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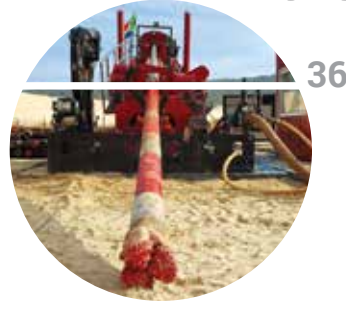
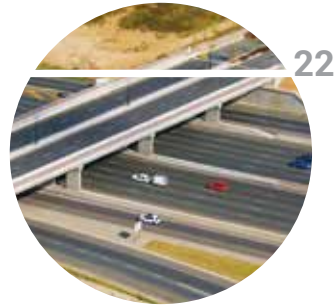
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## ON THE COVER

The world's most powerful range of small angle grinders from Bosch offers even faster work progress, thereby improving the productivity of tradespeople dramatically. Four models are available, each with a power output of 1 900 W, and covering a range of applications for different trades. These are the GWS 19-125 CI Professional, an all-round tool for all grinding and cutting operations, and the GWS 19-125 CIE Professional, which is ideal for material-friendly applications. Turn to pages 18 and 19 for more detail.

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# COMMENT

The African (and particularly) South African power and electricity woes are well known. For example, two out of three people in sub-Saharan Africa lack access to electricity. Yet, according to the organisers of the Power & Electricity World Africa (PEWA), Terrapinn, it holds vast opportunities too.

It is a well-known fact that Africa needs in the region of USD800-billion to develop its power infrastructure. Despite this seemingly insurmountable task, there are many African projects that illustrate how the African demand for electricity can be met.

Two of these are the Power Africa initiative and Ethiopia's Renaissance Dam, an initiative that is close to being realised and that has the potential of generating an impressive 6 000 MW of hydropower.

## Power Africa

In 2013, Power Africa was launched to bring together technical and legal experts, the private sector, and governments from around the world to work in partnership to increase the number

## About PEWA

PEWA has been taking place for 20 years and is Africa's largest and longest running power and electricity exhibition and conference. It was held on 28 and 29 March. It focused on innovative and cost-effective ways to tackle Africa's electricity and water challenges.

It featured the Solar Show Africa, Energy Efficiency Africa Show and was collocated with the WaterShow Africa.

At the time of writing, organisers indicated that the number of pre-registered visitors were 75% higher, sponsorships had increased by 50% and upwards of 40 African countries were participating (versus the 33 of 2016).



The construction of the dam, started in April 2011, is expected to create up to 12 000 jobs. The main contractor of the dam is the Italian company Salini Costruttori.

of people with access to power in Africa. It aims to generate 30 000 MW of new and clean power energy with which 60 000 million new electricity connections will be created.

Its Power Africa Tracking Tool tracks power projects as they progress through the development pipeline. Its website states that the numbers that are shown reflect deals that Power Africa's deal tracking application has made publicly available. However, Power Africa also internally tracks approximately 700 transactions that have the potential to add over 70 000 MW.

## Ethiopia puts Africa on the dam map

Currently nearing completion, The Grand Ethiopian Renaissance Dam is a gravity dam on the Blue Nile River in Ethiopia. At 6 000 MW, the dam will be the largest hydroelectric power plant in Africa when completed, as well as the 7<sup>th</sup> largest in the world. The dam is currently nearly complete, but will take between five and 15 years to fill with water.

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# NEW ERA for READYMIX CONCRETE

**The Southern Africa Readymix Association of Southern Africa (Sarma) continues to grow exponentially as producers seek to align themselves with the trend towards high quality concrete that is a hallmark of its membership.**

While numbers continue to swell, the association is also gearing for a new phase in the development of the industry as some of the stalwarts of the association make way for the next generation of leaders to drive their visions forward in the ongoing pursuit of a local industry that is a world leader in the development and delivery of quality concrete.

Incoming chairman of the association, Avi Bhoora, comments on the year ahead: "We've had quite a lot of changes in the lead up to 2017. Charl Marais resigned as chairman of Sarma at the end of 2016 and we wish him success with his future endeavours whilst thanking him sincerely for his stewardship in the past year.

## New direction

"Another change was the proposed initiative to consolidate all concrete industry bodies. We conducted a referendum in mid-January and a unanimous agreement from about 75% of our members to proceed. This has unfortunately resulted in the decision to withdraw from the joint office that we've shared with the Aggregate and Sand Producers Association of Southern Africa (Aspasa) for many years. We thank Nico Pienaar and his team for their unstinting support and congratulate Johan van Wyk

for succeeding Pienaar as director of Sarma. Van Wyk will also move office to Midrand at the beginning of February. "The external environment has been harsh and this has affected business confidence and markets adversely. The management committee deliberated on the status of our industry at our strategic planning meeting held in mid-September 2016.

We concluded that Sarma currently represents approximately two thirds of the industry and we will need to embrace an even greater majority in future to avoid losing our identity and also to make a more meaningful contribution to the overall construction industry.

We will also strive to derive a greater benefit from the consolidation of the Concrete Industry Bodies.

## What's to come

"In future, the industry, as well as the markets we supply can look forward to:

- An enhanced accreditation process for unquestionable credibility of readymix concrete quality
- Stronger lobby to have accredited Readymix Producers specified as exclusive suppliers of concrete
- The offering of more accredited training to uplift core skills within the industry
- The emulation of good practice from other successful industry associations in respect of statistics collection and dissemination, conflict management. Examples include the establishment of an ombudsman, adoption of a code of conduct, compliance and consequence management, etc.

"Furthermore, we pledge on behalf of the management committee, that we will work tirelessly to realise the objectives of Sarma.

However, it requires full support from all readymix suppliers to further improve



*Avi Bhoora is the new chairman of Sarma.*



*General manager of Sarma, Johan van Wyk, has been promoted to the post of director of the association.*

the image of the readymix industry as well as move the industry to a new position of profitability and sustainability," promises Bhoora. ●



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## Transformation in the built environment – IN BLACK & WHITE

By South African Institution of Civil Engineering

**It is a misnomer that racial and related economic transformation in the civil engineering and construction sector is not happening. The numbers tell a different story.**

Government has consistently invested more than 7% of GDP annually on infrastructure development over the past eight years, and promises of injections of trillions of rands into future infrastructure initiatives – all to realise the objectives set out in South Africa's National Infrastructure Plan (2012), together with the New Growth Path (2010) that promised to create five million jobs in 10 years, the National Development Plan and other initiatives.

This clearly indicates that the ANC-led administration has embarked on an infrastructure development plan for the overall socio-economic development strategy of South Africa. In doing so, the prospect for racial and radical economic transformation remains opportune.

How then has the sector been performing until now? The data shows steady growth in the number of black built environment practitioners in South Africa.

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

Data from ECSA, the organisation entrusted with protecting the health and safety of the public by registering engineering professionals, shows that the number or registrants of black engineering practitioners increased from 35% to 46% in all categories from 2011 to March 2016, compared to a drop from 65% to 54% for White practitioners in the same period. In that time, 9 194 black professionals registered with ECSA, compared to 2 225 white professionals.

It is well-known in the industry that ECSA and its CEO, Siphon Madonsela, a registered engineer himself, are positive about the

level of transformation over the past years, and especially among the young people, including females, from disadvantaged backgrounds – as seen in the figures above. These include engineers, technologists and technicians. Madonsela also reported that in 2016, for the first time in the history of ECSA, the number of registered engineering practitioners reached more than 50 000. ECSA can be proud of the visible effects of registration seen in the industry.

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

The SACPCMP registered 1 264 black construction project management professionals since 2008. Of the total number registered in 2008 (3 276) only 26% (841) were black and 74% (2 435) white. These figures in 2016 (4 364), however, show a significant increase to 48% (2 105) for black and decrease to 52% (2 259) for white.

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

The SACQSP registered 939 black quantity surveying professionals since 2011. Of the total number registered in 2011 (3 049), 39% (1 193) were black and 61% (1 856) white. These figures in 2016 (3 982), however, show a significant increase to 54% (2 132) for black and a decrease to 46% (1 850) for white.

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

The SACAP registered 2 400 black and 3 600

white architectural professionals between 2012 and March 2016. There is a general decrease in the number of both black and white registrants at SACAP from 2014 to March 2015. This is probably due to the lack of architectural project roll-out from the public sector.

The gap difference between the race groups, however, has narrowed over the past five years, with 266 black and 332 white professionals registering in 2016.

### **The South African Institution of Civil Engineering (SAICE)**

With some 13 000 members, it is the largest engineering voluntary association in South Africa. SAICE CEO, Manglin Pillay, another professionally registered engineer, states that more than 45% of SAICE's membership is black. Taking into account South Africa's history before 1994, Pillay explains, "A more accurate measure of transformation is found in that almost 70% of SAICE's membership under the age of 36 is black."

Pillay commends the public sector for driving the transformation agenda through policy. He also divulges, "The irony of Government's plea for transformation in the sector is that most Black engineering graduates are employed in municipalities, national and provincial government and in state-owned enterprises.

"But it is in the public sector that coaching, mentoring and technical engineering supervision – which are critical components for the training and development of engineers – are lacking."

Many local and district municipalities only have junior staff, few of them adequately developed. Many of these are indeed classified as struggling municipalities. As Pillay says, "This is the real challenge. It is not about black and white any longer, it is all about experience and inexperience."

Pillay comments further, "The sector has





SAICE CEO, Manglin Pillay and MD of SAICE Professional Development and Projects, Dr Allyson Lawless.

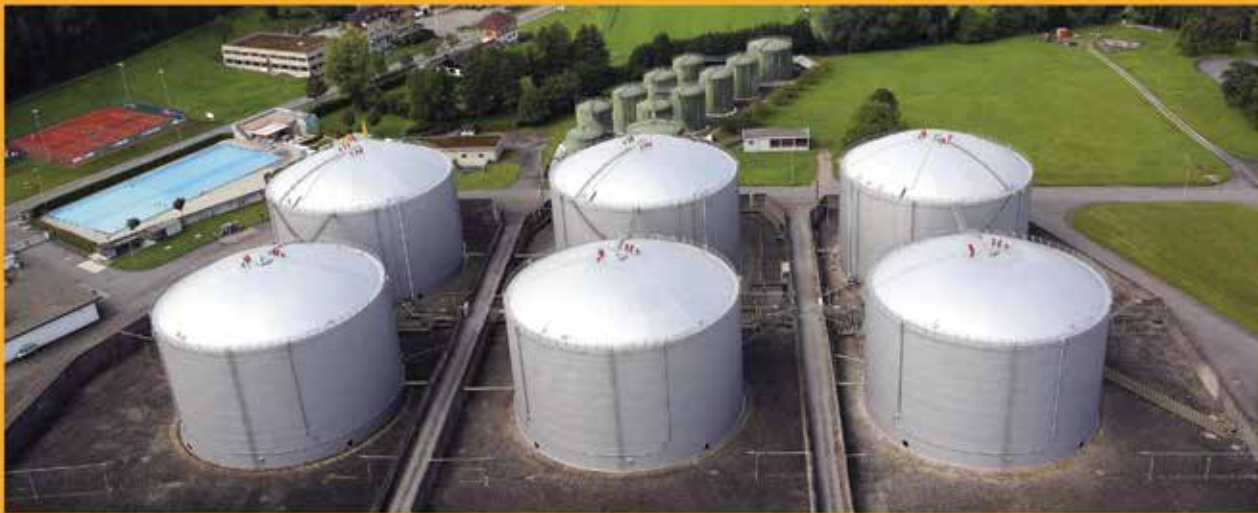
work to do on racial transformation, but the current actual numbers show remarkable progress in the built environment, considering that it takes about 10 to 12 years, excluding basic education of another 12 years, for any individual to accumulate the necessary education and training before they are ready to register as professionals. There is no quick-fix solution, but we can build on the existing successes."

One such success is the work done by the MD of SAICE Professional Development and Projects (PDAP), Dr Allyson Lawless,

another professionally registered engineer. Thousands of black graduate engineering practitioners are now registered professionals through PDAP's Candidate Academy and Road to Registration programmes.

Dr Lawless says, "There is a need to re-engineer local government capacitation and professional development for graduates. Assuming that an applicant with a tertiary engineering qualification can grow into a senior post, without working in a community of expert practice, is a fallacy. Since 2005, a dramatic loss of staff over

50 years of age occurred in municipalities – they would typically have been the strategic planners and leaders, also acting as mentors and coaches. Where senior technical design staff is not available, training should be sought through secondment and tapping into the pool of retirees to offer their expertise until in-house staff have been adequately trained." Only by doing so, the next generation of engineers will grow into skilled, competent, experienced and responsible candidates capable of filling senior posts. ●



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## Steady results amidst a volatile business climate

**Attacq Limited recently released its interim results for the six months ended 31 December 2016. Attacq has a total asset value of R27,1 billion at 31 December 2016 and strives to deliver longer term capital growth to investors. Since inception to 31 December 2016 Attacq has achieved a Compound Annual Growth Rate (CAGR) of 27,7% for net asset value per share adjusted for deferred tax (Adjusted NAVPS).**

Attacq has a creative approach to real estate investments and developments. Morné Wilken, CEO of Attacq Limited says that the tougher global economy, the strengthening of the South African Rand and international market volatility had an impact on the interim results.

He explains that Attacq is a long term property investment. He is confident that the company's vision to be the premier property company in South Africa is a sound one. The adjusted NAVPS decreased by 1,7% year-on-year from R21,72 to R21,35 mainly due to the strengthening of the South African Rand and international market fluctuations.

Attacq is a South African company with a quality diversified portfolio and development pipeline. Attacq has enjoyed healthy income growth from its core portfolio, of which the weighted average lease expiry is 6,5 years. This secures greater sustainability of investment in developments and resultant long term growth. "Attacq's development portfolio is focused in Waterfall, Gauteng. Development in Waterfall is a strategic priority for Attacq as an infill development that is easily accessible and centrally located between Johannesburg and Pretoria. The concept behind Waterfall is to create a new lifestyle city where people can live, work and play," explains Wilken.

Waterfall includes the Mall of Africa, the company's super regional retail development and a catalyst for growth in Waterfall; as well as mixed-use, office and light industrial developments. "Our crown jewel, Mall of Africa, performed above expectation in the eight months of trading to 31 December 2016. The Mall of Africa generated an exceptional monthly average trading density of R2 777 per m<sup>2</sup> and achieved more than 1,1 million visitors per month since opening on 28 April 2016.

Attacq's quality portfolio includes 58% of retail properties. All Attacq's regional malls across South Africa are performing well. If the past and the development of other cities are used as comparative case studies, the future of Waterfall as Gauteng's newest lifestyle, business and light industrial city is bright. Waterfall is rapidly becoming a favoured business destination. "One must note that Waterfall, with Waterfall City as its nucleus, is in the centre of Gauteng as the economic hub of the country. It is the ideal infill development between Johannesburg and Pretoria with excellent access and infrastructure," he says.

Waterfall is now recognised and rapidly gaining favourable business stature, as people see what is happening in Waterfall City, the 1,3 ha central Waterfall Park and the commercial development in the area.



*Morné Wilken, CEO of Attacq Limited.*

The second wave of development beyond the Mall of Africa and Waterfall park is well underway. "Four more buildings were completed in Waterfall in the last six months; the Allandale Building, Dimension Data, Torre Industries and the Amrod buildings. These buildings increase the total directly held in attributable primary gross leasable area by 70 424 m<sup>2</sup> in Waterfall," says Wilken.

"We look forward to the opening of the PwC Tower and Annex in February 2018. The opening of the PwC Tower will add more than 3 500 mostly high LSM new daily visitors to Waterfall which will bode well for the entire Waterfall," says Wilken. As the city densifies it will increase trading densities in the various retail properties across Waterfall and also increase week-day trading to be more comparable with the weekend visitor numbers.

Waterfall Point, opposite the Waterfall Polo Fields, is a unique offering not currently represented elsewhere in the city. Waterfall Point is a contemporary sectional title office development that consists of two super-basements which sit below four identical, two-storey buildings of around 2 500m<sup>2</sup> each.

More than 27 000 jobs will be created in Waterfall during construction and around 60 000 people will work there during the operational phase. "Attacq, as the leading visionary regional business force, is proud to invest in, develop and grow Waterfall and Waterfall City as a world-class city destination," states Wilken. ●

*The Mall of Africa in Waterfall.*





# Transforming South Africa's engineering sector

**Project delivery company WorleyParsons is collaborating with small and medium-sized black-owned enterprises to jointly deliver services in the mining, water, energy and infrastructure sectors, says WorleyParsons RSA, CEO Denver Dreyer.**

"As part of our unwavering commitment to transformation, we are leading this agenda in engineering across all sectors in South Africa and are partnering with sustainable, empowered businesses that are capable of growing with us," says Dreyer.

"We do not consider transformation a 'numbers game' in terms of BBE points. It is imperative for long-term success as our traditional markets are changing. Service providers have to adjust their business models to reflect the transformation agenda or else be at risk of becoming obsolete.

"The partnerships that we are creating are mutually beneficial. We will evaluate the strengths that each party brings to the table and identify where we can help each other. These enterprises will benefit from skills transfer and gain an understanding of how to successfully deliver bigger projects with our support, while we do our part to transform the engineering sector in South Africa.

"We are entering into agreements with suitable companies as equals for the benefit of both parties. Transformation is the right thing to do for our country, but on an enterprise level, it will also secure a better future for all the people engaged in our organisation, regardless of who they are. Through our transformation partnerships, we will be able to land

bigger projects alongside those partners, which will benefit everyone in our employ," says Dreyer.

WorleyParsons has already entered into an agreement with the ISF Group, a 100% black-owned emerging EPCM company that supplies specialised services in the energy, water, ICT, transportation and construction sectors.

"ISF is proud to be associated with WorleyParsons through a Memorandum of Understanding aimed at fostering a working relationship whereby both parties will utilise each other's strengths to pursue and potentially to implement projects, to bolster each party's business potential, to complement strategic intent, especially in business marketing, promotion and development, and, importantly, for ISF to engage with an established leader in the professional services, including engineering, procurement support and construction management services to the

global resources, energy sectors and complex process industries. ISF views this collaboration as an opportunity to firmly establish a 100% South African-owned EPCM company," says CEO of the ISF Group, Ian Sandile Funeka.

"ISF's engagements with WorleyParsons in the hydrocarbons, railway, energy and general infrastructure industries have brought much needed impetus for the growth of our business. We look forward to a long and fruitful relationship with WP wherein ISF's growth is able to impact positively on our business and on a social level in the communities where we operate," says Funeka. ●



*WorleyParsons RSA, CEO Denver Dreyer.*

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## 0,3% contraction in GDP

South Africa's gross domestic product (GDP) growth rate was -0,3% in the fourth quarter of 2016.

The main contributors to the negative GDP growth rate were the mining and quarrying industry and the manufacturing industry. Mining and quarrying decreased by 11,5% in the fourth quarter. This was largely the result of lower production in coal, gold and 'other' metal ores (including platinum).

Manufacturing decreased by 3,1% largely as a result of lower production in the manufacturing of food and beverages, manufacturing of petroleum, chemical products, rubber and plastic products and manufacturing of motor vehicles, parts and accessories and other transport equipment.

The agriculture, forestry and fishing industry has been in decline for eight consecutive quarters.

The largest positive contributors were the trade, catering and accommodation industry and finance, real estate and business services, which increased by 2,1% and 1,6% respectively, and each contributed 0,3 of a percentage point to GDP growth.

### Expenditure on GDP2

Expenditure on real gross domestic product fell by 0,1% in the fourth quarter of 2016.

Household final consumption expenditure increased by 2,2% in the fourth quarter, contributing 1,3 percentage points to total growth.



