

The business magazine for the construction industry

MAY 2017

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# Construction **WORLD**

**Kemach JCB launches formidable  
JS305 LC tracked excavator**



**BEST PROJECTS 2017**

First call for entries

135 West Street's  
**FAST TRACK REFURB PROJECT**

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## ON THE COVER

JCB Construction Equipment, solely represented in South Africa by Kemach Equipment (Kemach JCB) recently launched the JS305 LC tracked excavator.

Established in 2003, Kemach JCB is a joint venture between the shareholders of BH Botswana and Muscat Overseas in Oman. Both these companies are the sole JCB dealers in their respective countries.

As a leading earthmoving solutions dealer, Kemach JCB supplies high-calibre equipment to the mining, construction, quarrying and plant hire industries, as well as the central government. A focused dealer of distinguished equipment and support, Kemach JCB continuously strives to put the customer at the heart of its business, fixated on meeting each client's unique needs. Turn to pages 16 and 17 for more detail.

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# COMMENT

In this time of political and economical uncertainty, it is good to know that South Africa's construction industry is still rolling forwards. Ministers may change, the value of the rand may fluctuate, outlooks and even regime's may change, but the future will still need road, education, housing, water, electricity and a whole array of other infrastructure to cope with the demands of South Africa's growing population.

Recently the accounting firm Deloitte announced that it is set to open its new Gauteng office in the upcoming business node of Waterfall City (north of Johannesburg). PwC, a rival of Deloitte, already has a widely noticed and fast developing head quarter building in the node – it will open in 2018.

## Best Projects: **FIRST CALL FOR ENTRIES**

Despite the industry's cyclical nature, our annual Best Projects Awards have not had a dramatic decrease in the number of entries. What has changed is the nature of the entries: the multi-billion rand projects of earlier have been replaced by smaller, equally challenging and innovative projects that showcase the depth of knowledge in the South African construction industry.

In the 2017 competition we have seven categories that cover the entire construction world, from contractors to specialist contractors to professional services.

The 'AfriSam Innovation Award for Sustainable Construction' was one of the first competition categories locally to recognise sustainable practices in construction.

The entries for these awards close on 8 September 2017. The judging, by submission only, will happen early in October, while the awards function will be held in Johannesburg on 8 November. See pages 26 and 27 for an overview of the awards.

We are looking forward to receiving your entries.



Opening in 2020 is Deloitte's new Gauteng head quarter building which has a price tag of more than R1-billion.

Atterbury won the tender to develop the more than R1-billion office development on behalf of a 50-50 joint venture between co-owners Atterbury and JSE-listed real estate capital growth fund Attacq. The tender process was hotly contested – 15 submissions were received.

Deloitte's 42 500 m<sup>2</sup> office will open in 2020. The new office premises will consist of a ground floor with six storeys of offices and four basement parking levels, including nearly 2 000 parking bays. Commercial architecture practice Aevitas designed the new Deloitte headquarters, which will comply with a Silver LEED (Leadership in Energy and Environmental Design) Green Rating on completion.

The Johannesburg and Pretoria offices will be consolidated in the new office – some 3 700 people. Hopefully careful planning will go into how the bulk of these people will get to and from the office. As many will be travelling from Pretoria, one can only assume that they will do so via the already heavily congested Ben Schoeman highway. Time will tell what the developers will devise to get as many as possible on the Gautrain and not on the Ben Schoeman highway.

Bulk earthworks for the project will start in August with construction starting in the final quarter of this year. The development will be completed in the first quarter of 2020.

*Wilhelm du Plessis*

*Editor*

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# SCANIA

*AECOM showcased its design expertise on the Redhouse Chelsea Interchange and Arterial Roads project in Port Elizabeth.*



## MAJOR AWARD for Redhouse Chelsea Interchange

**AECOM has showcased its design expertise on the Redhouse Chelsea Interchange and Arterial Roads project in Port Elizabeth for main client SANRAL and contractor Basil Read. The project clinched an award in the Roads and Stormwater category at the 2016 IMIESA/CESA Excellence Awards.**

► The road network underpins the Nelson Mandela Bay Municipality's (NMBM) long term goal to expand the western areas to meet the burgeoning demand for residential and commercial growth in the greater Port Elizabeth area.

The Redhouse Chelsea Interchange and Arterial Roads project was fast-tracked by the development of the 92 000 m<sup>2</sup> regional Bay West Mall, completed in 2015. With the proposed interchange on the N2 offering direct access to the area, the commercial development became significantly more viable. As a result, the Bay West City special purpose vehicle was established to implement the project.

"AECOM was appointed for the design, management and supervision of the project, which included management of an extensive environmental approval process, as the site is situated in an extremely sensitive environmental biosphere with a number of plant species on the national Red List. This is a comprehensive

assessment of all South African indigenous plants," Franclyn Samuel, associate civil engineer (Civil Infrastructure), Port Elizabeth Office Lead, says.

Hence the road network went through many design iterations before an agreement was reached with the local authorities. "This was the main driver behind the extended design process, as the solution had to have the least invasive impact upon the natural habitat," Samuel adds.

The final road layout consisted of a new interchange on the N2, with two bridges and 4 km of ramps; the Cyclopa Bridge, extending over an environmentally-sensitive area; two river bridges, extending over the upper Baakens River; a three-barrel culvert servicing an existing watercourse and the outfalls from three major detention ponds; and 6 km of arterial roads, as well as intersections and services.

The project included the provision of several bulk services such as water, sewerage and telecommunications for the

Bay West City precinct, and street lighting for all roads, including a portion of the N2.

Work on the project commenced on 6 January 2014, with Basil Read appointed as the principal contractor. The contract comprised two major milestones:

- Phases I and II to complete unrestricted access and services for the Bay West Mall.
- Phase III to complete the arterial-road link from the N2 to Cape Road.

Due to a delay in the start of construction, the contractor proposed that precast members be used for the bridges. The main beams for the N2 bridges, weighing up to 70 tonnes, were manufactured in Gauteng and transported to site. The remainder of the precast members were produced on-site. Phases I and II were ultimately completed on time and Phase III completed ahead of schedule.

AECOM has over a century of experience managing and delivering highway and road projects for all levels of government and private industry globally.

It has extensive skills in construction and construction management, transportation planning, design programme management and asset support services, in addition to specialised project-delivery methods such as public-private partnerships and joint ventures. ●





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
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## Coatings' show entrusted to major global expo organisers

**Leading international exhibitions organisers, dmg events – Middle East, Asia & Africa, will in June next year stage Coatings for Africa 2018, the largest event for its industry on the continent.**

Coatings for Africa – the longest-running coatings event in Africa – is jointly presented by the SA Paint Manufacturing Association (SAPMA) and the Oil and Colour Chemists Association (OCCA). The major trade exhibition will augment dmg events' growing coatings industry portfolio, which already includes six exhibitions held across the Middle East and Asia.

By volume, Africa manufactures 28% of the world's coatings, with South Africa the continent's largest producer. SAPMA members produce more than 90% of all paint and coatings manufactured in South Africa, while many of the individual chemists and technologists who will visit the event are OCCA members. OCCA is an international organisation headquartered in the UK and active across the world, including South Africa.

Coatings for Africa 2018 will attract senior executives and technologists from the paints and coatings industry all over the world to view the industry's latest products, technologies and services. Delegates will also be able to participate in a developing education programme, which will include a three-day conference, plus interactive zones for workshops and live product demonstrations.

Deryck Spence, executive director of SAPMA, speaking on behalf of SAPMA and OCCA, stated: "Both of our associations are extremely excited about the new partnership with dmg events. We share the

vision of uplifting Coatings for Africa as the industry's flagship show on the African continent and expanding the expertise of the coatings industry in South Africa."

Ian Faux, vice president – Coatings, for dmg events, added: "Africa is one of the most exciting and rapidly developing continents. As well as supporting the local markets, we are confident that our international client base, familiar with our events in Asia and the Middle East, will be keen to move with us into this new territory and take advantage of the fabulous trade opportunities available here."

Coatings for Africa 2018 joins a coatings-specific portfolio of dmg events that includes Dubai's Middle East Coatings Show, the Asia Coatings Congress, the East African Coatings Congress, the Central Asia Coatings Show, the Asia Pacific Coatings Show and Cairo's Middle East Coatings Show. Coatings for Africa joins an expanding portfolio of exhibitions being created for the African market by dmg events' which opened South African operations in July 2016.

"The acquisition of Coatings for Africa is the latest in a series of strategic moves by dmg events as we expand our business into key markets on the continent," said Matt Denton, president of dmg events. "We have successfully launched The Big 5 East Africa and INDEX North Africa, while a third geo-cloned event – The Big 5 Construct North Africa – will debut in April 2017." ●

*Pictured signing the agreement were (from left): Terry Ashmore, chairman of SAPMA; Ian Faux, vice-president; Coatings of dmg events; and Danny Grady, vice-president of OCCA SA.*



## Digital construction expo 2017

**This year the construction community will come together for the second Digital Construction Expo (previously called the Construction IT Event) to meet hundreds of exhibitors and around 9 000 visitors from across the construction supply chain at Gallagher Estate from 23 - 24 May 2017.**

DCE 2017 is dedicated to promoting standards and technology in the built environment. As the only event to showcase digital construction in Africa, the growth of the sector on the continent, arguably led by Southern Africa, translates into considerable demand for this event.

The Digital Construction Expo is once again co-located with the giant African Construction and Totally Concrete Expo (ACE/TCE) at Gallagher Estate in Midrand.

Vaughan Harris, digital director for the expo says: "Both local and global companies are increasingly looking to help define 'local BIM standards' and this is driving the industry towards better digital innovation. This advancement brings with it an explosion in technology, from design to operation application."

Whether you work for a huge multi-disciplinary or a small professional organisation and trying to get to grips with the BIM, maybe wanting to explore new methods of construction or the use of mobile and connected technologies on site, or simply want to find out about more efficient ways of working with software, this is the expo for you.

### What's new for 2017?

The BIM Institute added a host of new features including the Drone Zone, free software workshops, an Autodesk Experience Lounge, the Smart Building Village and BIM Talks in action. ●





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# Building and construction industry PLAYERS STRIVE for HEALTH AND SAFETY

The recent collapse of a section of the roof at the Charlotte Maxeke Academic Hospital in Johannesburg has thrust health and safety issues within the construction industry into sharp focus.

Global stats reveal that construction contributes a significantly high number of injuries in the workplace. This is further borne out by research findings that indicate a serious lack of management support, especially among smaller operators and subcontractors and an inadequate or a lack of H&S training.

One of the cornerstones of the existence of Master Builders Association North, which has a more than century-old tradition of fostering unity and improving standards within the building and construction industry is continuous training on health and safety compliance.

## Interventions by Master Builders Association

Our very existence is premised on how we look after the people who, under our supervision, enable us to build skyscrapers that kiss the horizons of major South African cities. A fundamental right of every worker is to be able to return home at the end of each working day; alive and healthy in the same physical condition that they started that working day. This is one of the key principles guiding the Association and the 600 contracting members it represents.

In terms of our code of conduct, members are required to manage their businesses in an equitable manner, ensuring that all work is of the highest quality and carried out efficiently to satisfy the building requirements of the client by complying with contractual obligations with integrity and objectivity. Master Builders aims to ensure that the building and construction industry plays a constructive role within the country's economic growth and development goals.

One of the conditions of membership to the Master Builders Association is strict adherence to health and safety regulations. To ensure compliance among members, the association stages the annual Safety Competition to raise awareness of site safety across its membership base and the industry at large. The other critically

*By Mohau Mphomela, Master Builders Association North executive director.*

important weapon in our arsenal to minimise work-related injuries on construction sites and in transit is continuous education. If as players in the building and construction environment we don't do enough to reduce the scourge of accidents, we run the risk of allowing the cancerous tumour to eventually devour our livelihood. It must, however, be conceded that sometimes incidents are products of nature, but studies have shown that continuous training and reskilling have a positive effect on reducing site-related accidents and injuries.

## Workshops to educate members

It was with this in mind that Master Builders Association North hosted a half-day training workshop for members in Midrand recently. One of the keynote speakers was well-known former prosecutor Advocate Gerrie Nel, who led a discussion on the legal principle known as *dolus eventualis*, which is Latin and refers to whether a person foresees the possibility that their action will cause death but carries on regardless. "As an employer, you need to take steps to be responsible. If you see that something is amiss, it your duty to act," said Advocate Nel, who added that *dolus eventualis* could be traced back to the 1953 case, *State versus Mrs Horn*.

"Willful blindness is when you walk away from a situation that you know could result in an injury. You can't ignore things that you see," said Advocate Nel.

What Advocate Nel and other industry experts urged Master Builders Association North members to do is to always prepare for any eventuality. If you are prepared, you are better geared to handle any catastrophe that may come your way.

According to a research document commissioned by the Construction Industry Development Board, global health and safety performance of the construction sector show that more than 60 000 fatal accidents occur annually. The same research shows that there is one accident every 10 minutes, which has led to the Master Builders Association doubling its efforts to accelerate training on health and safety to preserve life and limb and reduce the impact these unfortunate incidents on the national economy.

Close to 50% of injuries on construction sites are caused by falling objects, followed by motor vehicle accidents. Falling is at a significantly lower rate of 14% and the number of injuries recorded as a result of workers being struck currently stands at 10%.

Master Builders, which has been supporting contractors in South Africa for more than 100 years, promotes high standards and quality of delivery in construction, through support to our members; promote the viewpoints and interests of the industry by engaging government and relevant regulatory bodies on national policies that affect the industry; promote a positive occupational health and safety culture in the industry, to reduce and eliminate occupational injury, disease, loss and any damage to the environment; and create a sustainable building industry in South Africa by engaging related associations and relevant stakeholders on behalf of our members.

A team of specialists with industry specific experience mans the MBA North Construction Health and Safety (CHS) department. We have representation on Department of labour task teams, Industry and Professional councils. The team are able to provide practical value add support to address health and safety concerns which may occur in the workplace, offering you a comprehensive service for all your CHS needs. ●

*Mohau Mphomela and former prosecutor, advocate Gerrie Nel.*





# NAMIBIAN DISTRIBUTOR

**Goscor Cleaning Equipment (GCE) is extending its footprint in the mining and retail sectors in Namibia with the appointment of Elso Holdings as its official distributor, with effect from the beginning of the year.**



*Rene Rusch, CEO of ELSO Holdings cc, with Rondhir Haripersad, Goscor GM for Africa.*

One of the oldest, most environmentally-aware cleaning-product manufacturers in Namibia, Elso Holdings was established in 1956 under the leadership of founder Rene Rusch. The latest addition of GCE equipment to the company's product portfolio represents the next stage in its ambitious growth strategy for the Namibian region.

The main brands to be distributed across Elso Holdings' seven locations in the region are Ghibli, a leading manufacturer of wet and dry commercial vacuum cleaners and scrubbers. Delfin industrial manufactures vacuum cleaners and suction units for solving particular material cleaning and recycling problems. However, the flagship product range to be distributed by Elso Holdings is GCE's Tennant range.

"Namibia as a market is definitely picking up, especially with the recent discovery of large platinum deposits in the Swakopmund area. Then there is the Husab uranium mine, one of the largest in the world," GCE General Manager Greg Venter comments.

He also highlights Namibia's NAD86-million Walvis Bay port expansion project, which is on target to be completed by May 2017 by developer China Harbour and Engineering Company (CHEC).

The ambitious project will create a new island from reclaimed land, and almost double container capacity from the current 375 000 TEU a year to 650 000 upon completion. Covering 40 ha, the new terminal will have a quay length of 2 100 m.

Apart from mining and infrastructure development, the Namibian retail sector is also booming, with two new shopping malls in Swakopmund alone, and one in Walvis Bay. "It is an important growth market for us, and in tandem with Elso Holdings, we will be ideally positioned to take advantage of all of these opportunities," GCE national sales manager Peter Esterhuizen explains.

With its array of chemicals and other consumable product for the cleaning industry, it is a natural fit to add the GCE product range.

"There are natural synergies between us, and it will empower Elso Holdings to be able to offer a total solution to its customers."

In addition, certain specialised product ranges such as GCE's Makro and Elgin road-sweeper range will also be available from Elso Holdings.

Commenting on the decision to partner with the company, Venter points out it is a well-established and highly-respected Namibian company, and shares the family-orientated business values and ethics that underpin GCE's continued success in South Africa.

Esterhuizen reveals that Elso Holdings is in the process of establishing its own workshop facility to allow its fully-trained technicians to offer complete customer service and aftermarket support. In addition, the company will have a full stockholding of consumables and critical spares for the GCE machine population already operating in Namibia, in addition to expanding its equipment footprint.

"We do aim to offer a refurbishment service in the future, but the main focus at the moment is to get the technical team up and running so that it is able to maintain and repair the GCE equipment," Esterhuizen elaborates.

GCE's national technical support manager has already paid a visit to Elso Holdings to assist with training requirements, while the sales staff paid a visit to the Johannesburg head office in February for specific product training.

"We were on the lookout for a partner hungry enough to grow its own business. Elso Holdings has an ambitious growth plan, and was looking for a reputable equipment supplier to take it to that next level. Its footprint in the Namibian region is critical, and it operates in a market segment complementary to us. We look forward to building on this important relationship," Venter concludes. ●

## Osborn appoints new MD

**Johan Goosen joins Osborn from Atlas Copco, where he managed Drilling Solutions and, in his most recent role of regional business line manager, was responsible for Mining and Rock Excavation Services.**

During his time with the firm, Goosen exceeded financial targets despite the challenging market, and he made significant contributions to increasing the business's market share and improving customer relations.

