is inspired by natural site forms: leaves, insects and spiders and particularly by the *Sediba* fossils first discovered i.e. the clavicle and scapula.





The structure also has a steel viewing deck capable of taking a maximum of 33 people. It is suspended from underneath the lattice girder and the roof using steel ties.



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➤ The main approach walkway is slightly raised above the site but handrails are omitted in the main to facilitate movements of animal species over and under the walkway.

“From the viewing platform, visitors will walk on the suspended walkway while being shown the excavation and education-about fossils, the site and the structure. The ‘suspended-from-the-roof-solution’ makes it possible to bring visitors much closer to the excavation than with more orthodox walkway solutions,” says Nel.

Although it is envisaged that the structure would remain in use for several decades, total removal would be possible leaving only a minimal footprint on the site.

Changing seasonal colours are considered and the bark-coloured structure will sit comfortably in both lush green summer and winter Highveld khaki.

The unexpected white interior enhances natural light; aided by a small skylight.

“With stainless steel and chrome details, this creates a ‘modern laboratory’, while contrasting to – and visually illustrating – the economic simplicity of the main structure,” explains Nel.

The on-site construction period was reduced by designing and manufacturing the structure in separate parts that could be erected for a trial period and testing off-site, dismantled into the eight legs with a section of the main truss attached, and then bolted together again on site in the eight pieces.

“The rights of the environment are becoming increasingly important on an ever densifying and populated planet. Architects have to stand up for the environment and through actual buildings illustrate the possibilities of minimal impact on pristine sites.

“This may be one of the most important contributions this structure can make,” he says.

## Innovation

“The main body is very slender and was constructed from an oval shaped lattice girder, connected to the top of the eight legs and supporting rafters that span out from a central point of the roof. The top of the structure is 11 metres above the ground,” says structural engineer, Peter Fellows.

“The structure also has a steel viewing deck capable of taking a maximum of 33 people. It is suspended from underneath the lattice girder and the roof using steel ties. A hoist is suspended from the viewing deck in order to assist in the removal of fossils from the site,” he continues.


“The legs supporting this structure are connected using hinges allowing them to swivel horizontally. This is important as the exact location and level of rocks used to found them could not be determined at the design stage and were only determined once on site. The upper legs branch outwards at an angle and connect to a plate and then to a lower leg standing at a more vertical angle, creating a bend that resembles a ‘knee’”.

## Engineering

The final shape, when viewed from above, is like a beetle with eight legs.

It was decided that during construction, once positions were chosen, rods would be drilled into rocks around the site onto which would be welded base plates. That of course requires that the eight columns are adjustable to suit the positions once identified.

How was this achieved? The roof was to be ‘rondavel-like’ in shape but not neces-



The proposed structure was to have no concrete footings), and removable, should it ever be required – leaving minimal traces. It was clear that some steel structures would be the answer.

sarily round, from which would hang the viewing platform and hoisting structure. So, introduce a Toblerone profile compression ring at lower and upper levels of the roof.

Attach the upper parts of the columns to the compression ring in a manner that would allow them to rotate in plan, make them also Toblerone in profile with curved upper ends (like those shoulder parts). Make the lower columns out of big tubes, whose final length and shape of the ‘dog’s leg’, which kink near their tops, and would be finalised on site after erecting the roof (on temporary supports) based on the positions of the bases now drilled and welded into position.

## Excellent use of steel

The detailing and fabrication of a tubular structure like this takes a special team. Spiral Engineering, the steel contractors on this project, is one of a few companies with the skill and dedication to build such a complicated structure.

### Project team

- **Developer:** The University of the Witwatersrand School of Geosciences
- **Architect:** Krynauw Nel Associates
- **Structural engineer:** Peter Fellows Consulting
- **Quantity surveyor:** Crane QS
- **Project manager:** Craig Harrison PM
- **Main contractor:** Omni Struct Nkosi
- **Steelwork contractor:** Spiral Engineering
- **Detailer:** KRU Detailing
- **Cladding:** Cupric Tectonics
- **Painter:** Mzekizeki Painters

The accuracy of the detailing and the dimensional accuracy of the fabrication was tested during a trial assembly on temporary supports (thus emulating the actual erection procedure) at a local rugby ground.

## Erection

To reach the site, one has to cover the 7,5 km farm track road, which runs partly through a river bed. Special trucks with limited capacity were used on the farm. After four unsuccessful tries, finally a 30 ton all-terrain crane made it to site and had a long enough radius and capacity to reach without damaging the trees and the bush.

Once the roof structure was erected on the temporary scaffolds and the upper columns were hung, only then could the final site-made dog’s leg kinks be done, leaving the beetle standing on its own legs. ◀

### The original brief:

- The structure must protect the fossil bearing deposits from elements – particularly rain and falling debris and must prolong working hours on site for the scientists.
- The structure must act first and foremost as a platform for research.
- The structure must be able to accommodate tourism, or group visits of up to 48 people, but must separate these visitors from the research activity.
- The structure must be able to lift rocks weighing around one metric ton
- and move these rocks to a vehicle loading point.
- The structure must not have a significant foundation and be as close to free standing as possible.
- The structure must not make contact with the ground within the anticipated 10 year excavation goals. The structure must be, due to the nature of the environment, temporary as it will almost certainly be there for many decades it must be permanent in nature (thus a temporary-permanent structural design).
- Due to the sensitivity of the environment the structure sits within, it must be as near as possible ‘invisible’ within the environment.
- Due to the importance of the fossils it protects and the projected tourism and VIP visitations, the structure must be impressive when one is within it and reflect the importance South Africa holds for these World Heritage objects.
- The structure must tell in its architecture the story of the site and the discoveries made there.
- The structure must be fire and animal resistant.
- The structure must be low maintenance.
- The structure must be flexible for placement when on site.
- The structure must allow for expansion of the excavation in the future.
- The structure must be, where possible, manufactured in South Africa and use environmentally friendly materials where possible.

# GEARED FOR GROWTH

Tile Africa Contracts, the commercial division of Tile Africa is set to grow substantially over the next five years as it's expanding its supply and fit offering due to a demand from current and new customers.

> Its supply and fit offering permits the company to not only source and supply products, but to also install them. "The development of our supply and fit offering will allow us to provide a total solutions offering to our customers and this move will give us a competitive edge," says Craig Irvine, commercial operations executive for the Tile Africa commercial division.

The company has close to 30 consultants and specifiers servicing clients nationally and is procuring additional subcontractors and giving them the necessary training to lay the foundation for growth. "We're also continuing with cost optimisation practices where we're reviewing our entire range and buying better," he says.

Tile Africa Contracts has direct access to local manufactured products through its sister companies TAL and Johnson Tiles. "The exchange rate is still an obstacle for us when it comes to importing products from overseas suppliers, but procuring locally manufactured products helps us to remain competitive," he says.

National corporate customers such as Pick n Pay, Spar, Mr Price and Famous Brands continue their relationship with the company and new customers include Pizza Hut and Domino's Pizza.

## Recent projects

Tile Africa contracts recently supplied and in some cases also fitted 10 100 m<sup>2</sup> of tiles to the Maskam Mall shopping centre in Vredendal, the 7 500 m<sup>2</sup> Mr Price flagship store in Boksburg and is involved in the refurbishment of the dormitories at the North West University's Potchefstroom campus.

It works closely with the in-house designers of its corporate customers. "We marry the product with the concept, keeping in mind the technical aspects of the specification to make sure that what we supply is aesthetically pleasing and that the product is suited for the project in terms of traffic and durability," he says.

The food and beverage sector remains the company's biggest customer followed by retail. It also services thirteen different auto brands, six financial services customers as well as provincial and private hospitals. The extensive refurbishment to the De Aar hospital has been one of its major projects this year.

Highly technical products that are used in manufacturing and processing facilities also form part of its product portfolio and expertise. Recent projects include the Parmalat plant for which the company supplied a 18 mm thick tile and the Coca-Cola and Mercedes-Benz plants.

## Design

"Our sister company Johnson Tiles launched its locally manufactured inkjet range earlier this year and it allows us to specify locally produced products in the latest designs to our customers," says Irvine.

Wood-look inkjet tiles are prevalent in the commercial and residential markets as well as inside/outside applications that offer polished, matt and slip-resistant finishes that can be used inside and outside for a homogenous look. Future product offerings include vinyl as well as epoxy resin flooring.

Glass mosaics remain popular as a design feature due to the clean finish and colour burst that they offer. Retro products such as the Johnson Tiles Nostalgia inkjet range that imitates encaustic designs are doing extremely well and are in high demand. "Inkjet technology presents us with an opportunity to customise designs to clients' requirements and we're already offering this service to some of our corporate customers," he says.

Sixty percent of the company's commercial work is in Gauteng, followed by the Western Cape and it's looking to expand its commercial offering to Zambia and Ghana in the near future.

"Our expertise, national footprint, strategic distribution centres and stock holding in well-placed areas add value to our customers. The expansion of our supply and fit offering will strengthen our position as a leading supplier of tile and flooring solutions to the commercial market," he says. <



Some of Tile Africa Contracts' recent projects: Coricraft, Pick n Pay and Standard Bank.



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# SEWER PUMP STATION

## relocation reaches completion

The multi award-winning, R120-million Mahatma Gandhi Road Sewer Pump Station relocation project in Durban officially reached completion in November 2014, following three years of industry-leading innovations and world-class project management.

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➤ As one of the largest pump stations in KwaZulu-Natal, the Mahatma Gandhi Road sewer pump station transfers all sewage from the Durban CBD, Berea and surrounding areas across the harbour to a treatment works on the seaward side of the Bluff.

Since it occupies a prime site within the upmarket development zone of the Durban Point Development Corporation (DPDC), eThekweni municipality requested that the pump station be relocated adjacent to the northern entrance of the recently commissioned Durban Harbour Tunnel.

Hatch Goba KwaZulu-Natal lead for water and tailings, Kendall Slater highlights the fact that the original pump station is supplied by a 1 350 mm diameter gravity sewer, located 250 m from the new site development. "The gravity sewer therefore had to be extended by 221 m, while the pump station was constructed 13 m below ground level," he notes.

### First-of-its-kind micro-tunnel solution

Montso Lebetsa, Hatch Goba manager for tunnels and trenchless technology, explains that the most appropriate and least risky solution for the extension of the sewer under the congested Mahatma Gandhi Road was identified as a trenchless method using

slurry type, AVN micro-tunnelling technique. There are many different trenchless technology methods in the market, but ground conditions, limited working space, size of sewer and vertical alignment control were primary factors influencing the choice of a technique. The other challenge was the horizontal curved alignment to bypass the historical buildings. The first-of-its-kind in sub-Saharan Africa, "this type of tunnelling method was unique in South Africa, and sets the precedent for future project innovations. The installation took just 24 days to complete in May 2012, which is a major achievement." Micro-tunnelling is a 'none-manned' mechanised pipe jacking technology, whereby all jacking and alignment are controlled from the computerised control cabin at the top of jacking pit, explains Lebetsa.

The 221 m long micro-tunnel consists of; a 113 m straight section from the jacking pit; a 102 m curved length with 350 m radius ( to bypass the protected historical Harbour Master Building); and a 6 m straight section breaking into the existing Harbour Tunnel northern entrance of the Harbour Tunnel.

The length of the tunnel was in excess of the designed length for the conventional hydraulic drive from container to machine. As a result, an electrically-driven hydraulic power-pack within the micro-tunnel was used to accommodate the longer distance tunnel drive.

This process of pipe jacking involves advancing rotating 'micro-TBM' machine cutter-head and the jacking equipment in the jacking pit, which pushes a string pipes behind the micro-TBM. The excessive length of pipes to be jacked including around the curved section would normally increase pipe skin friction exponentially. "To cater for this, two intermediate jacking stations were installed at 33 m and second one at further 100 m behind the machine, with eight 646 kN and 700 mm stroke hydraulic cylinders. These intermediate jacks would be used for staged incremental jacking, thus help reduce the length of pipes to be pushed installed to reduce the jacking pressures on the front pipes," he explains.

The Micro tunnel boring machine (Micro-TBM) with an advanced laser guidance system was used for this intricate and highly-complex task. The laser target position was relayed to the control cabin to allow the operator to effect steering adjustments as necessary to follow the design 'pre-programmed' alignment. When the tunnel reached the curve, Slater points out that a gyroscope guidance system was used to control line and level.

"The alignment was checked manually every 40 m using standard surveying equipment to ensure that the positioning system remained accurate. The TBM reached the end point within a deviation of less than 20 mm, which is testament to the accuracy of the guidance system and ability of the operating team," he continues.