The largest contributors to the growth rate of 2,2% were food and non-alcoholic beverages (up 2,4%), clothing and footwear (up 10,4%), and the 'other' category (up 5,9%). Final consumption expenditure by general government increased by 0,3%.

Gross fixed capital formation increased by 1,7%. The largest contributor to the growth was construction works, which increased by 3,6% and contributed 1,2 percentage points to growth in GFCF.

There was a R16-billion drawdown of inventories in the fourth quarter (following an R11-billion build-up in the third quarter), which contributed -3,5 percentage points to total growth.

Net exports contributed positively to growth in expenditure on GDP. Exports increased by 12,5%, mainly because of higher exports of precious metals and mineral products. Imports increased by 6,1%, mainly due to higher imports of machinery and equipment. ●

## 30<sup>th</sup> architectural student of the year competition

Eight finalists from Universities around South Africa have already won the regional competitions and will meet at the Hilton Hotel in Johannesburg between 8 and 10 May 2017 for the 30<sup>th</sup> Corobrik Architectural Student of the Year Awards evening.

The annual Corobrik Architectural Student of the Year Award is the country's premier event to highlight the creative and technical talent of the cream of South Africa's architectural students and to drive the advancement of design excellence nationally.

Participating universities include: University of the Free State, University of Cape Town, Nelson Mandela Metropolitan University, Tshwane University of Technology, University of Johannesburg, University of KwaZulu-Natal, University of Pretoria and University of Witwatersrand.

Participants thesis models are available to view at The Hilton Hotel between 9:30 and midday on 10 May 2016. Tertiary institutions are encouraged to send architectural and design students to view the models and listen to a student lecture that will be delivered by the eminent award winning architect Andrew Makin. ●

*Vedhant Maharaj is the winner of the 2015 Architectural Student of the Year Awards. His winning architectural thesis is entitled 'Yantra, Infrastructures of the Sacred and Profane' and is a water purification infrastructure for the hazarously polluted River Ganges in India.*



## New technical director

Kobus Burger has been appointed as a technical director of JG Afrika, a leading multi-disciplinary engineering and environmental consultancy.



With a total of 31 years' of experience, Burger's list of achievements includes his involvement in numerous projects throughout southern Africa designing a variety of reinforced and pre-stressed concrete bridges and temporary works for incrementally-launched bridges.

A SANRAL registered senior bridge inspector, his expertise is highly sought-after for other specialised complex technical undertakings, such as participating in forensic structural investigations.

Burger is manager of the structural design division of JG Afrika's Pietermaritzburg office in KwaZulu-Natal, and stepped into his new role on 1 March 2017.

Members of JG Afrika's board, including Paul Olivier, managing director, congratulate Burger on his recent accomplishment at the firm, and know that his technical expertise and experience will enhance JG Afrika's existing standing as a leading African engineering solutions provider. ●





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## Economic development as a competitive advantage

**South Africa's REIPP Procurement Programme awards projects based both on electricity tariff and economic development (ED) criteria. Since renewable electricity tariffs have decreased over the last few years – 35% and 78% for wind and solar respectively since 2008 – project owners are paying more attention to the competitive advantage of ED targets while increasing the number of local people employed on a project.**

According to Greg Austin, MD of juwi Renewable Energies, primary economic development optimization efforts revolve around local content (LC) and job creation which combined account for 50% of the ED score. Up until now REIPP projects have been awarded 70% on tariff and 30% on ED.

“We are finding since there is little difference in tariffs between bidders, we have to differentiate ourselves by maximising ED and one strategy is to fully integrate as possible the local community into the projects,” said Austin.

“Renewable energy has contributed massively to foreign direct investment, industrialisation and economic growth in South Africa and the current delay in awarding the next rounds of the REIPP is affecting ordinary people in local communities,” said Austin, prior to speaking at the African New Energy Update Conference to be held in Cape Town next week.

“In our most recent project the Mulilo-Sonnedix Prieska PV3 Solar, which reached commercial operation in August 2016, the key element of our strategy that led to juwi being selected as the EPC service provider for the project was due to the high level of employment of the local community in constructing this 86 MW solar plant in the Northern Cape.”

The local municipality of Siyathemba (including the towns of Prieska, Niekerkshoop and Marydale) has a total workforce of about 4 800 people. Unemployment is registered at 34,7%, with a participation rate of 57,4%.



Job Creation	Man months	Employees
Total man months	10 013	1 740
RSA based citizens	9 993	1 720
RSA based black citizens	8 631	1 479
Skilled employees	5 227	435
RSA based skilled black citizens	4 182	348
Citizens from local communities	5 332	911

“We are very proud to confirm that over 50% of the total number of people employed on the project involving the entire supply chain and construction effort were from the Siyathemba local municipality. 911 or 19% of the total local municipality work force of 4 800 were employed on the project in one way or another.

“At the same time we achieved a massive 69% of the total project value that was spent in South Africa, both in the form of construction contractors and equipment suppliers. Looking ahead, the IPP unit of the Department of Energy have indicated scrapping Community Ownership and moving this to another evaluation element. There will be no cost implication and this move will support an increased socio-economic Contribution to the Local Community. I believe this change is a positive one,” said Austin. ●

## Components arrive at Khobab wind farm

**The transportation of various wind turbine components to Khobab Wind Farm have commenced with the first two nacelles, two hubs, and three blades arriving at the wind farm on 22 February 2017.**

The tower sections travel to Loeriesfontein, in the Northern Cape, on the N1 via Worcester, Laingsburg and Beaufort West, a five day journey of 1 396 km. The 53 m long blades together with other components will travel a 1 158 km route along the N10 from the Port of Ngqura to Graaff-Reinet, Beaufort West and on to the site. Trucks with oversized trailers, varying in size of up to 57 m in length, will deliver the various components to Khobab Wind Farm from late-February, with the final load arriving during August 2017.

The locally manufactured sections mean that Khobab Wind Farm has achieved local content commitments exceeding 40% of the project's total value. “Local content plays a vital role in the growth of the renewable energy sector and its positive impact on the country,” explained Kevin Foster, project manager of Khobab Wind Farm.

Residents in Loeriesfontein and the surrounding towns of Niewoudtville and Calvinia have grown accustomed to wind turbine

component sections making their way to Loeriesfontein, as Khobab Wind Farm's sister property, Loeriesfontein Wind Farm, has already received all its abnormal loads.

The 53 m long wind turbine blades, tower sections, nacelles and hubs travel on the N10 via Uitenhage, Graaff-Reinet, Beaufort West, Three Sisters, and Carnarvon onto Loeriesfontein. “The blades, towers, hubs and nacelles take approximately 3-days, travelling at maximum speed of 50 to 70 km per hour,” explained Foster.

Road users are urged to exercise caution and to visit the wind farm's websites for additional information and updated transportation schedules; [www.khobabwind.co.za](http://www.khobabwind.co.za). Transportation is prohibited at night, during the school holiday period, on public holidays, during festivals or other special events. In the towns of Graaff-Reinet and Beaufort West transportation will be avoided during peak traffic hours, as far as possible.

Khobab and Loeriesfontein Wind Farms, which together span 6 653 hectares, will produce an impressive combined output of 280 MW generated by their 122 wind turbines. This is equivalent of 240 000 average households being powered each year, providing a massive boost to energy provision in the country. ●



## Green building is growing fast

**The Green Building Council South Africa (GBCSA) is gearing up for an exciting period as the local green building movement takes an exponential growth trajectory, one that is different in scale and scope from anything seen so far.**

As it enters its 10<sup>th</sup> year with sustainability expert Dorah Modise as its new CEO, the GBCSA is preparing to usher in a new era. It has identified its next areas of big impact as the residential and public sectors and is expanding its vision to include entire green communities and cities.

"This is an exciting time to join the GBCSA," says Modise. "It is already well established and has made great strides. It is in an excellent position to continue to grow and expand its areas of influence. GBCSA will continue to educate, advocate and certify while adding to its offerings and adapting its systems."

Founded in 2007 as part of a larger global network of Green Building Councils, GBCSA champions the movement to design, build and operate properties in an environmentally sustainable way in the South African property sector.

So far, more than 230 formal green building certifications have been achieved in South Africa, mostly in the commercial property sector. "Green building continues to gain even greater momentum in the country. It is clear from the increasing number of green star-rated buildings that it makes good business sense. The property sector gets it. This amazing community is leading green change and has given us all good cause to celebrate.

"We believe the impetus in the commercial property sector will continue to grow because market forces support the clear business case for green building – you can do well by doing good.

"Now, we want to share this message across even more sectors, so they too can see how simple it is to enjoy the many benefits of green building."

Modise took up the reins at GBCSA on 1 February, but has been a non-executive GBCSA board member since 2009, and is intimately familiar with its strategy and goals. During her first 100 days at its helm, she will focus on preparations to scale its growth significantly, especially in the residential and public sectors; and ensure it has the capacity, relationships and resources to deliver on this growth.



*Dorah Modise, CEO of GBCSA.*

Explaining the benefits of green building for the public sector, Modise says: "Government is a property investor, landlord, tenant, accommodation provider and employer. These are all touchpoints that can benefit hugely from green building. Our metros, cities and towns can achieve big wins with green building – financially, economically and environmentally. It's straightforward, and we're here to show them how."

Modise has unique insight into the massive impact that green building has on the bottom lines and delivery of municipalities. Before joining GBCSA, she was the Strategic Executive Director of City Sustainability at the City of Tshwane where she played a key role in transforming Tshwane into the greenest and most sustainable city on the African continent.

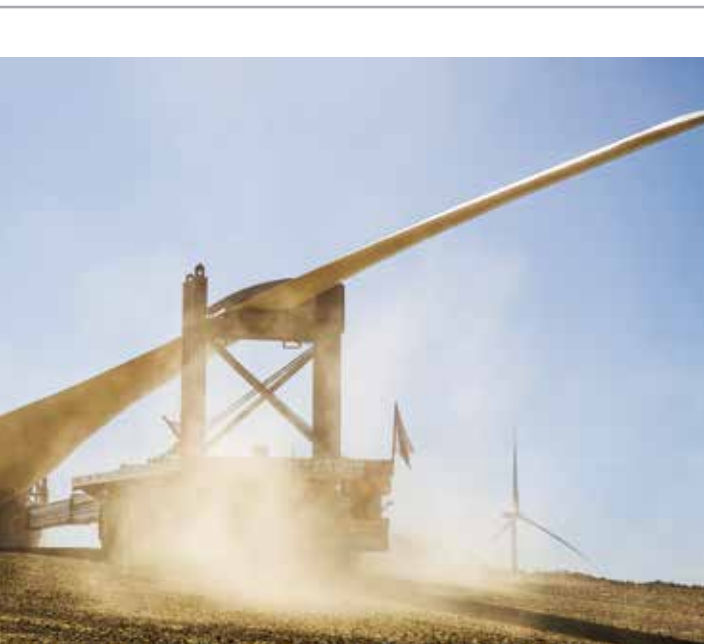
"We can support municipalities in developing clear policies, making their properties more efficient, optimising their infrastructure, enhancing their income streams, attracting and securing development, appealing to the economically active population, and boosting the productivity of their staff and departments. We can help them create great places for people to live, work and visit," says Modise.

When it comes to residential real estate development, GBCSA promotes neighbourhoods that are based on green principles to provide connected, healthy, affordable, and happy places to live.

Already, the residential sector is showing a rapid uptake in green building. So far 3 500 homes have been registered with GBCSA to target EDGE certification after only one year of the tool's operation in South Africa.

Linking into this, GBCSA is expanding its education programmes and making them accessible to more people. In this way, it is responding to and supporting the rise in green building. GBCSA will be engaging with SETAs, academic institutions and others to create a wider range of education solutions, including programmes geared to the residential and public sectors.

"Green building can have a tremendously positive impact on the lives and livelihoods of so many South Africans. We are excited to set our course towards the next great destination on the country's sustainability journey and make meaningful new inroads together with our country's pioneering green building community," says Modise. ●



## Developing a **WORLD-CLASS** retail look

**Menlyn Park Shopping Centre's R2,5-billion, two-year phased refurbishment has positioned the mall as the dominant super-regional shopping centre in Tshwane.**

BILD Architects and Terra Ether Architects partnered to shape the look of what has become one of South Africa's world-class retail destinations, says Eddie Pretorius, director of BILD Architects, that is considerably more than skin deep. "One of the biggest challenges in the redevelopment was seamlessly integrating the old section of the mall with the new, as the proportions were quite different," he explains.

Olive Ndebele, general manager of Menlyn Park Shopping Centre, says that delivering an all-inclusive shopping experience at Menlyn Park was the end goal of the redevelopment.

For the revamp, a new concept was developed to create new spaces and extensions with a fresh, classic look. "The look and feel needed to be both more current and timeless, to give the centre an extended lease of life," says Pretorius. One such innovation was the installation of skylights wherever possible, ensuring

plenty of natural light and neutral tones to help achieve a natural integration from the old and the new.

The new design centred on three major features: the outside piazza Central Park, the refurbished indoor food court, and the dining node at the new entrance.

Central Park has become a hub of activity, with ongoing events designed to keep the whole family engaged and entertained throughout the year. Flanked by popular restaurants and picturesque trees, the piazza is the perfect place to enjoy a beautiful evening at Menlyn Park. The revamped indoor food court is the perfect place to grab a quick bite to eat before enjoying some great retail therapy in the nearby fashion wing. The Hard Rock Cafe with its famous guitar and legendary burgers takes centre stage at the new entrance.

The centre remained open and trading throughout the renovations, allowing for construction works between 22:00 to 7:00;

to preserve a sense of normality to the much-loved shopping scene. A rare and innovative feature, was the retail village, constructed to temporarily house many outlets while their new stores were being built.

To shield the worst of the demolition chaos from shoppers, a giant origami artwork was installed as a temporary hoarding. "We created this intricate wall inspired by Pretoria's world-renowned jacaranda trees to serve as a decoration during our retail expansion," says Ndebele.

A major achievement was a 4-star Green Star Retail Design rating by the Green Building Council of South Africa (GBCSA) for the substantial efforts to develop the first building phase of the redevelopment along environmentally friendly design and construction principles.

Pretorius points out that BILD Architects were also involved in the redevelopment of the centre that took place in 2000. "This provided an advantage in anticipating the opportunities and challenges that lay ahead," he says. And that project raised the bar, achieving a merited industry award for 'Renovation or Expansion of an existing Project', by the International Council of Shopping Centres (ICSC). ●



## SACSC hosts networking breakfast

**Acclaimed economist Dawie Roodt shared his insights on the local and global economic landscape for retailers at the Gauteng leg of networking breakfasts hosted by the South African Council of Shopping Centres (SACSC) on 20 February 2017.**

The highly-regarded Roodt, who is currently Chief Economist at the Efficient Group, is renowned for his insights streaming from over two decades of economic and political analysis experience. Roodt addressed those in attendance at Sandton's Balalaika Hotel, by touching on how Trump's presidency will affect not only America's economy

but also Africa's and the rest of the world. He also commented on South Africa's increasing unemployment rate and how high debt will further send our economy on a downward spiral if no actions are taken immediately. "There are approximately nine million unemployed people in the country. We need to grow →





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# HALF in SANDTON

Nearly half of all the office development taking place in South Africa right now is happening in Sandton. Sandton Central is the epicentre of this development, which includes many of the most cutting-edge, exciting and innovative new buildings on the continent.

► The latest research in the South African Property Owners Association Office (SAPOA) Vacancy Survey for Q4:2016 shows that 48% of new offices being built are going up in Sandton. What makes this figure even more extraordinary is that no other area in the country comes close to it, with the closest contender below 9%.

Sandton Central is well established as Africa's financial and business capital and continues to grow with developments that embody its vibrant, high-energy 'live, work, play' environment.

Supporting the billions of rands being invested in these new developments is the fact that Sandton Central strives to offer a well-managed orderly space that provides all the necessary infrastructure to support the growing district. Transportation is a particular focus of the Sandton Central Management District (SCMD).

Boosting all modes of transport and easing traffic flows is part of an ongoing programme in Sandton Central, with the Sandton Gautrain Station at its heart. This includes the City of Joburg's expanding Bus Rapid Transit (BRT) system which will see Rea Vaya's fast, convenient and affordable bus service to Sandton Central begin in 2018. It adds new bridges, widens main roads, upgrades pavements and signage, improves street lights and signals, and introduces cycling and walking facilities.

In fact, Johannesburg has just received the global TomTom Traffic Index Award for its smart traffic management strategies, including



the Gautrain and integrated bus system, from an international panel of traffic experts.

## Enterprising business district

Elaine Jack, City Improvement District Manager of SCMD, which manages the public urban spaces of South Africa's cosmopolitan financial hub, comments: "Sandton Central has always been an enterprising leading business district. It is exciting to see it growing and improving with such confidence. In line with the best cities in the world, it provides an exceptional environment for the many people who live, work and visit Sandton Central each day."

Among the magnificent new office developments joining Sandton Central is Sasol's new 67 000 m<sup>2</sup> 10-storey head office. Developed by Alchemy Properties and Sasol Pension Fund, the distinctive corporate headquarters were completed in December 2016.

→ steadily in order to curb the unemployment rate and in doing so we will strengthen the rand and this will have a positive knock on effect in the future," he said.

Roodt mentioned of the country's retail industry and how resilient local retailers are in this tough economic climate. "We are faced with challenging times, in saying that I am impressed by how steadfast our retailers are. The retail industry at large is a vibrant and dynamic one. No matter where you go in the world, you are sure to find a retailer of sorts.

"This means that there are many opportunities-even in these tough economic times. The bottom line is that if retailers can survive under these challenges, they will fly once the economy stabilises. This year we will see our economy grow a little faster," he said.

"My advice to retailers is that currently, the country is experiencing low interest rates at the moment. Capitalise on this low interest environment and capitalise

now for the future. Position yourself towards economic growth because once our economy strengthens, retailers who have prepared for this can capitalise and succeed. I would also like let consumers know that we are all going through a tough time as well. The greatest weapon of all time is the pen and with the pen, we can decide who to put in power. With strong leadership, economies strengthen, unemployment decreases and people succeed," added Roodt.

These quarterly networking breakfasts hosted by the SACSC take place in Cape Town, Durban and Johannesburg and are attended by retail, property and industry heavyweights. SACSC CEO Amanda Stops said she was excited to have Roodt as a guest speaker for the first event of the year for Johannesburg. "Dawie Roodt is an acclaimed economist and his insights definitely have relevance for the retail industry," she said.

"Collectively, these types of events give everyone a chance to monitor trends,



*Dawie Roodt, chief economist at the Efficient Group.*

exchange ideas and share knowledge to support our industry growth and deliver value to our members" added Stops. ●





LEFT: Village Walk in Sandton Central. RIGHT Discovery head office in Sandton Central.

Sasol Place enjoys a prime position in Sandton Central at 50 Katherine Street.

The new Signature Lux Hotel will welcome guests from May this year At 135 West Street. The 218-room chic, urban 3-plus star hotel is developed by Richland Properties.

At 140 West Street, Zenprop is developing an iconic 27 000 m<sup>2</sup> office property in two linked towers – a 10-storey north tower and 14-storey south tower. Due for completion in October 2017, Hogan Lovells will have its new offices here.

### Discovery head office

Growthpoint Properties and Zenprop are developing, and jointly own, Discovery's head office in Sandton. The iconic new 110 000 m<sup>2</sup> resource-efficient, cost-effective and environmentally-innovative Discovery global headquarters is the largest single phase commercial office development in Africa. It is on the corner of Rivonia Road and Katherine Street, diagonally opposite Sandton City and one block's walk away from the Sandton Gautrain Station. It comprises three linked office towers which consist of a ground floor, eight office floors and a roof level, which holds Discovery's sports facilities. It will also offer nine basements with over 5 000 parking bays. Discovery is expected to take occupation from the end of 2017.