"Goosen has an excellent understanding of our industry and its challenges," comments Richard Patek, group president of Astec Aggregate & Mining, of which Osborn is a subsidiary. "He believes in an entrepreneurial approach to business that is founded on a customer focused philosophy. This is supported by strong leadership skills and interpersonal attributes. We are delighted to welcome him to the Osborn family." ●



## A QS against corruption on government projects

Government will spend over R50-billion to fund national and provincial economic infrastructure requirements, according to the National Budget 2017 announced on by the former Finance Minister, Pravin Gordhan. Noticably, however, according to the Auditor-General report on local government audit outcomes for the 2014-15, infrastructure was one of the items that municipalities struggled with most to correctly measure and disclose in the financial statements over the past five years.

Auditor-General Kimi Makwetu has also recently released three performance audit reports dealing with pharmaceuticals, water infrastructure and urban renewal projects. The Auditor-General reported in some instances the required skilled personnel were not appointed at the start of a project.

The Association for South African Quantity Surveyors (ASAQS) says that Quantity Surveyors are best placed to stem corruption in government infrastructure projects. "The first step," says Larry Feinberg, Executive Director of ASAQS, "is for both government officials as well as the ordinary taxpayer to understand what the role of a professional quantity surveyor (QS) is.

"Globally, construction projects are highly susceptible to cost-overruns, owing to a number of factors. Here in South Africa, as in many other countries, we have the additional problem of corruption, where due process is flouted in order to benefit connected individuals or companies, often during the construction process itself," says Feinberg. "The person best placed to identify deviations from the original tender in terms of both scope and pricing is the QS and, as such, they act as the client's watchdog. In the case of public projects, we should remember, the client is ultimately the taxpayer, whose money is being spent – or wasted, in some cases."



Feinberg goes on to say, "In order to have the greatest impact, QSs should be involved right from the initiation stage of the project and also be involved in the planning and feasibility reports in addition to the approval of the actual procurement strategies".

One of the key issues in any project is to ensure that the tender is awarded to the right contractor at the right price. QSs play a critical role here because they are trained to manage the financial and legal processes of a project. During the design stage the QS's estimate is the tool to ensure the design remains within the budget. During the procurement stage the QS produces the Bills of Quantities (BoQ) on which fair and equitable tenders are based. The BoQ is the ultimate document that provides the client with the knowledge of how much the project is going to cost before construction begins, which is invaluable in judging the tenders before they are awarded.

The QS's professional experience and training makes them the best persons to evaluate tenders. "The BoQ acts as the baseline for the entire project. Any subsequent additions or omissions to the project would also be assessed and costed using the BoQ as the guideline," Feinberg adds. "The QS then acts as watchdog throughout the course of the project: monitoring progress against the BoQ, authorising payments as work is completed, noting deviations from the tender and, ultimately, producing the final account and be able to defend it to any stakeholder."

National, Provincial and Local Authorities (NPLA's) are woefully short of experienced and professional QSs thus finding themselves not having enough bandwidth and experienced professional QS's to manage the many projects at any given time.

"Professional QSs are bound by a code of conduct and if they are found to have contravened it, they will lose their licence to practice as a QS," Feinberg concludes. "This combination of professional discipline, skill and experience makes them the best persons to ensure that a tender is awarded to the right contractor – and that the project is delivered on time and within budget. In this way, they serve both the NPLA's and its ultimate boss, provider the taxpayer." ●

## Rated as a top five company

SRK Consulting SA has been rated in the top five companies in South Africa's consulting engineering (mining and infrastructure) segment in the recent Top 500 Companies Awards.

The awards survey over 3 000 businesses and honour those who excel in their sectors in terms of best practice standards as well as implementing strong social, empowerment and development policies.

Conducted by Topco Media and the University of Cape Town's Development Policy Research Unit, the survey singles out the five top firms in each of 100 different economic segments; the top 500 companies currently have a collective turnover of R3,5-trillion.

Being ranked so highly among peers was gratifying and humbling, said SRK managing director Vis Reddy.

"We are certainly known as innovators and perfectionists in our efforts to create value for our clients' businesses, and we work hard to stay at the cutting edge of what is an increasingly competitive



Vis Reddy, managing director, SRK Consulting SA.

and demanding field," said Reddy. "It is also vital that business promotes equity and social transformation, so it is fitting that the awards recognise this in their adjudication."

The Top 500 Awards consider employment profiles and diversity in management and control, as well as commitment to corporate social investment, employment equity and skill development. As an independent network of consulting engineers and scientists, SRK is owned and managed by its staff and invests significantly in fostering talent in a culture of excellence.

Reddy said the growing social, environmental, financial and legal pressures on industry have led SRK to broaden its expertise over the decades from its mining base into fields including: civil engineering and infrastructure; water and waste; environmental management, social impact and governance; and the energy sector, including renewables. The SRK approach is to integrate all aspects of project success to optimise opportunities and manage risk.



# The 1 to 5 of a complete offering

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*Construction World* hosts its prestigious Best Projects Awards annually, now in its 15<sup>th</sup> year. The December issue is dedicated to the winners and entrants and is an overview of activity in the construction world – the ideal vehicle to associate your brand with excellence.

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# Construction

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**CROWN**  
PUBLICATIONS

# New partnerships driven by WATER SCARCITY?

**As President Jacob Zuma launched the United Nations World Water Development Report 2017, stakeholders asked if South Africa's water scarcity is helping to drive new forms of partnership within the private sector.**

Speaking on behalf of the Global High-Level Panel on Water (of heads of state), President Zuma shared his thoughts on the global water situation yesterday, stating "We have the potential to create new and more positive economic and social developmental pathways", making reference in part to the building of partnerships. The President was addressing a global audience hosted by the South Africa Water Sector for World Water Day on 22 March in Durban.

With more than one billion people in the world currently receiving water and wastewater services from the private sector, it was important for the ensuing discussion to address the question: could the private sector play a role in partnerships for water management in South Africa, differing from current practice? This would, among other things, lead to tapping into wastewater as a resource for various uses which was a key message from the United Nations World Water Development Report which the President launched in 2017.

Speaking in a debate at the same event, Martin Ginster – who heads up water management at Sasol, and co-leads work within the Strategic Water Partners Network (a public-private-civil society

*Gariep Dam on the Orange River South Africa.*



partnership) – gave some examples of how the private sector is already involved in a diversity of exploratory projects using non-traditional models of collaborating with government and civil society.

These models of collaboration go beyond the private sector carrying out measures to comply with regulation; delivering on water management contracts; or providing corporate social responsibility funds to government and NGOs. For example, through the Strategic Water Partners Network (SWPN), corporates in South Africa, working with the Department of Water and Sanitation and other stakeholders, are rolling out an innovative irrigation water management system that is so far saving an amount of water (55 million m<sup>3</sup>) annually that is about half the consumption of Nelson Mandela Bay. Ginster pointed out that the intention goes beyond this water saving result, but that this and other projects bear the philosophy of developing a joint understanding of the precise water problems to be addressed, joint trials of solutions to solve the identified problems and transparency of intent and results by the partners.

Against a backdrop of an estimated 40% of public-private contracts prematurely cancelled in Africa, and similarly in South Africa where such public-private

partnerships are not replicated, it was refreshing to see participants at the event addressing an old elephant in the room – trust between the public and private sector.

Nandha Govender, head of water management at Eskom, another co-leader at the SWPN, said that trust is a huge obstacle for public-private partnership.

An emergent conclusion from the discussions was that no amount of contract sophistication can replace trust needed to enable public and private organisations working together. Govender said that examples of collaboration, such as a Mine Water Coordinating Body in the Mpumalanga coal mining area, where coal mine companies and the government have carried out joint problem and opportunity analyses and are testing financial and institutional models for reducing pollution impacts from mining in the long term, enable such trust. This collaboration was borne out of the work of the SWPN and the relevant parties.

Even with growing water scarcity in South Africa, it appears that the public and private sectors in our country are pathfinders in developing collective action partnerships (and not just transactions) that enable a trust-building environment for sustainable public-private-civil society partnerships. ●

## Going Green Conference in Durban

**The 5<sup>th</sup> Going Green in Facilities Conference (GGC2017) takes place in Durban from 13 to 15 September 2017. The 2017 Going Green Conference promises to build on the success of the GGC2016 which was held in Johannesburg, Gauteng (at Saint Gobain's Training Centre).**

The theme of the GGC2017, 'Public Infrastructure leading through Innovation and Green Technologies', will challenge decision makers in government and industry experts to apply new thinking and the adoption of green technologies in reshaping the built environment industry.

The host city for the GGC2017 has been voted an official New 7 Wonder City of the World and is home to the ninth largest harbour in the world; it houses the largest shopping mall in Africa and it also boasts the world's fifth largest aquarium. The GGC2017 will be held at the Public Works Conference Centre in Mayville, 455a King Cetshwayo, in the heart of Durban, with a wonderful green working

space for both pre-and-post conference meetings and networking opportunities.

The GGC2017 will provide a suitable platform for building professionals to refresh their green building knowledge skills and to explore the innovations taking shape across the public infrastructure portfolio in the country with special contributions coming from the Ethekweni region, from all the three tiers of government. Key topics include 'sustainable water infrastructure services', 'energy services, resource efficiency, green finance', and 'small scale renewable energy' developments taking shape across the province and the rest of the country. ●



# Khobab wind farm lifts first wind turbine

Khobab Wind Farm has announced that it has completed the lifting of the first of its 61 wind turbine generators, ahead of schedule, on 22 March 2017. It is anticipated that the first power will be exported in the next three to four months and that the wind farm is to start supplying electricity from all 61 turbines to the national grid by end-2017, as part of the third round of the Renewable Energy Independent Power Producer Procurement Programme.

“This is a crucial point in the construction of the wind farm and even more pleasing that we are not just ahead of schedule but also on budget” said Kevin Foster, project manager of Khobab Wind Farm.

The wind turbines, which are 100 m tall to allow for optimum energy production, take up to three days to erect, weather dependent. The three 53 m blades, made from fibreglass reinforced epoxy, are connected to the rotor at ground level before being lifted to the top of the turbine tower. This is a complicated lifting exercise, in which one crane raises the assembled rotor

whilst another smaller crane and taglines guide the rotor into the correct position. The heaviest component is the nacelle, which contains the generator and gearbox; and weighs 82,5 tonnes.

This is the same team that was responsible for the installation of the wind turbines at Noupoort Wind Farm and more recently at the adjacent Loeriesfontein Wind Farm. “Working with an experienced crew, makes all the difference,” added Foster.

The site was chosen because of its excellent wind resource, its proximity to national roads for wind turbine



transportation, the favourable construction conditions, municipality and local stakeholder support, the straightforward electrical connection into Eskom’s Helios substation approximately 7 km south of the site, and studies showed that there would be minimal environmental impact.

When operating at full capacity, the Khobab Wind Farm will generate approximately 563 500 MWh of clean renewable energy per year; this is expected to supply electricity to power up to 120 000 South African homes. ●



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BUILDING TRUST



# Supporting POSITIVE PORTFOLIO enhancement

**Emira recently concluded several significant renewal deals across its industrial and office properties – substantial in area and value – supporting contractual income streams and enhancing the portfolio of the JSE-listed REIT (real estate investment trust).**

Emira CEO Geoff Jennett reports the sizeable deals retained some key leases and were achieved notwithstanding the weak domestic economy, which is exerting considerable pressure on local businesses with knock-on impacts for their property decisions. Commenting on the deals, Jennett says: “Although nationwide demand for space is soft in the current market, we’ve taken significant steps in the office and industrial sectors with proactive leasing. In many instances, this was a direct result of the strong client relationships we have built by providing solid levels of service, as well as the quality and locations of our properties.”

Emira is a medium-cap diversified JSE-listed REIT invested in a quality balanced portfolio of office, retail and industrial properties. Its assets comprise 142 properties valued at R13,3-billion. Emira is also internationally diversified through its direct interest in ASX-listed GOZ valued at R940,4-million.

Among its stand-out deals in 2016, Emira signed an early renewal with RTT for its massive 46 400 m<sup>2</sup> South African Head Office at ACSA Park, a prime asset in its industrial property portfolio. RTT is headquartered in a specialised facility with a prime position near OR Tambo International Airport. Supporting its logistics business, its head office enjoys links to several major road routes.

*Menlyn Corporate Corner.*



In addition, Emira further renewed the lease for the 13 000 m<sup>2</sup> RTT Continental facility, also at ACSA Park.

Also extending its property partnership with Emira, Auction Operation renewed its lease over 13 662 m<sup>2</sup> of industrial space at the WGA Epping property.

“The property has been Auction Operation’s base for over five years and is a good fit for its business model. It offers ideal, reasonably-priced storage of crash-damaged cars for its insurance company clients, supported by plenty of adjacent free parking for auction days,” explains Jennett.

At its prominent Menlyn Corporate Park in Pretoria, Emira secured three large deals with leading organisations.

In its biggest deal at the property, Emira provided an effective solution to support the growth of innovative insurer King Price. An existing tenant at the park, King Price has seen tremendous growth in its business, driving its need for larger office space. Emira helped King Price grow from offices of 3 000 m in 2012 to an impressive 10 400 m<sup>2</sup> in 2016. “This long term lease was concluded and retained on the basis of a positive collaborative relationship between King Price and Emira,” says Jennett.

Also at Menlyn Corporate Park, Emira extended its enduring relationship with Santam, which also renewed its lease for 4 500 m<sup>2</sup> of offices for a further period.

*ACSA Park for RTT.*



“In our negotiations with Santam, it acknowledged that the service, sound maintenance and on-site management provided by Emira was a deciding factor for its lease renewal. We look forward to continuing this high level of service for Santam and working with our clients to understand, and deliver, property solutions that truly support their businesses,” says Jennett.

Additionally, Emira renewed the lease for the offices of the South African Local Government Association (SALGA) at Menlyn Corporate Park.

“In signing the renewal for the 6 000 m<sup>2</sup> offices, SALGA acknowledged quality of service, including a service level agreement to ensure its internal maintenance is taken care of by an onsite team, as a major factor for staying in an Emira-owned building.”

Emira’s leasing initiatives have also attracted new tenants to its properties. Among its new deals, it signed a new long-term lease with The CAD Corporation, Africa’s largest Computer Aided and Digital Design Training Centre, for 5 000 m<sup>2</sup> of offices at 500 Smuts, Midrand. Its new address gives The CAD Corporation prominent visibility onto the N1 highway, excellent layout, and ample parking. It also provides an ideal location midway between Pretoria and Johannesburg with quick access to the N1, R55 and R101.

“Proactive leasing remains a key priority for Emira in 2017. We are committed to building on our successes and unlocking value from our properties, across all sectors and regions,” says Jennett. ●

*Emira CEO,  
Geoff Jennett.*





# Bringing BEACH LIFE to Gauteng



**Multinational water innovation company Crystal Lagoons has partnered with Balwin Properties for the construction and operation of South Africa's first Crystal Lagoon, the world's top amenity that will bring beach life to Gauteng.**

Balwin Properties' new R4,2-billion residential development, The Blyde at Riverwalk Estate, located in Pretoria East, Gauteng, will showcase Crystal Lagoons' unique technology, which is patented in 190 countries and has revolutionised the global real estate market by bringing idyllic beach paradises to new locations, where swimming, kayaking, paddle boarding and sailing can be enjoyed.

The Crystal Lagoon at The Blyde at Riverwalk Estate joins the ranks of over 600 Crystal Lagoons projects – in different stages of development and negotiation worldwide – in over 60 countries.

"At 1,5 hectares (which is equivalent to just over two rugby fields), the Crystal Lagoon will be a key selling-point to the development, and be the first lagoon to feature our game-changing technology and unique concept in sub-Saharan Africa," says Alastair Sinclair, regional director for Africa at Crystal Lagoons.

The Crystal Lagoon at The Blyde at Riverwalk Estate will be a unique draw-card for property investors, as well as buyers looking for a one-of-a-kind lifestyle. It will feature beaches, a pedestrian promenade as well as exclusive clubhouses for residents' usage. "A Crystal Lagoon is a family oriented amenity that allows for swimming and practice of water-sports in a safe, controlled environment, and in a sustainable manner", adds Sinclair.

In that sense, it will help solve the problem of safe swimming in dangerous coastal areas and will add value to inland areas far from the coast. In fact, it will be specifically useful for locations where the ocean or rivers are unswimmable due to pollution, sharks or dangerous currents.

For Crystal Lagoons, this represents only the beginning of its expansion into Sub-Saharan Africa. "With 13 projects in various stages of design, construction and operation in Egypt, the addition of this lagoon to our growing portfolio, serves to further extend our

footprint on the African continent, and cement the region as one of importance to the global growth of our company," Sinclair said.

Steve Brookes, CEO of Balwin Properties, said: "We are very excited about our partnership with Crystal Lagoons and foresee this as the first of at least 6 lagoons in South Africa combined with the Balwin brand.

"Balwin developments appeal to couples investing in their first home, retired people looking for safe lock-up and go apartments, young families who can let their children be children, and to investors who are attracted by the return on investment that the developments offer.

"By bringing the beach to Pretoria we are taking apartment living to the next level by making resort lifestyle living a reality. This development will also have the signature lifestyle centre that has become synonymous with Balwin Properties, including a fully equipped gym, squash court, restaurant, concierge, laundromat, cinema room and a function room as well as state of the art security. The continuous promenade around the lagoon is perfect for sunset strolls and it will connect the different amenities around the lagoon," Brookes added.