At its shallowest, the micro-tunnel was at depth of 6 m below ground and some 4 m below natural water table. The micro-TBM used a pressurised slurry system. The slurry, a 'conditioned fluid, usually water or mixed with bentonite in difficult and highly permeable ground conditions'; was pumped to the front of machine to generate a positive





3 4

1. The Micro tunnel boring machine (Micro-TBM) with an advanced laser guidance system was used.
2. Microtunnel Pipe being Installed.
3. Diaphragm Wall Cage being installed.
4. First-of-its-kind micro-tunnel solution.
5. The completed building.

pressure at the cutting face of the excavation, thereby preventing collapse. “Water was used initially for slurry. Bentonite was later used as the ground conditions became unsuitable for the use of water,” Lebitsa says.

The same slurry was used as a transport medium for the excavated material, and is pumped back via a slurry return pipeline into a separation plant at the surface.

The 250 m<sup>3</sup>/hr separation plant was equipped with a vibrating shaker screen rack, two 15-inch hydro-cyclones, and an agitator, designed to separate solids (in this case sand and pebbles) from slurry fluid. After the excavated material was separated the reconditioned slurry fluid is re-used and pumped back into the circulating slurry system.

## Laying the pipeline

Each concrete pipe was lowered into the jacking pit via a crane and inserted into the collar of the previously inserted pipe. A wooden packing was inserted between each pipe to prevent cracking as a result of point loads occurring during the jacking process. The hydraulic jacks were then closed onto the other end of the pipe, which continued the drive.

Slater states that the entire pipeline was jacked forward from the rear end of the pipeline. “The pipes needed to be designed not only for the permanent loading conditions but also the temporary forces on the pipes during installation. Bearing this in mind, inter-jack stations were available to reduce the forces on the pipes, and minimise the risk of damage and associated downtime.”

## About the pump station

The pump station consists of four main components, namely; the screening chamber, wet well, dry well and surface structure. It houses four 250 kW immersible pumps

connected to two 1 000 mm diameter rising mains that cross the harbour through the tunnel. The pumps are also connected to a combination of stainless steel and HDPE pipework, ranging between 600 mm to 1 000 mm diameter.

The pump station operates automatically, depending on the inflow to the station, which varies over a 24 hour period. Slater says that the sump level is constantly monitored for fluctuations in flow. “As the inflow increases, the pumps speed up via variable speed drives. The number of pumps running and their respective speeds is determined by a programmable logic controller (PLC) system.”

The pump station also features a ventilation system, an odour control system, backup generator and several sluice gates that allow various portions of the station to be isolated. The inlet sluice gate is programmed to close when power failures occur. Its motor is controlled by a UPS (Uninterrupted Power Supply) which closes the gate even when there is no power, thereby preventing the pump station from flooding.

## Health and safety

Slater admits that tripping and falling hazards, deep excavations, confined spaces, methane contamination, high scaffolding, deep water and high traffic areas presented a high number of potential health and safety risks to the project.

“Despite these potential risks, the main contractor accumulated close to 270 000 lost time incident (LTI) free hours with only a single LTI recorded over the three year construction period. This is an outstanding accomplishment.”

## Industry recognition

The South African Institution of Civil Engineering (SAICE) Divisional Award for Operation and Maintenance Projects was presented to Hatch Goba in October 2014 in recognition of the lead role that the company played in ensuring the overwhelming success of the project. Hatch Goba was again commended one month later with a special mention in the Civil Engineering Contractors category at the prestigious Best Projects Competition hosted by *Construction World*.

“The success of the Mahatma Gandhi Road sewer pump station project is a result of various teams working well together, including; client, contractor, subcontractors, architects and the Hatch Goba team. Thanks to everyone that contributed to these coveted achievements,” Slater concludes. <

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## SOLVING DRAINAGE PROBLEM

The vast Midrand Estates in Gauteng, which comprises Midstream, Midfield, Midlands and Midstream Hill Estates, boasts not only upmarket residential properties, but also private schools, shopping centres, sports and recreational facilities, fuel stations and churches.



Various in-situ soil types posed a challenge for effective drainage.

To add to all these facilities, a new hospital was constructed on Midstream Hill by main contractor Basil Read. Jordan Construction undertook the earthworks including the installation of the Sub-soil drainage systems.

The site for this new Mediclinic Hospital in Midrand Estates has undergone extreme excavation operations to accommodate basement parking. With the natural flow of ground water having been altered, resulting in a high water

table being exposed in the cuttings, it was imperative that an effective drainage system be installed. This is when Endecon Ubuntu Consulting Engineers proposed that a specific Kaytech geotextile would be the most suitable product for the problem faced. The difficulty in this area is the vast amount of different in-situ soils, ranging from sandy material to black clay and, of most concern at the hospital site, the presence of residual granites and ferriteretes. These sub-soil conditions could result in clogging of drains by means of ferric oxide build-up on conventional woven and nonwoven continuous filament geotextiles, thus a drainage product with larger openings was a necessity.

The engineers specified Kaytech's Geomesh, a dimensioned, PVC-coated, multi-filament woven polyester, designed for soil reinforcement and as a high modulus separator in composite drains. The conventional method of drainage would be to utilise washed river sand dimensioned as backfill over slotted pipes. However this sand may also potentially clog over time and the engineers proposed that a select, suitable geotextile would be the most practical solution for the problem at hand since its installation is similar to that of a conventional sub-soil drain which is more familiar to the site labour.

Other factors in this decision were the cost implications of importing washed river sand and that the structure of Geomesh is very similar



Geomesh has larger openings than woven tape to provide non-clogging drainage.

to the retention characteristics of a medium to coarse-grained river sand. The final product consisted of the installation of a conventional shaped drain: 300 mm x 300 mm with a 110 mm slotted pipe and 19 mm stone all of which was wrapped with 2 500 m<sup>2</sup> of Geomesh.

Although it is expected that some fine material will wash through the Geomesh, it will eventually create a natural reverse filter at the interface. The larger openings in Geomesh are known to retain grain sizes of 0,4 – 2 mm which will definitely assist to prevent the system from becoming blinded or clogged by the extremely varied sub-soils.

It is debatable whether any other upmarket estate in Gauteng can compete with everything that Midrand Estates has to offer the discerning investor and buyer making Kaytech a proud participant in this unique development. ■

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## VIRTUAL GUIDED TOUR

A novel website allows visitors to take a step-by-step guided tour through a physical home using only a cell phone, tablet or desktop computer.

Stand 47 is an award-winning concept house co-developed by Saint-Gobain, the world's leading producer of contemporary building technology. The home was built to physically demonstrate the considerable benefits of building with state of the art building materials and systems, rather than with more traditional materials like bricks and mortar.

While the public are invited to personally visit and experience the home (situated in Monaghan Farm in northern Johannesburg), this potentially excludes a broader, national audience who are based further afield.

Accordingly, the [www.stand47.co.za](http://www.stand47.co.za) website features an interactive filmed Virtual Tour that gives viewers direct visual exposure to the inside and outside of the house. The tour allows the user to easily move through the home at their own pace and examine information that explains the features and benefits in different parts of the home. Importantly, this 'first-person view' is accessible to anybody using any smart device connected to the Internet, without the need for any application download.

The site also offers useful insight on how to build a home that is more efficient, comfortable, safer and healthier to live in.

The website was produced by The New Order, a design-led multi-disciplinary agency directly involved in developing and building the concept house.

"The Stand 47 website is a great example of our approach to technology and innovation. We innovate to deliver tangible benefits to consumers. In this case, our digital innovation enables practically any consumer to visit our home and experience aspects of its benefits with the greatest of ease. The new design aims to attract more viewers, to demystify concerns and perceptions about contemporary building methods and to inform those interested to build their own Abode of Awesome," says Evan Lockhart-Barker, head of marketing at Saint-Gobain South Africa

Says Gavin Rooke, founder of The New Order: "We believe design is the interface between information and understanding. Everything we do is aimed at enabling consumers to understand the benefits of the brands we build. We believe this website achieves exactly that". ■



Scan and view the innovative virtual guided tour.



## TREACHEROUS B1 IN NAMIBIA UPGRADED

The stretch of road that is regarded as the most dangerous in Namibia is set to shed its notoriety when Aveng Grinaker-LTA completes a NAD239-million contract to upgrade this section of the B1 motorway.

➤ The project entails upgrading the B1 to a dual carriageway between Windhoek and Okahandja, from km 24,5 to km 34,5, states Aveng Grinaker-LTA Civil Engineering divisional managing director, Richard Evans. It will comprise 691 000 m<sup>3</sup> of mass earthworks and 324 000 m<sup>2</sup> of single seal (Cape Seal) surfacing.

The company will also undertake the construction of two interchanges, each with a north and south bound bridge, Evans notes. In addition, a 4,5 km service road will be constructed to create access to the plots next to the carriageways.

The B1 is the main corridor connecting Windhoek to the north and to the west coast,



and needs to accommodate a large amount of traffic on a daily basis. Because this specific piece of road had earned the reputation as the most dangerous stretch in Namibia, the Government, in conjunction with the Roads Authority, decided to upgrade it to a double carriageway in order to make it safer for all road users, Evans expands.

Aveng Grinaker-LTA's current project works are due for completion in April 2016. ■



Geomesh used in a conventional drain system.

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# Eastern Cape **EMPLOYMENT BOOST**

The opening of the R1,7-billion Baywest Mall in Port Elizabeth this April – the Eastern Cape’s largest retail and entertainment centre – will bring with it the creation of up to 2 500 permanent jobs, while development to the tune of R500-million rolls out around the centre, say the developers.

**ABOVE:** This aerial photograph, taken on 12 January 2015 shows progress on the R1,7-billion double-storey mall, as well as the R300-million road network surrounding the mall.

tenant list would be revealed in the weeks leading up to the April opening.

Blows said a key attraction at the mall was its R100-million Fun Factory wing featuring the province’s only ice rink, allowing for the formation of ice hockey leagues and school sports teams. Eight Ster-Kinekor cinemas, restaurants, a ten-pin bowling alley and a state-of-the-art games arcade would also form part of the Fun Factory, he said.

Also included in Phase I of the Baywest City development is a gym, a private school and hospital, 100 000 m<sup>2</sup> of office and commercial tenants and about 2 000 housing opportunities. Phase II will add another 2 000 housing opportunities, a light industrial park and value retail developments.

“Baywest City is a long term investment in the region,” said Blows. “It’s going to change the face of the city and put the Bay on the leisure and corporate tourism map, growing much the same way as Century City in Cape Town has grown around Canal Walk shopping centre.”

The project is a joint venture between Billion Group, headed by Johannesburg-based property magnate Sisa Ngebulana, and the Stellenbosch-based Abacas Asset Management, responsible for Cape Town’s Cape Gate shopping centre and Mooi Rivier Mall in Potchefstroom, among others.

Speaking about the economic impact of the mall on the region, Baywest MD Gavin Blows said an average of 10 permanent jobs would be created to staff the mall’s 250 retail outlets. On top of this, staff would be needed for security and cleaning services at the 90 000 m<sup>2</sup> (gross leasable area/GLA) centre – contracts which would be advertised in the coming weeks, he said.

“Because Baywest Mall is the catalyst to the entire Baywest City development,

development will continue around the mall once it opens in April,” Blows explained. “We already have R500-million worth of development lined up for this year, which includes office blocks and a motor showroom.”

Tenants, such as Shoprite-Checkers, have begun the hunt for employees to staff their Baywest outlets with advertisements in the local media and CV collection points at their Port Elizabeth stores.

“We have been inundated with requests for work at the mall,” said Blows. “Our community liaison officer has already received more than 500 CVs for our database. We will pass the database on to our tenants as they begin their search for staff.”

With major anchor tenants including Woolworths, Game, Shoprite-Checkers, Pick n Pay, Edgars and Blows said the centre’s full

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Workers carefully lay the piping which forms the foundation of the 2 300 m<sup>2</sup> Baywest ice rink in the mall’s R100-million Fun Factory wing. The mall will open this April, upon which time development around the centre to the value of R500-million will commence.



## Facts about Baywest

- The mall size, 90 000 m<sup>2</sup>, is the gross leasable area and excludes the parking area for about 3 200 vehicles.
- The development of the mall is a joint venture between Abacus Asset Management and Billion Group.
- The construction value of the mall is approximately R1,7-billion, with a further R300-million being spent on developing the road network in the area.
- The mall is central to the development of the greater Baywest City project, which will be similar in concept to Cape Town’s Century City development.
- About 25% of the 320 ha Baywest City site has been allocated for environmental preservation and will not be developed at all.

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# MAKING INROADS in KwaZulu-Natal

Murray & Roberts Infrastructure has secured its first roadworks rehabilitation contracts in the province of KwaZulu-Natal for the South African National Roads Agency Limited (SANRAL). This is a major coup for the company, established after the integration of Concor Civils and Concor Roads & Earthworks into a new single business called Murray & Roberts Infrastructure.