### The Central

The Central at 96 Rivonia Road is a 100 000 m<sup>2</sup> site being developed by Investec and Cri-Eagle to accommodate office, retail, hotel and residential development. The Central is located on the corner of Rivonia Road and Johan Avenue, directly opposite Sandton City Shopping Centre and 100 metres from the Sandton Gautrain Station. The first development to take place on The Central site is a 20 000 m<sup>2</sup> state-of-the-art office building, comprising fourteen floors of unique office space. Eight of the fourteen floors have already been taken by leading law firm Werksmans. This building is expected to be complete before the end of the year.

### Village Walk

The old Village Walk mixed-use development by Eris Property Group is a full redevelopment of this landmark site at 129 Rivonia Road. The development comprises of two high-rise towers – a 13-storey office tower and an 18-storey office tower, with a combined floor

area of approximately 62 000 m<sup>2</sup>. Below the two office towers will sit two levels of retail space spanning approximately 15 000 m<sup>2</sup> with a seven-level parking basement of around 100 000 m<sup>2</sup> to service the precinct. The project is set for completion in early 2019.

### Kgoro Central

Kgoro Central is the sizeable 200 000 m<sup>2</sup> mixed-use art precinct being developed around a public square situated above the Sandton Gautrain Station. Developers Regiments Real Estate report that the development is being rolled out for final completion in 2024. Kicking off in June this year, its first phase of two levels of retail, three levels of parking and 304 residential apartments is scheduled completion by the end of 2018. By 2021, this will be joined by a hotel with serviced apartments, two more retail levels, offices and a high-end residential building, The Jewel.

Abland is building on the success of the first two phases of its mixed-use Alice Lane development, with the third and last of three prominent buildings, nestled around a shared public piazza. It consists of 35 000 m<sup>2</sup> of space and will be 19 storeys high. Bowmans Law will be its anchor tenant.

The Legacy Group's next exciting project also takes advantage of an ideal Sandton Central location. Leonardo at 75 Maude Street is set to rise 150 metres above Sandton's skyline. It is a 40 000 m<sup>2</sup> mixed-use development, which includes 1 500 m<sup>2</sup> retail, 12 000 m<sup>2</sup> offices and 25 000 m<sup>2</sup> residential.

The 120 000 m<sup>2</sup> multi-storey mixed-use office precinct for the new Old Mutual Emerging Market Office is going up at the prominent corner of Rivonia Road and West Street across from the Sandton Gautrain Station. Developed by Old Mutual, Mutual Place is situated at 115 West Street.

"These are just a few of the hero developments going up in Sandton right now, and there are even more set to come. There are also several exciting residential developments underway, both within mixed-use properties and stand-alone developments, which create the opportunity for people to live close to where they work and add to the quality of life in Sandton Central," says Jack.

The Capital on the Park is one of the latest residential developments in Sandton Central. Located at 101 Katherine Street, with direct access to Mushroom Park, The Capital on the Park will have 240 one and two bedroomed apartments, as well as penthouse suites, available for occupation from July this year. ●

# World's most POWERFUL RANGE of small ANGLE GRINDERS

The world's most powerful range of small angle grinders from Bosch offers even faster work progress, thereby improving the productivity of tradespeople dramatically.

Four models are available, each with a power output of 1 900 W, and covering a range of applications for different trades. These are the GWS 19-125 CI Professional, an all-round tool for all grinding and cutting operations, and the GWS 19-125 CIE Professional, which is ideal for material-friendly applications using low speeds and special accessories such as brushes.

The GWS 19-125 CIST Professional has a higher torque rating, and is optimised for highly-intensive grinding operations such as machining of stainless steel. The GWS 19-150 CI Professional offers the largest disc diameter, meaning it has the largest cutting depth and grinding surface of the range.

"The significant improvement in productivity is due to the fact that the most powerful models available were previously rated at only 1 700 W," Campbell Mhodi, Bosch Professional Power Tools senior brand manager, reveals.

"The tools are simultaneously easy to operate and ergonomically designed,"

Mhodi adds. "They fit well in the hand, thanks to a 208 mm handle circumference, and weigh only 2,4 kg and 2,5 kg respectively. This means the tools offer the best power-to-weight ratio on the market."

Bosch's focus on a high level of user protection includes a Kick Back Control feature, known previously as Kick Back Stop. Additional safety features are a soft start, restart protection, a protective guard with anti-rotation lock, and an auxiliary handle with vibration-damping.

"These small angle grinders are ideal for continuous use, thanks to their high performance and ease of operation," Mhodi notes.

"They allow for gentle, fast, and powerful machining of sensitive materials, even when it comes to complex cutting and grinding operations."

The new angle grinders achieve especially good results when used in conjunction with Bosch ceramic accessories. The use of self-sharpening ceramic corundum means that these abrasive discs provide very high stock removal rates.

Efficient dust extraction is possible with Bosch extraction guards for angle grinders, allowing safe operation with minimum tool wear.

These compact angle grinders come standard with a mounting flange, protective guard, tensioning nut, auxiliary handle, and two-hole wrench. The extensive range of accessories available from

Bosch includes cutting discs, flap discs, diamond discs, and grinding discs, in addition to brushes. ●



Technical data		GWS 19-125 CI	GWS 19-125 CIE	GWS 19-125 CIST	GWS 19-150 CI
Rated power output	W	1 900	1 900	1 900	1 900
Power output	W	1 220	1 220	1 220	1 220
No-load speed	rpm	11 500	2 800 to 11 500	7 800	9 700
Spindle thread		M14 x 2	M14 x 2	M14 x 2	M14 x 2
Maximum disc size	mm	125	125	125	150
Weight (acc. EPTA)	kg	2.4	2.4	2.5	2.4
Length x height	mm	311 x 103	311 x 103	311 x 103	311 x 104
Grip circumference	mm	208	208	208	208
Guard adjustment		Tool-free	Tool-free	Tool-free	Tool-free
Disc change		Standard hexagon key	Standard hexagon key	Standard hexagon key	Standard hexagon key
Constant electronic		✓	✓	✓	✓
KickBack control		✓	✓	✓	✓
Restart protection		✓	✓	✓	✓
Soft start		✓	✓	✓	✓





*"They allow for gentle, fast, and powerful machining of sensitive materials, even when it comes to complex cutting and grinding operations."*





# LIFTING De Aar wind farm TURBINES

Challenging conditions are considered normal for Johnson Renew, and its contract at De Aar 1 Wind Farm showcased how this subsidiary of Johnson Crane Hire overcomes these with ease.



► Cornelis Grotius, general manager Johnson Renew, says that the current contract to supply cranes and support services for installation of 67 wind turbines started in May 2016 and is expected to have an eight month duration.

Being constructed by EPC Longyuan Engineering South Africa, the Longyuan Mulilo De Aar Maanhaarberg Wind Energy Facility project is a 96,5 MW wind energy facility. Longyuan Engineering South Africa, of which a local Community Education Trust

has a 30% shareholding, is a subsidiary of China Longyuan. The wind turbine generators are being supplied from China by Guodian United Power Corporation.

Grotius says the wind turbine components are offloaded on the installation pads ready for the heavy lift programme to begin. These lifts are done using a 250 t mobile crane. The heavy lift programme starts with the pre-installation of the bottom tower sections using a combination of a 550 t crane and a 100 t crane.

The main installation lifting will be done with a 1 200 t hydraulic crawler crane used in combination with a 100 t crane.

“As a subsidiary of Johnson Crane Hire, Johnson Renew has ready access to the depth of its parent company’s crane fleet which allows it to supply these different crane combinations,” Grotius says. “This is a major differentiator in the market and allows us to customise lifting packages for individual projects.”

Significantly, the LTR 11200 is the fleet’s newest crawler crane and was selected to undertake the main installation lifts due to its narrow track crawler undercarriage and 100 metre hydraulic boom. This technology allows the machine to move and set up

relatively rapidly between installation pads with the added advantage of travelling on narrow access roads. This will assist in increasing the productivity on the project.

Commenting on the challenges on this particular site, Grotius says that there are a number of very steep hills resulting in potentially difficult terrain in which to work.

Undertaking heavy lifts difficult conditions is not new for Johnson Renew. “We have an established track record with challenging conditions and will be able to leverage our resident expertise in heavy lifting and wind farm project experience to ensure that we meet the construction programme safely,” Grotius says.

Preparing for any lift includes a full assessment of the on-site conditions as well as route surveys. All this is done in close collaboration with both the client and the crane OEM to ensure all aspects are factored into the lifting solution.

“Upfront planning enables our heavy lift team to select the most appropriate crane configuration for the task at hand which in this case is the new LTR 11200 crawler crane,” he says.

“It is by understanding our crane fleet and how these machines can be adapted for specific site conditions that we are able to optimise the lifting solution and produce the results we do, and with an impeccable safety record.”

This knowledge comes with years of experience, and ensuring that all operators are skilled and competent. “Ongoing operator training also plays an important role in adapting the lifting operation to site specific conditions,” he says.



ABOVE: Johnson Crane Hire’s LTR 11200 crawler crane in action.

LEFT: Johnson Crane Hire’s new LTR 11200 was selected to undertake the main installation lifts due to its narrow track crawler undercarriage and 100 metre hydraulic boom.



## A move towards mixed-use spaces

**According to South African Property Owners Association's (SAPOA) 2016 Q4 Office Vacancy Report, the office sector is still firmly entrenched in its recovery phase although this is becoming increasingly fragile as a result of the sectors macro drivers.**

In Gauteng, Sandton – Johannesburg's premier business hub – has lost a significant number of big office tenants over the last year and office rental vacancies have surged to 11,9%. Coupled to this, the number of new speculative developments in Sandton continues to increase sharply adding to the amount of unlet prime space. Commercial and industrial property consultancy, Jones Lang LaSalle South Africa (JLL), pins the current Sandton office supply to 1,5 million square metres. After the completion of all construction developments, JLL anticipates Sandton's office supply to increase to 1,9 million square metres, which will be over the next three to four years.

Rode & Associates property economist, John Lottering, says the jump in Sandton's vacancy rate probably reflects weak demand for office space as a result of muted employment growth. He says that even more new space is coming onto the Sandton market over the next year or two.

This is a view shared by Hassan Shaikh, founder of Revolve, a specialist corporate and retail interior design strategy agency. Shaikh believes there are a number of reasons why there is so much commercial space vacancy. Some vacancies are as a result of the building's aesthetics or its location and access, while others relate to

cost, which is probably the most relevant. Whatever the reason, he predicts the rise in office space vacancies will not play out well for landlords.

"Delayed access into the hubs of the city center and areas like Sandton has seen a rise in companies looking for office space outside of these hubs," says Shaikh.

A recent report by Rode and associates shows that there has definitely been an increase in business looking for decentralised office space. Shaikh believes the solution lies in the creation of mixed-use spaces that encompass the live/work/play thinking that has become very successful.

"This trend is big in Europe and the US and we have started to see it here with big developments like the multi-billion rand Steyn City Lifestyle Resort, north of Fourways, and more recently the proposed R1-billion multi-use development set to begin in the Cape Town CBD. The development, which will be situated in the city centre between Riebeeck Square and the Bo-Kaap, will provide 4 000 m<sup>2</sup> of retail, lifestyle activities space and 250 residential apartments within the city. "While these are hugely successful, or at least hold the promise of success, they are mostly greenfield developments i.e. new builds."

"While it is very easy to start new developments that change the face of how we work and live, the real challenge is greater than this. As designers, we should be looking more toward brownfield sites i.e. existing sites, and, if possible, reviving these to create mixed-use communities with collaborative work spaces and organic office spaces." Shaikh believes that this will resolve many of the key issues facing individuals and businesses alike. "Creating



*Hassan Shaikh, founder of Revolve.*

these spaces from one dimensional buildings and transforming them into thriving developments that reinstate the ideology of community is the real challenge, from both a landlord perspective and a lifestyle perspective," he says. Maboneng precinct provides a good example of this, although it has its own unique challenges, and is struggling to work. "The problem at Maboneng is not the concept, but rather perceptions relating to location in relation to peoples comfort zones, as well as access and security concerns."

Shaikh says moving forward the smart money will go into repurposing or redeveloping redundant office parks or buildings in decentralised nodes. "We are sitting on a goldmine in Bryanston, for example. Access and security are good and there is a complementary mix of residential, retail and office development to support mixed-use developments. Parktown is another area with huge potential." ●

### *Johnson Crane Hire's new LTR 11 200 crawler crane.*

Johnson Renew was established to provide the group with the focus required to grow its presence in the wind energy market, as well as other key renewable energy projects.

Already the division has a strong presence in the South African wind farm industry on greenfields and brownfields projects, as well as the very important growing maintenance activities associated with these wind farms.

Grotius believes that there is scope for Johnson Renew to become involved in projects across the country's borders with other African countries executing large utility-scale wind and solar farms. ●



# Bridal Veil Overpass Bridge creates DIRECT LINK

The R160-million Bridal Veil Road overpass bridge, developed by Atterbury Property Development, has created a brand-new east-west transport route at the Mall of Africa in Midrand. AECOM provided design and construction-management services for this prestigious project.

AECOM was appointed by the Attacq Waterfall Investment Company (AWIC) in May 2014 to provide design and construction management services for the construction of the Bridal Veil Overpass Bridge, as part of a link over the N1 to the new Mall of Africa at Waterfall Estate on the southern side of Allandale Interchange in Midrand.

The AECOM design team was under the leadership of Frans Kromhout, and the construction management team under the leadership of Jacques Naude.

The construction phase started on 19 November 2014, and was completed successfully on 18 March 2016, in time for the new Mall of Africa opening in April 2016. About ten people from AECOM's Civil Infrastructure End Market participated in this successful project.

The new R160-million Bridal Veil Overpass Bridge creates a direct link between Midrand and Waterfall City, with the new R40-million, 1-km-long S-bend dual carriageway extension to Bridal Veil Road, which takes shoppers right to the doors of Mall of Africa.

The bridge's superstructure is 115,8 m long and 22,7 m wide. It carries four lanes of traffic – two in each direction – a pedestrian walkway, a cycle lane and a

raised centre median. In addition, road infrastructure was upgraded substantially on Maxwell Drive, to the west of the mall, where increased capacity was created at the intersections. The existing traffic circles were upgraded to signalised intersections at a cost of R17-million.

The conceptual design of the bridge was dictated by the possible positions where piers could be constructed between the north- and south-bound carriageways of the N1 Highway, in addition to the on and off-ramps of the Allandale Interchange, where the bridge crosses. Accommodation of traffic on the extremely busy N1 between Johannesburg and Pretoria had a major influence on the type of structure that could be built, as well as the aesthetic considerations of the bridge itself.

It was decided that the bridge would follow similar design principles to those applied on the nearby Allandale Interchange bridges. Precast M-beams in a pseudo box-girder arrangement with façade panels were decided on. Multi-column piers with vertical fluting similar to those of the existing bridges were designed, together with reinforced earth abutments with fluted concrete panels.

Durable concrete and suitable concrete cover to reinforcement were specified



*The AECOM design team was under the leadership of Frans Kromhout.*



*The AECOM construction management team under the leadership of Jacques Naude.*

to ensure a 100-year design life for the structure. The AECOM team earned high praise from the client with a NPS score of 9. "AECOM team's commitment, effort, drive, and ability to deliver a project within a very tight programme, and with a final cost-saving on the construction budget for the client, contributed to the overall success," Kromhout comments.

The team also received a very good safety rating of more than 80% on the project – this while constructing a bridge over the fully functional N1 freeway in Midrand, with an average of 200 000 vehicles using this stretch of the road network daily, without any recordable injury or construction-related accident on the project.

Developed by leading South African property developer and investor Atterbury, Southern Africa's largest single-phase shopping centre development, Mall of Africa is a new R5-billion, 130 000 m<sup>2</sup> super-regional mall situated in Waterfall City, with access from Pretoria, Sandton and Johannesburg. ●

*The new R160-million Bridal Veil Overpass Bridge creates a direct link between Midrand and Waterfall City.*





# Windhoek centre's multimillion-dollar refurbishment

Gustav Voigts shopping centre in Namibia's capital city of Windhoek is to undergo a multimillion-dollar phased refurbishment starting this year. "This investment is due partly to the growing demand for upscale inner-city shopping, driven by the professionals in the surrounding offices, banks and government buildings," says Carel Fourie, newly appointed CEO of Oryx Properties, the owner of the centre.

The three-level complex, built in the 1970s and located beneath the four-star Avani Hotel and Casino, was the country's very first mall. It is home to established brands such as Mr Price, Totalsports, Queenspark, Donna Claire and Pep as well as a Checkers supermarket and local brands like Nakara, Wecke & Voigts and Safariland. "With the redevelopment, Gustav Voigts will be able to improve on its tenant mix by providing multinational retailers with optimal retail space," says Fourie.

Oryx Properties – the only Namibian property company listed on the Namibian Stock Exchange – has appointed Stauch + Partners as the architect and principal lead on the project. Andy Chase, architect at Stauch + Partners, says, "We want to create a fantastic new look for Gustav Voigts and enhance shoppers' experience, while ensuring that the centre remains an iconic landmark in the CBD."

The first phase of the development will include the construction of a new roof to let in more natural light, the extension of shopfronts and the replacement of balustrades.

All public toilets will be renovated, new escalators will be installed and two additional parking decks will be added. The entrance on Independence Avenue will get a brand-new façade.

Despite a financially disappointing 2016, Windhoek is seeing a revival of its Central Business District (CBD). Retail events and street festivals are drawing people into the CBD after hours, creating a wonderful atmosphere in a previously quiet place.

"Namibia has one of the most stable economies in southern Africa due to a strong institutional framework, a good fiscal and monetary decision-making policy, and an innovative and relentless private sector," says Fourie.



## About Gustav Voigts Centre

Gustav Voigts shopping centre is situated in the heart of Namibia's capital city of Windhoek, in an area dominated by banks, insurance houses and government offices.

The three-level complex covers 24 827 m<sup>2</sup> and is located beneath the four-star Avani Hotel and Casino, one of only two luxury hotels in the CBD. Built in the 1970s, it was the country's very first mall, named after a past mayor of Windhoek.

Gustav Voigt is a home to jewellers, clothing stores such as Mr Price, Totalsports, Queenspark, Donna Claire and Pep, grocery outlets such as Checkers and local favourites like Nakara, Safariland and Wecke and Voigts. ●

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# STREAMLINING the complex residential roof

Every so often, a complex residential roof, of average scale and with relatively small truss spans, arrives for design and estimation at a timber roof truss fabricator. While it may not be of grand scale, even relatively small yet complex projects can cause frustrations to all along the supply chain – with mounting time and cost implications.

Stian de Jager, Institute for Timber Construction South Africa (ITC-SA) Category A Roof Inspector, weighs in on installation difficulties with complex residential roofs by drawing lessons from a completed roofing project in Kensington, Johannesburg, in which he was involved.

De Jager explains that the roof structure of this new residence, with a roof area of a little over 300 m<sup>2</sup>, was designed to carry concrete roof tiles and was, at first, nothing out of the ordinary. “That is until the walls that were designed and built just slightly (less than 5 degrees) out of square, with the roof specified to be square, were taken into account,” says de Jager. “In addition, the building had a cranked section at 40 degrees that further complicated the design and measuring of the site. This resulted in a roof design with over 100 different truss labels – enough to scare some of the most competent of roof installers.”

## Multiple origins of the problem

A prominent finding of the study revealed that the eventual installation difficulties experienced on site were not ascribed to a single source. De Jager expounds, “In my experience, these issues often arise from a combination of factors, starting with uninformed clients and inexperienced or easily-conceding architects. Add to this

designers working under pressure and installers lacking in effective communication and it becomes clear how the installation on site can spiral out of control.