The addition of a Crystal Lagoon to property developments greatly increases sales, and at a very low cost – in both construction and maintenance, and importantly, in basic resource consumption such as electricity and water. A Crystal Lagoon can be filled with fresh, brackish, or even salt water and uses 2% of the energy of standard pool filtration technologies, and 100 times less additives.

The sustainability of these water amenities makes them attractive in the South African market. A typical Crystal Lagoons uses 30 times less water than a standard golf course, and in many cases rainwater is all that is needed to replenish the water, thanks in part to the patented anti-evaporation film which restricts the amount of water lost via evaporation.

"We are confident that the inclusion of this water amenity at The Blyde in Riverwalk Estate will significantly increase the sales rate of the project and will enable other developers to see the return on investment that the installation of a Crystal Lagoon can provide. We are pleased to be partnering with Balwin Properties, bringing the first Crystal Lagoon to South Africa," says Sinclair. ●

# Formidable TRACKED EXCAVATOR launched

JCB Construction Equipment, solely represented in South Africa by Kemach Equipment (Pty) Ltd (Kemach JCB) recently launched the JS305 LC tracked excavator.

## Meeting unique needs

Established in 2003, Kemach JCB is a joint venture between the shareholders of BH Botswana and Muscat Overseas in Oman. Both these companies are the sole JCB dealers in their respective countries.

As a leading earthmoving solutions dealer, Kemach JCB supplies high-calibre equipment to the mining, construction, quarrying and plant hire industries, as well as the central government. A focused dealer of distinguished equipment and support, Kemach JCB continuously strives to put the customer at the heart of its business, fixated on meeting each client's unique needs.

Mark Senyard, the national support and marketing manager says that the JS305 is manufactured at JCB's state-of-the-art facility in India and is designed to be easy to operate, easy to maintain and to move more material at less cost.

Looking at the JS305, Senyard says that the first four units to arrive have been sold, with another 10 on the way. Orders have been placed for additional machines to ensure our order pipeline is in place so as to fulfil what we believe will be an increased demand for this machine.

The JS305 has been on test in India and in South Africa, it was on test with one of our customers.

"The feedback we've had from India and here in South Africa has been excellent particularly in terms of fuel consumption. The unit slots in with the JS205 that JCB launched many years ago."

The JS305's Dieselmex engine is built for the African and Middle East market as well as for lesser-regulated countries. "It's not a Tier 4 engine and is ideal especially in terms of fuel consumption.

"The JS305 has a simple mechanical fuel injection system that tolerates lower fuel quality and an engine and hydraulics designed with productivity in mind," Senyard says.

## Formidable Dieselmex engine

At its heart is a formidable 7,2 l Dieselmex engine that produces huge amounts of

power and torque. Key features include:

- The six-cylinder engine produces its peak power (165 kW) and torque (960 Nm) at a low 1 300 rpm. This allows fuel-efficient matching of the engine and hydraulics.
- With a massive 222,6 Nm of bucket tearout, fast cycle times are assured in all applications. The intuitive multifunction operation makes simultaneous tracking and excavating smooth and fast.
- The JCB JS305 provides a solid, stable work platform for fast cycle times.

Senyard says the control valve optimises hydraulic oil supply to different functions during combined operation. This multifunction prowess guarantees fast cycle times.

"When you're tackling tough applications and difficult working

conditions, one needs a durable and reliable machine. The JS305 offers exactly that with high-quality components along with simple and robust mechanical fuel injection.

The Dieselmex engine has a mechanical in-line Bosch fuel injection system which allows work in areas where fuel quality is poor. The machine benefits from a multi-stage fuel filtration system which protects against a wide range of contaminants as small as two microns.

"High tensile strength steel is used to construct the reinforced boom and dipper. Internal baffle plates help to ensure long-life durability, as do the heavy-duty wear strips at the dipper end," he says, adding that the advanced manufacturing and assembly processes help to guarantee an extremely high level of precision and quality in the components.

"The JS305 is built to last. With a heavy-duty lower frame and upper structure, as well as a high-strength boom and arm, this excavator is designed to excel in tough quarry applications. We use finite element analysis with extensive rig and endurance testing to make key components last longer."

All round-visibility is superb, with a large glass area on the right hand side and top corner of the cab. An innovative low-level bonnet allows clear rearward views.

Operators are kept abreast of key information via the 3,5" display, which can be accessed via a new rotary controller. A spacious stowage area behind the seat provides plenty of room for an operator's personal items.

JCB's optional rear view camera displays an uninterrupted rearward view for improved operator confidence while slewing. The bonnet opens front-to-rear for easy and safe engine service access. JCB's Safety Level Lock fully isolates hydraulic functions to avoid unintended movements.

The 2GO systems means a new JCB JS305 can only be started in a safe locked position via two separate inputs.

LiveLink telematics are fitted as standard. This is an innovative JCB







feature designed to maximise security and fleet utilisation, allowing the monitoring of information such as fuel usage on different shifts.

“The 30 t market is one that we haven’t really participated in, in South Africa, however, we believe that with the JS305, we are ready to tackle that now,” he says. “The machine is very competitively priced and the enquiries and leads are coming in.”

With the JS305 excavator, the innovative LiveLink software permits remote management of the machine either online, by email or by mobile phone. Access from everything from machine alerts to fuel reports and history information, is stored at a secure centre.

### Servicing and customer support

Discussing service, Senyard says this is ensured through the company’s extensive South African footprint, including its national office based in Gauteng, and regional offices situated in Johannesburg, Pretoria, Middelburg, Durban, Richards Bay, Bloemfontein, Mthatha, Cape Town, East

London, Port Elizabeth and George.

To guarantee seamless operations throughout Southern Africa, Kemach JCB’s network of distributors and service dealers are also strategically positioned in Windhoek, Nelspruit, Swaziland, Polokwane, Upington, Schweizer Reneke, and Vryheid.

“We get good support from JCB itself with a local team based here to support us. We have direct contract with our factories so there is support from the OEM itself,” Senyard confirms.

“I must say that I have visited the factories in the UK and in India, and have been blown away by the high-tech facilities. Whether in India or anywhere in the world for that matter, it is the same level of professionalism throughout.

“Our customers are seeing the value in the product, they are seeing the value in resale and it is our customers who are putting us ahead of everybody else,” Senyard says, adding that the involvement of senior management is tremendous.

“Our CEO Les Lothian is often at events and product launches, locally

and internationally, and is very involved in meetings and discussions with our customers. From a customer point of view this is invaluable.”

In conclusion, Senyard says that although the company doesn’t have mining equipment as such, there is a lot of support equipment that goes into the mines.

“The JS305 machines are ideal for the quarrying environment, “typically for aggregates loading, stockpiling, feeding of crushers and screens, etc. I see a great opportunity in construction and quarrying with these products.”

The company offers the best in earthmoving equipment, ranging from the backhoe loaders to skid steers, wheel loaders, excavators, telescopic handlers, rough terrain forklifts, and compaction equipment.

In addition to the equipment itself, Kemach JCB distributes the full range of JCB parts, while skilled field service technicians and expert product support engineers ensure that assistance is available at all times on a 24/7 basis. ●

# Polishing Bantry Bay's GLITTERING JEWEL

**Bantry Bay's moniker as the 'Monaco of Africa' is no longer a stretch of the imagination, and even less so now that Murray & Roberts Western Cape is making good progress with the Aurum luxury lifestyle development by extensively revamping the old Ambassador Hotel and Suites.**

Murray & Roberts Western Cape is a division of Murray & Roberts Construction which is being purchased by a consortium led by the Southern Palace Group of Companies; this will create the first major black-owned infrastructure and building construction business in South Africa.

Working in collaboration with Metle Construction, specialists in high-end Cape Town residential projects, Murray & Roberts Western Cape has been on site since April last year. The well-publicised project includes a building on each side of the busy Victoria Road between Clifton and Sea Point, with the eight sumptuous Presidential Residences cascading down to the water's edge below the road, and the 15 plush Luxury Residences climbing up the hill above the road.

Being developed by DA'Realty, the investment subsidiary of the Dubai-based, multi-national Darvesh Group, the development will encapsulate premium standards of quality and exceptional attention to detail, to create an atmosphere of sophistication and refinement.

The Group has marketed the apartments to their database of wealthy local and international buyers, and most have already been reserved. Indicative of how sought after this development will be, the Darvesh family will be keeping a top floor apartment for their own use, which will comprise a four bedroom, 530 m<sup>2</sup> penthouse.

The Presidential Residences, each occupying their own level with lift access, range in size from 270 m<sup>2</sup> to 600 m<sup>2</sup>.

The Luxury Residences across the road are sized from 140 m<sup>2</sup> to 550 m<sup>2</sup>, with three units to a floor; prices there range from R95 000/m<sup>2</sup> to R120 000/m<sup>2</sup>.

The high values associated with the development have much to do with the fact that there is simply no more land for development on this popular and wind-protected section of Cape Town's eastern seaboard. It is also designated as a 'scenic route' so is subject to stringent building regulations.

## The working context

The urban environment and tight space constraints also bring their own challenges for the contractors, according to Simon Dutton, senior contracts manager at Murray & Roberts Western Cape.

"To comply with municipal by-laws and in consideration of our neighbours, our working hours are restricted during weekdays, and there are no building activities on Saturday afternoons, Sundays or public holidays," says Dutton. "This arrangement also accommodates the high volume of tourist traffic, as it is a very popular area for visitors; even the Argus Cycle Tour comes through this route."

Safety is a key consideration, as traffic is generally heavy along the narrow road, and there is plenty of pedestrian traffic. There has even been a special concession to keep the ground floor pharmacy open during the construction phase, and it will continue to function after the Aurum is opened.

During construction closed-circuit cameras focused on various points on the road between the two buildings ensure that traffic and pedestrian behaviour is closely monitored, and that construction staff are safely managing the traffic flow while accepting the necessary deliveries of concrete, bricks and other materials.

Two tower cranes, one for each side of the road, facilitate quick and efficient lifting of materials to the workspaces where they are needed.

## Intricate structural changes

Much of the construction work has been focused on intricate structural changes which require intense supervision and care, says Dave Griffiths, partner at Metle Construction and project director for the Aurum refurbishment.

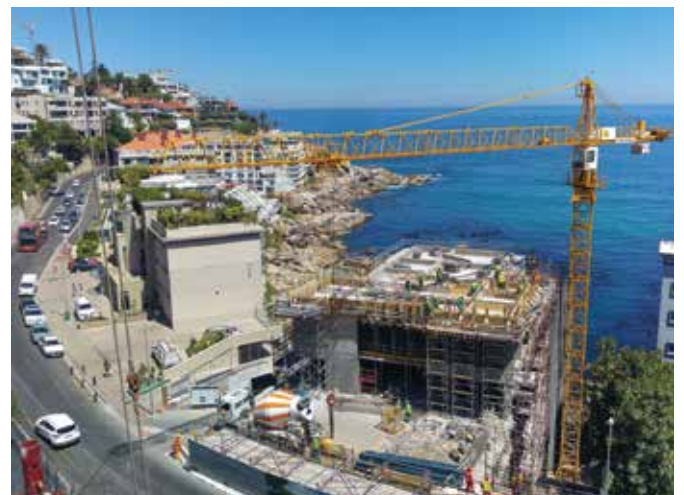
"The exacting requirements of the owner and architect require that many complex adjustments and improvements are implemented to enhance the residents' experience of living in this spectacular space," says Griffiths.

He highlights that where engineered demolitions are required, these are overseen and signed off by a certified engineer.

"Quality and engineering standards remain the watchwords, so wherever we consider that extensive adjustments need to be made, we call on the engineer for checking and go-ahead," he says.

The distinctive curving colonnade at the ground floor entrance to the Ambassador will be retained for the Aurum although it will be

*Murray & Roberts Western Cape is in partnership with Cape Town's Metle Construction Project Management on DA'Realty's Aurum development in Bantry Bay. Construction work on the Aurum Presidential Residences must contend with confined spaces and constant traffic flow.*







Internal excavations underway, with steel-clad pillar in the centre.



Steel braces provide support while this apartment's floor is deepened.

replaced with a new circular entrance complete with water feature. Unusually for Murray & Roberts Western Cape, they will take the construction only up to 'white box' stage, where floors and walls are tiled, ceilings are installed and all surfaces are prepared, painted and ready for their final coat.

"We will provide temporary doors and hand over the client's own contractors, who will undertake the finishing stages of the job including kitchen fittings, vanities, cupboards, door frames, doors and architraves," says Dutton.

The out-sized specifications of the specially imported tiles – 2,8 m long and 800 mm wide – are another indicator that this is

no ordinary development, and that no expense has been spared to create a luxury result.

"There will be little room for error in the handover to the final-stage contractors, so the pressure is on us and our South African tradesmen to complete our work to 'seven star' grade," says Griffiths. "We will have to leave our part of the work perfect in anticipation of the next stage, especially given the high value of the imported components which must fit exactly."

Top-end appliance brand names have also been associated with the apartments to assure buyers of the highest standard of finishes and equipment. ●

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# CONCRETE DOES THE TWIST

**The iconic PriceWaterHouseCoopers (PwC) Tower in Midrand – Africa’s first twisted building – placed a number of unusual demands on concrete during its construction; AfriSam and CHRYSO Southern Africa delivered the concrete solutions.**

Concrete is the construction material of choice for twisted buildings, as it can create the desired twists and turns while providing the required structural strength. It also suits the stylistic intentions of these buildings, which are to achieve a more organic shape; looking more like a sculpture than a traditional block shape.

Visible from a 30 km radius, the R1,5-billion PwC Tower will comprise 45 000 m<sup>2</sup> of office space and house 3 500 employees. Apart from its unique design, the building is also required to contribute to environmental sustainability by consuming less energy and having a minimal impact on the environment.

## Structural challenges

The biggest structural challenge was that the twist causes the gravity load to naturally create a clockwise torsional load on the building. To counteract this load, the designers Arup made unique use of parametric modelling software to establish the optimal solution.

This solution comprises five structural columns on the façade of the building every five floors. The structural columns slope in a counter-clockwise direction around the core and span from floor to floor (3,74 metres in height and 750 mm in diameter). The concrete strengths of these columns range from 50 MPa (from the basement levels to level four) to 40 MPa at the mid-levels (level 5 to level 14) and 30 MPa at the higher levels (level 15 to level 26).

Arup’s structural solution was aligned with the aesthetics of the façade design. The five structural columns along the slab edge resulted in a favourable perimeter span of eight metres; the decision to repeat the column series every five floors allowed the relationship between the columns and the façade units to remain constant. In other words, each of the 25 possible column positions relative to the slab edge align to the centre of a façade panel; if one follows any column up the elevation of the building, it will always be central to a façade panel at each floor.

*Concrete is the construction material of choice for twisted buildings, as it can create the desired twists and turns while providing the required structural strength.*



## Concrete supply

As the concrete supplier to this complex project, AfriSam designed 19 project-specific and special application mixes with an average ordinary Portland Cement replacement of about 30%. Also, each slide concrete mix had normal and retarded versions to satisfy the different applications; the trial mixes were produced at AfriSam’s Jukskei laboratory.

Each of these mix designs used a unique eight digit code, specifically created for the PwC project in order to make sure that the correct concrete was ordered during each stage of the daily pour. Concrete was delivered from AfriSam’s Jukskei A dry readymix plant backed up by Jukskei B wet batch plant, both situated at the Jukskei Quarry in Midrand, close to the PwC Tower site.

Both readymix plants have fully automated command batch computerisation, so it was possible to modify concrete designs remotely and at any time as the project demanded. Batch accuracy was within 1% on all materials batched, so there was no room for errors.

The close proximity of the readymix plants to the site made the planning and deliveries to site more convenient. AfriSam’s Jukskei A Plant was the primary supply plant while its Jukskei B Plant acted as the back-up, allowing for concrete to be delivered to site around the clock.

During certain construction phases, concrete was supplied 24 hours a day, with three readymix trucks on a permanent turnaround basis. These readymix trucks had the ability to efficiently mix the concrete at the Jukskei A plant and again on site.

*The five structural columns along the slab edge resulted in a favourable perimeter span of eight metres; the decision to repeat the column series every five floors.*







Visible from a 30 km radius, the R1,5-billion PwC Tower will comprise 45 000 m<sup>2</sup> of office space and house 3 500 employees.

Due to the close proximity of the readymix plants to the PwC site, the batch load size and loading sequences were optimised at 2 m<sup>3</sup> to make sure the mix was homogeneously mixed before it left the plant. The concrete slump was also maintained strictly at 180 mm from the plant.

### Slip forming the core wall

The building's core wall, at a height of 118 metres and thickness of 450 mm, was constructed using an interesting method of construction – slip forming. This sliding methodology starts with the assembly of the sliding system at ground level. Concrete is poured continuously within shutters and the system is lifted incrementally as concrete is poured, creating a structure without joints.

Reinforcing is then fixed into position as the slide progresses so as not to slow down the placement of concrete; over 400 tonnes of reinforcing was used in the core wall.

Working continuously in two 12 hour shifts, the sliding team comprised at least 62 workers on the slide shutter itself at any one time. This allowed the core wall to be constructed in 65 days, with an average of 90 m<sup>3</sup> of concrete placed per day.

### Concrete mixes

AfriSam had to design concrete mixes that were both pumpable and suitable for slip forming, including specialised retarded mixes that could be continuously pumped up into the moving slide around the clock. A static pump would pump the concrete into the slide cavities using a spreader that was fixed to the slide.

Pumping vertically over 100 metres would mean possible high pump pressures and the need for lubrication within the lines had to

## Grand scale

A total of 6 057 m<sup>3</sup> of concrete was used to construct the core wall. Concrete is normally placed using a bucket and crane; however, due to the large quantities of concrete involved, it was decided to pump the concrete vertically up to the height of 118 metres. When concrete was pumped to the top of the building, there was 3,5 m<sup>3</sup> of concrete in the pipeline.