➤ “There are actually two contracts that have been awarded back to back to Murray & Roberts Infrastructure. While the coordination and planning of these simultaneous projects represents a challenge in terms of logistics, it is a significant testament to the capabilities and expertise of Murray & Roberts Infrastructure,” Bennie Hook, project manager, says.

The scope of work on both contracts consists of periodic maintenance of National Route 2 (N2). The first contract is a 22 km stretch, namely Section 23 from km 33 to km 55, which is roughly from the Umzinto River to the Umkomaas River.

The second contract is a 14,5 km stretch, namely Section 25 from km 2,7 to 17,2, which is from where the N2 crosses the Umlaas Canal to what is known as the Spaghetti Junction. The first contract commenced in August 2014, with a duration of 16 months, while the second contract commenced in September 2014, with a duration of 14 months and an estimated completion date of November 2015.

Commenting on the pavement specification, Hook says the projects consist of rehabilitation work on the old road surface. This involves milling out a layer of the existing asphalt and replacing it with new material, followed by a final Ultra Thin Friction Course (UTFC) layer on top.

A major feature of the project is the use of a Comar mobile asphalt plant from Much Asphalt, which is providing the Recycled Asphalt Pavement (RAP) mix for the projects. Both projects will use 40% RAP content.

“Recycling the old asphalt in this manner represents a significant cost saving in terms of bitumen and aggregate, as well as being highly sustainable,” Hook comments.

“A particular challenge has been posed by closely monitoring the binder content of the existing asphalt, due to various rehabilitation work carried out over the years that has used different materials.

“The project is pretty straightforward. However, obtaining the correct RAP mix is tricky, as the varying binder content of the old asphalt affects the ratios of the mix

recipe. This has to be monitored closely as quality control is critical.”

In terms of volumes, 21 000 t of continuously graded fine mix and 23 000 t of continuously graded medium mix will be used on Section 25, in addition to 555 000 m<sup>2</sup> of UTFC. A total of 33 500 t of continuously graded course mix and 535 000 m<sup>2</sup> of UTFC will be used on Section 23.

Equipment on site includes a paver, a shuttle buggy, a milling machine, vibratory roller and water cart. Hooks says that Murray & Roberts Infrastructure has also been employing local labour in terms of SANRAL requirements. ◀



*“Recycling the old asphalt in this manner represents a significant cost saving in terms of bitumen and aggregate, as well as being highly sustainable.”*

ABOVE: Rolling and paving of the longitudinal joint.

CENTRE: The new asphalt surface being laid down by the paving train, comprising a dumper truck, paving machine and tandem rollers.

BOTTOM LEFT: The north-bound slow lane being milled prior to being replaced with new asphalt.

BOTTOM RIGHT: The tack coat being sprayed onto the milled surface.



## FIRST GREEN TAXI RANK

South Africa's leading building materials company, Lafarge South Africa, worked closely with Cape Town architects Stauch Vorster right from the design phase of South Africa's first green taxi rank in Wallacedene, in the northern suburbs of Cape Town. For the construction of the building, Lafarge supplied its innovative, market-leading product, Agilia™ self-consolidating concrete.



Lafarge Agilia™ concrete was used to construct South Africa's first green taxi rank in Cape Town.

Agilia™ met the requirement that all materials used in the taxi rank had to be environmentally friendly and contribute to a low carbon footprint for the facility. As well as producing high strength, durable concrete, Agilia™ is popular with architects for extending the avenues of creative concrete expression.

Lafarge South Africa is the local presence of the international Lafarge Group, the world leader in building materials. The Group is committed to creating solutions that help to build better cities that are more durable and desirable environments to accommodate the enormous global trend to urbanisation.

Innovation is a core strength of Lafarge, which operates one of the largest building materials research and development centres in the world.

The Lafarge Tygerberg Readymix plant supplied 133 m<sup>3</sup> of Agilia™ concrete to construct the columns and beams of the taxi rank structure. The product's exceptional fluidity enables it to fill all corners and areas in formwork or moulds without the need for vibration, while remaining

homogeneous. It is also an ideal product for achieving smoother architectural concrete finishes with minimal need for remedial work. The Lafarge Readymix team from the company's Cape Town branch provided technical advice and on-site support for the project.

Durability is a key issue in this type of high traffic public facility. Costing approximately R25-million, the taxi rank is expected to serve around 5 000 commuters daily travelling in 50 minibuses.

The challenging aspect of running cost has been exceptionally well addressed with the structure's PV panels and battery backup almost eliminating Eskom power usage. Stormwater is captured and stored in underground tanks and recycled for washing vehicles.

"This has been a fascinating project," comments Herbert Groenewald, building marketing manager – Lafarge South Africa. "Lafarge is proud to have provided the concrete solution for this taxi rank initiative and firmly believes it will be the model for future transport infrastructure development." ❏

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## PROJECT OFF THE GROUND IN MALI

Skyriders continues to live up to its reputation as the leading provider of rope access-aided inspection, non-destructive testing and maintenance services to African industries, following the company's second permanent appointment at Syama gold mine in Mali.

Skyriders was contracted by Société des Mines Syama Sa, Mali to carry out routine inspection work on a replacement smokestack that the company successfully helped to erect in 2013. Marketing manager Mike Zinn says: "In 2013 we assisted with the erection of the replacement stack, and recently our two-man team – including a Level III rope access technician and inspector – inspected the rebuilt stack."

The scope of their work includes inspecting the external and internal components of the structure – a task that takes four days to complete. During the inspection, the team conducts visual surveillance and, using ultrasonic meters, tests wall thickness. Findings are then submitted to an external consultant for final reporting. "To ensure the highest

standards of quality and efficiency, we worked with internationally renowned smokestack and industrial chimney specialist, Beaumont Specialist Consulting," notes Zinn.

Zinn admits that the work is physically demanding, with hot weather posing particular challenges. "The team wear backpacks that carry water and start work as early as possible in order to limit the time they work during the heat of the day. Despite these obstacles, Skyriders' scope of the project has been highly successful to date, as the company has the best team in the business, which boasts string of successful industry results," he concludes. ❏

**A routine inspection carried out by a rope access specialist at Syama gold mine.**





# GOUDA WIND FARM

Forty six precast concrete towers are being deployed for the construction of one of South Africa's largest wind farms to date, situated on farmland in the Gouda district of the Western Cape. The towers stand at 100 m and support wind-powered turbines, each with a maximum generating capacity of 3 MW.

**>** The wind farm is jointly owned by Spain's Acciona Energy and South Africa's Aveng Group and when completed in 2015, will feed up to 138 MW into the national grid daily. An agreement between the JV and Eskom will see ownership of the entire operation being transferred to the utility giant after 20 years.

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## Precast towers

The towers are being manufactured by Cape Town-based precast concrete producer and Concrete Manufacturers Association NPC (CMA) member, Concrete Units, in a joint venture with another Spanish company, Windtechnix. The latter has extensive experience in the manufacture of precast concrete wind towers and is providing engineering input. Once the project is completed some 16 500 m<sup>3</sup> of concrete, 2 800 tons of reinforcing steel and 160 000 m<sup>2</sup> of shuttering will have been used.

The on-site assembly of the towers and manufacture and installation of the turbines

is being handled by Acciona Energy's sister company, Acciona Wind Power. Another local company, civil engineering consultancy, Concrete Growth, was appointed by Acciona Wind Power as an external quality auditing agency, responsible for the implementation of quality management in the manufacturing process.

According to Concrete Units Cape Town manager, Brian Cook, each completed tower comprises five 20 m tapered concrete sections, each section assembled from individual precast concrete segments.

## How it fits together

The base section, T1, comprises four segments and is mounted on an in-situ concrete foundation. T2 which is mounted on T1, and T3, which is mounted on T2, are also assembled using four precast concrete segments each, whereas T4 is constructed with three parts and T5 requires only two.

T5 sections are assembled at Gouda's storage yard where they are made ready

for supporting the turbines. Turbines consist of the nacelle and hub which weigh 140 tons, and three blades each weighing 10 tons. Sections T1 - T4 are assembled at the actual tower sites where individual segments are lifted off the trucks and then lowered vertically onto circular concrete bases by a giant mobile crane. They are then joined to matching segments using 'bowtie' connections.

This is achieved by inserting reinforcing into hollow slots formed by the segments' two opposing vertical channels. A proprietary high-strength grout is then pumped into the joint to create a permanent seal.

The 20 m sections are attached to each other in a horizontal plane using male starter bars at the bottom end and female ducting at the top end and these joints are sealed with grout. The flawless execution of this process requires extremely accurate casting and very tight tolerances.

## Durability

The Gouda towers have been designed to bend with the wind and can move up to 700 mm at the top of T5 during strong winds. This flexibility is facilitated by the use of steel reinforcing inside the tower walls. However, this lateral movement is counter-balanced by the installation of six 90 mm steel cables, which attach the inner wall of T5 to the concrete base and provide additional strength to the overall structure. Once

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installed they are post-tensioned by Acciona Wind Power's engineers.

The segments, 782 in all, are being cast at Concrete Units' factory using five moulds which were shipped to South Africa from Poland and Brazil by Acciona Wind Power. Each mould section is two metres long and the sections were attached to each other using precision-based laser technology. Moreover, to ensure the accurate layout of the steel reinforcing, Concrete Units is using special reinforcing jigs.

## Casting

A maximum of five segments are cast daily. Various types of inserts and sockets are cast into specific positions to locate the mechanical (ladders, lifts and landings) and electrical equipment (cable trays etc) required inside the towers. Spaces for doors are cast into every fourth T1 segment. Mould stripping takes place either late into the night shift or first thing every morning by which time the segments have reached a compressive strength of 25MPa.

After three days the moulds are given a light post-tensioning prior to being transported to Gouda on extra heavy-duty low-bed trucks. Segment T1 which is 5,5m wide and T2, which spans 4,8 m, require police escorts. The smaller segments, using normal escorts, are generally shipped first which then allows the trucks to return for a second load.

## Innovative products

Santie Gouws, managing director of Concrete Growth, says that in terms of concrete manufacture, the Gouda Wind Farm project is cutting edge.

"For example, the tower segments were designed according to European as opposed to SANS codes. This allows us to design up to 115 MPa cube strength rather than the 60MPa which forms part of the SANS structural concrete code. The Gouda towers are being manufactured to 75MPa which is the strength required to handle the loading of the turbines and the wind. This high characteristic strength has allowed Acciona's engineers to opt for lighter concrete sections

which add a further eco-friendly dimension to the project through lower material usage and transport costs.

"Secondly, the towers are being manufactured with self-compacting concrete (SCC). SCC is comparatively new to this country and besides being the largest wind farm to date, Gouda is also the country's largest SCC project thus far. In fact it is using approximately half the amount of concrete used for the precast segments of the Gautrain project.

"Without SCC the project would have been much more complex, involving external vibration and more expensive moulds.

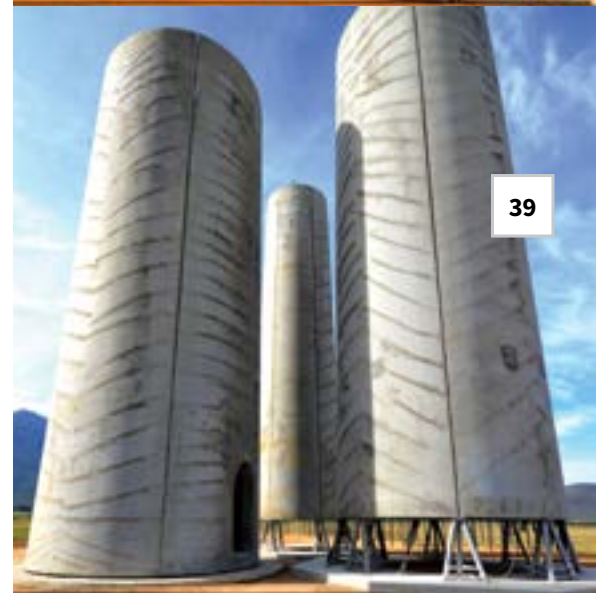
"The SCC is being supplied by Megamix, which has a batching plant close to Concrete Units. The SCC mix is one of the critical components of the whole manufacturing process and one member of the Concrete Growth team is permanently based at Megamix to monitor the batching process. Rainy weather can affect the mix because the amount of water used is critical. Even a slight water overdose can cause segregation and a loss of strength. We have a system in place and have had very few problems with the mixes. Needless to say the slump flow of every batch is tested at Concrete Units before being pumped into the moulds."