“In these situations, installers can be easily overwhelmed by the sheer complexity of the design and even experienced installers can start making novice mistakes. At this point, planning and good communication are abandoned, a ‘make-do’ approach is adopted, and any disconnect between designer, installer and inspector further exacerbates the problem,” says De Jager, adding, “Insufficient or incomplete details given to the roof designer by the architect can also lead to assumptions being made about the roof design, which can later develop into disputes once the trusses have been fabricated. Another factor contributing to these installation difficulties could also be the lack of special installation details from the manufacturer’s designer that should accompany the drawings when sent to site for the installer.”

## Difficulties that can arise on site

The misapplication of the universal nailing details as specified by the various Systems for roof truss manufacturing in Southern Africa is a common error that occurs on site. “Nailing details are often applied incorrectly at the perpendicular connections of jack trusses to girders at open hips or 90-degree infill hips,” remarks De Jager.

Inadequate or incorrect nailing of truss hangers, bracing, truss and batten connections is another common error. De Jager notes, “Because of the overwhelming complexity, confusion of bracing items, cleats, hanger and other details can occur, with many being switched around and some even being left out completely. In the same way, several of the small trusses can be neglected, because the main trusses are repeatedly repositioned in an attempt to ‘make the roof fit’. These are then left out of the structure, causing some unstructured open spaces in the roof, which then leaves the adjacent trusses to carry an additional load that they were not designed to bear.”

Another major issue that can arise is the on-site modification and cutting of trusses by installers without the prior consent and instruction detail from the designers. “Not only does this compromise the integrity of the roof structure, it is also not necessary in most cases. The trusses might merely need to be positioned correctly,” says De Jager. “Finally, many support blocks on internal walls that were meant to temporarily aid in the positioning can be forgotten and left in place. If this is not picked up by an inspector prior to roof loading, severe bending moments around these points can be created, for which the trusses were not designed, and they can fail at these or other points.”

While the above list is extensive, it only highlights the most prominent errors that presented themselves in this project.

## Impacting effects and results

“Sometimes, installers will start loading the roof tiles before the structure has been inspected, which can have damaging results. In complex roofs where bracing and metalwork can easily be installed in the wrong positions or neglected, long compression truss members can buckle and tension members can pull out of nail plates,” comments De Jager.

*Truss hangers not entirely nailed.*







*Truss hangers not installed due to a mix-up with a different section and detail.*

Fortunately, in the case of this project, the installation problems were on a new residence and De Jager was called out to inspect the structure timeously. That said, when taking the cost of capital at interest and other consequential costs into account, it is clear that all delays caused by installation difficulties can be detrimental to the scope of the project.

### The solution

Ideally, clients, architects and roof designers should all meet during

the planning stage of the project for discussion on any complex and out-of-the-ordinary roofs necessitated by walls that are not perpendicular and the like. However, this is not always possible and quite often the walls have already been started by the time the truss manufacturer receives the drawings to estimate for the roof. "When a collaborative approach is not possible from the start of the project, it can be of great benefit to all parties to get a competent roof inspector

involved from the start of the roof installation," advises De Jager. "Depending on the complexity and scale of the project, the roof inspector would visit the site at least daily to ensure that mistakes are not compounded and that the communication between installer and designer is clear. The inspector or engineer responsible for signing off the roof should also be able to observe and request any required special details in a timely manner. These simple steps can greatly reduce the time spent on site and ensure an accurate and efficient installation process," he concludes. ●

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# Setting benchmark in SUSTAINABLE building in NAMIBIA

**WSP | Parsons Brinckerhoff, Africa, one of the largest multi-disciplinary engineering consultancies in Africa, achieved the first 4-Star Green Star rating in Namibia for the FNB Namibia Holdings' @Parkside building – which is also well on track for its 'As Built' rating.**

Located in Freedom Square, Windhoek, @Parkside is the first building in Namibia to achieve a Green Star rating and – with its innovative, environmentally-friendly design, and sustainable operational energy management – the building sets a benchmark for building sustainably in the country for the future.

Construction of the building started in August 2013 with the buildings practical completion achieved in October 2015. During this time, the building was awarded its 4-Star Green Star Office SA-Namibia 'Design Rating' from the Green Building Council of South Africa in 2014. Since completion and being fully operational, the project is aiming towards an 'As Built Rating' by demonstrating that the sustainability initiatives designed into the building are installed and operating to their full efficiency potential.

As market leading sustainability consultants, WSP's GREEN by DESIGN team has been involved with this project from conceptualisation through every phase of design and construction – consulting with the project team on sustainability

and Green Star requirements – and now reviewing the operations of the building for the 'As Built' rating submission.

Greg Rice, sustainability consultant, WSP | Parsons Brinckerhoff, Building Services, Africa, says: "There are a variety of innovative and sustainable factors evident in the morphology of the building that have all contributed to this building receiving its Green Star rating.

We are also confident that the building will receive its 'As Built' rating, as the initial energy modelling has already shown a 40% reduction in operational energy compared to a building constructed according to minimum building regulations. This saving amounts to an estimated 1 million kWh reduction per year in operational energy."

A few of the keenly innovative and sustainable features of this building include:

- The sophisticated HVAC system that allows vast amounts of fresh outside air into the building so as to reduce the build-up of indoor pollutants. Occupants experience a high level of thermal comfort as a result of the materials selected for

the outer skin of the building and the air conditioning system. The building also contains dedicated exhausts to extract printing and photocopy pollutants which have an effect on internal air quality.

- A combination of water fixtures and fittings which are low flow are installed. The design of the roof and podium levels allow for rainwater harvesting. For reuse within the building. With recycling the grey water collection and a magnificent advanced filtration system, the building has been designed to surpass the most water efficient benchmark as set by the Green Building Council of South Africa (GBCSA). The advanced water system is also a contextual response to the water stricken environment.
- The project comes complete with a full and smart building management system (BMS) which has the ability to identify energy-use trends and monitor any anomalies. The BMS will notify the building manager of any irregularities in terms of power consumption, ensuring that appropriate remedial actions can be initiated if necessary.

However, Rice admits that this journey has not been without challenges: "Being the first Green Star rated building in Namibia, the principles of Green Star were new to the context and contractors. Added to this, working remotely across borders, and dealing with; obtaining work permits, paying import duties, delays at customs and, overall, keeping up to speed with the site activities more complex. While these were crucial challenges to the success of the project, overcoming them also offered an important knowledge sharing opportunity that was led by regular teleconferencing and various site visits during the construction phase. Each site visit also included an evaluation of Green Star requirements that assisted in growing the knowledge base of the heavy documentation process.

"Throughout this project we also placed significant focus on relaying the importance of future proofing the building, for instance, by installing and/or designing initiatives that are likely to account for unknown future energy, water, waste management, environmental and societal changes. Incorporating such initiatives ensures that the design and development of this building is innovatively smart, ergonomic and more sustainable – not only for today, but well into the future lifecycle of the building as well," concludes Rice. ●







A number of new world-scale CTL facilities have come on-line as advances in technology.

## Botswana office beneficial

**In October 2016, Hatch was tasked to provide design, engineering, and supervision services for the coal stockpile shed at Morupule, the largest power station in Botswana. Due to high rainfall, the power station had experienced major disruptions to its generating capacity over the last few years.**

"We leveraged our experience in Chile, South Africa, and Ethiopia to win what is an important project for us and this influential client, allowing Hatch to continue building a strong reputation in Botswana," Stephen Stacey, managing director, Botswana, project delivery group, comments.

Hatch was also awarded a major project by Botswana Oil, the national oil company, where it deployed a global team spearheaded by Mimi van Noordwyk from the Johannesburg office. "Our role as technical advisor will help our client technically define and quantify the value proposition for a coal-to-liquids (CTL) facility in this landlocked African country."

Despite having abundant low-cost coal reserves, Botswana relies heavily on imports to meet its liquid fuel requirements. "This initiative has the potential to evolve into a strategic imperative of national importance for Botswana," Pauli Baumann, XTL industry lead, explains.

The development of such a major CTL facility is expected to generate massive employment opportunities. It will also boost the value of local natural resources, providing both greater energy security for Botswana.

"Hatch will utilise its diverse experience in coal mining, unconventional oil and gas technology, power generation, and industrial infrastructure to support Botswana Oil in this endeavour," Baumann concludes. Hatch is also tendering on Phase 2 of the North-South Carrier (NSC) pipeline, which conveys raw water south for 360 km to Gaborone.

"This is testament to how our presence in the region supports the government's recently-launched economic stimulus programme aimed to grow the local economy, and diversify it from its dependency on diamond mining," Stacey points out.

"It is our intention to grow the Botswana office to about ten people by the end of 2017, and to 50 people with five years," Stacey highlights. The aim is to establish a significant local presence, with local shareholding and local employees.

The Hatch office in Gaborone was launched officially at a function on the evening of Thursday 27 October 2016. The keynote address at the opening was delivered by Botswana's Minister of Infrastructure and Housing Development, Nonofu Molefhi. ●

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# Big social INVESTMENT for Wild Coast Toll Road

The South African National Roads Agency SOC Limited (SANRAL) this week announced it has commenced with roll-out of a R120-million community development and SMME training programme which forms part of the small business support strategies to optimise local economic development through the N2 Wild Coast Toll Road development in the Eastern Cape's OR Tambo District Municipality and Alfred Nzo District Municipality.

“The aim of the projects are to provide local labour and local SMMEs with the necessary skills to optimally partake in the forthcoming N2WCR opportunities, enhance road safety for both through traffic, local traffic and non-motorised traffic utilising the N2WCTR, and enhance access of local communities to the N2WCR to facilitate socio-economic development,” said Gcobani Socenywa, SANRAL project manager.

SANRAL's SMME training programmes in Mbizana, Lusikisiki and Port St. Johns is empowering 31 local business owners of construction SMME's and new start-ups (CIDB levels 1 – 3). SANRAL has appointed three training service providers tasked to primarily train, mentor and develop 'learner subcontractors'. Following stakeholder consultation and candidate selection, the business owners selected to the programme will be provided with National Qualifications Framework (NQF) level 3, 4 and 5 training, leading to a full learnership, which is an official qualification, which is accredited by the South African Qualifications Authority (SAQA). The programme will also be inclusive of a selective training to CIDB grading 3-6 local SMME's.

## Local labour

SANRAL is also preparing local labour forces for these SMME's. The programme will also train an additional 330 individuals to help create a local skilled and semi-skilled labour force for the N2WCR. SMME's that employ their own labour from local communities will also be supported as labour will also receive accredited training.

“The programme's ultimate goal will ensure that SMME's benefit and participate in forthcoming Mtentu and Msikaba mega bridge,

the new greenfields section and legacy projects such as road maintenance of the N2WCR,” said Gcobani Socenywa, SANRAL's N2WCR community development project manager.

## Access roads

As part of their practical training, the business owners will be responsible for upgrading and constructing community access roads in Ingquza Hill Local Municipality, Mbizana Local Municipality and Port St. Johns Local Municipality in the Eastern Cape.

“The upgrading of the community access roads itself forms part and parcel of the work package of the N2 Wild Coast Highway as reduced informal access points along the N2WCTR will improve road safety for motorists and pedestrians,” said Socenywa.

“Between now and February, business owners are attending business management, tendering skills and financial management training. We have included these modules because we want to create sustainable, capable and empowered road construction SMME's and start-ups,” said Socenywa.

“In February next year, we will move into the theoretical dimension of road construction and a practical component through community access roads. In this regard, the SMME's and start-ups will be responsible for building storm water drainage system, upgrade roads from gravel to surface standard, construction of sidewalks and concrete pavement works,” he said.

Daliwonga Sibeni, Ngxathi Trading Enterprises in Mbizana: “This project will help me create work for people in an area where almost 85% of youth are unemployed. My goal is to learn more about the construction industry. I am also excited about the N2 Wild Coast road project. This project will boost tourism in the area and create much needed jobs.”

Wandile Mngeni from Dubana Administrative Area outside Lusikisiki believes the N2WCTR project is a “great project for the community”. Mngeni's company WM Construction Projects is a CIDB level 1 grade. He is a former training project manager for a motoring company in Port Elizabeth and also worked for a non-profit organisation in Lusikisiki. “I have worked all over South Africa. Development must come to rural areas, then we don't have to flock to bigger cities to find work.

“I heard about this SANRAL training programme from the PLO and was called to meetings by the municipality in Flagstaff. I have not experience working in the construction industry but believe this course will be a great help.

“The N2WCTR project is a good project for us to get involved in from the start. It will depend on us to maintain that road. I have already hired a supervisor for my company and this person is also part of the SANRAL training programme. There is going to be a lot of job creation in this area with this project,” said Mngeni.

Sivuyile Xuku, Port St Johns Local Municipality, enterprise manager said the SANRAL project “seek to assist and empower our people to alleviate poverty and create employment.”

“A lot of people will benefit from the N2 Wild Coast road project. The project will boost our tourism economy. There are possibilities that once the road has been built investors would be attracted to the area,” said Xuku. ●

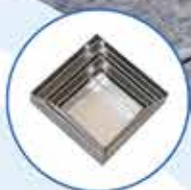
*SANRAL's community development and SMME training programme is giving construction SMME's and new construction start-ups in the Wild Coast skills and opportunities to participate in the development of the N2WCTR. Pictured here is SANRAL's Gcobani Socenywa with Learner SMME's recipients Nombali Hlongwe, Mongezi Gcuma, and Ntomb'zonke Ngwekazi.*



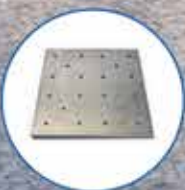




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# Cape Town's TALLEST BUILDING

## set to begin in April

**Costing in the region of R1,5-billion, development of the soon-to-be tallest building in Cape Town, has now been scheduled to begin in April 2017. Although the development will take 30 months to complete, over 60% has already been sold out.**

Emerging market property developer Land Equity Group, headed by Stuart Chait, recently purchased Old Mutual Centre and Exchange Place in Cape Town's bustling CBD from Old Mutual Properties. The site, situated on the corner of Adderley and Strand streets,

across the road from Cape Town Central Station, is designated to be redeveloped into the 44 000 m<sup>2</sup> tower, which, at 44 storeys, will be Cape Town's tallest building. The building is still to be named, however its current code name is 'Zero-2-One Tower'.

The development, situated at arguably one of the most iconic and strategic sites in the city, will comprise 624 apartments, 760 parking bays, retail space of 5 000 m<sup>2</sup> and a 360-degree viewing deck and restaurant at roof level which will be open to the public. Land Equity Group has appointed FWJK to co-develop the project.

Comments Chait, "This building is set to transform the Cape Town city skyline, and once complete it will mean that Cape Town finally features in the 'top 10 tallest buildings in South Africa'. It will in fact be the same height as the Reserve Bank building in Pretoria."

"The CBD is highly sought-after by investors and tenants. Statistics continue to show that both buyers and tenants are prepared to sacrifice bigger homes or apartments in outlying suburbs, in exchange for the convenient and urban lifestyle that the city has to offer. There are already at least a dozen new high-rise buildings in development in the CBD, with many more on the drawing board for 2017.

Buyers and investors are able to get the tax benefit of the UDZ allowance which makes their investment highly attractive, and with the massive ongoing capital investment taking place, the Cape Town CBD will now be on a par with some of the best cities in the world. Prior to Old Mutual developing the FNB building only a short time ago, no skyscrapers had been built in the city for nearly 40 years.

Land Equity has secured another two strategic blocks in the Cape Town CBD and plans to develop further mixed-use projects in the bustling node. In total, the company is planning over R4-billion in new developments in the area this year alone.

Chait has been recently responsible for various major developments across South Africa, including Melrose Arch, Tyger Falls in Tyger Valley, Big Bay in Bloubergstrand, Nettleton Ridge in Clifton, Victoria Junction adjacent to the V& A Waterfront (Cape Town's first scalable regeneration mixed-use development), Stonehurst Mountain Estate, and many other mixed-use projects in South Africa.

"We are now going into an aggressive development cycle, having raised significant funding for a R40-billion pipeline of development projects across sub-Saharan Africa, and including South Africa," adds Chait. ●





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*AECOM was appointed to provide project management services relating to the development of the Sol Plaatje University.*

## On track at Sol Plaatje University in Kimberley

**In May 2014, the University of Witwatersrand appointed AECOM to provide project-management services relating to the development of the Sol Plaatje University precinct in Kimberley. Over the past two and a half years, the team has been under the leadership of Don de Koker, Bradley Marais and Toni Capuzzimati.**

To date, 15 people from the Construction Services business line have participated in the completed projects, as well as projects currently underway. AECOM's first task order, from 1 July 2014 to 31 March 2016, was completed on time for the start of the 2016 academic year, and within the cumulative budget of about R750-million for the first three building projects and associated infrastructure. The value of the total programme, comprising all projects completed to date, as well as projects currently underway, is approximately R1,5-billion.

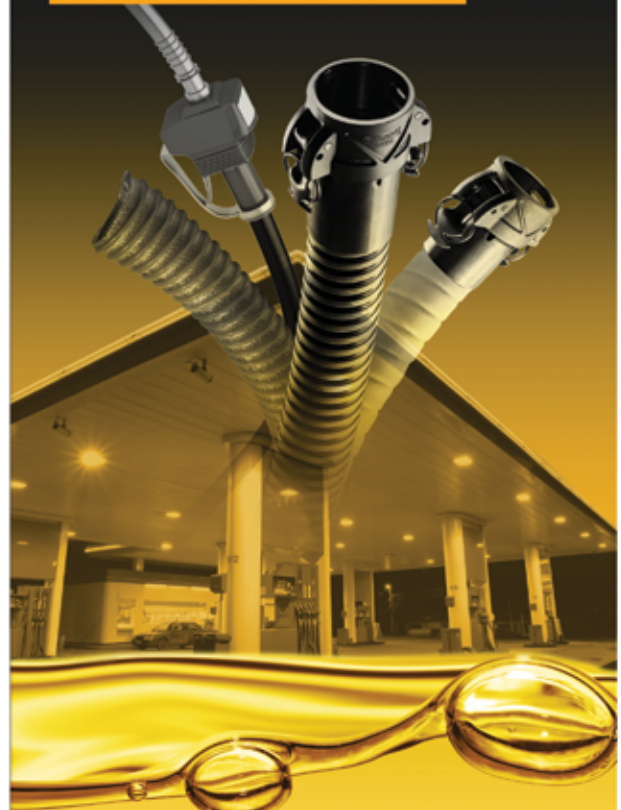
The team earned high praise from the client, with AECOM receiving an extension of its contract up to May 2018. "This is testimony to the client's satisfaction and faith in the AECOM team," De Koker comments.

"AECOM team's commitment, effort and drive contributed to the overall success of this project as it enabled design challenges to be overcome; getting consultants to commit; being able to assist with the contractors' commitments to deliver; managing socio-economic commitments in a difficult environment; and overall professional conduct. This is while always placing the interests of the programme first, particularly with a challenging NEC target-cost framework contract," De Koker elaborates.

The team received a 'Very Good' Safety rating on the project, with no serious injuries reported to date. AECOM utilised its LifeGuard reporting system, which allows anyone on-site to log an occurrence or incident on-line, with an accompanying photograph and any background information. The relevant contractor is then notified and the incident is only removed from the LifeGuard reporting system once it has been resolved. ●



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**Andrew Teixeira – Fortress executive director.**

## R650-MILLION Louwardia development launched

**The JSE listed Fortress Income Fund has officially launched the Louwardia Logistics Park, a R650-million A Grade logistics facility that is under development alongside the N1 in Centurion.**

Speaking at the launch, executive director Andrew Teixeira said that Louwardia was part of the 1 million m<sup>2</sup> of warehousing that is due to be developed by Fortress over the next five years. This equates to a combined investment of an estimated R8-billion in South Africa's logistics sector during that period.