Concrete is poured continuously within shutters and the system is lifted incrementally as concrete is poured, creating a structure without joints.

be considered, and steps taken to avoid segregation and blockages. If the pumping pressure was too high, excessive pressure would be placed on the mix and this could force segregation of the concrete (water washing out of the paste) and cause blockages in the pipe.

In addition to this, the pump would be started and stopped for extended periods when shuttering inserts and reinforcing had to be installed, with the pump and pipeline full of concrete. Another factor would be the continuous stop/starting action as the hose was lifted out of the reinforcing forest and inserted again into its next position; the reinforcement in the lift shafts would also be very dense. This highlighted the need for the concrete to remain workable for up to six hours, long enough for it to pass through the pipeline and be placed into the structure. A concrete non-return valve was used to prevent any backflow; opening and closing as the pump worked.

AfriSam incorporated about 30% fly ash in the mixes to increase the pumpability and slow down the initial setting time. To achieve this, a combination of three CHRYSO additives was used including a superplasticiser and retarder which delays the setting time of the concrete. This provided enough time for concrete to be placed into the form, around the core wall, and vibrated so the sliding process could continue.

The concrete would exit the bottom of the slide 10 to 12 hours after casting. It could not be allowed to harden during this time as this would reduce the 'slip effect' and make it difficult to incrementally lift the sliding system. The concrete supported the slide platform. →

## What makes a twisted building so different?

The Council on Tall Buildings and Urban Habitat defines a twisted building as one that progressively rotates its floor plates or its façade as it gains height. The PwC Tower twists both its façade and floor plates as well as the supporting structure, which is essentially a concrete frame with post-tensioned concrete floor plates. These twisted manipulations create a stunning variety of textures, view angles, and ripple effects.



*As the concrete supplier to this complex project, AfriSam designed 19 project-specific and special application mixes.*

### Admixtures

AfriSam also paid particular attention to the aggregate grading and fines content. If the grading of the aggregates was incorrect, they could be pushed out during pumping and this would result in blockages in the pump or pipeline.

When pumped, concrete moves in a cylinder and is separated from the pipeline wall by a lubricating layer of water, cement and fine aggregate or sand. This lubricating film is vital to achieve the necessary workability of the concrete so it can be pushed through this channel.

The CHRYSO® Superplasticiser was therefore added by AfriSam; it is designed with the CHRYSO® Fill Free technology for a cohesive concrete paste which is less sticky, as stickiness can increase the resistance of the flow of the concrete in the pipeline. And will make it difficult to maintain a constant rate of pumping.

It was important to achieve exactly the correct slump. The sliding process may be delayed if the slump is too high and it may be difficult to slide if the slump is too low. Since the CHRYSO®

*AfriSam had to design concrete mixes that were both pumpable and suitable for slip forming, including specialised retarded mixes that could be continuously pumped up into the moving slide around the clock.*



*The core wall, at a height of 118 metres and thickness of 450 mm, was constructed using an interesting method of construction – slip forming.*

Plasticiser is a multi-dose admixture, it could create concrete with the best suited slump for the project.

This admixture created a dense, cohesive concrete mix with sufficient paste volume that enabled the correct level of workability of the concrete. It also assisted with a good aggregate coating by dispersing the cement grains, thereby minimising agglomeration of the mix and increasing plasticity and therefore workability of the concrete. The 180 mm slump was achieved without any segregation of the mix. Any segregation of the mix would cause blockages as the slush is pushed through the coarse aggregates causing a plug

CHRYSO® Plasticiser also helped in creating a favourable water-cement ratio by reducing the amount of water, improving durability by preventing shrinking, cracking and porous concrete.

The landmark PwC Tower now stands as testimony to the skill and innovation found in South Africa's built environment disciplines, including the providers of cement, concrete and specialised chemical admixtures. ●

*AfriSam incorporated about 30% fly ash in the mixes to increase the pumpability and slow down the initial setting time. A combination of three CHRYSO additives was used including a superplasticiser and retarder which delays the setting time of the concrete.*







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*More than  
steel.*

# USD95-MILLION KUMASI CITY MALL

The new Kumasi City Mall in Ghana's city of Kumasi opened 20 April 2017. It is leading property developer and investor Atterbury's fourth successful retail development in Ghana.

Atterbury's first trio of prior successful developments in the country are all in Ghana's capital, Accra: Accra Mall, Westhills Mall, and Achimota Mall.

The world-class 18 500 m<sup>2</sup> modern mall, with potential for a future 10 000 m<sup>2</sup> expansion, will give the city of Kumasi its first one-stop environment with shopping and entertainment under one roof when it opens next month.

While the mall's public opening was in April, its formal launch will take place in early May 2017, in the presence of the King of the Ashanti Empire, Otumfuo Osei Tutu II Asantehene.

Atterbury is developing Kumasi City Mall for its owners and, AttAfrica has been appointed asset manager, responsible for its day-to-day running and operations.

Cobus van Heerden, of Atterbury Property Development, says: "This is the first big development we have undertaken in Kumasi, and it has been an absolute pleasure doing business here."

He adds: "We are optimistic about Ghana and Kumasi City Mall, notwithstanding the challenging economic context in West Africa and competition. There's a growing positive feeling about Ghana in the market. With its new president, there is also renewed confidence and positive sentiment about Ghana. Kumasi City Mall is perfectly timed for this upsurge in confidence."

Virtually fully let, Kumasi City Mall's anchor tenants are Shoprite and Walmart brand Game, with the new shopping centre supporting the growth of both retailers in the region.

Its retail mix includes food, convenience, banking, services, fashion, electronics and a cinema, club and children's games for entertainment, with a long list of local retailers.

The mall's tenant mix and architecture combine to create a unique setting, perfectly matched to the shopping trends of the local Ashanti, as well as visitors to the region.

Kumasi Mall is enclosed on either end, with a semi-enclosed food court at its heart.

"It's exceptionally strong food court serves as an excellent third anchor. It responds to the outgoing and social nature of the people of Kumasi by offering a vibrant dining and entertainment space with generous seating and shaded areas," explains Van Heerden.

With superb access from the Eastern Bypass of the city's main ring road, Kumasi City Mall is nestled between the dual carriageway Lake Road, Hudson Road, Yaa Asantewa Road, and Kofi Adomako Street.

It has a prominent road frontage, generous undercover and on-grade parking, and is accessible from both a specially created slip lane off Lake Road and at its intersection with Hudson Road. There's also a large taxi drop-off and pick-up facility right in front of the mall.

The word 'Kumasi' means flower, which is portrayed in the mall's logo. True to its name, this retail asset has blossomed over its 24-month development period, making a positive impact in its community, bringing opportunities for employment and giving a boost to the local economy.

Designed in a joint venture between South African architect practice Boogertman + Partners and Ghanaian practice MultiCAD, the mall incorporates steel, concrete, and wood, in an elegant design inspired by an African tree, which branches out to create a roof canopy. Together, its many different tree-shaped columns create a forest, illuminated by plenty of natural light from beautiful African skies.

"Kumasi City Mall's leading design is inspired by its setting, which makes it an asset to be proud of," says Van Heerden.

All firms in Kumasi City Mall's professional team operated with local partners for the delivery of professional services. The mall's development and construction has boosted jobs in the area and will continue to do so as part of its ongoing operation. ●

*Cobus van Heerden, of Atterbury Property Development.*





# REINFORCING SITE of new Mamelodi Mall

**Kaytech's quality separation, basal reinforcement and subgrade stabilisation solutions for the new Mamelodi Mall, east of Pretoria, resulted in significant savings for New Africa Development. With the planned Mall strategically situated in the centre of Mamelodi, a township of over half a million inhabitants, it is destined to become a leading commercial and social hub.**

Upon inspection of the site, D & G Consulting Engineers encountered extremely weak clay subgrade that could neither support massive stormwater pipes nor future construction of the platforms for the structures. With the only conventional option being an expensive layer of dumprock (over one metre thick) to compensate for the low bearing capacity of the in-situ soil, Danie Herbst of Kaytech was consulted to recommend a favourable solution.

It was decided that RockGrid PC 100/100, Kaytech's composite geotextile, would be installed as a separation and reinforcement layer in the bedding of the stormwater pipes. This solution helped facilitate a reduction in the layer of dumprock required.

The PC 100/100 composite geotextile was used as the combination of a nonwoven separation layer in conjunction with high tenacity, bi-axially orientated multifilament polyester yarns, gives RockGrid PC its exceptional characteristics; a high tensile modulus providing excellent reinforcement properties and, compared to polyethylene or polypropylene grids or woven fabrics, minimal creep deformation. The contractor Renico installed a total of 16 000 m<sup>2</sup> of RockGrid PC 100/100.

In addition to the separation and basal reinforcement, a drainage system comprising 1,6 km of Flo-Drain was installed alongside the stormwater trench to protect the integrity of the platforms. The Flo-drain system is Kaytech's solution for highly effective subsoil drainage in a wide variety of applications.

Compared to a conventional aggregate drain, pre-assembled and lightweight Flo-Drain offers several advantages, including ease of transportation, ease and speed of installation, flexibility, as well as quality assurance.

Kaypipe geopipe, positioned at the base of the Flo-Drain fin, accommodates high localised flows since its 70% open area allows for a significant increase in the infiltration rate of water. Manufactured from HDPE, Kaypipe geopipe is lightweight and flexible, making it far easier to install than other drainage pipes. Its exceptional infiltration rate, coupled with its ability to tolerate extremely high stresses, places Kaypipe geopipe in a class of its own.

For optimum subgrade stabilisation of the platform created for the mall, Kaytech recommended a combination of their TriAx TX 160 and bidim A2. The TriAx provides a mechanical stabilised layer and the bidim A2 beneath fulfils the separation function to the soft clayey subgrade. This creates a stable platform for the building.

The rigid polypropylene triangular geometry of TriAx is a revolutionary geogrid design providing near uniform stiffness through 360°. Compared to bi-axial geogrids, TriAx enables greater reduction in aggregate layer thickness which in turn, reduces the quantity of natural aggregates required as well as the volume of material to be excavated. This completely multi-directional product with near isotropic properties produces a

mechanically stabilised layer of unsurpassed performance.

After technical advice from Tensor UK, the manufacturer of TriAx, Kaytech proposed that all dumprock be removed from the layerworks and completely replaced with the TriAx TX 160 and bidim A2 combination layer. This design resulted in on-site material now becoming usable due to the excellent compaction facilitated by the geogrid (G6 fill at 370 mm, the minimum depth as per TRH14, was compacted to 95% MOD AASHTO), and by using bidim as a separation layer, up to 50% less fill material was needed.

Manufactured in Kaytech's ISO 9001 registered factory in Atlantis, Western Cape, and meeting stringent civil engineering and industrial specifications, bidim has become the leading geotextile in Africa. Over the last decade, Kaytech has processed over 25 million kilograms of high grade polyester from discarded plastic cooldrink bottles, converting this 100% recycled material into eco-friendly A-grade bidim, a continuous filament, nonwoven, needlepunched geotextile. It is the needlepunching process that gives bidim its unique characteristics including appreciable thickness, high porosity and a high drainage capacity both transverse and normal to the plane. 101 081 PET bottles were effectively recycled to manufacture the bidim for this project.

Kaytech's solution for this project not only provided considerable economic benefits for the developer, but also greatly impressed the engineer and, with 22 000 m<sup>2</sup> of both TriAx TX 160 and bidim A2 providing the ultimate in subgrade stabilisation, there's no doubt that the Mamelodi Mall will be built on solid ground. ●



# Construction WORLD

# 2 BEST PROJECTS 17

*Construction World's* Best Projects showcases excellence in the South African building, civil engineering and project management sectors.

In its 15<sup>th</sup> year, the aim of *Construction World's* Best Projects is to recognise projects across the entire construction industry: from civil and building projects to professional services to specialist suppliers and contracts.

There are six categories in which to enter. Projects may be entered in several categories, provided they meet the prerequisites for entering each one, as well as meet the entry criteria.

## Judging

A panel of independent judges from the construction industry has been appointed. These judges represent ECSA, SAICE, MBA and CIOB. They are Trueman Goba, chairman of Hatch Goba and former ECSA and SAICE president; Nico Maas, chairman of Gauteng Piling and former president of the Master Builders' Association; and Rob Newberry, managing director of Newberry Development and founding president of the Chartered Institute of Building.

Each criterion as set out for the various categories will be scored out of 10 – with 10 being the highest score and one being the lowest – it is therefore VERY important that entries address the criteria for the particular category it is entering.

In each category an Overall Winner Award and one or two Highly Commended Award(s) will be made. A 'Special Mention' award may be given.

## Awards evening

The awards ceremony will be held on **Wednesday, 8 November 2017** at the Royal and Kensington Golf Club in Johannesburg.

## Entry criteria for each category

- Construction innovation technology
- Corporate social investment
- Design innovation \*
- Environmental impact consideration
- Health and safety
- Quantifiable time, cost and quality \*
- Risk management \*
- Motivating facts about the project

(\*The same criteria pertain to all categories except for 'Category B: Specialist Contractors or Suppliers' where the following do not apply: Design innovation; Quantifiable time, cost and quality; Risk management.)

## Category A1: Civil Engineering Contractors

### Prerequisites for entries

- Only South African construction and civil projects executed by locally based companies.
- Projects are eligible during the execution of the project and up to 12 months after completion.
- Projects must be 50% complete at time of entry.

[REFER TO ENTRY CRITERIA](#)

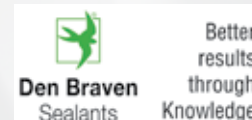
## Category A2: Building Contractors

### Prerequisites for entries

- Only South African construction and civil projects executed by locally based companies.
- Projects are eligible during the execution of the project and up to 12 months after completion.
- Projects must be 50% complete at time of entry.

[REFER TO ENTRY CRITERIA](#)

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## Category A3: Civil Engineering and Building Contractors (outside South Africa)

### Prerequisites for entries

- Projects outside South Africa, executed by a South African contractor.
- Projects are eligible during the execution of the project and up to 12 months after completion.
- Projects must be 50% complete at time of entry.

[REFER TO ENTRY CRITERIA](#)



# FIRST CALL FOR ENTRIES

## Submitting entries

- Each entry must be accompanied by the completed entry form; available on [www.constructionworldmagazine.co.za](http://www.constructionworldmagazine.co.za) or by requesting it from [constr@crowm.co.za](mailto:constr@crowm.co.za).
- The maximum length for submissions is 2 000 words
- Each submission must clearly state which category is entered for\*
- IMPORTANT It is to the entrants' own advantage to address ALL the criteria as set out in the category being entered. If a criterium fell outside the scope of the contract, please state this.
- The written submission must be accompanied by up to six high resolution photographs with applicable captions.
- The photopgraphs and copy must be submitted separately – NOT in PDF format.
- The submission must also contain a summary list of important project information such as client, main contractor etc. – i.e. the professional team involved in the project.
- Electronic submissions are acceptable – entrants do not need to produce hard copies of entries.

\* *Construction World* retains the right to move entries into a more appropriate category.

## Deadlines

Deadline for entries is  
**Friday, 8 September 2017 at 17:00.**

## Contact

For further information contact the editor, Wilhelm du Plessis on 011-622-4770 or [constr@crowm.co.za](mailto:constr@crowm.co.za)

## Special issue

The December issue of *Construction World* is dedicated to the various winners and entries and is thus an overview of activity in the built environment during the past year.

## Category B: Specialist Contractors or Suppliers

### Prerequisites for entries

- Only South African construction and civil projects executed by locally based companies.
- Projects are eligible during the execution of the project and up to 12 months after completion.
- Projects must be 50% complete at time of entry.

### Criteria for category B

- Construction technology innovation
- Corporate social investment
- Environmental impact consideration
- Health and safety
- Motivating facts about the project

## Category C: Professional Services\*

### Prerequisites for entries

- Only South African construction and civil projects executed by locally based companies.
- Projects are eligible during the execution of the project and up to 12 months after completion.
- Projects must be 50% complete at time of entry.

REFER TO ENTRY CRITERIA

**\*Depending on the entries received, an award for both consulting engineers AND architects will be made.**

## Category D: The AfriSam Innovation Award for Sustainable Construction

Description of category: Working with the community on a project that has socio-economic impact.

### Prerequisites for entries

- Only South African construction and civil projects executed by locally based companies.
- Projects are eligible during the execution of the project and up to 12 months after completion.
- Projects must be 50% complete at time of entry.

### This category will be judged on the project's

- change and transferability
- ethical standards and social equity
- ecological quality and energy conservation
- economic performance and compatibility
- contextual and aesthetic impact

REFER TO ENTRY CRITERIA

Main sponsor:



# PROVING its METTLE

## on fast track refurb contract

Working to exact measurements, a fast-track construction programme, unprecedented rainfall, operating within 100 metres of a premier Sandton Hotel and having two tight site boundaries are a few of the challenges faced by leading building contractor, Murray & Roberts Buildings, on its contract at 135 West Street in the heart of Sandton.

► The seven month contract will see Murray & Roberts Buildings convert an existing office block into a 218 room luxury hotel. A fifth floor will be constructed on top of the existing structure of four concrete floors. The basement will remain but will be refurbished accordingly.

While plans for the development were in the process of being finalised Murray & Roberts Buildings carried out demolition work. This comprised the stripping of all existing finishes and external brickwork. This demolition work was carried out over weekends to limit disruptions to surrounding hotels, clinics, and office blocks as the project site is located in a high-traffic area.