Gouws added that turbine towers generally amounts to approximately 15 to 20% of a wind farm's capital cost, a figure which does not include the foundations.

In most instances, the higher one goes, the better the wind, and for heights above 80 m, concrete towers tends to be less expensive than imported steel towers, thus impacting on the cost of the electricity generated positively.

To date, most wind turbines in South Africa have been mounted on steel towers, – which have the disadvantage of being imported and a comparatively low local labour and job-creation component.'

By contrast, concrete wind towers come with high local-content inputs and by default carry a much higher job generating capacity. For example, over 95% of the raw materials for Gouda's concrete towers including the reinforcing steel were sourced locally.



## Renewable energy

Moreover, wind power forms part of the Government's renewable energy strategy which was formulated by the Departments of Energy and of Trade and Industry in 2011. The CSIR was tasked with researching its job creation and economic development potential, and it was on the basis of the CSIR's report that the DTI increased the local-content wind-farm requirement for Round Three of its Renewable Energy Programme, of which Gouda forms a part.

Alternative energy is scheduled to add 9 000 MW (equivalent to two coal-fired power stations) by 2030, and it seems a safe bet that precast concrete towers will play a major role in rounds four and five of the programme. <

**This article was first published in Precast**

# Hout Bay HEAD TURNER

Nestled among indigenous vegetation, with spectacular views of Chapman's Peak and Hout Bay harbour, a new development will alter the Hout Bay skyline for ever.

➤ Built by the Silverline Group using the light steel frame building (LSFB) method, this eco-friendly 340 m<sup>2</sup> triple-storey house, took approximately four months to complete and has drawn attention from tourists and locals alike.

The LSFB method produces very little waste and has a much smaller carbon footprint than conventional building practice and saves significantly on construction time. This project started at the end of February 2014 and was largely completed by the end of June 2014.

The low mass of the structure and walling allowed the engineers to design a shallow concrete raft foundation with outer beams 450 mm deep and 250 mm wide and a 70 mm thick slab cast in recycled PVC Modulo Blocks. "Compared to the heavy reinforcing and thick concrete for conventional building techniques this LSF house saved costs on materials and labour associated with the foundation and floor slab construction," says Charl van Zyl, CEO of the Silverline Group.

Once the foundations were completed, the ground floor walls were erected using LSF panels made from high-strength galvanised steel sheeting. The engineer specified the use of chemical anchors to bolt the structure to the concrete foundation. A LSF joist floor was erected on top of the walls and covered with fibre cement boards as the new floor.

The remainder of the walls were constructed with light steel frame wall panels fixed together with corrosion protected screws, ensuring a rust free building in spite of its close proximity to the ocean. Nine mm fibre cement board external cladding gave an overall external wall thickness of 133 mm, with an R-value of 2.8. The R-value is a measure of the thermal insulation of the wall panels – the higher the R-value the more effective the insulation of the building.

Comparing the R-value of the light steel frame structure – with external walls consisting of 9 mm fibre cement board, fixed to the light steel frame through a thermal break layer and a Tyvek vapour permeable membrane, glasswool Cavity Batt insulation installed in the wall cavities followed by a 15 mm fire resistant high impact gypsum board on the inside – to a standard uninsulated double brick wall with R-value of 0.26, shows the superiority of the composite wall system that LSF offers.

Internal walls consist of light steel frame panels clad with high impact 15 mm fire stop gypsum boards with a more than 30 minutes fire rating, and glasswool cavity batt insulation in the cavities, to enhance acoustic insulation.

## Reducing energy requirements

The insulating layers in the external walls reduce the building's energy requirements for heating and cooling, with tests on the building's total energy demands indicating that it has achieved a 17% to 20% improvement in energy efficiency, compared with those of conventional designs.

Due to the energy efficient design, the building will heat up faster in winter and will cool down faster in summer.

"According to the CSIR, energy required for heating and cooling a well-insulated LSF dwelling will be less than half of that needed to keep the internal temperature of a uninsulated masonry dwelling at a comfortable levels," adds John Barnard, director of the Southern African Light Steel Frame Building Association (SASFA).

## Even more eco-friendly

To make the house even more environmentally friendly, the owner will be using solar heating and recycling rainwater which he will use to water the plants in his garden.

The owner, Dieter Losskarn, who describes himself as "a regular brick-and-mortar kind of guy" was initially quite reluctant to build with anything else. "But this Hout Bay Harbour House in Harbour Heights has converted me. Light steel frame houses are the future – especially in this country.

"Everybody talks about green and saving energy and this house does it so well. Even on really cold days, when a brick structure would be chilly as a morgue, the LSF house retains the daylight sun and is – even without any additional heat source – surprisingly warm inside. With a fire place burning there, even my triple-story, open-plan house will be pleasant and cosy inside.

Not only is the house warmer, it was also built in less than half the time of a normal brick structure. I loved the fact, that the electrician and the plumber followed the build through the wall cavities, instead of messily breaking and chasing through brick walls afterwards. A much cleaner build – with less rubble and waste," Losskarn says.

Project manager Ruann Mare says "Light steel framing is definitely the future and I think many more people should consider building this way." ❏





**BOTH PHOTOS:** Using the light steel frame building (LSFB) method, this eco-friendly 340 m<sup>2</sup> triple-storey Hout Bay house, took only four months to complete.



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# BEAUTIFUL STEEL

Paragon Architects was approached by Investec during 2011 to propose a design to accommodate amongst other tenants, the law firm Fluxmans. In keeping with the mores of Investec and the tenant, a classical architectural approach was adopted, although the language was not that of classical architecture.

Following a discussion with the local residents' group, a design evolved that comprised a raised platform at street level that included parking but was expressed as a planted volume. Most of the plants, especially the trees were pre-grown so that once they were planted during October 2013, they had reached some level of maturity. They included: *Acacia xanthophloea*, *Celtis africana*, *Viburnum sinesis* and *Ficus microcarpa*. Access to the street was to be welcoming.

Sitting atop the platform were the offices themselves, that were heavily screened to the east and west with deep overhanging sun screens on the north.

## Steelwork forms

The steelwork forms and integral part of the design and the engineers developed a language that was as elegant as possible. The columns are 24 m long in a single length and from the 5<sup>th</sup> floor to roof they taper to 250 mm from 500 mm. There are 12 columns externally and 16 internally.

The sunscreens were designed from a series of sun studies executed by the mechanical engineer and internally the orientation of the blades directs your gaze to the treed residential suburbs beyond.

Revised fire regulations required an extra staircase and this was included in the architectural design.

## Glazing

The glazing formed an integral part of the design and included the following glazing specifications: AGC: double glazed Stopray clearvision 50T, spandrels with clear glass, double glazed back painted unit and 3,85 m high ground floor vision panels. The biggest unitised glass panels are 4,5 m x 1,4 m.

This office building is located on Jellicoe Avenue close to the corner with Oxford Road. It is essentially on the border with Dunkeld, which is a residential area. There was close co-operation with the local residents and this was taken into account when designing the five storey, 10 000 m<sup>2</sup> building.

The simplicity of the steel structure supports the large over sailing concrete roof while the monolithic nature of the pristine white north wall that floats above the ground with the help of the steel structure behind stands in contrast to the fineness and delicacy of the steel louvres on the east, west and north that takes grates care in displaying its textured, soft nature. The basement also enters the mix to create a green, textured podium for the structure to occupy.

## Why steel was chosen

For the columns, tubular steel was chosen to keep the structure as slender as possible (due to the stiff nature of tubular steel) while maintaining a smooth finish in and to achieve an automotive metallic finish. The columns were also finished off by adding a tapered section at the top which was formed by rolling flat steel sheets.

The columns on the north, east and west elevations were five storeys high, so steelwork was chosen for ease of construction as

these columns were going to be very difficult to construct in shuttered concrete over that height. Tubular sections were chosen for their bending properties in both directions primarily, and also for their elegance. They allowed for the choice of the elegant taper at the top of the columns.

The steelwork frame element hiding inside the northern façade was chosen to be constructed from steelwork for the same reason of build-ability.

The framing structure for the brickwork substrate behind the tiles would have been very difficult to construct in shuttered concrete as an element on its own, which only interacts with the building at the fifth floor. The louvres that shade the building on the east, west and north elevations were manufactured from large flat steel sheets, lasercut to form interlocking louvre blades which come together to create a ripple pattern

## Steelwork on this project

The slenderness and proportion of the tapered tubular steel columns give the building an elegant aesthetic that sets it apart from its neighbours. The ripple that is created by the louvre blades add another level of detail that finishes off the overall concept. The fineness of the steel elements work together to create a truly special building.

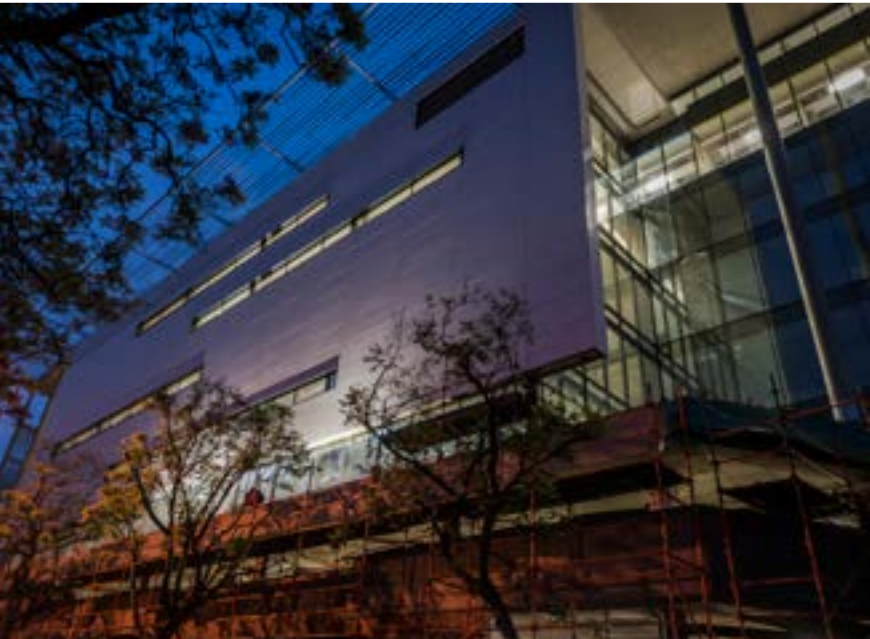
## Sustainability considerations

Passive design principles were considered during the design process and the steel louvres form a major part in the east/west and north shading of office areas. The louvred profiles needed to be designed in such a manner that they could be fabricated in panel sections and easily erected on site with no welding required. The louvre blades were designed to be profiled and cut from single sheets by interlocking the faces in order to achieve minimal wastage and maintaining the integrity of the texture.

## Challenges and solutions

The challenge was always the tight programme. OmniStruct did a fantastic job on the steelwork's quality considering the time implications. Another challenge was to make the connections elegant and pleasing to the eye: designing with an appreciation for fabrication and transportation while keeping an eye on the end product so as not to defer the connection away from the original concept of 'beautiful'. ◀





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# Isando PEDESTRIAN bridge

The Isando Pedestrian Bridge stands as a visible marker to the current efforts to overhaul and upgrade the freeways in and around Johannesburg. With a total length of 446 m the bridge and its approaches connect the Isando Rail Station with the OR Tambo International Airport (Johannesburg).

The structure is well used with some 9 000 commuters crossing each day. The new bridge replaces two sub-standard footbridges that were a legacy of urban planning in the early 1970s. Commuters predominately used one of the 2 m wide bridges with the other remaining unused. The new foot-bridge's 4,5 m wide walkway now provides a much improved level of service to the surge of commuters who exit the trains in the morning peaks.

## General arrangement

The central 126,4 m long section of the bridge has a 4-span configuration with spans of 25,4 m, 14,8 m, 22,2 m and 64 m. The superstructure consists of a continuous composite steel box girder with a 5,4 m wide concrete deck slab. The 64 m long main span is supported by two vertical planes of fanned cables that are anchored into the back spans. A main feature of the bridge is its two un-braced cigar shaped steel pylons. One leans forwards at 11 degrees and the other backwards, hence the bridge's name.

## Influence of consulting engineer on the design

Dubbed the 'Walking Wonder', the concept design was the selected entry by means of a design competition. The client, the South African National Roads Agency Limited (SANRAL), identified the importance of creating an interesting aesthetic that responded to the site's prominence. For this reason SMEC's engineers were asked to come up with several different solutions and to also invite three architects to submit independent derived concepts. In the end one of the two designs submitted by SMEC was selected. Seeing value in a collaborative design approach, the design team then selected one of the architects to act as an architectural advisor.