Fortress Income Fund has become a powerhouse in the South African property industry since listing in 2009. Innovative asset management and a diverse property portfolio has seen the fund showing positive growth every year.

The fund focuses on development of prime logistic warehousing, retail centres and strategic offshore investments. Fortress owns 336 investment properties valued at R28,7-billion at the end of December 2016 and has one of the largest logistics property development pipelines in South Africa.

Louwardia, which will see approximately 90 000 m<sup>2</sup> of warehousing developed on the 16,7 hectare site, is expected to be completed within the next 24 months.

The first phase, which comprises a 21 785 m<sup>2</sup> warehouse with 1 843 m<sup>2</sup> offices, is complete and ready for occupancy. It has already drawn a great deal of interest from prospective blue chip tenants.

National leasing manager, Grant Lewington, said that Louwardia was an example of the Grade A logistics facilities that the fund is developing in three major nodes – Gauteng, Cape Town and Durban.

The Fortress Income Fund's portfolio is strongly weighted

towards logistics facilities located in prime locations. These are let to corporate tenants on long leases.

The focus on logistics is due to ever increasing demand for these sorts of facilities from companies operating in a highly competitive economy that is driven by imports, primarily through Africa's busiest container port, Durban.

South Africa's economy is transport intensive and imports destined for South Africa as well as neighbouring countries are expected to grow. Already logistics is one of the fastest growing service sectors in the economy, ensuring a strong income stream for the fund going forward.

Teixeira emphasised that, as long term holders of property, Fortress is focussed on delivering a quality product and was setting new trends in the development of logistics facilities in South Africa.

"In a tough economy where cost containment and efficiency are king, we are actually providing A grade logistics at a lower cost. With properties that offer high tech design that includes the likes of solar and natural light to reduce power consumption, strategic locations that make for more efficient distribution and properties that provide easy access and better turnaround times, we are effectively lowering the cost per pallet," he explained.

Lewington noted that Fortress continued to strengthen its position as the preferred developer of logistics warehouses by delivering a technically superior product that, together with the group's strategically located land, would ensure a sustainable development pipeline.

He emphasised that all of Fortress's parks were developed according to global best practice and to the highest standards. They include the provision of adequate internal height, flat floors, large loading areas with hard wearing concrete surfaces as well as good access to freeways and arterial routes.

The newly launched warehouse at Louwardia has a height of



# Maerua Mall begins interior upgrade

**Maerua Mall, established in 1990, is Windhoek's original shopping centre. Close to the heart of Namibia's capital city and bordering the eastern suburbs, it welcomes over nine million shoppers every year.**

Carel Fourie, newly appointed CEO of Oryx Properties, the owner of the centre, describes it as "more than a shopping experience, from convenient shopping to a fun, family dining opportunity".

This year, the well-known and vibrant mall will undergo a complete facelift, bringing both its look and its offerings up to date. New tenants are joining, with the first John Dory's in Namibia set to open its doors, Queenspark, Cappellos and Checkers Liquor. The phased upgrade offers everything under one roof, from entertainment and dining to leisure and shopping. Public areas and walkways will be upgraded in keeping with the new, contemporary look, while a timber-slatted ceiling suspended with liquid-crystal light hoops will be installed.

The food court will be redesigned over two levels, making space for great new restaurants. An outside eating area will offer close proximity to the family entertainment centre "We're excited to be introducing a trampoline park, glow-in-the-dark putt-putt, bowling alley, a climbing wall and much more," says centre manager Thea Thornley.



Four entrances and ample parking, including dedicated parking for the disabled and elderly, as well as moms and tots make access a breeze. The mall is named after the trees that surround it. Ringwoods (Maerua schinzii) are a protected species in Namibia. "The tree is symbolic of sustainability and vitality, and this

resonates with our ethos," says Fourie.

The mall's commitment to sustainability is evident in its NAD17-million 1 MW rooftop solar-power plant, which generates about 20% of the centre's electricity. The 1 407 MWh generated by the plant during the 2016 financial year reduced the mall's CO<sub>2</sub> emissions by 1 128 tons.

13,5 m to the underside of the eaves which offers efficiencies of scale and an FM2 floor which provides a solid platform for the erection of racking and easy movement of mechanised machinery with a 38 m yard.

It also provides a secure park environment with 24 hour security, a central gate and electric fence and a fire system with central pumps and tanks that will serve the entire park.

Green building best practice is incorporated via features such as low maintenance indigenous landscaping that is fully irrigated and buildings that can accommodate photo voltaic cells for the production of electricity.

However, the key draw card remains Louwlandia's prime location with excellent highway visibility and accessibility to road, rail and domestic and international air freight hubs.

"It is well situated adjacent to the N1 highway between Johannesburg and Pretoria with access from the N1 via Brakfontein and Nellmapius Roads. It is also well connected to two major alternative routes (the R21 and N14) and provides easy access to both the OR Tambo and Lanseria Airports as well as major centres," he explained.

He added that the N1 frontage was a prime location with excellent highway visibility for signage and branding. ●

## Skukuza safari lodge project

**Murray & Roberts Buildings has been awarded the R200-million contract to construct the new Skukuza Safari Lodge for the South African National Parks Board (SANParks).**

Rui Santos, managing director of the company which is now part of the Southern Palace Group, says the company is thrilled to have secured this prestigious project which is being built within the existing Skukuza Rest Camp in the Kruger National Park (KNP).

Santos says the 128 bedroom three star double storey hotel, which maintains the KNP typical architectural theme, is designed in a figure eight configuration with bedroom wings on either side of a centre double volume area.

The scope of work includes a thatched public facility with lounge, restaurant, kitchen and rest rooms. It will offer a four star service to wildlife conference attendees using the adjacent SANParks conference facilities. The bedrooms look inwards to inner courtyards on each wing with a pool and landscaped areas. Construction also includes single quarters for hotel and visiting staff.

The project site was handed over on 21 February 2017 and completion is scheduled for June 2018.

# PROACTIVITY in overcoming challenges

**Keller's Franki Africa has developed a reputation for being able to deliver cost effective geotechnical solutions using a wide range of appropriate technologies in a host of different, and often challenging, ground conditions.**

“We have worked in Southern Africa for many decades and have a profound understanding of the different soil conditions and the optimal geotechnical solutions for them,” says Franki’s trenchless technology manager, Byron Field.

He adds that this knowledge often enables the company to be proactive in solving problems that, on the face of it, sometimes seem insoluble. “The Drakenstein Municipality’s Bulk Sewer Pipeline is an excellent example of this,” says Field.

## The challenge

The path of the sewer pipeline – which is in the Paarl, Western Cape area - includes a ±105 m stretch across Arboretum Rd and the N1 highway followed by a ±110 m section which runs parallel to the Boschenmeer Golf Estate boundary wall at a depth of between -6 m and -8 m.

According to Field, the main challenge was the relatively unstable ground conditions, which comprised sands from 0 to -4 m with loose cobbles and boulders from -4 to -8 m and a very high water table.

He adds that SANRAL also had strict wayleave conditions prohibiting the DM from conducting works beneath the national highway unless they were able to prove that every conceivable precaution was taken to protect the highway and to ensure uninterrupted use.

It was obvious that a ‘trenchless’ methodology, like pipejacking, was required in order for the new sewer to run under the roads without interrupting traffic. But, also, the depth of the pipeline and its proximity to the Boschenmeer Golf Estate boundary wall made open excavation unpractical in this area.

The ground conditions were analysed

and a new challenge was encountered. Field explains: “Firstly, the level of the sewer passed directly through the cobble layer between -4 m to -8 m and when pipejacking through this type of ground it is virtually impossible to prevent collapse of the cobbles during excavation. Secondly, the high water table tends to draw fines from the surrounding ground towards the jacking shield. Both of these things could have led to over-excavation resulting in ground level settlement,” he says.

## Franki’s proactive proposal

Franki then approached the Drakenstein Municipality with a proposal to treat the ground beneath Arboretum Rd and the N1, as well as alongside the Boschenmeer golf estate boundary wall.

The proposal entailed Jet Grouting – which involves the mixing and partial replacement of the in-situ soil with cement slurry – to consolidate the in-situ ground condition along the sewer centreline and between the depths of -4 to -9 m and then installing a pipejack through the treated ground. “The treatment of the ground would prevent collapse of the sand and cobbles during pipejack excavation and would reduce the ingress of water to manageable levels,” Field says.

He adds that Jet Grouting was Franki’s preferred method of treatment as high pressure jetting can be used to consolidate in-situ ground at exact levels and can provide up to 2,5 m diameter columns with only an 80 mm drill stem.

The municipality’s design team found the proposed solution acceptable, included it in a tender document for this phase of the works and, in August 2016, Franki was appointed by the main contractor, Vakala Construction, to carry out



*Jet grouting rig alongside N1.*

the specialist geotechnical works as per their envisioned specification.

## The result

Field says that the result could not have been better. “The Jet Grouting work went according to plan and was carried out with zero impact on traffic. In addition, once the Jet Grouting was completed and the site was cleared, there was no remaining evidence at ground level that the ground beneath had been treated,” he says.

As for the pipejacking Field says the entire operation went smoothly with the ground treatment ‘working beyond even our highest expectations’.

The subcontract work was completed by Franki on time (February 2017) and on budget.

## More than just piling

Franki is renowned for its geotechnical solutions using an array of different piles including driven tube piles, precast piles, auger piles, full displacement screw piles, rotapiles, micropiles, the famous Frankipile (driven cast-in-situ pile) and many more. It is

By being part of the Keller Group, Franki’s leadership in the Geotechnical space in Southern Africa has been significantly enhanced. Keller is the world’s largest independent geotechnical engineering contractor, giving Franki significant advantages including access to a wide range of innovative technologies – including trenchless technologies – and in the areas of finance for future growth, new state-of-the-art machinery and, of course, a wealth of geotechnical intellectual property and experience.





*Treated jacking face holding cobbles and fines in suspension.*

### Contract Summary

- Contract No. CES 14/2015
- Client: Drakenstein Municipality
- Engineers: Lyners
- Main contractor: Vakala Construction
- Specialist geotechnical contractor: Franki
- Contract Commencement/completion: August 2016 – Feb 2017
- Scope of specialist geotechnical work: 215m 1780ø O.D. Pipejack; 250 m<sup>3</sup> Grouting

also well-known for its soil improvement systems including dynamic compaction, deep soil mixing, accelerated consolidation and of course Jet Grouting as discussed above.

Franki's skills in trenchless technology are just as strong and for more than 30 years it has successfully provided pipe-jacking and other trenchless technologies – augering, thrust boring and large diameter

case boring – to a wide range of clients in Southern Africa.

Trenchless technology is a 'family' of methods, materials, and equipment capable of being used for the installation, replacement or rehabilitation of existing underground infrastructure with minimal disruption to surface traffic, business, and other activities. It is, therefore, often the most cost-effective solution.

Pipejacking, an integral part of this 'family', is a technique for installing underground pipelines, ducts and culverts. Powerful hydraulic jacks are used to push specially designed pipes through the ground behind a shield at the same time as excavation is taking place within the shield. The method provides a flexible, structural, watertight, finished pipeline as the tunnel is excavated. ●

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**Kaytech has launched a unique service offering: Online CPD lectures on geosynthetics. Industry professionals can now 'attend' the lectures, accredited by SAICE, whenever and wherever they like – from the comfort of their own office, home or even waiting to board a flight.**

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  - Bitumen Based Formed In-Situ Dam Lining with Geosynthetics
  - Road Pavement Maintenance with Geosynthetics

Kaytech will continue to offer live lectures, delivered by Peter Davies who, with 50 years' experience in the industry, provides an invaluable perspective in these presentations. Customised lectures at your own premises can be arranged directly with your nearest Kaytech branch or via this



*Geosynthetics expert, Peter Davies.*

link: [www.kaytech.co.za/cpd-lectures-customised-business/](http://www.kaytech.co.za/cpd-lectures-customised-business/).

Kaytech strives to achieve the highest possible standards in service and innovation, and is therefore able to offer solutions to individual customers' CPD needs. Whether you prefer online or live lectures (or other educational requirements in geosynthetics), Kaytech is committed to their chosen brand slogan, 'People, Planet, Progress'. ●

# LESS TIME, COST AND DISRUPTION

## for large-bore pipelines

**With 30 years of experience laying pipelines for the civil engineering sector, Raubex Group company LR Civil and its partners have imported a well-established technology for unobtrusively installing large bore pipelines – proving its value on South African soil.**

While there has been some local adoption of horizontal directional drilling (HDD) in small bore applications, with holes measure less than 500 mm in diameter, South Africa has not realised the potential of large bore HDD, according to LR Civil operations manager, Daniele Carnicelli.

Partnering with geotechnical engineers, Geopractica and HDD experts TRG International, LR Civil recently completed an HDPE pipeline a kilometre long under

a Port Alfred beach and out to sea. “This contract demonstrated a number of benefits that this technology has to offer in South Africa, including little or no environmental impact, much less time spent on permits and approvals, and no disruption or danger to the public,” says Carnicelli.

### The project

Drilling horizontally at depths of between 20 and 30 metres, the 150 tonne Maxi-

Rig drilled the outfall pipeline for the new reverse osmosis desalination plant at Port Alfred, without any threat to the pristine beach environment.

“With the capacity to install pipelines of up to 900 mm in diameter, this powerful rig has a maximum torque of some 70 tonnes and 150 tonnes of pull-back force,” he says. “This makes it capable of working through rock with a hardness exceeding 250 MPa, and to achieve daily horizontal distances well in excess of conventional trenching.”

He estimates that, on the desalination plant project, the rig could achieve a horizontal distance of at least 30 metres on an average day and 45 metres on a good day. With traditional trenching, involving digging, laying, backfilling and perhaps even blasting, such daily rates could take a week or more to achieve.

Not having to dig from surface to lay and bury large diameter pipes means that many of the normal challenges of pipeline installation are sidestepped altogether. Where a pipeline crosses a watercourse, for example, a water use licence may be required. This a process could take up to 18 to 24 months and possibly delay a project significantly.

Other permissions usually need to be secured wherever a trench will intersect a gas, power, telecommunications or water line. In the case of HDD, the drill path simply goes under these facilities and safely avoids them.

Safety risks on a project are reduced, as the absence of trenches means less danger to workers and the public. Inclement weather, which can often threaten the timeline of a project by flooding trenches and stopping construction work, is no longer a factor, as most of the activity in an HDD project is carried out underground.

### Fuel consumption

Fuel consumption is vastly reduced, as comparisons show that the Maxi-Rig will tend to use as little as 5% of the diesel normally consumed by earthmoving equipment, including excavators and trucks, over the life of a project.

According to Carnicelli, there are also substantial savings in reducing the pipeline length by installing it ‘as the crow flies’ through a horizontal drill hole, rather than the more circuitous route required by trenches which have to avoid objects, →

*The 24 ton Maxi-Rig with the control tower in view.*



*The rig drilling 650 metres under existing sand dunes towards the connection point. Differential in heights is 60 metres from the rig position to the connection point.*



### 1 - Rockfall barriers

Our flexible rockfall barriers are designed for impact energies ranging from 100 to 8'000 kJ. They are successfully tested in a 1:1 field test and certified in accordance with the Swiss and ETAG Guidelines for rockfall net approvals.

### 2 - Slope stabilisation

The TECCO<sup>®</sup> SYSTEM<sup>®</sup> is appropriate for stabilising steep soil, sediment and rock slopes as well as for retaining walls. The mesh is anchored with soil or rock nails behind the sliding layer pretensioned at a defined force using spike plates at the surface.



# We protect people and infrastructure from the forces of nature

### 3 - Rockfall drape

The TECCO<sup>®</sup> rockfall drape is a safe and economical alternative for situations, where the catchment area is too small and the calculated rockfall bounce heights as well as the expected kinetic energies are too high for a dynamic rockfall barrier.

### 4 - Rock slope protection

The SPIDER<sup>®</sup> spiral rope net is suitable to protect rocks that threaten to break off or slide down from a slope, rock ledges and overhangs as well as unstable rock formations.

### 5 - Shallow landslide barriers

Comprehensive 1:1 tests in collaboration with the Swiss Federal Research WSL in three test installations have verified the function of our shallow landslide barriers. In contrast to flexible debris flow barriers, shallow landslide barriers are intended to be applied on unchannelised slopes.

### 6 - Debris flow barriers

Each of our flexible ring net barriers can stop as much as 1'000 m<sup>3</sup> of material derived from rocky torrents containing boulders, trees and other vegetation, while allowing continued water flow; culverts are kept from dogging; road and railway embankments are protected.

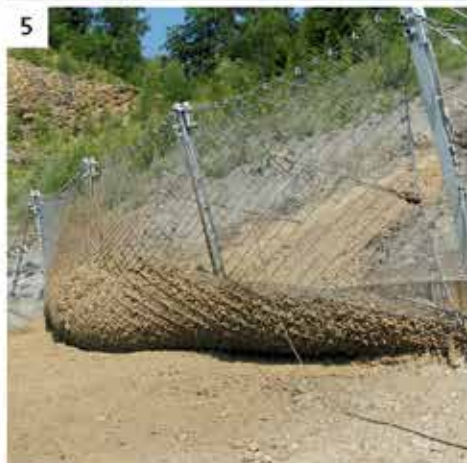
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# A CONNECTED APPROACH: the application of LiDAR in construction

**The African mining industry is starting to experience growth after a prolonged period of negativity, thanks to conditions in China now stabilising and rising commodity prices. But while this recovery is welcome, growth is expected to be sluggish. Here, Matthew Bester, general manager, Africa from geospatial technology specialist 3D Laser Mapping explains how technology can be used to streamline operations so firms can retain profit levels.**

► After a protracted slump, signs that the African mining industry is starting to recover are emerging. In the last quarter of 2016, the price of copper increased by 10%, compared to the same period in 2015. During this time, the price of iron ore also doubled, helping metal and mining corporation Rio Tinto finally return to profit following losses of USD866-million in 2015.

This growth is being fueled by demand and investment from the Asian continent and despite upturns in certain areas key to stabilising the African market, the industry remains volatile, with Rio Tinto also reporting slumps in the copper and diamond product groups for the last 12 months.

To ensure businesses are robust enough to withstand these fluctuations, mining operators will no doubt look to reduce capital expenditure through technology. Part of this involves looking to other sectors to see how they have recovered from a crisis, while addressing issues like labour costs, more rigorous safety regulations and skills shortages.

## Automation technology

Automation technology is used widely in manufacturing and construction but the development of specialist applications means demand for it is growing in mining. Using connected, networked tools and machinery enables operators to access data about the site which can increase efficiency and reduce the need for workers to access unsafe areas. With scaled-down operations winding back up, companies can now look to data-driven methodologies as a way to improve their processes and employ new team members who can use technology for positive change.

## LiDAR systems

A recent development in this field is LiDAR (Light Detection and Ranging) systems, which use lasers to build in-depth, three-dimensional models of a site so they can be accurately monitored, without people being exposed to dangerous situations. While remote surveying tools such as total stations, are not new in a mining setting, the

use of LiDAR increases the accuracy of a scan because the light moves at a constant and measurable speed, enabling operators to calculate distances more efficiently. The ability to collect time-series measurements remotely also means that land changes can be detected and patterns of behaviour identified, enabling pre-emptive work to be carried out before problems occur.

When combined with an integrated GNSS system and an Inertial Measurement Unit (IMU), a record of the precise global location and spatial position can be added to the data from the laser scanner, resulting in a 3D point cloud.

From this, a digital terrain model (DTM) can be created, providing a detailed picture of the environment, including millimetre accurate visualisations, which can then be used to calculate slopes and gradients, widths and depths and clearances for machinery and vehicles.