"In addition, there is less foot traffic through the area during the weekend and this was also an important consideration for us from a safety point of view," explains MacDonald Ngobese, site agent at Murray & Roberts Buildings.

The additional fifth floor will be constructed using structural steel and will have a soft roof to mitigate weight and associated load bearing issues on the existing structure.

Ngobese explains that this method of construction is quicker and will assist in the management of project time constraints. "As there are no concrete columns being installed on the fifth floor there is also no time needed for the curing of concrete either," he points out.

Furthermore, in terms of reconstruction work, two new lifts will be installed and the hotel will feature a state-of-the-art reception area featuring a triple-volume chandelier and an adjacent lounge

*A view of the project (left) highlighting its proximity to the Michelangelo Towers (middle) and Citibank South Africa (right).*



ABOVE: The project site is bordered on three sides by public roads.

TOP: Construction activities on the fifth floor of the hotel. Note the structural steel ceiling supports.

area. The scope of work includes all new structural works and adjustments to existing concrete work as well as new brickwork, dry-walling, plumbing, electrical reticulation and the installation of high-end finishes.

Ngobese explains this particular building contract requires a dynamic approach to its construction programme. "Our experience and ability to execute plans quickly and efficiently have been vital to the challenges encountered on the project site. While maintaining a fluid approach to our fast track construction programme, we need to be adaptable to achieve appropriate solutions."

An example of this fluidity and adaptability can be illustrated when the construction team cut an opening for tanks and boilers in an existing concrete slab covering the existing basement. The slab was post-tensioned and cutting through it could not be approached as a simple cut. Murray & Roberts Buildings used a methodology that facilitated the de-stressing of the cables before the cut. The cut itself also changed the integrity of the slab and its load capacity. This was adjusted accordingly before the slab was re-stressed.





Precast wall units that have been tested at the manufacturer's facility are crucial to the acoustic requirements of the interior walls.

*"Our experience and ability to execute plans quickly and efficiently have been vital to the challenges encountered on the project site. While maintaining a fluid approach to our fast track construction programme, we need to be adaptable to achieve appropriate solutions."*



Sub-frames are being used for all of the openings in the external walls to ensure they are consistent to the mm.

## Flow of pedestrians

One of Murray & Roberts Buildings' most significant challenges on this contract is managing the flow of both pedestrians and vehicle traffic in and around the project site.

Before site activities began Murray & Roberts Buildings established channels of communication with the nearby Michelangelo Hotel, as well as Citibank and the Sandown Clinic.

These three buildings border the construction site so it was necessary to discuss the project timeline and the exact nature of activities that would be taking place as well as the areas nearby the building site that could be affected.

To facilitate materials handling activities on the project, Murray & Roberts Buildings was granted two way leaves from the Johannesburg Roads Agency for a piece of road where its site crane is located as well as another area for deliveries to site.

"When we have large volume deliveries, we are able to close the access road to West Street and make the dual entrance lane a two-way street," explains Ngobese.

To negate any adverse disruption to peak hour traffic, the access road is not closer after 16:45. The Sandown Clinic also allows the building contractor the use of its service entrance for concrete deliveries.

## Challenges of an existing building

Working in an existing building is challenging. To ensure perfect room measurements, including the bathrooms and bathroom components, the Murray & Roberts Buildings team is using steel templates to outline a series of rooms in a fraction of the time it would take a team using traditional measurement tools. "We're also using sub-frames for all the openings in the external façade to ensure they are millimetre perfect and consistent," states Ngobese.

A further time saving measure is the use of prefabricated plumbing systems which arrive at the building site with all the required back-to-back piping already connected in a sub-frame.

"These are positioned, the concrete poured into the cage and then the surrounding brickwork commences," outlines Ngobese. All these methods have collectively saved the construction team a tremendous amount of time.

The use of innovative alternative methods of construction has enabled Murray & Roberts Buildings to increase its productivity on the build. An example of this is the use of plastic shuttering as opposed to the traditional steel or timber materials.

"This allows a team of two to manoeuvre the shutters around instead of a team of six, allowing us to allocate our teams more effectively on the project," points out Ngobese.

A standout feature of this building contract is its acoustic requirements. This comprises acoustically designed partitioning, cavity back walls, plumbing and power reticulation systems.

"We have a completed a showroom where we can test all the construction elements which also include the window frames, doors, plug points, cabling conduits, ceilings and carpets to achieve our limit of 50 decibels," explains Ngobese.

## Safety

Murray & Roberts Buildings has a focused approach to safety on all its projects. Ngobese explains that all 23 subcontractors conduct their activities in line with Murray & Roberts' Stop.Think.Act.24/7 safety policy.

This safety strategy extends to the areas surrounding the project site where there is pedestrian foot traffic, and the entire external façade of the building is surrounded by scaffolding covered with net to prevent objects falling into the public thoroughfares below.

In line with its commitment to environmental stewardship, the company also minimised the amount of airborne dust on the construction site during demolition activities. This was done by wetting rubble and keeping it moist by covering it with shade net prior to mechanical removal. "At the end of every day we make sure that all of the surrounding streets and pavements surrounding our construction are swept clean as an extra measure to safeguard the public," highlights Ngobese.

Construction activities are scheduled for completion in April 2017. Murray & Roberts Buildings is a division of Murray & Roberts Construction which is being purchased by a consortium led by the Southern Palace Group of Companies and which will create the first major black-owned infrastructure and building construction business in South Africa. ●

# New WATER STORAGE TANKS

## support local government

As a member of the Structa Group, Structa Technology proudly services the government by assisting it in the provision of much-needed water storage to rural communities throughout South Africa.

“Over the years, our 40-year proprietary product, Prestank, has proven to be a hygienically safe, cost-effective, and reliable water-storage solution for communities, commercial sectors, private sectors, and even for personalised storage,” says Structa Technology’s Prestank director, Rodney Cory.

“We are one of the preferred suppliers of water storage tanks for municipal authorities and mines, as we are known as a supplier who always strives to deliver our water tanks on time and within budget, adhering to the best quality standards,” says Cory, adding that Structa Technology’s Prestank water storage tank is the ideal water storage solution for large volumes of water – from 10 000 litres and up.

### Improved service offerings

Cory notes, however, that the company has improved its basket of service offerings for municipalities by introducing its newly

patented water storage tank. We have responded to the need to also offer our government a patented water storage solution for lower volumes of water – up to 10 000 litres – as an alternative, durable, robust, and cost-effective solution, with minimal maintenance required,” says Cory, adding that the Roddy Tank is ideally suited for smaller villages, schools, and clinics in rural areas.

The Roddy Tank is a sectional, round, galvanised water storage tank that offers 3 900 litres, 7 200 litres, and 10 000 litres capacities. However, if the client requires more than 10 000 litres – for example, if a village population grows and requires a bigger water storage tank – this patented system allows for the user to expand the capacity of the water storage tank.

“There is, therefore, no need to replace the original water storage tank with a bigger water storage tank,” says Cory, adding that the Roddy Tank can remain on ground level or on a stand of 5 m or 10 m.

### Service delivery partnership

Structa Technology provides municipalities with a cost-effective and durable product.

The company’s philosophy is to partner with local contractors in the area to provide the foundations of tank installations, thereby supporting the respective municipality’s localisation policy and assisting with much needed job creation for locals.

### Ideal for South Africa

Structa Technology offers local water utilities and municipalities two durable and cost-effective water-storage products, namely the Roddy Tank, for lower water volumes, and the Prestank, for water volumes above 10 000 litres.

Prestanks can be used for various water storage applications, including temporary or permanent installations at mines, power stations, building sites, hospitals, water utilities, municipalities, rural communities, and farms.

Structa’s customisable, high-quality pressed-steel sectional tanks are hot-



*The Roddy Tank is a sectional, round, galvanised water storage tank.*

dip galvanised for corrosion control in accordance with SANS 121 (or ISO 1461) galvanising standards. The thickness of the hot-dip galvanised coat is applied within a range of 80 µm to 100 µm – more than five times that of zinc on pre-galvanised corrugated steel cylindrical tanks. This ensures an extended maintenance-free life when water with aggressively corrosive properties needs to be stored. Meanwhile, the Roddy Tank can be used for lower-volume water storage of up to 10 000 litres applications, such as rural, domestic, industrial, and agricultural water storage.

### Watering SA

Structa Technology provides municipalities with water infrastructure so that they can offer communities access to water in a controlled environment. The company is geared to assist government with its water infrastructure and maintenance programmes.

Cory concludes, “As a result of our continuous commitment to technological advancements, we are able to offer municipalities more cost-effective and durable solutions for water storage such as the Roddy water storage tank for smaller rural villages, schools, and clinics. ●



*Prestank on Stand manufactured by Structa Technology.*



# Engineering design for bulk services for Sibaya Precinct

**SMEC South Africa has been appointed by Tongaat Hulett Developments (THD) to conduct the engineering design for the bulk services for the Sibaya Precinct in KwaZulu-Natal.**

Sibaya Precinct is a mixed-use residential development on the north coast of Durban, sprawling over 1 000 ha of coastal landscape. It includes a coastal dune forest conservancy and wetland rehabilitation, with about 75 km of paths, boardwalks and trails planned.

Situated directly west and south-west of the coastal town of uMdloti, the precinct will be confined by the uMdloti estuary to the north, uMdloti Town and the ocean to the east, the uMhlanga estuary to the south, and the N2 to the west.

The precinct will consist of seven different nodes, to be developed in a phased manner. Development of Node 1 commenced mid-2016. Sibaya Casino will be situated centrally within the precinct, with additional areas earmarked for commercial development.

New bulk services are being constructed that will service both the new and existing developments. The existing Waterloo Reservoir will also need to be upgraded. However, this is only anticipated to be necessary following Node 4.

"We conducted water modelling for Sibaya Precinct, including the demands from future developments in the area such as THD's Cornubia North and Mount Moreland South," SMEC South Africa project director, Etienne Viljoen explains.

Construction has commenced on the 700-mm-diameter steel bulk water main (about

3,6 km long), and the 355-mm-diameter trunk sewer main to service Node 1. The latter gravitates from the Sibaya traffic circle on the M4 tying into the existing 450-mm-diameter trunk sewer main (about 2,1 km long).

"We are responsible for site supervision services as well," SMEC South Africa project manager Siebren du Plessis highlights. The design of the 600 mm gravity trunk sewer main and the upgrade to the Sibaya Sewer Pump Station is underway, with construction dependent on the demand for the second phase (Node 4), adds Engineer Terence O' Flaherty.

SMEC South Africa has also been appointed to conduct the preliminary engineering services report for the Environmental Impact Assessment for Node 4 and the Sibaya ForestEstate.

Node 4 is situated between the N2 and the M4, bordered to the north by the M27 and to south by Sibaya Drive. It will comprise residential, mixed-use residential, commercial, and education facilities. Here SMEC South Africa will carry out the engineering design for the civil services, including roads, stormwater, sewer and water reticulation.

The Sibaya Forest Reserve forms part of one of the largest pristine dune forests in South Africa, outside of the iSimangaliso Wetland Park. Here visitors will be able to enjoy the scenery by accessing boardwalks through the forest.

The reserve will include a visitor centre, restaurant, treehouse view point, and a boutique spa. SMEC South Africa is providing engineering input into the civil services such as water, sewer, stormwater and access. ●



*SMEC South Africa project director, Etienne Viljoen.*



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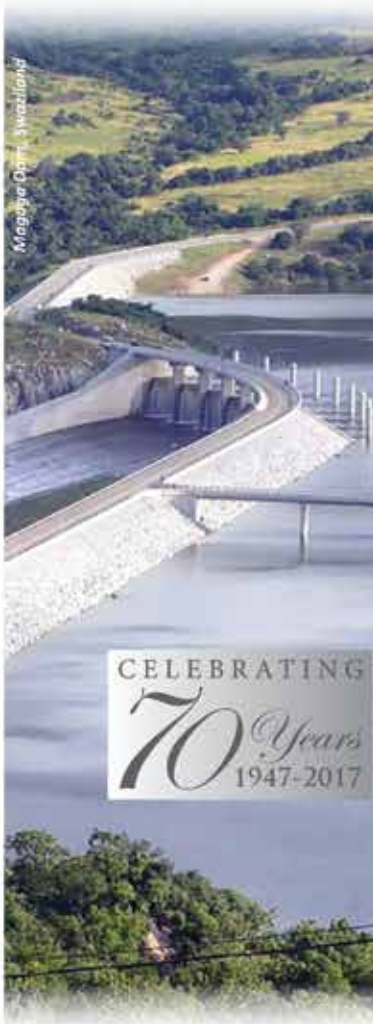
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## Reduce permeability – concrete more durable

Many concrete durability problems can be prevented if the concrete is made less permeable, says John Roxburgh, lecturer at The Concrete Institute's School of Concrete Technology.

Roxburgh says air and water will carry chemicals into the concrete where, in the presence of water, chemical degradation will start both in the concrete and the reinforcing steel. Concrete should be made less permeable right at the mix design stage. Here Roxburgh provides three guidelines:

- The first is to reduce the amount of voids in the form of capillaries and pores in the paste part of the concrete. This can be done by either reducing the water content or increasing the cement content. By doing the above the water to cement ratio (w/c) is lowered which leads to a stronger concrete – and stronger concretes are typically less permeable than weaker concretes. "This is an older, well tested and popular approach to making concrete less permeable. However, it can be an expensive approach if the cement content is increased. So, with an optimal amount of cement, mix designers should concentrate on reducing the amount of water. It is the excess water in concrete that is responsible for the capillary and pore sizes and overall volumes. Here admixtures and especially the plasticising admixture will play an important role in the reduction of the water content in concrete," he advises;
- A more modern approach is to use extenders as a portion of the binder. Using fly ash will result in a finer pore

structure being produced within the paste with a resulting reduction in permeability. Similar outcomes can be produced with slag-based cements, especially with longer curing times and post 28-day ages. Silica fume and to a lesser extent finer fly ash will also densify the usually less dense transition zone between the paste and aggregate so helping the concrete to become less permeable. "The reduction in permeability can be quite dramatic with the use of silica fume," Roxburgh observes; and

- Finally, the use of well graded smooth rounded sands that pack well will reduce water resulting in a less permeable concrete. Fundamental to producing a cheap but durable concrete is to use a good sand.

"Concrete mix design to reduce the permeability of the concrete should also always be considered along with the plastic properties of the concrete. On site, the formation of cracks, voids and bleed water lenses and channels within the concrete will cause permeable concrete so the plastic properties of the concrete should be designed to minimise these. Also the transport, placing, compaction and curing of the concrete plays just as an important role in the reduction of permeability as the original mix design," Roxburgh adds. ●



LEFT: Over 82 years after being erected, these concrete intake towers of America's Hoover Dam prove how durable properly mixed concrete can be.



Many concrete durability problems can be prevented if the concrete is made less permeable, says The Concrete Institute.

BELOW: John Roxburgh, lecturer at The Concrete Institute's School of Concrete Technology.





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## Concrete crack injection systems

MC Bauchemie of Germany have joined forces with VERNI-Speciality Construct Products. VERNI will be marketing and selling the MC range of Concrete Crack Injection systems for structural reinforcing, concrete repairs, structural waterproofing, sub-soil stabilisation and stabilisation and lifting of concrete slabs.

MC Bauchemie is a world leader in Concrete Crack Injection systems with MC Branches worldwide. The technology is superior and MC offers the complete range of materials to replace damaged waterproofing systems, typically such as car park decks, roof gardens, bridges, tunnels, water retaining structures, dam walls, etc whereby the crack injection is done on the underside/reverse side of the concrete, thus eliminating the need to shut the plant causing downtime or removing the existing roof garden, tar or paving, etc.

The MC Crack Injection systems offer:

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VERNI will be selling the materials onto specialist pre-approved and trained subcontractors and specialist concrete repair companies. ●



### Official Launch

Verni is exhibiting at Totally Concrete (Gallagher Estate, Midrand) stand no. 304. The Official Presentation Launch (30 min) will take place on 23 May 2017, Area 2 at 13:00.

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## Closing the gap

A high performance joint sealing system supplied by Sika has solved a problem at an ageing reservoir in Primrose, Gauteng. Constructed in 1985, the 40 Mℓ Ekurhuleni Reservoir is just one of dozens of reservoirs supplying potable water to the people on the East Rand.



The problem at the reservoir was an excessively wide wall-to-floor joint measuring over 75 mm in width. In consultation with Sika's Jacobus Pretorius, engineers from Ekurhuleni Water specified the effective Sikadur-Combiflex SG System for the project. Designed for use in construction, expansion and connection joints, the Sikadur-Combiflex SG System consists of a modified, flexible Polyolefin (FPO) waterproofing tape bonded to Sikadur-31 DW, a moisture-tolerant, structural two-part adhesive and repair mortar based on a combination of epoxy resins and special fillers.

Both products have international approval for contact with drinking water and can be applied to both dry and damp

concrete surfaces. Sikadur-31 DW is a high strength, thixotropic adhesive that hardens without shrinkage and is impermeable to liquids and water vapour. Requiring no primer, it is easy to mix and apply, and provides excellent adhesion to most construction materials.

Extremely flexible and performing well in a wide range of temperatures, the Sikadur-Combiflex SG System is suitable for use in many difficult situations. When fixed to a joint, the system allows for irregular and high movement in more than one direction, while still maintaining a high quality seal. It is ideal for use in tunnels, culverts, hydro-electric power plants, all water retaining structures including seawater and even sewage treatment plants.

Aquatan Lining Systems, experts in the geosynthetic installations, was awarded the contract and used a total of 350 m of Sikadur-Combiflex tape (450 mm x 2 mm) to seal the gaping joint. The waterproofing tape is supplied in 25 m rolls of various widths, either 1 mm or 2 mm thick.