## Budgetary compliance

In submitting the concept design SMEC's design team was cognisant of the client's desire for aesthetics at a reasonable price. A self-anchored composite steel and concrete cable stayed bridge was chosen as

the most economical form. The bridge's individual character was added thereafter. The strategy was successful and the construction costs of the main span proved economical at a rate of R18 000/m<sup>2</sup>. This is considered a very competitive rate for a long span structure. The final structure was completed within budget with a total cost of R38-million.

## Quality of engineering

The final form of the structure is a direct product of the quality of the design process and the versatility of the various structural materials used. It is also a function of the bridge's 'buildability'. For the inclined pylons, the use of steel enabled offsite fabrication and the relatively simple erection of sections. The use of a torsionally stiff structural steel box girder proved an economical means of supporting the 5,4 m wide concrete walkway. It also allowed for the asymmetrical cable arrangement on either side of the deck. The depth of the deck section enabled a cable spacing of 11,4 m, which reduced the number of cables required.

## Sustainability

The long term relevance and functionality of the bridge was an important consideration during the preliminary design stage of the structure. The width of the main deck is set to accommodate future increased flows of commuters from the Isando Rail Station. The possible upgrade of the Isando Rail Station was also considered. The level of main deck was set to allow direct access from a possible future elevated concourse over the rail lines. The bridge is in fact already providing impetus to that upgrade.

The choice of construction materials was also carefully reviewed. Duplex struc-

tural steel pylons were investigated to eliminate the need for future access to re-paint the structures. However, in the final life cycle analysis a painted carbon steel proved the more economical solution. Elements suspended over the highway were galvanised and then painted to extend the maintenance intervals and to reduce future impacts on traffic. This was judged important as the carbon count associated with traffic delays and disruption far outweighs the carbon count of the galvanising process.

The rail station is part of a busy inter-modal transport junction that caters for the needs of 19 000 pedestrians per day. Pretoria Road runs parallel to the railway line and is often blocked during peak periods when informal taxi ranks form in two of the four lanes as taxis drop-off and pick-up commuters.

The creation of formalised links between the various modes of transport dictated the crossing position.

## Complexity and sophistication

The bridge was analysed in Bentley RM using a simple beam model. In order to model creep and shrinkage effects accurately, the construction sequence was modelled by activating the concrete slab properties at various stages after the structural steel deck placement. The effects were analysed for a 100 year time period and the associated restraint stresses in the steel box section were calculated. The bridge deck was constructed on 30 m long through trusses supported on temporary piers.

## Unusual construction methods

Temporary steel trusses spanning 30 m supported the deck section during construction. However, careful account of the temporary truss deflections was required to avoid locked in stresses during the staged construction process.

An initial pre-camber on the temporary support truss was set so that so when the steel deck section was installed the deflected shape matched the required alignment. This ensured that the construction joints on fabricated steel deck sections could be matched and welded. Prior to pouring the concrete deck slab the truss section was manually deflected upwards by some 40 mm. This was done so that when the wet concrete was added the deck shaped again deflected downwards onto the desired alignment. This method prevented locked in stresses developing in the steel box section.

## Project information

- **Client:** SANRAL
- **Main contractor:** Raubex
- **Architect:** GAPP Architects
- **Consulting engineer:** SMEC South Africa
- **Project value:** USD3,8-million (project cost)



### *Pylon Pile Cap*

An unusual aspect of the project is that the pile cap for the two main pylons has to straddle over a bank of high voltage electrical cables. These services were installed during the expansion of the OR Tambo International Airport and did not appear on any service drawings. Critically they could not be moved. Rather than redesign the bridge a bespoke pile cap was designed using a detailed finite element model.

### **Aesthetics of engineering elements**

The shaping of the towers was carefully considered as they are a visually dominant feature of the footbridge. To create a taper that appeared intuitively correct the section tapers in accordance with the golden ratio. The golden ratio is where two quantities have the same ratio to each other as the ratio of their sum is to the larger of the two quantities. Mathematically, the ratio is 1 to 1,618.

The lower tower section is 13,225 m long and has a constant diameter. The next section is a tapering section with a length of 8,175 m, which is 13,225 m divided by 1,618. The taper is then continued with the same pattern as shown.

### **Ingenuity originality and innovation**

It is hoped that the bridge is a testimony

to an engineer's ability to create original structures that combine economy with aesthetics. Unseen ingenuity is perhaps the integral abutments and connections that minimise the number of expansion joints required in the ramps or the complex interaction between the structure and its piled foundations.

The deck's torsion box is also a key structural element in dealing with the unbalanced cable forces at each pair of outriggers. Innovation within the context of a rational structural system drove the final form of the outriggers, which went through many design iterations.

### **Responding to needs of client and community**

The most satisfying aspect of the project is to witness the daily use of the bridge by thousands of people and the improved space that commuters now have. It is fulfilling to see the structural form that is conventional yet unconventional as such a functional piece of infrastructure.

The bridge sits in an industrial zone next to the airport and stands apart from its surrounding to some degree. In doing so it acts as a visual marker for pedestrians heading to and from work. The intent with the leaning towers was to give the structure a dynamic feel that reflects the urgency of the commuters who hurry across it. The architecture of the bridge also responds to the adjacent international airport.

The urban planning inputs to link the rail, taxi and pedestrian transport modes played a large part in the structure's final form. Significant effort was invested in conceptualising the functionality of the bridge to ensure it can be used and accessed by all. Safety and security concerns were also mitigated by providing multiple access and egress points.

### **Planning and technical design planning**

From previous experience the design team was aware of the importance of translating the original design intent through the detailed design stage and onto the engineering drawings. The innovative step of producing a design intent booklet with sketches illustrating the look and feel of components and swatches of the preferred materials was developed and maintained. This helped team members focus of the desired outcomes during the various design iterations.

### **Meeting the client's deadlines for readiness**

The project experienced delays due to the discovery of underground services. However, the carefully considered construction sequence and temporary works designs meant that pedestrian access across the R21 was maintained throughout the construction period. ◀



## Alternative **LIFTING** technologies

Johnson Crane Hire is positioning itself as a heavy lifting solutions provider rather than a crane hire company as it focuses on alternative lifting technologies as being complementary to cranes.

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➤ “Adopting alternative lifting technologies has definitely given us an edge in the marketplace. This falls within the ambit of our brand promise, which is total cost effective solutions,” James Robinson, heavy lift manager for the Crawler Cranes and Projects division of Johnson Crane Hire, says.

“We have the equipment, but more importantly, we have the expertise to apply to solutions. This is a highly specialised and niche sector of the market. What sets us apart is that our experience and intellectual property reside within Johnson Crane Hire; we are very much hands-on and in-house.

“We love cranes, but know it is not always practical to send a crane into Africa. When it is there it does the best job possible, but the logistics of getting it there is almost a project in and of itself. Alternative lifting technologies are a lot easier to mobilise and therefore

**ABOVE LEFT:** Crane Hire successfully delivered a specialised lifting solution at Sasol’s Secunda plant.

**ABOVE RIGHT:** The scope of the heavy-lift operation undertaken at Sasol Secunda involved the removal of three vessels for the Gas-Heated Heat Exchanger Reformer (GHHER) project at the gas reforming plant.

represent a much more cost effective solution in some instances,” Robinson says.

“These are ideal when it comes to once-off projects. As soon as the work becomes repetitive and we need to have a lot of flexibility, then cranes are the answer. However, when you can specifically design a lift and it follows a certain set of criteria, then alternative lifting technologies are the best. We are always on the lookout for integrated solutions that best meet our clients’ needs.”

While Johnson Crane Hire has already used jacking and sliding techniques to great success on some projects, Robinson says “there is a range of other technologies where we have the know-how and are ready to expand into if need be.” These include hydraulic gantries and strand jacking. However, the latest trend is Self-Propelled Modular Trailers (SPMTs).

The Crawler Cranes and Projects division of Johnson Crane Hire is ideally positioned to offer such alternative lifting technologies to its clients. “We have invested in one of the latest versions of jacking and sliding technology, opting for a system that is ultra portable. This is particularly important in confined or cramped areas where you cannot get any other sliding equipment in,” Robinson says.

In keeping with its focus on total solutions, Johnson Crane Hire has invested significantly in boosting its crawler crane fleet. “We recently expanded our big cranes, not in terms of capacity, but in numbers. We now have a 750 t lattice boom truck mounted crane, a 600 t crawler crane and a 750 t mobile crane.”

Looking at the latest trends, Robinson says there is a move towards the modularisation of plant equipment, which reduces assembly time and enhances both quality and improves. Modules are transported to location and erected on site. “I think the trend is definitely going to be for larger lifts, which falls in line with our portfolio of crawler cranes, in which we have made a substantial investment, especially in terms of capacity.”

Robinson concludes that Johnson Crane Hire will continue to offer its clients the latest innovations. “Within a competitive market, clients are always demanding better solutions. There are some exciting innovations in alternative technologies that we are keen to bring to the market, as it strives to keep with international best practice and standards.” ◀

**Johnson Crane Hire successfully completed a specialised lifting solution at the B2Gold Otjikoto project in Namibia.**





# RELOADED FACE DRILLING RIG LAUNCHED

Atlas Copco's well-known Boomer M-series drill rigs, which were relaunched in Australia after a major upgrade, are now available worldwide.

> The medium sized, one or two-boom Boomer M-series drill rigs from Atlas Copco have been favourite workhorses for many years in underground mining and tunneling. Now they have become more useful and efficient than ever.

During a major upgrade, the Boomer M-series rigs have been 'reloaded' with a range of enhancements that make them stronger, cleaner, safer and easier to operate.

Johan Jonsson, product manager, explains: "The use of contractors in the mining industry is becoming increasingly common and these companies have told us they need extremely robust drill rigs for drilling in tougher environments, and preferably rigs that can be used for more than one application. In response, we have further developed the new Boomer M-series. These rigs are now much stronger

and more powerful and can be used for face drilling as well as rock bolting."

Jonsson points out that the rigs have been 'reloaded' with a range of design improvements. These include stronger booms, a new filtration system, increased safety features and Atlas Copco's award winning rig control system. In field trials in Australia these enhancements have returned top ratings for productivity, longer service intervals and lower operating costs.

The new, stronger BUT 36S booms provide steadier articulation and faster, more accurate positioning. They also incorporate several new design features that help to extend the service intervals. The new filtration system keeps lubrication air and hydraulic oil free from water and fine particles. This improves the quality of the air and the oil, which, in turn, prolongs the life of the hydraulic components and the rock drills.

These rigs also offer increased safety for the operator. For example, the BUT 36S boom's Safe Bolting configuration makes it possible to swing the feed all the way back to the cabin so that the operator can load it with bolts while standing on platforms on either side of the rig. This eliminates the need to work in front of the machine under unsupported roofs, substan-



tially reducing the risk of injury from rockfall. For added safety, the spacious and comfortable cabin is now ROPS/FOPS certified.

The reloaded M-series rigs are equipped with COP 1838HD+ rock drills and come with a robust hydraulic control system or, as an option, with the award-winning, new generation Atlas Copco Rig Control System, RCS 5. ❏

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# NEW IN PARIS

The Doosan Portable Power display at the Intermat 2015 Exhibition will include a number of important new products being launched at the show. They include redesigned and Stage IIIA compliant G40-IIIA and G60-IIIA generators, alongside several new portable compressors including the Stage IIIA compliant 7/53, Stage IV compliant 12/154 and 12/254 and 7/125-10/110 Stage IIIB Dual Mode models.



## New generator platform

Providing 40 kVA and 60 kVA prime power, respectively, the G40-IIIA and G60-IIIA models are part of the new platform of generators from Doosan and share a common design with the G80-IIIA to G200-IIIA models launched over the last two years. The Yanmar-powered G40-IIIA and John Deere-powered G60-IIIA generators will both be available with electronic speed regulation (optional on the G60-IIIA model) providing, in addition to stability and better load take-over capabilities, a flexible dual frequency 50/60Hz working mode (optional for both models).

## New stage IIIA portable compressor

The new 7/53 portable compressor is a 36 kW Stage IIIA compliant replacement for the 7/51 model and has been redesigned to allow Doosan to keep this model in the Stage IIIA category, avoiding the need to transition to meet Stage IIIB regulations. The new features on the 7/53 portable compressor include forklift slots and a new bundled base option.

The 7/53 compressor has an intuitive,

simple key-start sequence, ideal for rental companies because of the reduced risk of machine abuse by untrained operators.

The user-friendly control panel offers an open layout of instruments and warning indicators. A folding lift bail reduces the risk of theft by keeping the lifting eye within the compressor enclosure. A built-in toolbox compartment offers ample storage space.