## Advances

Recent advances in LiDAR systems have made them more mobile, compact and affordable, so they can be used on construction projects of any size. Previous devices, like terrestrial laser scanners, require operators to undertake numerous set ups to generate a meaningful DTM. Not only is this time-consuming, it makes it all the more difficult to access those hard-to-reach or dangerous locations. This is where mobile LiDAR technology can be a real asset to surveyors and project managers: by

→ infrastructure or buildings on surface.

## The competitive advantage

Among the various applications in which HDD offers a competitive advantage, he predicts that desalination plants like the one at Port Alfred are likely to present substantial opportunities for this technology in the near future, as these plants become an increasingly popular option for coastal towns affected by regular droughts.

The ability to govern the direction of the drill head is vital to the versatility of the rig, allowing a bore plan to be designed and accurately implemented by the highly-trained operator. Moreover, the operator and tracker can at any time check the depth

and location of the drill head when it is in the ground. Data on both the depth and the pitch of the drill-head is available to the operator and tracker on surface at the push of a button.

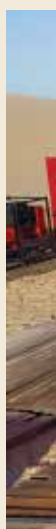
The unit also has its own mixing plant, for creating the 'mud' of bentonite and water which is the 'blood flow' of HDD, providing coolant to the drill head and reamers, stabilising the hole by lining the walls, and flushing the hole clean by carrying out the heavy debris being cut.

At the final stage of the project, when the product pipe is to be inserted, the mud plays another important role: lubricating and suspending the pipe, and thereby protecting it on its journey down the hole. When the

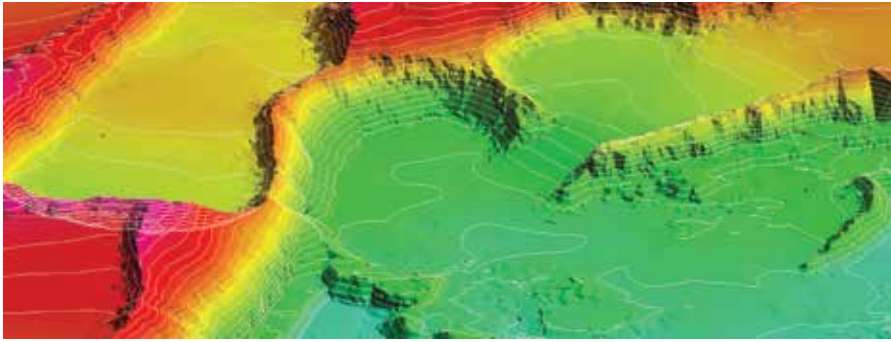
mud has done its job, it then fills any void space due to over-cut.

On large and longer bores, it is common practice, although not essential, to use recycling units, says Carnicelli.

"This is due to the large volumes of bentonite required for the size of the bore, and is achieved by creating a sump hole in the ground into which the returning mud can flow," he says. "From there it is then pumped to the recycling unit and the mud is cleaned through a process of shakers and cyclones. After all the debris is removed, clean mud is mixed with a small amount of bentonite to ensure the continuity of the viscosity, and can then be pumped back down the bore hole." ●







**ABOVE:** Point cloud showing contours of an open cast mine.

**LEFT:** Point cloud of an extractives facility.

capturing vast quantities of data while on the move.

One of the key advantages of Mobile Laser Scanners (MLS), including multi-platform mapping systems such as ROBIN, is that they can generate full digital surface models in a single set up. In environments that are deemed unsafe or remote, they can be mounted to automated vehicles such as trucks, trolleys or UAVs (Unmanned Aerial Vehicles) to gather data.

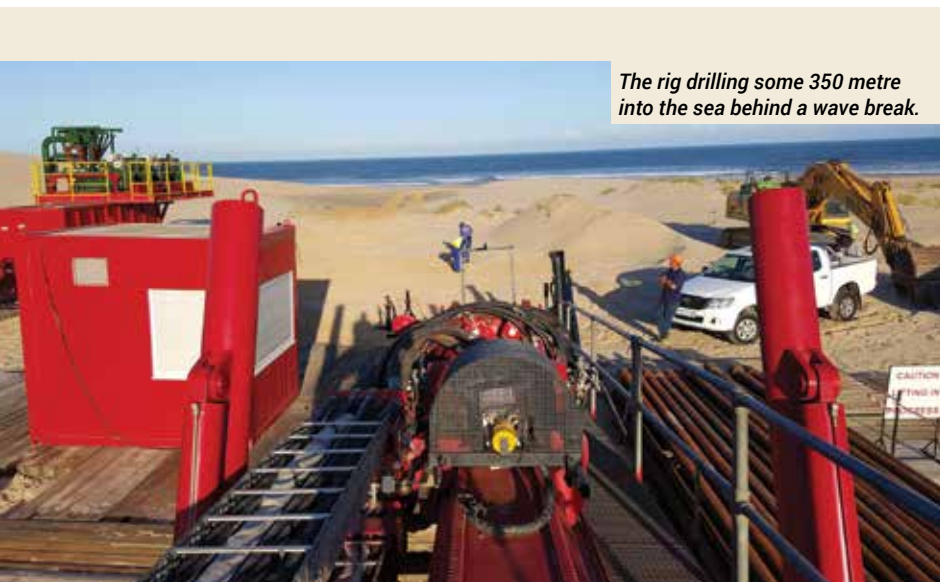
It also speeds up operations significantly as data is collected around 80 per cent faster than it would be if a terrestrial scanner or total station were used. From this, operators can make decisions about how machinery and vehicles should be safely deployed to site, as well as take note

of any changes to the landscape which could potentially cause harm to workers or force an expensive suspension of operations.

This technology is now being harnessed at large-scale and complex projects including Mogalakwena in South Africa, the world's largest open-pit platinum mine.

The operator, AngloAmerican, invested in the SiteMonitorSV, which provides real-time reconciliations for stockpiles and volumes, to enable better forward planning.

SiteMonitor has helped contribute to an increase in productivity at Mogalakwena by 33% over two years and helped to lower the lost-time injury-frequency rate from 0,68 in 2013 to 0,12 per 200 000 hours worked in 2014. ●



*The rig drilling some 350 metre into the sea behind a wave break.*



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# ROAD REHABILITATION: AKKEDISBERGPAS

Akkedisbergpas is one of the most southerly mountain passes in South Africa. It is situated on the R326 regional road between Rivieronderend and Stanford in the Western Cape. Whether national or regional roads, the roads need to be maintained to keep motorists safe. All mitigation processes should be scientifically and geotechnically approached keeping in mind costs at all times.



Usually the mechanisms that attribute to slope failure and the integrity of the fill embankment is a combination of things such as loss of vegetation resulting in erosion of exposed grounds as well as changes in the consolidation characteristics of the fill material over time. Natural disasters like fires or heavy rains also contribute to the degradation of the area. Consulting firm AECOM was approached by the Western Cape government in 2015 to do a slope



stability analysis in the Overberg area of Akkedisbergpas and propose remedial actions to be taken to get the road back to a desirable state.

Fires in the area destroyed much of the fynbos vegetation. Rains shortly after the fires caused more topsoil to be washed away, leaving the ground vulnerable to slope failures.

Four different sites along the R326 road were identified where rehabilitation work was to be done. In the second half of 2016, the tender for the construction work was awarded to Penny Farthing Engineering with the undertaking to complete the project by the end of March 2017 before the rainy season in the Western Cape starts. A combination

of gabion walls, backfill, steel mesh and soil nails were proposed for rehabilitation along the R326 on Akkedisbergpas.

Prior to commencing work, a geotechnical engineer inspected the area to ensure that the wall footing and mesh positions were correct. Geobruigg's Greenax mesh was used as a permanent erosion control measure. Greenax is a three dimensional poly-propylene erosion control mat that is incorporated into high tensile steel wire mesh, providing an integrated, reinforced composite that is suitable for temporary and permanent erosion control.

Greenax can be used on embankments and cuttings where vegetation is to be encouraged. The erosion control mat provides restraint to the surface, restricting water and wind erosion from occurring, whilst still providing an ideal environment for the vegetation to grow.

The geotechnical design allowed for the Greenax mesh to be supported by summity cable fixed to the crest anchorage. Mesh were securely anchored from the crest downwards along the slope with Geobruigg's spikeplates and grouted soil nails. Adjacent mesh panels were clipped together with T3 connection clips leaving no overlaps of the mesh and reducing wastage of material.

Gabion walls ranged from 1 m to 3 m height and had to be installed in maximum 5 m sections to minimise disturbance to the existing slope. Backfill material was specified to be coarse granular material selected from excavated material where possible. The backfill was to be sloped at 1V:2H (26 degrees) with erosion protection woven mat placed on the backfill material and positioned with wooden pegs.

The rehabilitation along the road on Akkedisbergpas is a good example of integrating various methods for slope stability. ●





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# First recipient of IE3-COMPLIANT DRN motors

A major wastewater treatment project in the Vaal Triangle has become the first recipient in South Africa of the new IE3 compliant DRN motors from SEW-EURODRIVE. The new energy-efficient motors were introduced at Electra Mining 2016.

► The initial order is for 10 complete units, with gearboxes and motors (six 45 kW motors and four 55 kW motors), head of projects Rudi Swanepoel comments. These specific units will be used for aerator applications.

“With aerator and mixing applications, our projects and engineering teams have to double check all of the loads and bending moments. These loads are supplied to us by the client, based on their designs. We then have to ensure that the gearboxes that have been selected are suited to the application at hand,” Swanepoel explains.

“Our calculation programme has been designed specifically to determine if the gearbox selection is adequate, based on the loads and bending moments. This is particularly important when it comes to aerators and mixers. Thus these are not off-the-shelf products, but have been selected specifically for the system in question.”

SEW-EURODRIVE also had to comply with stringent specifications in terms of these motors, due to the arduous conditions

on-site in the wastewater treatment plant. These included the addition of auxiliary instrumentation such as PT100s (to measure temperature) and thermistors (a cut-out failsafe when the motor temperature reaches a set high point). Other additional accessories included strip heaters for colder conditions, and rain canopies.

Swanepoel reveals that, following this initial order, SEW-EURODRIVE has received a subsequent order for another major wastewater treatment in the Eastern Cape. “These two major orders in quick succession represent a foothold for us in this industry, which is definitely picking up in terms of business.”

SEW-EURODRIVE now offers its energy-efficient DRN motor series as standard across its entire product range. “The main benefit for our customers is that it reduces the total cost of ownership over the long term, which means the payback period is much quicker, and also the return on investment is that much higher.”

European regulations introduced at



Rudi Swanepoel, head of projects at SEW-EURODRIVE.

the beginning of 2016 meant that all two-, four- and six-pole asynchronous motors with a power rating of 7,5 kW to 375 kW have to meet the requirements of energy-efficiency class IE3 in the European Union (EU). In 2017, IE3 is now mandatory for all asynchronous motors with a power rating of 0,75 kW to 375 kW.

“SEW-EURODRIVE has always remained at the forefront of new technological and regulatory developments, and keeping the South African industry up to date is important to us and to our customers. The first successful order of these latest-generation motors for the wastewater treatment industry is testament to this approach,” Swanepoel concludes. ●

SEW-EURODRIVE has supplied 10 IE3 compliant DRN motors to a wastewater treatment plant.





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# RECYCLING SOLUTION concrete returns

**After years of trying to responsibly resolve the headache of readymix wastage and returns, AfriSam's Jukskei Quarry in Midrand has made a breakthrough that will see this unsightly and potentially problematic material reused in its G5 sub-base product for road-building.**

According to Mohamed Docrat, production superintendent at AfriSam's Jukskei Quarry, it is "in the nature of the game" that unused concrete will be returned to their on-site readymix facility on those occasions when customers over-order or when there are other factors that prevent the customer from taking full delivery.

"We have had a readymix batching plant on our quarry site for many years, and have always faced the challenge of having to accommodate the returned concrete in a way that is safe and environmentally acceptable," says Docrat.

"The returned concrete comes in at any time of the day or night; it can't be left in the mixers, of course, so it has to be dumped, even after hours when there is not as much supervision."

He says that a number of solutions have been tried over the years – some more successful than others – including the filling of mined out areas, the creation of roadways and block making for separation barriers in the quarry.

"One of the issues is the inconsistency

of the material being returned," he says. "Applications employing formwork, such as block making, are often constructive, but when the concrete arrives back as a 'slush', it may not keep its shape in the formwork and this can create other problems."

## Solution

Many of these ideas worked quite well in terms of the purpose for which they were designed, but they all came with associated, and sometimes unpredictable, costs.

"Ideally we wanted a solution that could pay for itself by generating a revenue stream," says Docrat. "So last year the management team put their heads together to come up with a way of generating a saleable product from the waste."

The solution focused on the idea of adding the recycled concrete to the quarry's G5 product, as this was a product category that was permitted to contain material from multiple sources (unlike products within the G1 classification, which were single-source only).

Indeed, the process of breaking up the

returned concrete generates plenty of fines, says Docrat, which is beneficial to the product as the class specification for G5 demands that it must comprise about 80% fines.

It was decided that returned material would mainly be dumped in a specified area at Jukskei Quarry some distance away from the main quarry site.

"It was important to contain the returned concrete, because it can run when it is wet," he says. "After enough drying time, we send in an excavator-mounted hydraulic hammer to break it up into sizes between about 250 mm and 400 mm. It is then loaded by excavator into a dump truck, which hauls it to a secondary stockpile."

The plant operators, as well as the load-haul operators, play an important role in checking that the material is within specification. For instance, the load-haul operators must be selective in what they bring to the stockpile, so that it can be blended in the appropriate quantities before crushing.

The blended material is then fed into a jaw crusher, after which the crushed material goes onto a production stockpile. Here, a loader operator again blends, or homogenises, the material before it is taken by dump truck to a set-back stockpile, where it is ready for sale.

"We add between 15% and 20% of

**LEFT:** Mohamed Docrat, production superintendent at AfriSam's Jukskei Quarry showing some of the paving work done using recycled concrete. **RIGHT:** The return concrete has also been used around the readymix plant to pave large areas.







*Waste at the facility that will be recycled.*

recycled concrete into the G5, giving us a good mixture of decomposed material and returned concrete,” Docrat says. “During our G5 run to produce the material for sub-base layers in road making, we began testing by trickle-feeding a small portion of returned material into the G5, and found that it worked well.”

### Quality

The first trial was on the Gauteng Freeway Improvement Project’s N1 extension, where AfriSam provided G5 for a few runs and the contractor gave it the thumbs-up; that was where the success of the idea really started to prove itself, according to Docrat.

As with all AfriSam products, quality control and rigorous testing is constantly required to ensure that it is fit-for-purpose. The material is sampled first from the production stockpile. Then, once it is in the set-back stockpile, it is fully tested for compliance with the final specification for G5 product.

“Customers also rely on the fact that all AfriSam products comply with the South African Bureau of Standards’ COLTO (Committee of Land Transport Officials) material grading specifications,” he says. “Our G5 product containing the recycled concrete has passed all the necessary quality hurdles under the SABS requirements.”

### Paving the way

Another successful application for the returned concrete at AfriSam’s Jukskei Quarry has been the paving of many parts of the readymix site.

A concerted effort is underway at the quarry’s readymix division, where a new plant is in place, to construct pedestrian walkways and to pave open areas. This is likely to consume a portion of the returned concrete.

“We have already been able to pave large areas of the readymix site,” he says. “This is possible when there is a return during the day, when there are people available to manage and supervise the pouring of returned concrete in the appropriate areas.”

This process begins with the preparation of areas to be paved, so that wet concrete can be poured into the waiting formwork and immediately leveled, with expansion joints left between the slabs.

It is a well-organised process that ensures an attractive and functional end-result, he says.

### Environment

Docrat highlights the importance of an environmentally friendly response to the issue of returned concrete, as there are no dumping facilities which accept this kind or quantity of waste. Recycling also means no slush around the plant, less potential for contamination, and a smaller carbon footprint.

“Our Environmental Management Programme requires that we achieve a certain level of recycling in our waste management strategies, and this breakthrough in recycling concrete is certainly a contribution to our performance in this regard,” he says.

The actual amount of concrete recycled each month is dependent on sales, which

vary according to the economic climate and times of year. But he is confident that the amount of returned concrete that will be recycled into saleable AfriSam product could comprise up to 60% of the total concrete returned to the readymix site.

The recycling process, he says, will certainly make for a more sustainable environment; while at the same time make a contribution toward offsetting the costs that returned concrete place on the business.

### Preserving the planet

AfriSam’s Jukskei Quarry, one of the company’s 17 aggregate plant sites nationwide, produces concrete aggregate, crusher sand, base and sub-base material.

As part of AfriSam’s corporate commitment to conserve the planet, it directs significant effort towards environmental stewardship. As a result of ongoing research, the company has developed a cement product – Eco Building Cement – that has a carbon footprint of 453 g/kg, which is almost half of the world average of 890 g/kg. ●

*The final product after it has been recycled and blended.*



# INNOVATIVE environmental INITIATIVES

## An innovative approach saw several impressive environmental initiatives implemented by Murray & Roberts Infrastructure on the Loeriesfontein Wind Farm and Khobab Wind Farm project in the Northern Cape.

Situated close to the Helios substation in the Hantam Municipality, when completed these two wind farms will boast a total of 122 wind turbine generators between them and each will feed 563 500 MWh of clean renewable energy into the national grid.

The Loeriesfontein Wind Farm and the Khobab Wind Farm were constructed by Murray & Roberts Construction in a consortium with CONCO. Significantly, the two companies also successfully completed the construction of the Noupoot Wind Farm for operator, Mainstream Renewable Power South Africa.

### An arid region

“Constructing such important projects in

this remote location called for innovative thinking on our part,” Stephan Venter, project manager for Murray & Roberts Infrastructure, says. Boesmanland in the Northern Cape is an arid region, which has been further exacerbated by the grips of a severe drought making the availability of water a major challenge for all. As a result of this major water scarcity, limited extraction rates were allowed in the Water Use Licences.

Venter says that the water shortage and low extraction limit was taken into account by the Murray & Roberts Infrastructure team, and an intense water management plan aimed at reducing water consumption was put into place.

Marli van Rooy, environmental officer for Murray & Roberts Infrastructure on the project, says that the main strategy was to reuse as much of the water under the company’s control as possible as this would reduce the need to source additional water supply.

As part of the initiative, Murray & Roberts Infrastructure installed a modular water treatment plant on site. The plant has a screening system which removes

the heaviest solids, while bacteriological rollers treat the remainder. Significantly, no chemicals are used during the process.

“Having the plant allowed the treatment of grey and black water generated on site and the reuse of this recycled water for construction purposes,” Van Rooy explains.

Majority of the recycled water was used on the earthwork layers for the wind turbine bases. On average, the treatment plant cleaned 30 000 litres per day and the treated water was stored in two reservoirs for reuse.

Another initiative aimed specifically at reducing water consumption was the construction of a specialised wash bay solution at the on-site batch plant. “Washing the drums of readymix concrete trucks is a necessity on any construction site, but wasting water is not,” Van Rooy explains.

The wash bay comprises a series of settlement ponds, with each having an overflow which reports to the next pond once it reaches a certain level. The concrete sludge settles in the pond and once this happens it is removed manually and left on a specially constructed bunded slab to dry. “This resultant dried material was removed

*Marli van Rooy, environmental officer for Murray & Roberts Infrastructure, outside the modular water treatment plant installed by the company.*



*“On a site as remote as this, soil contamination can be an extreme challenge as there are further complications including the distances to the nearest hazardous landfill site which is in Cape Town.”*





Another initiative aimed specifically at reducing water consumption was the construction of a specialised wash bay solution at the on-site batch plant.

to the quarry site where it was crushed and blended with aggregate for reuse in the turbine bases," Van Rooy says.