Although 30 years old, this was the first refurbishment project on the Ekurhuleni Reservoir and forms part of the Ekurhuleni Metropolitan Municipality's water infrastructure upgrade plan, which also includes the construction of 20 new reservoirs. Thanks to Sika's exceptional joint sealing system, the Ekurhuleni Reservoir was saved the ignominy of being decommissioned, as has been the fate of many other ageing reservoirs. ●



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# Huge CONTRIBUTION to dams

Danie Badenhorst, dams and hydropower lead at AECOM, won the prestigious title of Engineer of the Year at the 2016 SAICE-SAFCEC Civil Engineering Awards. Badenhorst was honoured for a 40-year career that has seen him working on more than 120 dam projects in Africa.

One of South Africa's premier dam-design engineers, Badenhorst won the Engineer of the Year award at the event held in October last year at Emperors Palace, Johannesburg. He has more than 20 years' experience in major water resource and hydropower development projects, involving master planning, feasibility studies and design, totalling a 40-year career in civil engineering.

He has performed many tasks as an approved professional engineer, a requirement in South Africa in terms of the Dam Safety Act. Badenhorst has contributed to national and international best practice in dam engineering, including safety designs, and has excelled as a meaningful mentor to many young engineers.

In line with creating awareness for civil engineering in South Africa, Badenhorst has represented the country at the annual meetings of the International Congress of Large Dams for several years. He has been Chairperson of the South African National Committee of Large Dams (SANCOLD) for the past seven years.

Badenhorst's work with AECOM has seen him involved in leadership roles with some of the most prominent current dam projects. These include the Itare Dam Water Supply Project in Kenya, the Mooi Mgeni Transfer Scheme for the Spring Grove Dam and Appurtenant Works, and the Umkhomazi Water Supply Project, together with the rehabilitation of 20 large dams for the Department of Water and Sanitation.

Badenhorst is currently project manager and study leader for the engineering investigations for the bilateral Noordoewer/

Vioolsdrift Dam Feasibility Study. On this project, he is training client and sub-consultant staff on various aspects of dam-design considerations at the feasibility level.

He was also involved in managing repair works at the 145-m-high Mohale Dam during Phase 1B of the Lesotho Highlands Water Project, together with his role as Dam Design Engineer. His mentorship on this project saw him win the BKS Prize for Innovative Engineering for the design of a river diversion mechanism using a breaching section for the coffer dam.

Badenhorst says his most challenging project to date was Corumana Dam on the Sabie River in Mozambique, where his project proposal was accepted by the World Bank, resulting in considerable cost and time-savings for the client. Skills development is a key focus, with Badenhorst currently mentoring six candidate engineers at AECOM to build technical and professional skill sets in dams and hydropower.

Badenhorst was also responsible for organising the highly successful 2016 ICOLD annual meeting and symposium in Sandton in May 2016. The symposium was attended by 1 200 public and private-sector delegates from a record 75 countries, with 24 countries from Africa.

The SAICE-SAFCEC Civil Engineering Awards is an annual celebration of engineering excellence, whereby civil engineering companies, projects, institutions and individuals are all honoured for the most outstanding civil engineering achievements during the previous year. ●



Kubota U50 digging next to the canal.

Danie Badenhorst, dams and hydropower lead at AECOM.



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## Mini-excavator for Rand Water contracts

With a relentless work ethic, Sinned (pronounced Si-Ned) Construction owner Dennis Mukwebo, says that the Kubota U50 mini-excavator – distributed in South Africa by Smith Power Equipment – has been central to his success.

“Working on Rand Water contracts is challenging. We dig trenches, do a lot of concrete work and install manholes and, for this work, we need power and, very importantly we often need to work in very confined spaces. The Kubota U50 is ideal for these requirements,” he says.

He adds that the Kubota team is always willing to help when the need arises.

“Productivity is all-important in my business and downtime can be very expensive. I commend Kubota for going the extra mile to ensure that we operate to the maximum,” he says.

The fact is that in its 40 years’ involvement in the mini-excavator industry Kubota has continuously set the standard with technological innovations that have rocked the industry. The integration of the zero boom and tail swing was one such innovation. Others, which also helped create the future of compact construction machinery, included the pioneering, advanced features of Auto Idle, which helps save up to

10% fuel; a digital LCD panel and the Kubota Intelligent Control System (KICS), which help reduce downtime and save on repair and technician costs; and Kubota’s revolutionary ‘three-pump’ hydraulic system, which uses three independent pumps for boom, arm and swivel for more efficient bucket operation.

Kubota mini excavators are used the world over in a variety of construction applications including agricultural jobs, road-building, municipal works, pipe-laying, landscaping, water conservation projects and more. “Our Kubota mini excavators’ characteristics of being tough, reliable, efficient and easy to operate and service, enable them to work in the toughest conditions and take on any challenge,” says Tom Bloom SPE general manager construction equipment division.

He adds that operators like Dennis Mukwebo are shining examples of how best to ensure these Kubota mini excavators are used to their optimum. “With traditional machines the type of jobs that Dennis undertakes are made significantly more difficult. The compactness and extraordinary power-to-size ratio of the U50 not only makes life easier but boosts the bottom line accordingly,” he says.

Mukwebo has been in the construction industry for over 20 years having previously worked for a leading construction giant in Johannesburg. He has owned his own company for the last 10 years and says that going on his own “was the best thing I have done”.

“I would recommend anyone who is contemplating making the change to do so. Have the courage to live your dreams, be disciplined, know what you want and success will be yours. And deal with the pros, like Kubota, as looking always for the cheapest option will cost you in the end,” he concludes. ●

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# A GRAND EXPANSION

Located in Abu Dhabi, United Arab Emirates, Doka has been working on the Sheikh Zayed Grand Mosque Center, a facility that will increase the area of the existing holy site to include a visitors' centre and commercial establishment.

Completed on 20 December 2007, the Sheikh Zayed Grand Mosque is the largest place of worship in the United Arab Emirates. Named after the late Sheikh Zayed bin Sultan Al Nahyan as a way of honouring his legacy as the founding father of the nation, the mosque itself is capable of hosting more than 41 000 people at any given time and was completed at a cost of just over half a billion dollars. Included in the mosque's design is a 17 000 m<sup>2</sup> courtyard that features a floral design and is considered to be the largest marble mosaic in the world.

Plans were drawn up to develop a visitors' centre and commercial facility that would be sympathetic to the existing architecture while providing functional facilities that would enhance the overall experience.

In order to cause minimum disruption, the project was designed to be one level of slab (basement to ground floor), with a built-up area of almost 60 000 m<sup>2</sup> and a floor-to-floor height over 6,15 metres. With this in mind, Doka provided a solution combining its Doka flex table using Eurex 20 top 550 props and D3 tables for beams.

*Sheikh Zayed Grand Mosque Center,  
Abu Dhabi, United Arab Emirates.*

## The facts

- Project: Sheikh Zayed Grand Mosque Center
- Location: Abu Dhabi, United Arab Emirates
- Contractor: Masri Engineering and Contracting (MEC)
- Start of construction: Q2 2015
- Opening date: Q3 2017



The Dokaflex tables were implemented in order to provide greater flexibility in terms of height adjustment, which was necessary during movement to the next casting site, while the D3 tables, which were integrated with a beam side shutter and quick release pin, meant that the client was able to save both time and money by minimising manpower that would ordinarily be needed for re-installation and refabricating.

While time is always an important factor on construction projects, delays during the early phase had meant that the Doka team had to deliver above and beyond expectation in order to meet the demands of the client.

With some of the earlier delays affecting the supply of materials, Doka's resources and highly flexible logistics, technical and operations teams meant that materials were made available, despite the commissioning quantity tripling due to the acceleration of the construction process.

The construction process was further expedited thanks to an on-site assembly area, which was accompanied by our formwork instructors who were able to supervise the process and ensure any ad hoc requirements were implemented correctly, preventing any further loss of time.

With an expected handover date set for Q3 2017, the construction of the visitors' center and plaza at one of the United Arab Emirates' most iconic sites was not only an honour for Doka to work on, but also a textbook example of how a combination of attention to detail, flexibility, diligence and hard work can support our clients while delivering results. ●

## The Professional team

"We chose Doka because of its ability to deliver systems and services on schedule, while providing full technical support throughout. Given the significance of this project, Doka's efficiency has enabled us to remain on time and on budget."

– Mohamad Majed, operations manager, Masri Engineering and Contracting (MEC)

*The center is anticipated to be handed over in Q3 2017.*







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Designed as a lightweight steel construction with powder-coated frames, this beamless hand-set formwork system is faced with wood/plastic-composite sheets and makes possible three different working methods: with or without drop-head, and early stripping based on proof of concrete strength.

Dokadek 30 combines the advantages of panel floor formwork system with those of Dokaflex floor slab formwork, that means its 3 m<sup>2</sup> large panels make it fast in typical zones, yet – thanks to Dokaflex – it is also quick and flexible in the infill zones. Dokadek 30: Slab formwork at its most evolved.



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# Up for an ARCHITECTURAL HIGHLIGHT 'down under'

**In Melbourne, the continent's largest shopping centre has been renovated and expanded. Now an architecturally demanding, curved glass construction covers the Chadstone Shopping Centre which was opened in 1960.**

For the scaffolding contractor, the biggest challenge was to meet the extremely tight timetable in spite of only minimum crane availability. The project-specific planning service provided by PERI Australia's engineers, together with the system advantages of the flexible PERI UP Flex Modular Scaffolding, helped the construction team to complete the work within the very tight time schedule.

Construction work for the 34 000 m<sup>2</sup> expansion of the Chadstone Shopping Center began back in 2014; today, the largest shopping centre in Australia has a total area of around 212 000 m<sup>2</sup>. The structure receives up to 70 000 visitors a day – who now have the opportunity to stroll under an impressive, undulating curved glass roof.

## Flexibility and sophistication

PERI engineers developed a project-specific solution in close collaboration with scaffolding contractor, Nomad Scaffolding, which was optimally adapted to match the extraordinary geometry and scaffolding heights of up to 20 m. It was necessary to be able to reach every angle of the steel construction along with bridging large areas and ensuring the reliable transfer in part of concentrated loads. Nonetheless, the scaffolding construction could be erected almost exclusively with system components.

PERI UP Flex impressively demonstrated its adaptability during this challenging project. Thanks to the modular scaffold's high level of flexibility, the loads generated by the steel roof construction could then be reliably transferred from all areas and, in addition, the PERI UP solution offered

access points to all areas of the complex shaped steel roof as well as the safe and level work spaces. The modular scaffolding can be optimally adapted to suit almost any local conditions due to the continuous metric system grid of all components along with the possibility of changing the direction of the decking. Through the self-locking ledger connection on the rosette and integrated lock against lifting, PERI UP Flex can also be installed extremely quickly.

## Light solution up for the task

A particular advantage of the PERI UP Flex Modular Scaffolding in the project was the low weight of the individual system components. One reason: due to the rectangular ledger cross-section, PERI UP achieves an increased load-bearing



**BELOW:** *The PERI UP Flex Modular Scaffolding was adapted to suit the complex-shaped glass roof structure: all working areas could be easily and safely reached while every load transfer was optimally planned.*







**ABOVE:** Up to 70 000 visitors flock daily to Australia's largest shopping centre which is now completely covered by a gigantic glass roof – the result of an expansion project. Work was carried out while the centre remained opened for daily business; the schedule for the entire construction project was extremely short.

**BOTH PHOTOS:** All working levels could be completely covered with PERI UP Flex while the flat and even work areas were free of any tripping hazards. (All Photos: PERI GmbH)



capacity together with a corresponding reduction in weight.

### Safety within the system

Through the almost exclusive use of system components and well thought-out PERI UP connection technology by means of rosette nodes, time-consuming tube-and-coupler operations could be consistently avoided during scaffold assembly. In addition, thanks to the different part lengths from 25 cm, all working areas could be fully covered with PERI UP Flex featuring a complete absence of any gaps while obstacles and rising steel profiles could easily be accommodated and covered virtually gap-free. For users of the scaffolding, this meant that all working areas could be safely reached without any dangerous tripping hazards. During use, end-to-end guardrails and yellow toe boards as well as non-slip decking ensured a high level of operational safety. This allowed safe and cost-effective working operations at heights of up to 20 m above the ground on work platforms up to 85 m long.

The target deadline for all working operations was safely and reliably achieved: three days before the opening date, the scaffolding team dismantled the last PERI UP system components. ●



*It was necessary to be able to reach every angle of the steel construction along with bridging large areas and ensuring the reliable transfer in part of concentrated loads.*



## Quality imperative in engineered WALKWAY PRODUCTS

**In any working environment where the safety of people depends on the quality of the products that have been used for the walkways that they use, cutting corners could be a recipe for disaster.**

Elaine van Rooyen, marketing manager at Andrew Mentis, explains that the use of a quality manufactured product is imperative, and in this respect it is important to deal with a manufacturer that produces engineered products.

Andrew Mentis has over 60 years' experience in the manufacture of walkway products and the company is probably best qualified to comment on this.

Andrew Mentis has a solid track record of quality manufacture when it comes to engineered walkway materials including RS40 grating, expanded metal and Die Line. The company has been manufacturing grating for over sixty years and was South Africa's first manufacturer of these products. Hence it has vast experience and know-how both in the manufacture and in the application of these products.

Van Rooyen says the company does not compromise when it comes to quality. "Collective experience has shown that there are risks involved in the manufacture, and it is essential not to compromise quality for price," she says.

Andrew Mentis is well known for a number of its walkway products and Van Rooyen says the selection of a particular product is simply a situation of horses for courses.

Probably the most commonly-known of all walkway products in industry is the Mentis RS40 floor grating. "This is our number one premium brand, and is often considered the floor grating to have," comments Van Rooyen. She notes that the product has the kind of top-of-mind awareness in its market similar to

which Hoover has enjoyed in the vacuum cleaner market.

The most important factor in flooring is the load-bearing capacity of the product. The design, engineering and manufacture of steel floor grating products have particular relevance to their structural integrity, and floor grating should always be viewed as an engineered product. It is formed through a process of compressive locking of the load bearing flat bars (bearer bars) and the round bar transversals to form an exact 40 mm<sup>2</sup> pitch with openings of 35,5 mm x 32,4 mm, and is designed with specific load-bearing characteristics.

Van Rooyen notes that expanded metal also has a wide range of flooring applications, and is ideal for catwalks, conveyor and access walkways and platforms. Good examples are walkways on large billboards, which need to ensure safe access to the billboard, as well as maintenance walkways on process plants.

Expanded metal walkways are lightweight and self-cleaning, have non-slip surfaces, interlocks at the joints, and hence no butt welds, as well as allowing the passage of air and light. Durable industrial flooring with excellent underfoot conditions is possible with expanded metal walkways and flooring from Andrew Mentis.

As a complete industrial flooring supplier, the company can help customers identify the most appropriate flooring solution for their application requirements.

Another of its products, which is ideal for incline conveyor walkways in particular, is Die-Line. This lightweight and economical walkway system offers flexibility in walkway design, is easy to erect and has excellent non-slip characteristics.

This range of positive grip-pressed section walkways is designed as complete walkway sections with integral kick-plates formed as a single unit. The elimination of heavy stringers or separate kick plates makes Die-Line quick, easy and safe to erect. The sections are designed for longitudinal spans, and have a high strength-to-mass ratio.

"Emerging contractors are also increasingly using the company's products as they become more aware of the safety concerns when it comes to walkway products," she concludes. ●

*Mentis RS40 is used across a wide range of industries.*





# PHASING OUT Hydro chlorofluorocarbon

**The Montreal Protocol of 1987 and its amendments on Substances that Deplete the Ozone Layer (a protocol to the Vienna Convention for the Protection of the Ozone Layer) is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion.**

The two ozone treaties have been ratified by 197 parties, which includes 196 states and the European Union, making them the first universally ratified treaties in United Nations history. The Protocol is structured around several groups of Ozone Depleting (ODS) and Global Warming Potential (GWP) substances that are classified according to chemical families. For each group there is a timetable for the phasing out of the production and consumption of the substances with the aim to eliminate them completely

The phasing out process for HCFC's was gazetted in South Africa in 2014 when all the country had to phase out R22 (HCFCs). By 2030 use must be down to 2,5% of the 2013 baseline

The change in the refrigerants are placing a great burden of responsibility on the refrigeration practitioners as the mechanics have to change to the new refrigerants not being as easy to use as the older R12 and R22. The skills of the installing mechanics will have to be improved in order to handle the new gasses as not everyone knows how the gasses will react in the long run How phase-out of HFC refrigerants, e.g. R134a and R410a impact on the equipment currently being installed will be next on the plan being proposed by the Department of Environmental Affairs.

Natural refrigerants are coming into favour like Carbon Dioxide known as R744 is being used in supermarkets. Some systems use CO<sub>2</sub> as a secondary refrigerant in a 2 stage cascade system. Ammonia R717 is sometimes used as the primary refrigerant. Some people consider that these systems are easier to use, but new skills are needed for installation and maintenance.

Hydro carbons (R600) and (R290) are being looked at for small refrigeration units. These refrigerants are highly flammable and need special handling skills.

Methylene Fluoride (R32) is being considered for use in room and packaged air conditioners. It is classified mildly flammable.

HFO 1234yf and it family of refrigerants are used in car air conditioning and Chillers but it is mildly flammable but has energy efficiency advantages. With packaged air conditioning units the refrigerant charge with HC and HFO may be too large.