## New stage IV compliant portable compressors

The largest single axle model from Doosan, the new 12/154 compressor is the Stage IV successor to the previous 12/150 model and is again powered by the Cummins QSB6.7 6-cylinder diesel engine and meets Stage IV regulations without the need for a diesel particulate filter (DPF).

Compact in size, the 12/154 offers excellent towing stability. It is intended for applications in plant hire, construction, quarrying and general industry.


This encompasses not only standard compressed air applications such as powering breakers and tools in road repair, demolition and refurbishment, but also more specialist uses such as drilling,

abrasive blasting, spray painting and optical fibre blowing.

Also meeting Stage IV emission standards, the new 12/254 compressor is powered by the 247 kW Cummins QSL9 diesel engine meeting the regulations without the need for a DPF. The 12/254 model again offers both compact size and easy serviceability for added value performance.

## New 'dual node' feature

The 7/125-10/110 Stage IIIB model has a new 'Dual Mode' feature as standard, with a choice of two pressure and flow ratings on the same machine. By pushing a button on the keypad, the operator can switch between 'LO' and 'HI'. This 'two-for-one' solution replaces the need to choose between different models as used to happen in the past and offers much greater operational flexibility from the same machine.

The new 7/125-10/110 portable compressor is powered by the Stage IIIB Cummins QSB 4.5 water-cooled diesel engine providing 97 kW of power and meeting emission regulations through the use of cooled exhaust gas recirculation (EGR) and diesel oxidation catalyst (DOC) after-treatment technologies, without the need for a DPF. 



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# CONCRETE SOLUTIONS FOR SA CAR DEALERSHIP

A flooring specialist has completed a 6 300 m<sup>2</sup> car dealership project using tools supplied by Diamond Products – a leading specialist in the manufacture, assembly and sale of diamond tools and equipment for industrial applications.

> The company finished working on a project for the BB Motor Group, which owns more than 30 car dealerships nationwide. The Pretoria-based project involved the construction of new Renault and Suzuki workshops, in addition to customer parking.

The 6 300 m<sup>2</sup> building consists of a basement, and three floors above ground. The most challenging aspect of the project was the rehabilitation of a 2 000 m<sup>2</sup> section of concrete flooring that was severely damaged by rain while being poured.

Diamond Products supplied the BMG-435 Diamatic triple head grinder with coarse grinding pads to complete this challenging task. Diamond Products director Brian Clark states: "The BMG-435 Diamatic triple head grinder is the ideal machine for this project, as it is designed for surface preparation, concrete grinding, and cleaning and removal of coatings."

The BMG-435 Diamatic triple head grinder was used to grind off the excess damaged

material on the surface of the floor. It has proven to be efficient and durable during this time consuming task, which required full grinding of the surface four times in order to remove all damaged material.

In order to complete all concrete core drilling tasks, a hand-held RH1531 Shibuya motor core drill and a R1721 Shibuya core drill were used. Clark adds that the Shibuya core drill is lightweight and easy to handle. "It is also highly-durable, making it ideally suited to numerous applications, including; balustrading, air conditioning and anchor drilling."

Work on the project started in mid-2013, and was recently completed according to specified deadlines and budgets. Diamond Products has played an important role in the continued success of this project, thanks to its high-quality range of machinery that is backed up by dedicated after-sales and technical support. ■

## About Diamond Products

Diamond Products is a specialist in the manufacture, assembly, sales and support of diamond tools and equipment for the construction, glass, quarrying and flooring industries. Based in Jet Park, the company is unique in its ability to assemble and support its product range and is the only diamond tool company in South Africa with laser welding facilities for the manufacture of diamond blades and core drills.

The 220 V Diamatic 435 WD model is ideal for use with the CHRYSODeco Brush combination.



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# IMPROVED SOLUTION

Torre Industries is adding Elephant Lifting Equipment to the Plant and Equipment Division of its group of companies, along with SA French, Manhand and Kanu Equipment.

> The ultimate aim is to combine SA French and Elephant Lifting Equipment under the umbrella brand 'Torre Heavy Lifting' which, combined with the extensive distribution network of the Torre group, will allow Torre to offer a total lifting solution from consumables to tower cranes to its customers across Africa.



#### FROM TOP TO BOTTOM:

**A 5 t WLL (Working Load Limit) under slung overhead crane from Elephant Lifting Equipment. WLL refers to the maximum load that the crane can lift.**

**A 15 t/5 t WLL double-girder electric overhead travelling crane from Elephant Lifting Equipment in operation at a mine.**

**A 'C' hook from Elephant Lifting Equipment that is used for lifting steel coils.**

The acquisition was announced on the Johannesburg Stock Exchange on 20 November 2014 and Competition Commission approval is expected in January 2015. SA French and Elephant will continue to trade under their own names for the foreseeable future, however integration between the two entities will commence from 1 January 2015.

Elephant Lifting Equipment is headquartered in Centurion and has branches in Durban and Pemba, Mozambique, as well as a manufacturing facility in Pretoria West. Its products include EOT cranes, monorails, electric chain hoists, chain and lever blocks, winches and wire rope pulling machines, lifting and spreader beams, mechanical grabs and clamps, slings (chain, polyester and steel wire rope), shackles and rigging accessories.

"For every tower crane we supply, new or used, there is probably another 20% of the total value of the crane that we can offer in add-on services," Quentin Van Breda, managing director, SA French, says. "The acquisition will allow us to offer a genuine one-stop shop for tower cranes, from slings to shackles, concrete buckets and pallet forks, for example. We can now even offer foundation bolts and spreader beams in-house."

SA French offers both European and Asian versions of the Potain tower crane range. It has been recognised as an Elite Dealer by Potain of France, which means a guarantee of 80% availability of spare parts on first call. "We have not dropped below 85% over the past three years," Van Breda says. SA French's hoist range includes Orbit and Torgar brands, while it also offers Dieci telescopic handlers and self-loading mixers. It has a rental fleet of 20 cranes and 27 telescopic handlers and hoists.

Recent new-crane sales include a MC235 conventional crane and two MCT205 topless cranes for the WBHO/Tiber Bonvec JV building the new Discovery Health head office in Sandton. SA French also sold two new MC125 cranes sold to M&T Developments. Repeat customer Trencon Construction acquired a MC125 crane for a university in Kimberley, following its purchase of an IGO 50 self-erecting crane a year ago, in addition to an MC205 crane that is still active on the KPMG extension project off Empire Road in Johannesburg. ❏

## CAT E-BOOK DOWNLOADS

Caterpillar's e-book versions of the 144 page 'Guide to Asphalt Compaction' and the 124 page 'Guide to Soil Compaction' are now available and can be downloaded for free.

> "These e-books take a practical approach to the complex topics of compaction and provide examples of how to use their principles to maximum effect," explains Johan Hartman, industry manager: global paving at Barloworld Equipment. Each guide covers the basics of compaction and then discusses the science and techniques involved.

### Android calculator app

The popular Paving Production Calculator app is now also available for Android devices. (An IOS version of the app was previously released.)

This app helps estimate trucking needs, paving speeds, compaction and other factors. Other features include the ability to build a library of specs from prior jobs for later reference, as well as e-mailing job summaries from your device. ❏

The popular Paving Production Calculator app helps estimate trucking needs, paving speeds, compaction and other factors.



# New equipment **SHOWCASED**

Case Construction Equipment will showcase its full line of industry leading equipment and services at Intermat 2015.

The Case team will welcome visitors on the ample, 4 150 m<sup>2</sup> stand, where it will present the brand's comprehensive offering for urban construction, road building, aggregates and recycling applications complemented by Iveco's vehicles for the construction industry.

> The main theme of the stand aims to highlight the close relationship between the brand's products and services, its teams and its customers, and Case's drive to provide intuitive and straightforward solutions to the challenges of construction businesses.

## 360-degree solutions

The service and parts teams as well as CNH Industrial Capital will be on the stand to explain the ways the brand is able to support customers in partnership with its dealers, providing 360-degree business solutions that include tailored financing packages, extended warranty, planned maintenance programmes, competitive cost of ownership, efficient parts and technical service.

## New generation Tier 4 crawler excavators

Case will introduce its new generation D Series crawler excavators with four new models ranging from 25 to 40 tonnes that feature Tier 4 Final (Stage IV) maintenance-free technology and raise the bar on performance, controllability, fuel efficiency, comfort and reliability. These machines offer the high productivity, comfort and safety combined with low running costs that construction businesses look for.

## Tier 4F Series wheel

The new F Series wheel loaders will also make their first public appearance at Intermat 2015. They feature heavy duty axles and four solutions unique to Case for quarrying, waste handling and major contractors: the Hi-eSCR in-house technology that meets Tier 4 Final and EU Stage IV standards without the need for particulate filter or EGR valve, as it kills the sparks in the exhaust; the rear mounted engine that increases bucket payload and ensures easy maintenance from ground level on models up to 20 tons.

## The first Case grader

Also on display will be the first Case grader

range, the C Series. This powerful grader features the patented Hi-eSCR technology developed by FPT Industrial to meet Tier 4 Final standards, delivering a big performance with exceptionally low fuel and maintenance costs. The new machine bristles with features contributing to its superior controllability, performance and traction. Together with the comfortable cab and smooth ride, they offer the ultimate operating experience.

## Compact wheel loaders

Also on the stand will be the F Series compact wheel loaders launched in September 2014, which set new standards of productivity, versatility, comfort, all with low cost of operation. The four model line-up, ranging from 4,4 to 62 tonnes, delivers consistently high levels of performance in every task with the powerful, highly efficient new hydraulic system.

## Skid steer and compact track loaders

Case will introduce five new models that will extend and upgrade its skid steer and compact track loader line-up. The new models, some of which will be on display in the Urban Construction area, introduce Case's maintenance-free Tier 4 Final technology and deliver more power, higher torque and breakout force while using less fuel. The new additions to the line-up expand the variety of applications Case is now able to serve.

## The Case backhoe loader family grows

Visitors from African and Middle Eastern countries will have the opportunity to see the new 570T backhoe loader at the Case Customer Centre, availing themselves of the shuttle service provided by the brand. This entry-level backhoe loader specifically designed for these markets expands the brand's industry-leading range and stands out for its highly fuel-efficient engine, the

strong S-styled boom, the heavy-duty front axle, the largest cab in its segment, as well as the design that makes it very easy and quick to service. <

The Case 321F.



The Case 21FXT.



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The Case grader, 856C.



The Case TLB 570%, specifically for the AME region.



The Case CTL TR310.



# COMMITMENT, PASSION and RELIABILITY

For over six decades, D'Avino, the Italian self-loading concrete mixer manufacturer, has been building strong relationships with their clients through its exemplary product and after-sales service.

*Construction World* spoke to Tienie Ferreira, director of D'Avino South Africa, who is importing the D'Avino equipment to South Africa.

## Put the the D'Avino brand in context?

D'Avino was established in Italy in 1950. The D'Avino self-loading concrete mixers now available locally, are being built by the D'Avino family. This family-owned business is based in Naples, Italy. They distribute their equipment worldwide, particularly to developmental regions such as South America, Asia and Africa where batch plants may not be available close to construction projects.

I was first introduced to the D'Avino brand when I attended the Bauma 2013 show in Germany. D'Avino subsequently exhibited at the Bauma Africa show in 2013.

## Why a self-loading mixer?

D'Avino builds self-loading concrete mixers that enable customers to mix concrete according to the desired concrete design on site. If one gets concrete from a batching plant, this plant will use the concrete design to get the desired MPa. This concrete is then transported to site. These mixers cost-effectively negate the necessity of a batching plant.

The D'Avino mixers allow you to produce concrete on-site using raw materials – to

the exact MPa required. The mixers set the user free from timing issues and it allows the contractor freedom to mix only the volume of concrete that is needed.

## Who are your customers?

We are at the initial phase of selling the product: our target market will be any contractor involved in low cost housing, those doing construction in rural areas as well as bigger companies.

In South Africa there has been limited competition, thus far in respect of this kind of solution but we are confident that we will achieve significant market share.

## What products do you offer?

We offer self-loading concrete mixers from 1 m<sup>3</sup> to 4m<sup>3</sup>. Some of these are in stock while others will be sold on an order basis. Generally speaking the 4 m<sup>3</sup> concrete mixer is the product that interests our market most.

## How does the machine do in the South African context?

When a machine operates in a rural environment, everything must be uncomplicated. The D'Avino complies with this criteria, it is uncomplicated, includes components locally available and is easy to maintain on site and as such is ideal for South African operations. We piloted a machine and utilised it for 1 250 hours which enabled us to do our own tests to make sure that it functions optimally in the South African environment.

The reason why the machine is ideal for particularly the rural context, is that it is built with standard parts. This makes the fixing of these machines in remote areas easier as such parts are normally readily available.