Dust suppression is critical on any gravel road and especially more so in an extremely arid region where excessive dust can pose a safety hazard.

### Dust suppression

"The rate of traffic on the Granaatsboskolk Road more than quadrupled with the construction of the wind farms and there was a need to implement a system that would allow control of the dust but would not be a water intensive system," Van Rooy explains.

The introduction of the E-Cat dust suppression system on this main access road resulted in a significant reduction of water consumption. It is an added benefit that this particular dust suppression system is environmentally friendly.

### A bioremediation facility

Other environmental initiatives on site included a specially constructed bioremediation facility. Van Rooy explains that the issue of contaminated soil is always a challenge on construction sites.

"On a site as remote as this, soil contamination can be an extreme challenge as there are further complications including

the distances to the nearest hazardous landfill site which is in Cape Town," she says.

The bioremediation facility breaks down hydrocarbons to water and gas, thereby eliminating the hazards associated with contaminated soil. Van Rooy is quick to add that this has gone well beyond the requirements of the EMPR.

### Flora

Commenting on the protection of red data flora, Van Rooy says that protected and endangered species within the development footprint which included the road, laydown and foundation base area were identified and relocated.

Van Rooy says that what was specifically an interesting challenge was that one of the protected flora species, *Hoodia gordonii* (commonly known as Xhowa), has been part of some of the local community's diet for many centuries.

"The Bushmen who previously inhabited this area used to eat these plants as it was known to suppress hunger, and this practice is relatively widespread among their descendants. This has necessitated an extensive re-education programme among these people," Van Rooy says.

Another example of a protected species is



An interesting challenge was that one of the protected flora species, *Hoodia gordonii* (commonly known as Xhowa), which has been part of some of the local community's diet for many centuries.



Another example of a protected species is the *Skilpadtoontjie* (*Aloinopsis luckhoffii*) which is endemic to the area.

the *Skilpadtoontjie* (*Aloinopsis luckhoffii*) which is endemic to the area.

Van Rooy says that being environmentally responsible is part of Murray & Roberts Infrastructure's ongoing commitment to sustainable development, and this includes educating all its people in terms of using environmentally sound practices. ●

# TRIMMING COST of PRODUCTION

Sharing its expertise to help customers build their businesses is a vital part of the way AfriSam works, and now the company has developed a special value-added service to boost efficiency among concrete product manufacturers (CPMs).

“Times have been tough for most sectors in recent years, and AfriSam is extending its partnership with customers to offer an Efficiency Audit that highlights areas where CPMs can streamline their operating processes making them more profitable,” says Amit Dawneerangen, AfriSam national sales manager.

“We have a close relationship with our customers and this partnership is based on always striving to do things better,” says Dawneerangen. “So the conversations we have with them often touch on a range of technical and commercial challenges that we work to resolve together.”

The Efficiency Audit is conducted

by a team of AfriSam experts, who are invited into the customer’s production facility to collect information on a range of operational areas, from raw materials and testing systems, to production processes and quality controls.

“Taking on the role of a technical consultant, some of the industry’s most experienced professionals are made available to the customer, so they can engage on how best to drive down unit costs and improve business sustainability,” he says.

## Experts in materials

He emphasises that while CPMs have experienced production managers and staff, it is seldom affordable to have their own materials experts. This is where AfriSam’s Efficiency Audit teams can play a valuable role.

Implementing the initiative is AfriSam’s Centre of Product Excellence and according to manager, Mike McDonald, the Efficiency Audit team focuses on improving the overall cost of production, which may require changes to any of a wide range of variables.

“We are specialists in the materials that make up concrete, so most of our value is added on this side of the business, which also makes up a large part of a customer’s operating cost,” says McDonald. “We can ensure that their material quality and mix is optimal at the lowest possible cost to the business.”

## Strategic partner

For various reasons including down-scaling and retrenchments during the current downturn, many companies do not have a concrete technology specialist in-house. This is a role that AfriSam is well-placed to provide, as a strategic partner, says Dawneerangen.

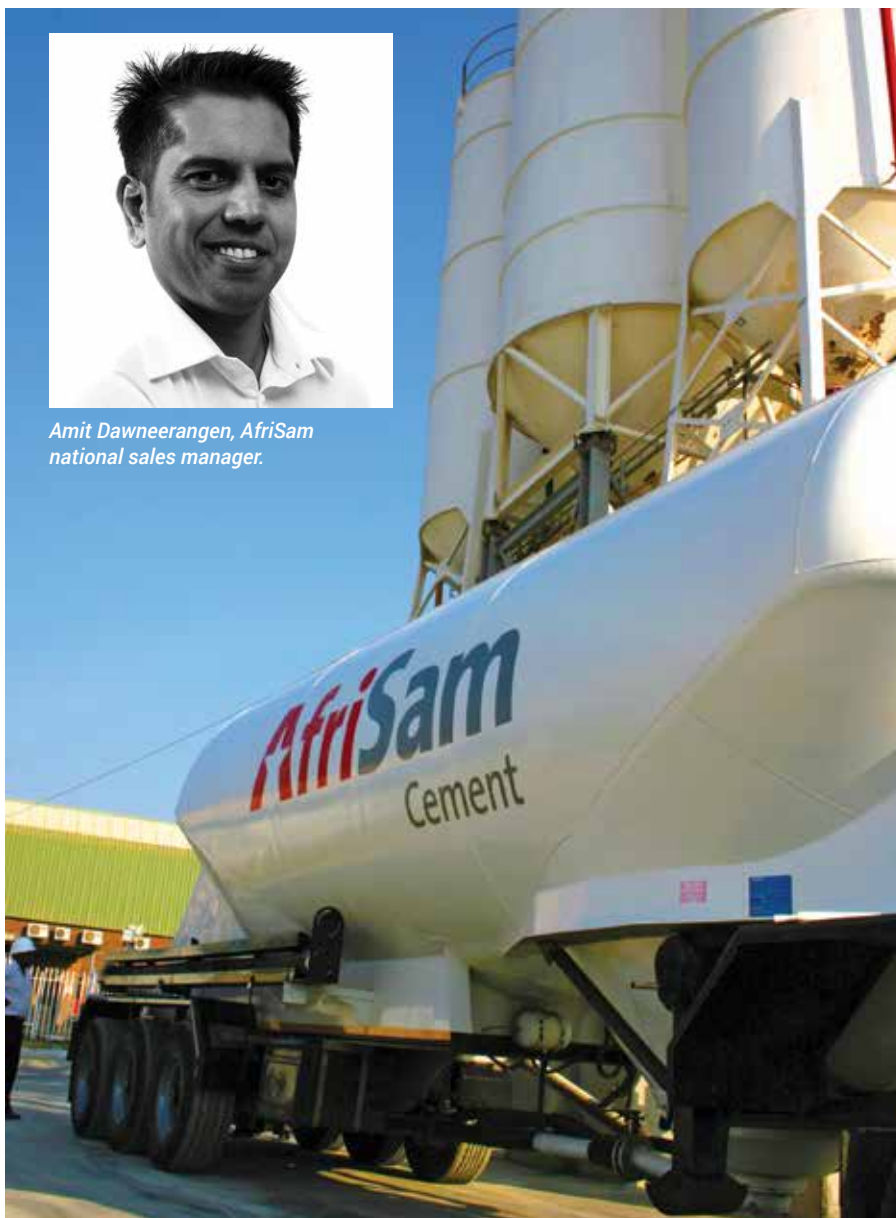
“Conditions are tough with low growth in the demand for cement and cement products since 2010,” say McDonald. “The focus on cost efficiency has led to a lot of rationalisation, where inefficient plants were closed down and industry had to find ways to consolidate production.”

Dawneerangen highlights the fact that the current industry mindset often focuses only on the cost of materials in terms of Rand-per-ton, leading many businesses to buy the cheapest available materials without carefully considering the impact of this decision on other important business objectives.

“For example, admixtures can be a vitally important ingredient in the success



Amit Dawneerangen, AfriSam national sales manager.



Sharing its expertise to help customers build their businesses is a vital part of the way AfriSam works.





**Mike McDonald, manager at AfriSam's Centre of Product Excellence.**

of their products," he says, "so changing the admixture for the sake of a relatively minor cost saving could have damaging consequences in the production process and end up costing more."

### Transparency

To get the most out of an Efficiency Audit, says McDonald, there needs to be an open and honest relationship between the team and the customer.

"The customer needs to allow us access to their plant and all relevant figures and data, so we have a full and clear understanding of operations at that facility," he says. "Clearly it would not be possible to engage usefully and offer constructive advice if important information is hidden."

The audit is an intensive process involving usually about four experts, each one being a specialist in concrete, cement, aggregates or processes.

"These specialisations do not necessarily reside in a single person, hence the importance of an integrated team, where their knowledge overlaps and reinforces the value for the customer," McDonald says.

The audit covers the full scope of the operation, from when the materials are delivered, to the in-house testing methods, the manufacturing process and the quality of the end products, says Dawneerangen.

"This reveals areas where improvements can be made, which might include increasing efficiencies or optimising mixes for the purposes intended," he says. "Many CPM plants employ relatively old technology and methods, and they find it exciting to discuss new ideas that could boost their profitability."

### More to choose

With the continuous evolution of cement applications, there is now a wide range of highly specialised cements that can add extra value to specific applications, while also saving on the overall cost of the operation.



*One of the most valuable aspects of the Efficiency Audit is the access that customers gain to AfriSam's SANAS-accredited laboratory at the Centre of Product Excellence's Roodepoort premises.*

For instance, AfriSam's innovative Rapid Hard Cement, South Africa's only product in the 52.5R strength class, is able to give concrete a strength of 30 MPa in just eight hours when correctly activated and treated. This offers CPMs quicker turnaround times as the manufactured concrete product can be released from the mould sooner, making the production cycle more efficient.

The cement's highly consistent strength performance adds to the value proposition, allowing customers to time their processes with precision. Efficiency is further enhanced by ensuring that there is no breakage due to weakness when products are removed from their moulds.

McDonald emphasises that, with material quality at the heart of the drive toward efficiency, one of the most valuable aspects of the Efficiency Audit is the access that customers gain to AfriSam's SANAS-accredited laboratory at the Centre of Product Excellence's Roodepoort premises.

"Here, we can conduct tests on customers' material at a very high level of integrity and technical standard," he says.

"Concrete is a complex product and requires more than visual assessment before recommendations can be made."

### Cost effective trials

Trials in the laboratory are a very cost effective way of comparing the performance of different materials and identifying the opportunities for improvement, says Dawneerangen.

"Our facilities allow us to simulate the curing process, for instance, with state-of-the-art curing chambers that are controlled for temperature and humidity," he says. "This means we can test various conditions, especially because our larger customers use this kind of modern technology in their day-to-day processes."



*AfriSam's innovative Rapid Hard Cement, South Africa's only product in the 52.5R strength class, is able to give concrete a strength of 30 MPa in just eight hours when correctly activated and treated.*

While quality control tests are conducted at the larger CPMs' own laboratories, AfriSam's advantage is the ability to investigate in detail what alterations in the mixture will lead to optimal results.

McDonald also emphasises the value of a 'fresh pair of eyes' in any business, bringing a new perspective to potential cost saving opportunities that are not so easily visible to staff who are under daily production pressure and who have grown accustomed to existing patterns and habits.

"Managing and recovering waste is one of those areas where improvement is frequently possible," he says. "There is often a lot of money literally going down the drain, be it in the form of water, cement, sand or other costly production inputs."

He concludes by reiterating the importance of looking at the whole production process for efficiency opportunities, rather than trying to save on one or other input in isolation. ●

# The key to MAKING QUALITY mortar and plaster

**With so many reports of poor workmanship in the construction of houses and other buildings, it is worth going back to basic truths about how to achieve a high standard of mortar and plaster.**

► Brenton Brouard, technical manager, concrete at CHRYSO Southern Africa, explains that an acceptable standard mix design demands the use of ingredients that are of an acceptable quality.

“The choice of materials is vital,” he says. “Use good cement; one with the South African Bureau of Standards (SABS) mark that complies with the SANS 50197 standard. It is probably most practical to use cement in the 32 N and the 42,5 N (preferred choice when making plaster) strength class.”

One should also use clean, well-graded sand. This, Brouard explains, is because washed plaster sand will ensure that clay levels have been reduced. “Sand with too much clay is not good for plastering as the clay greatly increases the water demand of the mix and this increases the potential for shrinkage and cracking. He says that even water quality is important and says clean, potable water should be used.

This should give a good quality mortar and plaster that is soft and plastic; cohesive without being sticky and can be placed easily. Using sub-standard materials in plasters may result in cracking, dusting, poor cohesion and crazing – those narrow, shallow, interconnected cracks that appear on plastered surfaces within a few days of casting.

Brouard says one of the biggest problems on site is the mixing of quantities of mortar and plaster which are too large to be accommodated by the rate of application. This results in the rapid loss of workability due to evaporation (caused by sunlight, heat and wind).

On many sites, the solution is to increase the workability to the original level by re-tempering with additional water. “In almost all cases, this both reduces the strength and increases the potential for shrinkage cracking of the mix,” he says.

Brouard says mixed batches should be protected by immediately placing the mortar or plaster into watertight containers with lids and only quantities that will be applied relatively quickly should be removed from these containers.

This will reduce the risk of evaporation from the mix and as a result, increase the pot life of the mix.

Chemical solutions company CHRYSO Southern Africa recommends the use of CHRYSO® Stab rather than water in order to retain workability of plaster or mortar. CHRYSO® Stab acts as a retarder and an air entrainer, imparting micro-bubbles into the plaster or mortar, significantly reducing the amount of water in the mix. This reduces the risk of shrinkage and the potential cracking resulting from it.



**Brenton Brouard, technical manager: concrete at CHRYSO Southern Africa, explains that an acceptable standard mix design demands the use of ingredients that are an acceptable quality.**

CHRYSO® Stab also makes the mix light and fluffy and for an optimum workability, with sufficient entrained air, a targeted slump of 120 to 150 mm is recommended.

In conjunction with the appropriate protection, typical dosages of CHRYSO® Stab will produce brick laying mortars with pot lives of eight to 36 hours and plasters with pot lives of four to six hours. Brouard cautions that it is important to remember that extended pot lives are not recommended for plasters because additional bleeding from large exposed surface areas will increase the risk of shrinkage cracking.

In addition to CHRYSO® Stab, using CHRYSO® Fibrin Fibres will inhibit surface cracking. Once the plaster has been applied, it is also important to cure the surface using fog sprayers as well as a curing agent from

**The Vodacom Data Centre where a waterproof plaster was used to prevent tiles from falling off the façade.**



**CHRYSO® Stab will produce plasters with pot lives of four to six hours.**







*Chemical solutions company CHRYSO Southern Africa recommends the use of CHRYSO® Stab rather than water in order to retain workability of plaster or mortar.*



*In conjunction with the appropriate protection, typical dosages of CHRYSO® Stab will produce brick laying mortars with pot lives of eight to 36 hours.*

the CHRYSO® Cure range. Another useful product when dealing with mortars and plasters is a bonding agent called CHRYSO® Cim. CHRYSO® Cim is very effective in improving the bond, but only if the substrate has been properly prepared.

CHRYSO® Pigments can also be used to impart colour to the mortar or plaster. For uniform colour, the pigment should be thoroughly mixed with the cement prior to

mixing with the sand. Machine mixing is preferable, if not essential.

Products from the CHRYSO® Fuge range can also be added to mortar or plaster to prevent the ingress of moisture through the wall. By reacting with calcium hydroxide produced by the cement, pores within the plaster or mortar are blocked and this prevents moisture from penetrating the surface of the plaster or mortar.

Mechanical mixing is another important contributor to a good quality mortar or plaster, as are the right mix proportions. Where volumes are sufficiently large enough, many readymix concrete companies are able to provide sites with quality controlled retarded mortars and plasters. This eliminates many of the problems associated with volume based site batching. ●



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# PLASTERING DEFECTS

## beyond cracking

While cracking of plaster is the most common problem encountered by property-owners or contractors, there are also several other types of plastering defects to cause headaches. Here John Roxburgh, lecturer at The Concrete Institute's School of Concrete Technology, deals with other types of plastering defects, what causes it, and what to do about it.

### Debonding

Debonding of plaster is often noticed as a hollow sound when the surface is tapped. Plaster is inclined to curl and debond from the wall because the outside skin of the plaster exposed to the air will shrink at a different rate than the plaster in contact with the wall. This is especially true of excessively thick plaster layers.

Small areas of debonding (about the size of a plate) are not significant, but larger areas should be removed and replaced. Because debonding is generally the result of inadequate preparation of the substrate, it is important to make sure that the bond between plaster and wall is as good as possible.

This can be done by:

- Cleaning dusty or oily wall surfaces thoroughly.
- Allowing the walls to reach the correct moisture content.
- Using a cement slurry or spatterdash coat before plastering.
- Using bonding liquids and following the procedure recommended by the manufacturer.

### Lack of hardness

There are no specifications covering the hardness or strength of plaster, and no reliable way of measuring it.

Evaluation is often carried out by scratching the surface with a hard sharp object such as a screwdriver or a key, and is consequently quite subjective.

It is often better to have a slightly weaker plaster less likely to show significant cracking or debonding than one which is too strong. However, very weak

plasters will be unable to resist impacts, will have reduced resistance to water penetration and picture nails will tend to fall out. They also tend to encourage moss growth on sheltered faces, particularly if poor quality paint is used. There are five common causes of soft plaster:

- Insufficient cement.
- The use of sand containing excessive quantities of dust (more than 15% by mass passing the 0,075 mm sieve).
- The use of a mix with poor water retention properties.
- The addition of extra water too long after first mixing (a practice known as re-tempering).

Rapid drying due to plastering in full sun or wind results in moisture loss, generally caused by:

Evaporation, if the wall is not protected from sun and wind.

- Suction into the walls, if the masonry units are absorbent and have not been dampened.
- Use of a sand that is badly graded and lacks fine material (less than 5% by mass passing the 0,075 mm sieve).
- Not using building lime or a masonry cement when the sand lacks fine material.

### Grinning

Grinning is the term given to the appearance of a plastered wall when the positions of the mortar joints are clearly visible through the plaster. It is caused by the difference in suction between the masonry units and the mortar. Raking out mortar joints also causes grinning and the practice should thus be limited to soft clay brickwork.

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



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Debonding of plaster is often noticed as a hollow sound when the surface is tapped. Pictured: debonding from an off-shutter concrete surface.

Plaster popping as a result of expansion of ash bricks.

While grinning may be unsightly, it is unlikely to lead to further cracking. The choice is to live with it, or to remove and replace the plaster. Application of an undercoat or a spatterdash coat before plastering will help to avoid grinning.

### Expansion

This includes swelling, softening, layer cracking and spalling of the plaster. It is usually caused by the inclusion of

proprietary gypsum-based products in the mix. Under moist conditions, the sulphate from the gypsum reacts with the portland cement paste and forms compounds of increased volume which disrupt the plaster.

The only remedy for expansion-induced disruption due to gypsum in the mix is to remove and replace the plaster.

### Popping

Popouts are conical fragments that break

out of the surface of the plaster leaving holes that vary in size. These are caused by the presence of contaminant particles in the mix which, reacting with the moisture in the mix, expand and cause cavities in the plaster.

Contaminants are usually seeds, other organic material, or particles of dead burnt lime. Once the cause of the popout has been removed, the hole can be filled with a proprietary filler and painted over. ●



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# PRECAST concrete for a MODERN HOTEL

To meet demand, management of EMM Convention Centre are expanding the existing sophisticated infrastructure by as much as 61 rooms by building a new hotel on site in Sibasa, Limpopo.