CO<sub>2</sub> systems will become more common for supermarket and cold room refrigeration, but R410a and R417 will be in use for some time until the Department of Environmental Affairs starts a phase out for HFC refrigerants as is being done in first world countries.

Refrigerants are classified on the basis of ASHRAE standard 34. Refrigerants are the gasses that are the compounds that make the refrigeration work. They are classified by reference numbers, safety classes and limits on concentration in parts per million for permissible exposure levels or occupation exposure levels. The refrigeration process provides the motion of the gas from a low temperature and pressure to a high temperature and pressure and condensation to a liquid in the condenser. ●

## About SARACCA

SARACCA is an association of contractors who have individually and jointly agreed to a set of governing standards whilst operating in free competition against each other.

The common aim is to continually strive to improve the image and standards of the industry and the association provides a forum for this purpose.

In July 2009 the Department of Labour published the ' Pressure Equipment Regulations' as part of the Occupational Health and Safety Act Number 85 of 1993. The South African Qualification and Certification Committee for Gas (SAQCC Gas) has been accredited by the Department of Labour to register 'Authorised Persons'. SARACCA, as a member of that committee, is tasked with registering refrigeration and air conditioning practitioners.

The association participates in several forums where industry-wide issues and requirements are discussed e.g. Master Builders South Africa (MBSA), Contractual and Legal Committee (CLC), SAQCC Gas, JBCC technical committee on contracts, the Pressure Equipment Regulations Forum (PERF) and the South African Bureau of Standards (SABS) on Duct Manufacturing, Installation, and Refrigeration.



# Inferno raises importance of FIRE-DETECTION systems

**A huge fire in Durban at the end of March, believed to be one of the largest factory fires ever in the Southern Hemisphere, has raised concerns about fire prevention and risk management at large industrial estates.**

Large warehouses must have a suitable automatic fire-detection system installed. This is critical in order to alert occupants of a fire as quickly as possible, especially given the large size of such warehouses, so they have sufficient time to evacuate the premises. "This will allow on-site first responders to tackle a fire before it grows out of control," ASP Fire CEO Michael van Niekerk points out. At the blaze in Durban, 400 firefighters battled 15 hours to get the inferno under control.

Fire-hose reels and fire extinguishers are essential elements of a first respondent capability to suppress a fire successfully before it grows too large in order to be able control. An appropriate fire-suppression system such as automatic sprinklers will control a fire, provided that the product stored in the protected area does not exceed the fire load that the sprinkler system was designed to control.

Large industrial warehouse estates, and those used by logistics companies in particular, are at risk when they do not own the goods stored in their buildings. Clients do not always declare the fire risks associated with hazardous goods, as they are either unaware of the hazard, or are

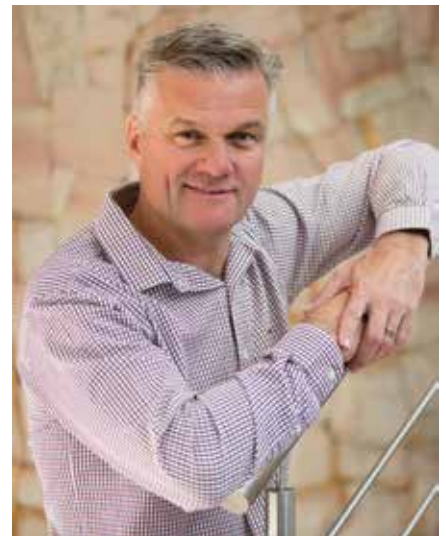
trying to avoid paying a premium for the handling and storage of hazardous goods.

"The net result is that the actual fire load or fire hazard of the goods stored in the building far exceeds the designed fire load of the building in terms of its construction, and the fire detection, fire suppression, and life-safety systems," van Niekerk points out.

"It is also difficult to manage access in and out of a very large warehouse site. Buildings that cover many thousands of square metres are not necessarily staffed to a level that allows for a fire to be detected and suppressed rapidly," he adds.

ASP Fire is able to conduct a fire-risk assessment to determine whether the actual fire load within a building exceeds the installed fire-protection system design. "We are able to advise a client accordingly, and assist them with a suitable fire-protection strategy and system design to cater for the likely worst-case scenario that could be faced in the course of normal operations. ASP Fire can also supply, install and maintain fire protection equipment in buildings," van Niekerk explains.

In terms of regulations, fire protection in a warehouse environment stems mainly from SANS 10400-T: Application of the National Building Regulations Act, Fire Protection; SANS 10287: Automatic Sprinkler Installations for Firefighting Purposes; SANS 10139: Fire Detection and Alarm Systems for Buildings (System Design, Installation and Servicing); SANS 10228: The Identification and Classification of Dangerous Goods for Transport; and SANS10263-0: Warehousing of Dangerous



*Michael van Niekerk CEO of ASP Fire.*

Goods. Local municipal emergency service or fire brigade by-laws are also applicable.

Van Niekerk stresses that the main lesson to be learnt from the recent Durban inferno is that, ultimately, prevention is better than cure. "It is far cheaper and less disruptive to your business to stop a fire before it starts, than to try and put it out once it gets going. Do not rely on the fire department or your insurer to advise you of any fire-protection shortcomings," he warns.

"Rather contact a fire consultant like ASP Fire and we will assess your fire risks and advise you as to what practical steps can be taken to, firstly, reduce or eliminate fire hazards and risks through implementing or changing processes or procedures. Secondly, we can advise you on appropriate fire-protection equipment required where fire hazards cannot be eliminated or reduced to a level where they do not pose a threat to the building, the operations of the business, or the lives of employees and visitors to the site," he concludes. ●

*ASP Fire can determine if the fire load within a warehouse exceeds the installed system design.*



## About ASP Fire

ASP Fire operates across the entire African continent from its Gauteng base, providing professional, accredited fire risk management and support to its clients. ASP Fire designs, installs and maintains a full range of fire detection and suppression equipment suited to clients' needs. ASP Fire provides a holistic, proactive and preventative fire solution based on integrated fire risk assessment, training and consulting, with the installation and maintenance of fire detection and suppression systems that meet SABS, NFPA, FPASA, FDIA and SAQCC standards.



## Preparing land for development

Bobcat has launched new flail mower attachments for use on its market-leading range of compact excavators. The flail mowers are ideal tools for cutting and shredding vegetation, branches, thick grass, bushes and small trees alongside ditches, roads, hillsides, river banks, parks, fences and for preparing new land for development.

A flail mower demonstrates the versatility offered by a compact excavator, utilising the long reach and manoeuvrability of the carrier to cut vegetation in hard-to-reach places like hillsides and riverbanks. Two Bobcat flail mower attachments are available, the 30FM and 40FM, with working widths of 762 mm and 1016 mm and hydraulic flows of 46-74 l/min and 53-85 l/min, respectively.

The 30FM model is designed for use on the Bobcat E32 and E35 compact excavators and the 40FM flail mower is intended for the Bobcat E45, E50 and E55 models, and both flail mowers offer high power output, with the ability to cut trees and branches up to 10 cm in diameter.

Key features include a robust construction allowing the user to tackle the toughest environments and most uneven terrain.



A reversible, spiral mounted triple-knife design helps to deliver the smooth cutting action necessary to rip through hard and soft woods, grass, vines and brush. A compact deck allows the flail mowers to manage various ground contours, maintaining surface contact for efficient cutting. A direct drive motor provides an ideal balance between torque and rpm for optimal performance, with no belts, chains or gearboxes involved for maximum uptime.

The flails are reversible, providing bi-directional rotation by switching the hydraulic hoses at the drive motor, which is equipped with a check valve to prevent damage from the change in direction of rotation. A rubber torsion disk absorbs impact loads during operation, whilst the heavy duty flanges on both sides of the rotor protect the drive train from dust and debris.

A case drain prevents excessive back pressure and side safety chains help deflect and contain debris within the housing that could be thrown out during operation. A rotor brake slows the mower from full speed to stationary in seven seconds or less after the flail mower hydraulics have been deactivated. ●

## Complete HiLight range unveiled

Atlas Copco has expanded its range of HiLight towers to seven models, including four advanced LED solutions.

Users have a variety of choices when it comes to sourcing safe and efficient light towers for multiple applications and industries, including construction, outdoor events and industrial applications. The HiLight range includes the H5+, B5+, V5+ and E3+ LED light towers, plus the V4, H4 and E2 metal halide variants.

Atlas Copco's latest LED light towers feature a unique, fully directional optic lens that maximizes practical light coverage while minimizing dark spots. A single HiLight LED light tower, depending on the model, can illuminate large areas with an average brightness of 20 lux. They also can run as long as 260 hours before needing to be refueled.

The LED HiLight towers are designed with dedicated power packs that optimize power output. The power packs also minimize the risk of under-loading the engine, which enhances efficiency and improves power pack longevity.

The LED lamps are designed for portability and performance with heavy-duty floodlights that offer high ingress protection (IP) and

impact protection (IK) ratings. The LED lamps also offer extreme durability without deterioration in lux level while providing instant light. The bulbs also require minimal fuel, which reduces CO<sub>2</sub> emissions by 70% on each model.

Atlas Copco's HiLight H5+ is ideal for large construction sites where workers are constantly on the move. The unit offers low fuel consumption and each of its four LED lamps project 350 watts of light for a 5 400 m<sup>2</sup> illumination area.

The H5+ is compact and easy to transport; contractors can fit as many as 10 units on a 42-foot trailer. Ideal for general construction and tough mining conditions, the HiLight V5+ can also illuminate a 5 400 m<sup>2</sup> area while saving as much as 60 percent in fuel compared to the typical fuel consumption of a 6-kilowatt metal halide solution. The LED lamps in the V5+ are designed for both portability and performance. Heavy-duty floodlights benefit from high ingress protection (IP) and impact protection (IK) ratings. ●



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## Recognised in the global arena

The commitment by FAW Vehicle Manufacturers SA to the African region and its successes this and last year, have not gone unnoticed. Recognised as the most determined and successful Export and Import business units of the massive FAW Group worldwide, the local company has received a sought-after accolade.

FAW in South Africa was recognised this year on 27 and 28 February in China, amidst representatives from all the active FAW regions worldwide. It was during the FAW Import and Export Corporation's annual Global Sales And Marketing Conference in Chengdu, that Richard H. Leiter executive director from FAW SA who attended on behalf of FAW SA, was called up to receive the special honour of the 'FAW – Best Distributor Award 2016'.

Wang Zhijian, President of the FAW Import and Export Corporation who was proud to announce the award explained: "This award stands for the united spirit of FAW employees and Dealer partners who jointly tackle regional and global challenges. It is awarded in recognition of collaboration between all teams working for the company or dealers in: sales; aftermarket; service and support; parts and maintenance; and finance and Insurance.

"It acknowledges these teams that have worked according to a co-ordinated strategy with a single unified vision."

While the award mainly recognises the efforts of a particular year, the fact remains that FAW SA is continuing with its growth strategy into 2017. FAW SA set new benchmarks and company sales records in both January and February this year.

First were the astounding 107 units sold



in January setting the highest benchmark yet for FAW SA, regarding year-on-year growth comparisons.

As if this in itself was not astonishing enough FAW SA further proved another record in February. This achievement was even more exciting for all the employees and partners when the company and its dealers together racked up 134 units sold, the most ever recorded in a single month.

One of these 2016 highlights happened in the second half of last year when the Coega-based plant near Port Elizabeth saw its 2 000<sup>th</sup> locally built truck roll-off the production line, after just two years of production, giving rightful claim to the company's motto – 'Built in South Africa, for Africa.'

It was in the export market that FAW SA was particularly prominent and flourished in 2016, having one of the most consistent month-on-month export drives in the SA

truck building industry. The company exceeded the 200-unit mark in exports into African countries in just a year of exports.

A growing number of Africa truck dealers who traditionally placed their orders from FAW China continue to move their orders to originate out of South Africa owing to the shorter lead time for delivery, the high levels of quality from the South African plant, and the reduced cost of sourcing FAW vehicles on the same continent.

The Coega-plant has also been the bedrock for further investments in the region as a number of China-based industrial giants have visited Coega to see first-hand what the region can offer in infrastructure, logistics and labour. The FAW SA plant, at a start-up cost of USD60 million, was the first massive investment by a China-based company in the Eastern Cape region. A number of China-based companies are considering following suit, based on FAW SA's successes. ●

## Mammoth lifting seamless

**Development in Africa continues and this has seen an increased need for a capable lifting specialist.**

Johnson Crane Hire has an established reputation as a lifting specialist which gets the job done. The company operates a fleet of cranes that offers the necessary depth and range of movement, but it is the heavy lift capability that really sets them apart from other crane hire operators.

Operating the largest heavy lift fleet of cranes in sub-Saharan Africa, the company undertakes complex heavy lift assignments with ease. Steve Robson, executive business development at Johnson Crane Hire, is quick to point out that this is not just because of the enormous investment in its fleet of cranes but also because the company has the depth of resources to underpin its service offering.

"Having such large and comprehensive fleet is without doubt a major differentiator, but we believe that the proficiency of our people is just as important," he says. "Undertaking such a complex and specialised activity requires the ability to engineer the lift from the initial assessment through to the actual completion of the job."

"Importantly, Johnson Crane Hire can undertake these mammoth projects in a seamless operation," Robson says.

The heavy lift division makes use of 3D CAD software for both the design and engineering of the lift as well as the simulation thereof. "Full time, dedicated mechanical engineers form part of the team, and understand the implications and requirements that go into the planning and execution of these complex lifts," Robson says. "This level of attention to detail is essential during the planning stages."



*Richard H. Leiter executive director from FAW SA.*



# Hoists gain traction for vertical movement on sites

The use of hoists for vertical transportation of personnel and materials is gaining traction across a wide range of industries, including the construction and mining sectors.

Quentin van Breda, managing director of SA French, says the increased popularity is because one of primary challenges on any site is the need to move both people and materials to levels where critical activities need to be performed, and this has to be done safely while maximising productivity.

Many sites make use of tower cranes to handle heavy loads, and move these across a wide area on the site. This mode of materials handling, however, cannot be justified for smaller components such as scaffolding material and other equipment. Also, tower cranes cannot move personnel to various levels.

"The traditional method of moving such equipment manually is not productive at all, and often results in excessive standing time with the associated loss of productivity, and even worse can increase unsafe work practice on a site," Van Breda explains.

The contractor's challenge is to find a piece of lifting equipment that will transport both men and materials to various levels on multi-storey constructions, and one that will reduce the manual handling as well as a the consequential risk of injury. Hoists not only fit the profile for this type of lifting activity, but can also travel at a speed that is effective and safe.

"Often the vertical lifting of men and materials is not appreciated in terms of the complexity it adds to logistics on a construction or mining site," Van Breda says. The challenge is to provide safe, efficient vertical travel on a project while it is being constructed.

A recent example where a hoist supplied by SA French provided a best fit logistical vertical lifting solution is at Kusile Power Station. The company supplied man/materials hoists to Mitsubishi Hitachi Power Systems Africa (MHPS) and this purpose engineered single mast hoist is equipped with two separate cages. One has a 2 t capacity to carry personnel, while the other is capable of carrying 3,2 t of material. Significantly, both cages operate simultaneously



SA French hoists are available to move both people and materials.

increasing productivity; while the configuration of the hoist also allows for materials to be loaded by forklift, further speeding up the operation.

An example within the mining sector is the recent supply of two 0,5 t passenger hoists to a copper mine in Zambia. These will be responsible for moving personnel, together with light tools and equipment, up the shaft headgear framework.

Vertical transport solutions need to comply with the most stringent safety parameters, and the hoists supplied by SA French incorporate advanced security safety including speed regulators and an overspeed emergency braking system. ●

Planning is a critical activity, especially when undertaking specialised lifts in remote areas. Robson says the company is no stranger to working in Africa and is well positioned to extend its footprint even though there are differences from country to country; the lifting specialist has the distinct advantage of understanding the conditions across the continent.

Describing the logistic complexity of a heavy lift project, Robson says that after all the planning has been completed the crane being taken to the lifting site must be broken down into modular components. These are then loaded onto trucks with all the auxiliary equipment including the boom configuration and luffers and this is then transported either via road or sea to the country where the lift is taking place.

This includes route surveys, bridge formulae calculations, permits and road

ordinance clearances, permit verification and axles loadings, and communication with utility suppliers and relevant authorities in all countries. Planning around the logistics is just as important as with the arrival of components it is critical to ensure that these arrive in the correct order to facilitate the timeous building of the crane.

Operators are also a critical aspect of a heavy lift success, and Johnson Crane Hire has a core of specially trained and highly skilled operators.

What needs to be appreciated is that a heavy lift operation is an extensive project and can take anywhere up to 60 days or more. Johnson Crane Hire has conducted successful heavy lift projects in Mozambique, Zimbabwe, Zambia, Lesotho and DRC in the past, and each package was tailored to the specific requirement to ensure its success. ●



Johnson Crane Hire's 750 t Liebherr LG 1750 lattice boom all terrain crane doing a wind farm installation.

# Reaping proficient DRIVING RETURNS

**The quality of construction vehicle fleets is directly linked to the quality of its drivers. It is for this reason that Scania is offering an array of driver training courses to help its customers reap gains associated with positive driver behaviour, writes *Munesu Shoko*.**

Employee training plays an integral part in the overall profitability of an organisation. Most companies are aware that improvement at an individual level can prompt organisation-wide advancement.

To help its customers achieve commercial success through informed driving, Scania South Africa is pushing boundaries with its Driver Training Programme that comprises an array of courses. Faried Arnold, Connected Services Manager at Scania South Africa, says the consequences of poor driver behaviour are well documented.