## After-market support?

Our philosophy is that the salesman sells the first machine and after-sales service the rest. The brand offers parts availability. We also have support from Italy – if it is a warranty issue we fly parts in. As far as support is concerned, I am satisfied that customers will get the best service.

We are also a dealer for Doosan in Middelburg (Mpumalanga), which is in the middle of



the mining area: so we are on duty 24/7/365. We therefore have an acute understanding of the need for excellent and speedy after-sales service. The infrastructure for after-sales support therefore already exists. Most of our competitors do not have a similar infrastructure to service that type of market.

## Are there plans to have a wider footprint?

It will be increased to Cape Town and Durban while an appointment has already been made in Bloemfontein. The latter was important as it is in the middle of a rural environment. The appointed dealer, JIT Exploration has an existing footprint into the northern and southern Cape, and is well-known and trusted.

## What sets you apart from other players in this market?

The D'Avino product has conventional and unconventional machines. The 360 Delta 4 rotates 360° – it is the first concrete mixer that operates on a 360 degree basis.

All the machines have excellent maneuverability and can get into small spaces, while the weighing system is integrated into the steering column – the operator has a running total in front of him at all times while raw materials are being loaded.

It is an extremely safe machine, offering good visibility for the operator. I also regard our after-sales services as something that sets the brand apart. We will ensure that a prospective customer has peace of mind that he will be looked after.

## Do you offer prospective clients financing?

We do. Our associate company is Fast Forward Finance. It is an inter-group asset based finance and related services sales organisation which was founded in 2005. There are sale, rental and hire options – this will be worked out for clients based on their needs.

## What training is offered?

We have an operator trainer available who also was the operator during the piloting phase. We also will be able to give technical assistance as our main technician has been to Italy for training on the complete D'Avino range of mixers. <

BACK, FROM LEFT: Derek Gerber, Tienie Ferreira, Salvatore D'Avino and Dominic D'Avino. FRONT: Gianluca D'Avino (left) and Pasquale D'Avino.



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No load speed (r/min):	250-500
Net Weight:	6.8kg

Vibration absorbing housing

Active dynamic vibration absorber

Damper spring

### HR4003C - Rotary Hammer

This model has the same specifications as the HR4013C but does not feature the Soft No Load and Anti Vibration Technology, making it a more cost effective option for users who do not utilize the tool for long periods of time.



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# INDUSTRIAL PAINT SUPPLIER

## provides solutions for Africa

Global paint giant Beckers is turning its attention to developing a wide range of paint products especially for African conditions.

➤ The company intends working closely with all-manner of manufacturing clients across the continent, and to use its substantial research and development capabilities to produce paints that can enhance these manufacturers' products. Whether designing coatings to protect earth-moving equipment in tropical Africa, or provide lower-cost coatings for roof sheets used in the development of low-cost housing in West Africa, the company is focused on finding the right solutions for specific applications.

In South Africa Beckers is best known for its leadership in the provision of advanced coil coatings. These are used by the country's steel and aluminium mills to provide finishes for a variety of flat sheet products that are supplied to local manufacturers to make everyday goods such as roof sheets, appliances, automotive and other products.

### Coil coatings

According to Beckers Group managing director, Willem van Heerden, the company's

expertise spans far beyond coil coatings. Worldwide the company has also developed special coating technologies for trains, agricultural, construction, earthmoving equipment and even consumer devices such as cell phones.

"These range from coatings in making tractors more durable and even providing attractive cladding that assists architects to build 'greener' structures and phone manufacturers to introduce trendy new phone designs.

"However, in Africa our well established network has been geared mainly to service steel and aluminium mills in sub-Saharan, East and West African regions. Therefore, in order to expand our reach, we have recently also begun to mobilise our technical staff to work closely with key industrial manufacturers and assist them to enhance their product offerings.

### African solutions

"This has already led to us developing Beckry® Save cost effective coil coatings for roof sheeting in West Africa and now supply coatings for rolling stock (PRASA), corrosion resistant paints for Eskom's new power stations and a number of other major successes. It shows that our technically advanced coatings are far beyond the ordinary and can be developed for use in a wide range of industries. The only challenge that we face now is to familiarise industry with



Beckers Group managing director, Willem van Heerden.

our service offering and to introduce our specialised coatings to a far wider potential client base," says Van Heerden.

He adds that at present the company's strategy is to work closely with engineers, specifiers and architects, etc., to develop solutions for their own specific requirements. With assistance from the company's global research and development centres and long-term development groups, the company is committed to work with these specialised industrial customers to develop new products and find solutions for manufacturing dilemmas. ◀

BELOW LEFT: A typical coil coating operation. RIGHT: A number of high end projects have been undertaken using coil coating from Beckers Group.





# EASY-RAIL MODULAR GUARDRAIL SYSTEM CRASH-TESTED

Easy-Rail, a crash-tested guardrail system representing the latest European safety and quality standards, is being manufactured in South Africa by Andrew Mentis, under license from Volkmann & Rossbach of Germany.

Andrew Mentis has teamed up with Road Furnishing Services (RFS) to ensure that the guardrail system is installed according to specification.

This quality modular guardrail system has received attention from the South African National Roads Agency (SANRAL) and the South African Road Federation (SARF). "The Easy-Rail guardrail system is tested to EN 1317-2. It is a modular system that allows for the most cost efficient solution for various applications," Elaine van Rooyen, marketing manager, Andrew Mentis, says.

It provides maximum safety at minimal weight as well as being simple and fast to install. All Easy-Rail modules connect to each other without any transitional construction required, so that the containment level and working width can be adjusted accordingly for a specific application.

In addition to Easy-Rail, Andrew Mentis also manufactures and distributes its own Mentrail guardrail. "Guardrails prevent vehicles from leaving the roadway and striking a hazard by containing and redirecting the vehicle. The specific design of Andrew Mentis' Mentrail guardrail, with a W-shaped profile, allows it to be used in a variety of roadside situations," Van Rooyen explains.

An independent survey in the US indicates that not only can guardrails reduce the vehicle accident rate by about 30%, but that when accidents do occur the number of fatalities and injuries are reduced by between 45% to 50% respectively.

Mentrail guardrails are manufactured using specialised machinery at Andrew Mentis' facility in Elandsfontein in 2,6 mm thick steel to standard 3,81 m lengths, according to SANS 1350-1982 specifications.

Available in either galvanised or uncoated lengths, the guardrails have a buried end for the start and terminate in an end wing. In terms of double rows of guardrails, a bullnose end wing is used for termination. The performance of the guardrail is enhanced by joints that absorb normal expansion and contraction forces so that the posts remain aligned correctly. Concave and convex rails are also available to cater for bends and turns.

Not only are Mentrail guardrails ideal for use on existing roads, but they are also extensively used where roadworks are taking place, providing a resilient temporary safety barrier throughout the construction phase. During road construction, guardrails can be moved from completed sections to protect new sections in progress. The success of Mentrail in this application has often resulted in the permanent erection of these guardrails. ■

**Andrew Mentis has teamed up with Road Furnishing Services (RFS) to ensure that the Easy-Rail guardrail system is installed according to specification. The system is manufactured in South Africa under license from Volkmann & Rossbach of Germany.**



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# NEW READYMIX plants commissioned

AfriSam is cementing its presence in the key province of KwaZulu-Natal (KZN) with the commissioning of new readymix plants at Pietermaritzburg and Umlaas Road.

➤ “The plants were commissioned in late 2013 and were in response to increased demand in the Durban/Pietermaritzburg corridor development, as well as to give AfriSam a readymix presence in areas where we already had quarries established,” Pieter Uys, sales manager at AfriSam in Durban, says.

“As we use AfriSam cement in readymix production in KZN, it also gave us an opportunity to pull through additional volumes of cement,” Uys adds. The construction materials group currently operates seven readymix plants and six quarries in Durban, the Natal Midlands and Northern KZN. It also operates a fleet of 50 readymix trucks and two sophisticated boom pump vehicles. “KZN is a strategically important market for a construction materials company, hence the plan to expand the footprint of AfriSam in the province.”

AfriSam focuses on a range of market segments in KZN, from building (residential and non-residential), to civil, retail, national and local government, municipalities, asphalters, readymix, concrete product manufacturers and cash customers. “Although we had a presence in terms of cement at retailers for many years, we started marketing cement to other market segments through our KZN sales team from 2012,” Uys explains.

In KZN, AfriSam has already supplied product to flagship projects such as the Galleria Shopping Centre in Amanzimtoti, the widening of the harbour mouth at the Port of Durban and the Spring Grove dam on the Mooi River at Rosetta. Major growth opportunities at present include the dug-out port that Transnet proposes to construct on the site of the old Durban International Airport (DIA) at Isipingo.

Another major opportunity for AfriSam to bolster its presence in the province is the 20-year, multi-billion rand Cornubia mixed-use development in Umhlanga, the eThekweni Municipality's first Cabinet Lekgotla priority project.

**AfriSam uses its C-Tech cement to produce its concrete mixes, which assists in reducing the carbon footprint of its concrete products.**

“Additional provincial flagship projects at present include development plans at Richards Bay Harbour, the Durban to Pietermaritzburg Corridor Development and mass housing throughout the province,” Uys says.

Looking at particular initiatives launched by AfriSam in KZN, Uys says it offers various services to its customers, “including mix optimisation using our high performing cement as well as providing on-site training on aggregate and concrete sampling and concrete cube making procedures.”

The KZN Provincial Development Plan aims to make the province the ‘gateway to Africa and the world’ by 2030. It is a major contributor to the South African economy, behind Gauteng but ahead of the Western Cape. Of the nine provinces, KZN has created the most jobs, with 128 000 employment opportunities generated from October 2012 to December 2013. The 2014/15 Medium Term Revenue and Expenditure Framework for KZN has earmarked R32-billion for infrastructure projects in the province. This represents a significant injection of funds into the economy and will act as a major stimulus to growth and development.

“Major provincial projects such as these not only require large quantities of concrete, but will also prompt the development of ancillary infrastruc-



**AfriSam operates a fleet of 50 readymix trucks and two sophisticated boom pump vehicles in KZN.**

ture to support these projects, which in turn will generate additional demand. Our strategy in KZN is not only to grow in order to meet this increased demand, but also to ensure we are able to offer our customers a total solution for their specific requirements,” Uys concludes. <



**AfriSam has supplied flagship projects in KZN such as the Galleria Shopping Centre, widening of the harbour mouth at the Port of Durban and the Spring Grove Dam.**



**The company operates seven readymix plants and six quarries in Durban, the Natal Midlands and Northern KZN.**



# LAYING the foundation for INNOVATION

Van Dyck Carpets is leading the way when it comes to investing in the latest equipment, new products and sustainable manufacturing in South Africa.

> Much of the company's substantial achievements can be credited to the innovative approach of the forward thinking Dr Mehran Zarrebini who has headed the company since the family owned holding company PFE International purchased it from Belgian company Domo Carpets in 2004.

Van Dyck was a perfect fit and perfectly complemented the rest of PFE International's South African investment portfolio. It also provided an opportunity to draw on its more than 40 years of international experience in the manufacturing of carpets and fibre and yarn extrusion.

Van Dyck is not only South Africa's oldest carpet manufacturer but the only one that offers a combination of tufted, needle punch and woven carpets. The company also manufactures a range of acoustic underlays made of recycled rubber crumb from used truck tyres.

PFE International's first investment was a joint venture with textile group Ninian & Lester in 1995. South African Polypropylene Yarns (SAPY) is located in a 70 000 m<sup>2</sup> factory in Hammarsdale and is a market leader in the production of multi-filament polypropylene yarn for the textile, plastic and construction industries.

Six years later, when the Zarrebini family decided to relocate their UK based machine extrusion and staple fibre manufacturing operation, they again turned to South Africa. They set up SAFYR in Hammarsdale

in conjunction with the Industrial Development Corporation in 2001. The company was sold in 2004 when PFE International acquired Van Dyck.

Dr Zarrebini says Van Dyck was a good fit. The company was struggling to contain costs as most of its raw materials were imported. They believed that, through vertical integration, they could reduce these and opened PFE Extrusion in Hammarsdale in 2008 to provide fibre and yarn for Van Dyck.

PFE International has invested around R350-million in South Africa. Of this, R80-million has been directed towards Van Dyck to upgrade the old and poorly maintained equipment they acquired and meet stringent quality and environmental standards.

Despite tough economic conditions and massive changes in its market, the company has grown its market share to an estimated 25 to 30 percent. The choice of floor covering is driven by fashion and he says many consumers are opting for newly introduced laminate floor and ceramic tiles.

In 2004, Van Dyck's business was split 50/50 between its residential and commercial divisions. Since then, the ratio has changed to 30/70 with sales into the commercial and hospitality sectors proving particularly resilient.

Van Dyck's strong focus on sustainability and environmental efficiencies stands it in good stead as large corporates favour environmentally friendly materials to attain



Dr Mehran Zarrebini, director of PFE International is pictured in the Van Dyck Carpets factory.

green building certifications, says Zarrebini.

Van Dyck is both ISO 9001:2008 and ISO 14001 accredited and, in 2013, became one of just a handful of companies with ISO 14064-1 accreditation, requiring annual reports on greenhouse emissions. Zarrebini has also set his sights set on implementing an ISO 150001 energy management system in conjunction with the United Nations with the backing of the United Nations by 2015.

"We realise that there are a lot of opportunities, especially in terms of reduction of costs and brand association. We see this as an opportunity rather than as a threat," he says, adding that Van Dyck will be ahead of its competitors when a planned carbon tax is introduced in South Africa.

He adds that PFE International is committed to South Africa for the long term. "We are looking to expand further by acquiring new equipment, introducing revolutionary new products and growing existing markets including exports."

Already, Van Dyck sells to 20 countries and intends focusing on growing markets in Africa. "Creating an environment where outside the box ideas are heard and taken seriously unlocks innovation. When minorities form a critical mass and leaders value differences, creative, innovative and value-driving insights are unleashed," says Zarrebini.

PFE International intends to go this route. The company employs more than 520 people and, with continued growth, intends to create more jobs. <

## HARARE BRANCH OPENED

Leading South African stone surface distributor, International Slab Sales, has opened a branch in Harare, Zimbabwe.

> Supplier of top quality granite, marble, onyx and engineered stone surfaces, International Slab Sales is the sole Southern African wholesaler of Caesarstone, Café Quartz and Rudi's Choice surfaces. They also carry The Africa Range Namibian granite.

Market-leading engineered quartz surface, Caesarstone, will be in supply, along with trending marble materials and a wide variety of granite surfaces.

"International Slab Sales is bringing a wide variety of top quality products, and excellent service in stone trading to the Zimbabwean market," says Whelan. "We are looking forward to bringing the most comprehensive

selection of luxury and affordable stone surfaces to Zimbabweans for their homes, commercial premises and construction developments," he adds.

Although the branch has been open since August, the official launch only took place on 18 February. <



# Setting benchmark **FOR SAFETY**

Floor grating products from Andrew Mentis have set the benchmark in South Africa, according to Elaine van Rooyen, marketing manager at Andrew Mentis.

➤ These highly engineered products have been used by local and international companies for more than 40 years. They are manufactured in a world class facility at Elandsfontein, Johannesburg, to ISO 9001:2008 standards, using a pressure locking system pioneered by the company.

The two main floor grating products from Andrew Mentis are Rectagrid RS40 and Gripweld. RS40 is a premium brand produced by means of compressive pressure locking of bearer bars and transversals to form a pitch of 40 mm by 40 mm. Gripweld on the other hand features transverse bars fusion welded into the bearer bars. RS40's non-slip characteristics are due to the positive raised sections that create multi-directional obstructions on the top of each bearer bar, allowing for a far larger surface contact area.

Non-slip grating and serrated grating products from Andrew Mentis are prominent in industries from petrochemical to mining, where stringent safety requirements are critical in product selection. Grating is available in mild steel, galvanised, 3CR12 and stainless steel for a variety of applications and environmental challenges.

"Andrew Mentis has also developed a range of corrosion-resistant floor grating ideally suited to the extreme conditions found in wastewater treatment plants. All products in this range are designed and engineered to suit situations where the strength to weight ratio is important, such as wastewater treatment plants," Van Rooyen says. The non-slip characteristics of Andrew Mentis floor grating are effective

in all directions, in all finishes and work well for both leather- and rubber-soled safety shoes. In addition the self-cleaning properties of this grating prevent dirt build-up. Quality control is stringent to ensure tight tolerances are maintained during the manufacturing process and that the round transversal bars fit snugly in the punched bearer bars. This intersectional locking method is designed to utilise the entire depth of the bearer bar when calculating loads.

Andrew Mentis floor grating is engineered to take specific loading, which ensures optimum safety of people walking or working in those areas. A complete understanding of the load bearing capacity of grating is necessary to ensure that the correct floor grating is selected for a specific application.

"The best way to ensure the structural integrity of floor grating is for customers to align themselves with a manufacturer that has designed and engineered the product to attain predetermined tolerances," van Rooyen says. Andrew Mentis pays scrupulous attention to the strict criteria it has established for its floor grating products.

"In addition, there must be no cracks or crevices at intersections which could harbour corrosion. The locking method at the intersections should be designed to use the full depth of the bearer bar when calculating loads. Finally, the grating panels should be flat, square and untwisted. Safety in the workplace simply cannot be compromised," van Rooyen explains. An emphasis on safety underpins the development of all Andrew Mentis floor grating products. "Corrosion and damp can weaken floor grating and result in inadvertent slips, trips or falls, which impacts negatively on productivity as unnecessary downtime is incurred," Van Rooyen concludes. ◀

**BELOW: Non-slip grating and serrated grating products from Andrew Mentis are ideal for applications involving stringent safety requirements.**

**BOTTOM: Andrew Mentis pays scrupulous attention to the strict criteria it has established for manufacturing its floor grating products.**

Andrew Mentis floor grating is engineered to take specific loading to ensure optimum safety.



## LABEL CHANGE



TAL continues to update and improve its product labelling and the latest products to sport new labels are its 20 kg bags.

> The local manufacturer of tile adhesives and ancillary products is introducing new labels to simplify the selection process for the end-user and tiling contractor.

Products in the 20 kg pack size featuring the new labels are those in the rapid-set adhesive range, such as TAL Goldstar 6; quick-set adhesives such as TAL Porcelainfix as well as standard-set adhesives such as TAL Professional. TAL Wall & Floor Grout and TAL Super White Wall Grout in 20 kg pack sizes also feature new labels.

"Our aim is to make tiling easy and our new product labels enable customers to choose the right products they require to get the job

done quickly and efficiently," says Gela Ohi, marketing manager at TAL.

The updated packaging equips customers with clear information that is straightforward to understand so that they can rest assured in the knowledge that they are purchasing or specifying the correct products.

TAL's packaging may be changing, but customers can still expect the same reliable, top quality and locally manufactured products that they've come to trust from TAL.

The improved packaging complies with the Consumer Protection Act and contains clear and precise instructions for the installer to follow. ■

## OUTLET IN BALLITO

The Corobrik Ballito Centre opened in October. The open-plan building – which is one of seven Corobrik branches across KwaZulu-Natal – will replace the satellite branch based at Salt Rock.

> The new building is much more spacious and has a clean, fresh design with easy accessibility.

The superior design is also the model for all future Corobrik Centres, so customers will eventually experience the same look and feel at whichever of the 28 branches they visit nationwide.

"The North Coast has grown phenomenally in size," explains Corobrik sales' manager for eThekweni, Chris Mungle, "and we needed the right location that was accessible to the public and trade."

With the residential estate development and growth northwards, there has been increased demand in the residential sector for the quality building products offered by Corobrik.

The Salt Rock branch will close at the end of the month and relocation to the bigger branch will take place simultaneously.

"There is a much bigger yard space with

more products that will include a wide range of face bricks, clay and concrete paving and concrete retaining blocks including Geolok and Terraforce."

Mungle said the new premises would offer a full display of product, including the 36 different types of face brick, catering for every taste. With the additional space stock kept on site will also increase from 40 000 to 250 000 bricks to ensure better availability and service levels.

Corobrik has been in the brick-making business for the past 112 years and every staff member undergoes comprehensive training to ensure they can provide the appropriate responses to customer queries.

The Ballito Centre's team, headed by experienced area sales' manager for the North Coast, Indren Munsamy, is no different.

Each staff member stands ready to assist customers in making informed choices for their building needs. ■



From left: Isaac Nsele, assistant centre manager, Afsana Saib, sales administration cashier, Indren Munsamy, manager Ballito, Nikita Ackah, salesperson, Shadrack Busane, yard assistant and Welcome Zulu, yard supervisor on forklift.

## CONSTRUCTION APP

Atlas Copco Construction Technique business area is launching an app for use with Apple and Android devices, tablets and smart phones.



> The new Construction App contains a huge store of information about Atlas Copco's extensive range of products and services for the Construction sector. It also keeps the user up to date with the latest news about the construction market and has a host of other useful features.

Designed to make life easier for Atlas Copco customers and distributors, the Construction App contains information on portable energy products, road construction equipment, demolition and recycling equipment, concrete and compaction equipment, and service products.

The App provides all the information required to make the optimal choice when selecting from Atlas Copco's extensive portfolio.

### Highly user-friendly

The different sections of the Construction App are configured in such a way that it is child's play for the user to find exactly the information she or he is looking for. When there are questions about the product range and service offer, the App will provide the answers.

The latest information and technical data on Atlas Copco construction equipment are easily accessible in the App and can all be downloaded.

The App also provides heads-up notifications of new product launches, and other important news.

Simple-to-use filters make it easy to find products and if more information or a quotation is required it can be requested within the App.

The App also contains videos for training purposes and interviews about Atlas Copco's operations. Based on the user's location it will give information on the location and contact details of the nearest Atlas Copco Customer Center.

### A daily working tool

The Construction App is the simplest way to keep informed about Atlas Copco's entire offering to this industry. It also enables users to engage with Atlas Copco on the social media and other media channels. All-in-all, it is a daily working tool that makes life simpler for everyone involved in using, purchasing or selling Atlas Copco construction equipment. ■

## GLOBAL CHIEF EXECUTIVE

Giam Swiegers joined Aurecon as Global Chief Executive Officer on Monday, 2 February 2015.



> "2 February will be my first day as the Global CEO of Aurecon and it's very exciting. The engineering and professional services markets are experiencing unprecedented change and offer enormous opportunities for a company like Aurecon, which is leading in technology driven innovation and tailoring its services to meet client needs around the entire infrastructure lifecycle," said Swiegers prior to his start.

"I remember Africon (one of Aurecon's heritage companies) well from my early career days in Tshwane. I know what a terrific contribution Aurecon makes in many industries across South Africa. I am very proud to take this role as Global CEO of such a company," he added.

Swiegers began his career as an auditor with Deloitte in South Africa and was previously managing partner of Deloitte's Tshwane office after working for Deloitte in the United States of America. He joins Aurecon from his previous role as chief executive officer of Deloitte

Australia after a highly successful 12 years in the role. Deloitte won both the Accounting Firm of the Year and the Audit Firm of the Year in the Australian Financial Review CFO Awards 2013-2014, with judges highlighting Deloitte's innovation and agility.

"He has a superb track record as a CEO and is a great cultural fit for us as a business. His accomplishments in building a great culture and an agile, growing business are a great strategic fit for us as an expanding global business," says Teddy Daka, global chairman, Aurecon. ❑

## AFRICA'S ONLY 3 STOREY EXPO

The African Construction and Totally Concrete Conferences and Expos will be returning to the Sandton Convention Centre, between 12 and 14 May 2015.

> These platforms not only facilitate open dialogue but provide a unique opportunity for a diverse group of professionals and stakeholders involved in the transformation and development of the African construction, cement and concrete industries to network and share knowledge, best practices and the latest thinking.

The audience comprises over 600 – 700 key decision-makers from Africa's construction, cement and concrete industries who attend the conference; and over 6000 mid-to-senior level executives who visit the expo. Over 200 companies will display their products and services in the first ever three storey expo in Africa.

"For 2015, we're creating five unique experiences to culminate into Africa's biggest gathering of qualified buyers and sellers for the entire cement, concrete and construction industry value chain which includes African Construction Expo, Totally Concrete Expo, Coatings for Africa, Housing for Africa and African Roads Evolution, together all five conferences and expos will tell the story of shaping the future of Africa's cement, concrete and construction industries value chain," says Soren du Preez, 2015 programme director.

Over 170 speakers will present content in a variety of formats and cover topics as diverse as 3D printing, mega-project development, self-healing concrete, pavement design, enterprise development and investment in infrastructure.

"Our stimulating conference programme pushes the envelope for innovation in format delivery. We have reliably built an interactive, participant-led experience leveraging both local and international expertise to create a conference that you will want to attend and actively participate in," says Du Preez. ❑



# APPOINTMENTS

### Green Building Council of South Africa

Seana Nkhahle, chairman.



### Hytec Engineering

Pierre Goosen, general manager.



### Legrand

Shavahn Fareed, sales and business developer for KwaZulu-Natal.



### Hytec Group of Companies board

Roland Keller (LEFT) and Andrew Castle joined the Hytec Group of Companies board.



### Aurecon

Geoff Linke, managing director, infrastructure.



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