Martha Montsho, Driver Training Coordinator at Scania South Africa, adds that road traffic accidents occur as a result of poor driving and these can be costly to companies that need to find both driver and vehicle replacements, while spiralling insurance premiums add to the woes. Both Arnold and Montsho drive home the point that positive driver behaviour, which can only be achieved through informed driver training programmes, can help fleet owners combat these problems.

## Detailed training

Both experienced and new drivers can benefit from Scania driver training. The progressive techniques are aimed at increasing fuel efficiency, road safety and sustainability, while reducing downtime and operating costs. "Our one-on-one driver coaching paves the way for greater driving habits. Our techniques help drivers reduce wear and tear, stress, fuel consumption on the vehicles they operate, while increasing road safety," says Arnold.

Scania has several driver training courses on offer. The primary course is the two-day Vehicle Introduction Course. When a customer purchases a new Scania vehicle, the deal already includes the costing of this particular course. A single driver is eligible for training per each vehicle purchased. However, if need be, an extra driver can enrol for the course at a separate cost.

The first day of the Vehicle Introduction Course entails both theory and practical sessions. According to Montsho, presentations on the interior and how the vehicle operates, including features and functionalities, form part of the first theory sessions. "Following the presentations, a Scania trainer then goes out on the road with the drivers. The ratio is normally one trainer per four drivers," says Arnold.

Before the vehicle goes out for practical road training, a pre-trip inspection is conducted. This encourages drivers to always conduct pre-trip inspections every time before they go out on their trips to make sure that there are no faults on the vehicle that may trigger larger mechanical issues.

When out on the road, the driver trainer will drive the vehicle, demonstrating all the necessary procedures to the drivers. The drivers are then given the chance to drive the vehicle. The trainer rates their driving habits and feedback is given on each driver's performance, highlighting the strong points and areas of improvement.

On the second day of the Vehicle Introduction Course, it's all about recapping all the topics discussed on the first day. Drivers are given a chance to address their shortcomings identified on the first day. They will be given feedback again on areas of improvement

before a final assessment is conducted. After the final assessment, the trainer gives an evaluation report before issuing competency certificates valid for one year.

## More courses

The second Scania driver training course is the Refresher Course. It is conducted in one day. "New driving habits are as hard to keep up as old ones are as hard to shake. The Refresher Course realigns drivers with proper driving habits," says Arnold. This course is conducted every time before the competence certificate issued to drivers during the Vehicle Introduction Course, expires. "To qualify for the Refresher Course, you must have undergone the two-day Vehicle Introduction Course," says Arnold.

The Advanced Product Knowledge is the third course on offer. This is a five-day course targeted for driver trainers at customer level. "Some of the customers have their own in-house trainers that help maintain good driving habits internally. This is an in-depth course, focusing on issues such as fuel consumption, safety and general driver behaviour," adds Arnold.

Of note is that Scania's driver training programmes fall in the same division as fleet management. Fleet management is crucial when it comes to driver training. The use of fleet management technology provides a ready-made platform to remotely assess the standard of driving across several fleets and set training targets for each individual driver based on areas of improvement picked by the telematics platform.

Instant feedback from Scania's fleet management platform can positively modify behaviour at the earliest point of application, while regular progress reports can show an individual driver how much they have improved in any given time.

"Apart from the geo-fencing capabilities, Scania's fleet management platform allows us to see what speed is the driver driving, fuel levels in the tank, odometer readings and when a vehicle is due for service," says Arnold.

This is complemented by a Driver ID button, a tag that the driver uses every time they step into the vehicle. This is used for driver identification. "When the driver boards the vehicle and uses his/her tag, it will load up a bit of driving behavioural history, from fuel consumption, issues such as harsh braking and speeding," says Arnold. "Within the Scania truck, there is also what we call Driver Scoring. This constantly rates the driver through a star-rating system. As they are driving, Driver Scoring gives them tips on how to improve on certain areas." ●

*Scania South Africa is pushing boundaries with its Driver Training Programme that comprises an array of courses.*







## 175<sup>th</sup> anniversary

CASE Construction Equipment celebrates the 175<sup>th</sup> Anniversary of the Racine Threshing Machine Works, opened by Jerome Increase Case in Wisconsin, USA. What began with J.I. Case in 1842 is a story of ingenuity, practicality and entrepreneurship that remain as strong today in the CASE teams around the world. Right from the early days of steam-powered machines, CASE has pioneered equipment and technologies that profoundly influenced construction businesses.

The innovations developed by CASE throughout its history have provided practical solutions to every-day challenges of the construction jobsite. The introduction of the first portable steam engine in 1869, which led to the birth of road construction, and the launch in 1957 of the industry's first factory-integrated tractor loader backhoe are just two of CASE's pioneering developments that have changed the construction world.

Many milestones punctuate CASE's history: from the 500 000<sup>th</sup> backhoe loader that rolled off its production line in 2005 to almost sixty years of wheel loader excellence, and close to five decades of skid steer loader development – all these landmarks are testament to the expertise CASE has to offer today's construction businesses across the world.

This rich heritage of innovation comes with a passion for serving the customer and helping them solve their technical and business challenges. J.I. Case believed in doing what's right and going the extra mile for the customer. This belief remains just as true today and drives CASE's 360-degree approach to supporting construction businesses with products and services, and its teams' ability to build long-lasting relationships with customers. ●

**PICTURED ABOVE:**  
CASE Construction Equipment celebrates the 175<sup>th</sup> Anniversary of the Racine Threshing Machine Works, opened by Jerome Increase Case in Wisconsin, USA.



**RIGHT:**  
Jerome Increase Case.

## World's most powerful demolition hammer

The world's most powerful electric breaker has been launched by Bosch for demolition work in concrete, stone, or asphalt.

The Bosch GSH 27 VC Professional has an impact energy of 69 joules, with an average material removal rate of 3,2 tons an hour, a 50% increase over the previous model.

Another major advantage of this breaker that boosts its efficiency is its low vibration of 8 m/s<sup>2</sup>, due to the vibration-reduced hammer mechanism and decoupled handles, Campbell Mhodi, Bosch Professional Power Tools senior brand manager, points out.

This means that the permitted trigger time of the tool is therefore more than three hours per working day. "All these benefits provide professional tradespeople with fast work progress, as well as more comfortable working conditions, with reduced vibration, even in the toughest applications," Mhodi comments.

The Bosch GSH 27 VC also sets new standards with regard to lifetime and tool handling. Durability and superior lifespan are guaranteed thanks to the robust construction, which uses high-quality aluminium and steel components.

A brand-new feature is the anti-slip surface on the housing cover, which means that this 27 kg breaker can be propped up against a wall conveniently and safely, or against suitable objects between operations, without any danger of falling over.

"This saves the user the extra expended effort of having to lay down and lift up the tool repeatedly," Mhodi explains. The tool's low centre of gravity and ergonomically-shaped, soft-grip handles ensure optimum tool handling.

Optional accessories for the Bosch GSH 27 VC include the new SDS-max RTec Sharp flat chisel and SDS-max pointed chisel. The particularly long, self-sharpening cutting edge of these chisels has been optimised even further for greater material removal in the shortest period possible.

In addition, the high material removal rate is guaranteed to remain unchanged over the entire lifetime of the chisels, which translates into highly-efficient operation without time-consuming reshaping or downtime. ●

*The Bosch GSH 27 VC Professional has an impact energy of 69 joules, with an average material removal rate of 3,2 tons an hour.*



# PRODUCTS for SUBSTATION

Fibertex South Africa has recently supplied a range of geosynthetic products for use in the construction of a large electrical substation in Cape Town. The new Eskom Pinotage Substation is located in Faure, near Somerset West.

“Fibertex SA – with vast geosynthetic solutions in construction and building works for separation, filtration, drainage, protection, erosion control and reinforcement - form an integral part of structural designs,” says Paul Baxter, Fibertex South Africa.

“The substation, which consists of a 400/132 kV high voltage yard gave the Eskom Engineers some initial challenges, including a large cut to fill operation necessary to create a level platform for the new transformers. This necessitated the erection of a suitable peripheral precast segmental block retaining wall system.

“Because correct geosynthetic reinforcement and drainage design is key to the stability and safety of any retaining structure, rigid Secugrid geogrids were used in combination with a heavy duty precast concrete segmental block.

“Fibertex also supplied various components for an advanced subsoil drainage system.”

Approximately 46 550 m<sup>2</sup> of Fibertex’s PET (polyester) Secugrid 80/20 R6 uniaxial geogrid was installed. Secugrid, with its high residual strength at low strain, forms an integral part of the block wall by adding tensile resistance to the reinforced soil zone.

The wall is approximately 700 m in

length with heights varying from 7 m to 11 m and was constructed by Terrafirma Retaining Walls.

Secugrid is designed to strengthen naturally unstable soil and subgrades so that the composite soil structure will be able to withstand the required loading conditions, through both an interlocking and frictional effect, with little or no movement in the overlying soil materials over the structure’s lifetime.

This robust reinforcement material is also highly resistant to biological and chemical degradation, as well as installation damage. Secugrid is supplied in rolls and is quick and efficient to install, with minimal demand on labour resources.

Flexidrain, an extruded high density Polyethylene (HDPE) geonet covered with a Fibertex F-25 Polypropylene (PP) non-woven geotextile jacket to form a 500mm wide wick-drain composite, was placed at 8m centres horizontally and 45° to the vertical, between the G7 fill material and the selected granular fill.

The subsoil water is then led to a front collector drain behind the toe of the retaining wall and discharged into Fibertex Drainex DN160 drainage pipes, which are also chemically inert.

Fibertex supplies a comprehensive range of other geosynthetic products into



*The substation, which consists of a 400/132 kV high voltage yard gave the Eskom Engineers some initial challenges, including a large cut to fill operation necessary to create a level platform for the new transformers. This necessitated the erection of a large peripheral precast segmental block retaining wall system.*

the civil engineering and mining industries. These products include nonwoven and woven geotextiles, gabions and mattresses, geosynthetic clay liners, composite cusped drainage and leak detection systems, erosion control blankets and cellular confinement solutions. ●

*Fibertex geotextiles: with critical functions in construction and building works for separation, filtration, drainage, protection, erosion control and reinforcement.*



*Secugrid geogrids, with high residual strength at low strain, form an integral part of the block wall by adding tensile resistance to the reinforced soil zone.*





## Five major benefits of concrete

There are at least five major benefits in designing and building with concrete: versatility, attractive appearance, cost-effectiveness, structural integrity, and sustainability, says Bryan Perrie, MD of The Concrete Institute (TCI).

"Concrete is changing the face of South Africa's landscape. One only has to consider the high number of truly impressive structures competing for the 2017 Concrete Society of Southern Africa's Fulton Awards to see how many cutting-edge architects and engineers are making concrete their material of choice," Perrie states.

He says concrete's versatility is the material's first major positive factor. "As requests for changes are common in any construction project, the design flexibility of concrete allows the contractor to accommodate design changes after the process has begun.

"As for aesthetic appeal, the range of colours and textured finishes available in concrete is amazing. Mixing and matching colours and textures provide a spectrum of design possibilities. Concrete textures can resemble smooth, high-polished granite or exposed aggregates with a rugged feel. As natural stone becomes inaccessible or the costs prohibitive, concrete is a natural alternative for recreating traditional finishes in a cost-effective way."

Perrie says speed has become a top priority in building. "When designing with concrete, there is no delay as concrete is readily available. Earlier start-up means better cash flow for owners and developers. It also could mean getting the jump on rainy seasons.

"Should office tenant requirements include sound transmission control, the natural mass of concrete floor and wall systems provides both acoustical resistance and vibration control.

"Shallower floor systems are an important structural advantage of concrete. On average, the construction of concrete buildings will allow one additional floor to be created for each 10 stories of traditional building height, resulting in more rentable

space for buildings of similar size. When faced with height restrictions, concrete construction is a key consideration and could represent initial construction cost savings and additional income generation."

Perrie says advanced construction techniques, such as 'flying formwork systems', increase the speed of floor construction. As a concrete frame progresses upward, workers on the completed floors below can proceed with interior partitions, exterior finishing, electrical, mechanical and plumbing systems. "Concrete construction assists in energy efficiency; a major consideration in the life cycle cost analysis.

"With concrete cladding panels, a great range of finishes and textures are available. Precast panels are extremely durable, weather resistant, offer superior air tightness, increased sound attenuation and thermal properties and are inherently fire resistant. Concrete claddings permit fast enclosure of the structure, allowing other trades to start sooner, cutting construction time, and reducing wall thickness to maximize rentable space."

Perrie adds that due to its longevity and ease of construction, concrete is often the most economical choice for engineered structures. Load-bearing concrete exterior walls serve not only to enclose the buildings, but to carry roof and wind loads, eliminating the need to erect separate cladding and structural systems.

"When it comes to energy efficiency, most concrete is produced locally, reducing fuel requirements for handling and transportation. Once in place, concrete offers significant energy savings over the lifetime of the structure. The mass of a concrete structure makes it a thermal reservoir with the ability to store large amounts of energy. This thermal mass



**ABOVE:** Precast concrete panels offer wide design possibilities as well as important economic and practical advantages on building sites.

**BELOW:** The sky is the limit for designers when creating structures with concrete. Pictured: an innovative concrete roof in Tenerife, Canary Islands.



allows concrete to help maintain a relatively steady interior temperature.

"Finally, concrete is an inert material that is easily recyclable. Old concrete that has reached the end of its service life can be reused as aggregate for new concrete mixtures. The addition of industrial by-products such as fly ash, silica fume and blast furnace slag make concrete less permeable while incorporating materials that would otherwise be deposited in landfill sites," Perrie concludes. ●



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## Managing stormwater attenuation

All new properties developed in the Ekurhuleni region, regardless of the size, are required to submit a stormwater management plan to the Ekurhuleni Municipality.

To meet this prerequisite, the consulting engineers, Mhiduve, developed an innovative storm water attenuation management system through the use of Technicrete's Aqua Zig Zag Sustainable Urban Drainage Systems (SUDS) and DZZ interlocking pavers on the new Columbia Pharmaceutical factory development in Boksburg, thereby enabling it to meet local authority requirements.

Deon Slabbert, Project Engineer from Mhiduve (Pty) Ltd, commented "We believed that the successful management of the storm water element at this new factory required an innovative approach due to space challenges we faced on site. In addition to permeable paving used as a covering for attenuation ponds, we used Technicrete's DZZ 80 mm interlocking pavers over areas of 3 000 m<sup>2</sup> and 1 200 m<sup>2</sup> respectively below the permeable paving that had capacity to hold 1 600 m<sup>3</sup> of storm water. We also sourced 4 300 m<sup>2</sup> of Aqua Zig Zag 80 mm Class 40/2.6 pavers. The DZZ pavers were coupled with 2-4 mil of filler stone that was used as grout in the system."

"The DZZ paving blocks are in fact 'slotted' paving blocks, which allow the storm water to penetrate the surface through these slots and be collected in the unique layerworks underneath the paving surface from where it can be released in a controlled manner into the system of the local authority. The SUDS that were supplied by Technicrete are increasingly being used to prevent run-off



and flooding, as well as a method of collecting, attenuating and cleaning storm water," said Slabbert.

Technicrete Sales

Representative, Wayne Oliver commented "SUDS are increasingly being used to prevent run-off and flooding, and as a method of collecting and cleaning storm water. It is an interesting and successful use of our DZZ range of interlocking pavers for an application as crucial as storm water attenuation management that was a critical component of the Columbia Pharmaceutical factory development. The combination of the DZZ with the Aqua Zig Zag and filler stone established a good permeable paving system suitable for the dispersion of the quantities of storm water expected."

The Technicrete sustainable urban drainage system allows heavy rain to infiltrate through a permeable concrete block paved surface into a unique sub-base before being released in a controlled manner into sewers or water courses. The paved areas must be firmly restrained and Technicrete kerbing was utilised for this purpose on this attenuation project.

"The DZZ offer a hard wearing surface overlay for traditional applications such as commercial and industrial roadways, depots, suburban streets, petrol station forecourts as well as residential driveways and pavements" said Oliver. ●

## New improved packaging

Sika has recently implemented new and improved changes to its labeling and artwork. The product labels and packaging artwork have been rebranded to reflect Sika's personality of building trust with its customers. Sika products are now more practical and useful than before.

When the new corporate design was introduced in 2013, a basis for clearer lines and better reader orientation was created, which now also applies to Sika's product packaging.

The growing product range was taken into account in relation to space, as well as the changing needs of the market. Sika is proud to introduce an exciting new packaging design across the entire product range. The packaging design might have changed, but Sika's promise stays the same.

There are new label versions which are more suitable and usable for different user groups. These include designations, descriptions of a product, or the use of images. Sika has renewed pictures and drawings on the cartridges, boxes, bags and buckets. Now it will

be easier to identify which application field the specific product is suitable for – be it professional specialists, retail trade, craftsmen or DIY users.

The goal is to deliver a clear product message and simple orientation, which will make it even easier for customers to identify which Sika product they need and what that product can deliver for them. With the exception of the logo and the

prominent use of Sika colours, the visibility of the Sika products has been improved and Sika has simultaneously created a unique, stand-alone product label design.

All Sika packaging is as recyclable as possible. All paper packaging is certificated, plastics are recycled for other productions, and the steel and other metal sheets of barrels are re-used for production after use. The materials needed for some packaging are minimized, which makes a big saving in total.

Though Sika's packaging will be modified, the contents inside will not. There are no changes to form, fit or function of any of these products. Customers will

receive the excellent quality they are accustomed to. All Sika solutions are designed with the customers' success in mind and to build long lasting and mutually beneficial relationships. ●







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