The new 2Ten Hotel being built next to the convention centre in the heart of Sibasa, five kilometres outside Thohoyandou in Limpopo, will more than double the current hotel room capacity. It will also feature the same high quality facilities its patrons have come to enjoy over the years.

By June 2018, owner of the facility, George Magwabeni, intends opening the new hotel to his clientele, which includes representatives of state and business people, as well as students and personnel of the University of Venda.

## Planning

Right from the early planning stages of the second phase expansion, Magwabeni and his management team decided that they wanted a modern structure that would continue to add value for the next 30 years.

Paragon Architects have therefore designed a robust and durable building that relies extensively on a precast concrete solution from Corestruc.

"I was introduced to Corestruc and its systems by Paul Botha,

our structural engineer. Representing VBL Consulting Engineers, he has nurtured a long working relationship with the precast concrete specialist. I was very impressed with what the company had to bring to the project," the property developer and successful entrepreneur tells *Construction World*.

Certainly, one of the other benefits this system offered the professional team was a quicker and safer build considering that all of the precast elements are manufactured in tightly controlled conditions and then transported to site where they are installed.

## Benefits

By undertaking construction in this manner, Magwabeni's team has also overcome one of the most challenging aspects of the project, namely extremely constrained on-site conditions.

A precast solution has reduced the number of workers on site, while eliminating complex co-ordination of ready-mix deliveries, as well as the erection and dismantling of formwork and scaffolding.

There is just enough space for a tower crane to lift and help install the various precast elements placed in a very limited laydown area, which receives about nine wall panels and six slabs a day to complete the rest of the structure now that the columns, beams and floor slabs are in place. Horse-and-trailer trucks had to be separated after offloading of the pre-cast concrete elements to allow Corestruc to turn the trailers around the tower crane so that the truck could exit the site.

One of the most complex aspects of the project is the installation of and the coping and 840 m<sup>2</sup> of precast concrete wall panels around the perimeter of the structure.

## Accuracy

The accuracy and tolerances of between two millimetres and three millimetres on the features and dimensions of the wall panels and coping is testament to Corestruc's manufacturing and installation processes.

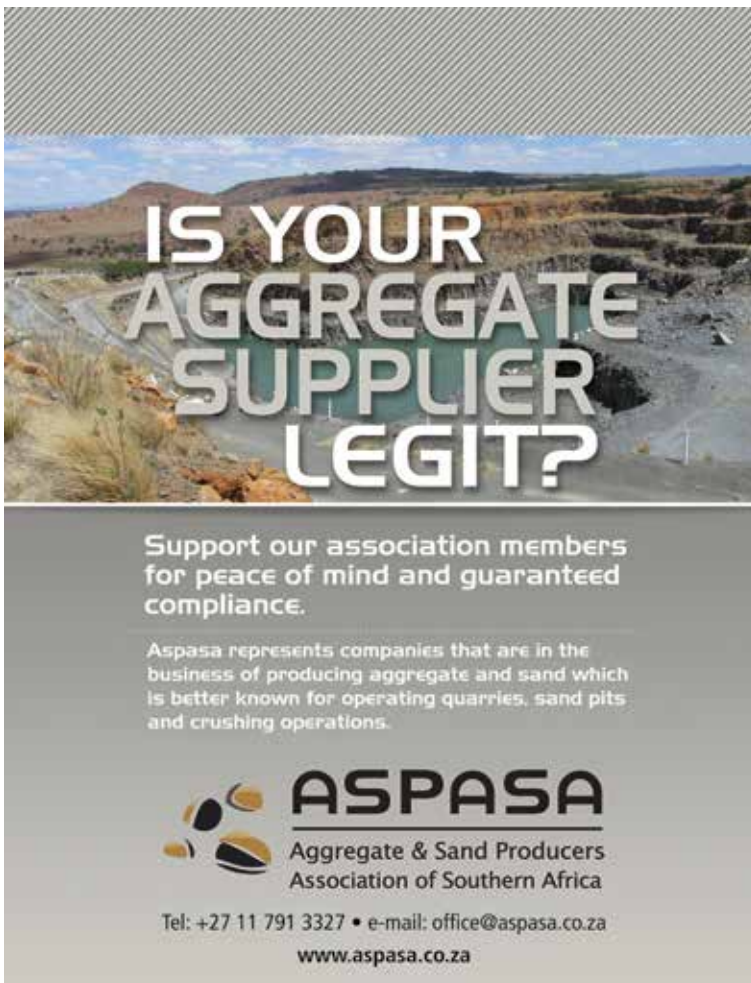
As the company's Russell Hobbs points out, achieving this level of accuracy deploying conventional in situ construction techniques would be near to the impossible without prolonging the building period.

The use of self-compacting concrete (SCC) to manufacture all of the panels, as well as coping allows for a very high-quality finish, ensuring an aesthetically appealing façade. Importantly, this SCC, which has been designed by Corestruc's own concrete technologists, also adds to the overall durability requirements of the final build, with each of these items between 80 Mpa and 94 Mpa.

This fluid concrete that does not segregate is poured into specialised forms that Corestruc imported from Australia especially for this project. This technology has streamlined and accelerated manufacturing, as well as logistics of supply to site.

As is the case on all of Corestruc's projects, accuracy in the precast yard and on-site have also been bolstered by sound up-front planning. This includes the design of a template right around the structure to guide the manufacture and installation of the extensive coping and wall panels required for the build.

They are installed using a small team of five people, including the tower crane operator, starting with the bolting and grouting of the coping into the hollow-core floor slabs. They, in turn, support the large panels upon



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the use of floor space, while allowing the architects to achieve an impressive slenderness ratio. They are connected to the perfectly aligned columns that were installed according to a template that was placed on top of the foundations in the very early stages of installation.

which the smaller precast concrete items rest. This allows for a repetitive process, with accelerated production rates on site also aided by the choice of an international fixing system early on in the final design stages of the project to facilitate quicker installation of the various precast elements.

Most of the precast concrete items are bespoke items and designed especially for this project, including the 'fanning' to close openings between slabs due to the sloped terrain of the building site.

However, it is the continuous precast concrete columns towering over the site that best reflect Corestruc's design, manufacturing and installation capabilities.

Extending all the way from ground level to the roof of the hotel, they vary between 60 MPa and 70 Mpa. One of these columns carries about 400 tons, including structural steel, as well as the pre-cast concrete floor slabs and beams. The latter span between 5,5 metres and eight metres between the centre columns, optimising

A total station was used to align them to achieve the dimensional accuracy, with the installation teams achieving tolerances of between three and five millimetres at height during this stage of the build.

Once the beams are in place, the floor slabs are laid and then filled using a non-shrinking grout designed by Corestruc to provide high weather proofing properties. This is in addition to the good curing traits of the material, which achieves a 30 MPa and even exceeds 60 MPa within the traditional 28 days.

At the time of writing, Corestruc's team was forging ahead mainly working standard shifts to allow the various trades to access the site as soon as possible, with brick works scheduled to commence in June this year.

While Magwabeni remains impressed with the overall performance of the company and its pre-cast building solution, he says he is excited to be part of the deployment of a modern construction technique in the property development sector. ●

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# SPECIALLY-FORMULATED coolants essential

**It is essential that heavy-duty vehicles utilise specially-formulated coolants for optimal performance and efficiency. While modern diesel engines are highly efficient, they are also stressed and need to be looked after. Coolant therefore plays a vital part in proactive vehicle maintenance.**

While many consider the radiator as the critical part of a cooling system, the use of a high-quality coolant is essential in optimal performance and efficiency. This is especially critical in light of the fact that 40% of engine failures are attributable to cooling-system problems.

Coolant comprises water, ethylene glycol, and a chemical portion. "The coolant is an integral part of vehicle engine maintenance. Its water content portion cools down the engine, while the ethylene glycol forms the anti-freeze portion of the mixture. The smallest, but arguably the most important component, is the chemical make-up, which protects the internal surfaces of the engine," Tinus Naude, Cummins filtration mining manager, explains.

A vehicle's cooling system has various metals, with differing sensitivity to corrosion. Aluminium, for example, is extremely sensitive to corrosion by chemical attack. In order to protect aluminium components in the engine, a silica compound forms part of the coolant formulation to specifically protect aluminium surfaces.

## Danger of chlorine

While water is a critical ingredient, ordinary tap water cannot be used, as this could be detrimental to the lifespan of a vehicle's cooling system. "Chemicals such as chlorine are commonly added to water to make it safe for human consumption. These chemicals not only disrupt the chemical makeup of the

coolant, but cause rust. This has resulted in the specific formulation of long-life pre-diluted coolants such as ES Complete were formulated," Naude elaborates.

Some industrial operations even make use of borehole water, which is often calcium-enriched, leading to calcium deposits forming in an engine. These deposits form an insulation layer that separates the water from the engine components it should be cooling. A 3 mm build-up of calcium creates an equivalent heat barrier to that of 50 mm of extra steel. This obstructs heat transfer, leading to a dangerous temperature spike.

ES Compleat Glycerin pre-diluted coolant is an innovative heavy-duty engine coolant made from Glycerin, a raw material derived from renewable energy sources such as biodiesel by-products. Glycerin is used in place of ethylene glycol (EG) or propylene glycol (PG), making for a 'green' product for superior engine protection.

## Regular coolant testing

Naude stresses that a good vehicle cooling system maintenance programme should include regular coolant testing. "It is recommended that a cooling system test be completed every 30 000 km to check the quality of the vehicle's coolant, and to determine any level of contamination. One of the most neglected parts of an engine system is the cooling system, and the only way to recover from a failure is to overhaul the engine, which is immensely costly."

Coolants can be tested effortlessly and accurately with either a refractometer or with coolant-quality test strips, both of which are supplied by Cummins. The Fleetguard Refractometer is a fast, easy way to determine the freeze point protection of both Ethylene Glycol and Propylene Glycol coolants.

Cummins-branded Restore alkaline-based cleaning fluid is designed to clean a vehicle's engine and cooling system by removing all unwanted deposits and residue from inside the cooling system itself. In the event of a lack of regular maintenance, Restore highlights any leaks or problems



detected. If the cooling system has been maintained properly, and the correct coolant used, Restore will ensure that the cooling system continues to operate in good working condition for a prolonged period.

## Fleetguard range

Cummins also supplies a range of Fleetguard coolant products, which protect engine components against corrosion, liner pitting, cavitation, scale and deposits and acidification. These include ES Compleat OAT, ES Compleat, Fleetcool EX, Fleetcool, and Fleetcool Recycled.

For example, the environment-friendly Fleetguard ES Compleat Organic Acid Technology (OAT) coolant formulation is free from harmful inorganic compounds such as nitrite, amine, phosphate, borate and silicate. OEMs consider these chemicals as being particularly harmful to human health and safety and the environment. Other inorganic compounds such as 2-Ethylhexanoic acid is also particularly damaging as it degrades silicon-based seals.

Naude points out that the Fleetguard ES Compleat OAT coolant formulation does not contain any harmful additives that are declarable under the Global Automotive Declarable Substance List. "It is the most effective and environment-friendly solution to the increasingly challenging maintenance demands of today's heavy-duty diesel cooling systems. Using this technology, fleet owners can extend service intervals to 6 000 hours, or even 500 000 km," he concludes. ●





## Vane-tastic flowmeter

The Vane Technology Principle, a method of measuring and monitoring the flow of different media through piping, has been proven worldwide. Kobold flow meters/monitors work with this proven principle.

KOBOLD, represented locally by Instrotech, has on offer a new rotating vane flowmeter; the equipment of choice whenever traditional impeller technology is to be used for the measuring or monitoring of volumetric flow rates.

The modular design of this type makes the system universal in use, inexpensive and space-saving in operation.

The DFT completely fulfils the requirements of industry for efficient and low-cost production methods. Due to the option of a PTFE housing users get a resistant and highly reliable measurement system for operation in aggressive media.

The wide measuring range of 0,2 – 2 l/min up to 3 – 60 l/min means that

DFT rotating vane flowmeters can be used for a wide variety of applications. With a maximum operating temperature of 80 °C and a maximum pressure of 16 bar (if the brass housing is used), this device can be used for almost all process conditions.

The heart of the Kobold impeller is a securely embedded ring magnet which is hermetically sealed against the respective medium. It transfers the rotation of the impeller to a Hall sensor fixed to the housing with a space-saving attachment. This sensor in turn transforms the rotational movements into a frequency signal in proportion to the volumetric flow. The downstream Kobold electronic evaluation unit then transforms the signal into either



a digital display or an analogue normalised signal or it can be used to switch up to two limit contacts. LEDs show operational readiness and switching state of the limit value relay. Also counter or dosage electronics can be used.

In combination with the Kobold electronic unit this system provides extremely accurate measuring results, under difficult conditions.

Typical applications are in cooling water monitoring; general mechanical engineering; waste water treatment; all heavy goods industry and in the chemical industry. ●

## Faster sample results

Leading condition monitoring specialists WearCheck recently invested in excess of R1,7-million in new high-tech equipment in both the transformer and fuel sections of their Joburg-based Speciality laboratory.

The Kruss K11 tensiometer, an ADU 5 distillation unit, a SVM3001 stabinger viscometer as well as the PMA 5 Pensky-Martens closed-cup flash point tester are among the new pieces gracing the countertops in WearCheck's laboratory.

These highly accurate, sophisticated instruments – which have boosted the lab productivity by offering new tests and saving time on existing ones – have also reduced the turnaround time to generate customers' sample results.

The ADU 5, a fully-automated distillation unit which is operated by a touch screen interface, performs distillation tests according to ASTM D86. This is recognised as one of the most reliable methods to determine the boiling range characteristics of petroleum products, and is a critical measurement of the overall performance and safety of fuels.

A given volume of sample is placed in a distillation flask and distilled according to strict guidelines as specified in the standard. The sample is heated and vapourised. This vapour is then cooled in the condenser line and the condensate is collected in a graduated cylinder. The temperature of the recovered volume of condensate is recorded precisely during the test.

The SVM3001 is a Stabinger viscometer which is capable of multiple parameter measurements in a single analysis, eliminating the need for many separate tests.

The instrument can simultaneously measure kinematic viscosity according to ASTM D7042, dynamic viscosity, as well as the density according to ASTM D4052 in lubricating oils, base oils, additives and fuel oils. The sample is simply injected using a syringe and measurement is started via a touch screen panel.

The automatic PMA 5 Pensky-Martens closed-cup tester measures the flash point at the lowest temperature at which the



Senior laboratory technician at WearCheck, Lizzy Chabangu, operates the condition monitoring company's brand new PMA5 Pensky Martens closed cup flashpoint tester in Johannesburg recently.

application of an ignition source causes the vapours of a sample to ignite. This instrument is suitable for flammability applications on fuels like diesel, heating oil, kerosene as well as both biodiesel and biodiesel blended fuels.

The ADU 5, SVM3001 and PMA 5 are upgrades to existing equipment operated by WearCheck. The acquisition of these instruments has boosted our service delivery by yielding highly accurate results and reducing our turnaround time which is of benefit to our customers.

Using the Kruss K11 tensiometer, the analysis of the decomposition product content of transformer oil is done in accordance with ASTM D971. This fully-automated instrument conducts precise measurement of surface tension and interfacial tension (IFT). The IFT is determined by measuring the force necessary to detach the platinum ring from the surface of the liquid of higher surface tension under rigid conditions based on the fundamental Du Nuöy principle of establishing surface tension.

This data is key in the maintenance of transformers and in making informed decisions on whether to extend the life of the oil – a useful way to save customers money. ●

# COMPACT machine, big machine POWER

**Smith Power Equipment (SPE), distributors in South Africa of Kubota tractors and construction equipment, has announced the arrival of the Kubota KX080-3S Super Series 8-ton excavator, which is the ideal solution for jobs requiring extra power and performance in confined spaces.**

“The KX080-3S can do almost anything that larger, more conventional machines can do but it can achieve this level of industrial performance on small, space-restricted construction sites. It’s unique proposition for local contractors needing real power in the congested urban environment,” says Tom Bloom, SPE general manager construction equipment division.

In its more than 36 years’ involvement in the compact-excavator industry Kubota has continuously set the standard with technological innovations that rocked the industry. Initially, the integration of the zero boom and tail swing in the mini-excavators and now the ‘tight tail swing’ of the bigger KX080-3S are examples of such innovation. Other innovations, which also helped create the future of compact construction machinery, included the pioneering, advanced features of Auto Idle and Kubota’s revolutionary ‘3-pump’ hydraulic system, both of which also feature in the KX080-3S.

**Tight tail swing** – due the KX080-3S’s contoured tight tail design and shorter rear overhang, it is more stable, can handle a wider range of loads and can work in significantly more restricted space than traditional tail swing excavators.

**Auto Idle** – this system helps save up to 10% fuel. When the control levers are in neutral for more than four seconds, the engine idles automatically. Move any

control lever and the engine immediately engages. This innovative feature reduces noise, exhaust emissions and running costs.

**3-Pump Hydraulic System** – this load-sensing hydraulic system uses three independent pumps for boom, arm and swivel for more efficient bucket operation. The system’s high capacity control valve and hydraulic variable pumps enable high performance shovelling and loading.

There are also several other unique features which differentiate the Kubota KX080-3S excavator from its competitors. These include:

- **Stability** – the KX080-3S combines smooth, harmonised, hydraulic system performance with optimum balance for optimum stability in a tight tail swing excavator.
- **Range** – together with extended dumping height, a swing boom, large bucket capacity and deep digging capability, the KX080-3S can match or exceed the latest high capacity dumpers, tippers and construction site requirements.
- **Oil Flow Control** – this unique function enables the operator to control the oil flow according to requirements at the time of operation including the requirements of the specific attachments in use.
- **Electric Fuel Refilling Pump** – standard with the KX080-3S’s, this new pump includes a hose long enough to refuel in three minutes from a fuel tank at the push of a button.
- **Auto-Shift** – when working with heavy loads, making turns or backfilling trenches the system automatically downshifts for more torque.
- **Boom Lowering Prevention** – Kubota’s unique anti-drop valve prevents accidental lowering of boom.

The source of the KX080-3S’s energy and power is the clean-running 70-hp

(52.2-kW) Kubota diesel engine. Its 3331-cc turbo direct-injection facility contributes to easy starting on cold

mornings, low sound levels and energy-saving fuel economy. The engine complies with Tier IV emissions regulations without the loss of power or reduction in the ease of operation.

With respect to operator safety and comfort Kubota has always been ahead of the game and Bloom says that the company’s recognition that a safe and comfortable operator is not only an important ethical issue but that it is also vital to productivity, has made a real difference to the performance of its equipment. “The design of the operator environment on the KX080-3S is unsurpassed,” says Bloom.

Some of the important features of this environment in the KX080-3S include:

- **Wide and Comfortable Space** – the cabin is spacious and offers excellent visibility minimising operator stress and fatigue.
- **Deluxe High-back Suspension Seat** – for greater comfort and productivity
- **Easy-open front window** – unlike many excavator windows, the front glass window opens with ease through a gas-assisted mechanism
- **Fully compliant ROPS and FOPS cabin.**
- **Air conditioner and heater** – this ensures great climate control and increased productivity. Fresh outside air can easily be introduced by activating the external air vent.

Bloom says that serviceability is a crucial aspect of any great machine and the KX080-3S’s triple-opening bonnet is one of its strongest features. “Maintaining this machine could not be easier,” he says. “All three of its access panels can open simultaneously; enabling easy inspection and access to the hydraulic components under the centre hood or the battery, oil filter and tool box under the right hood.

In terms of service generally, it is a truism that a machine is only as good as the backup service one gets and in this regard SPE has an enviable reputation. Its countrywide footprint of dealers and service facilities ensures that its customers get the best possible service 24/7.

“We understand that in this market uptime is the primary concern of our customers. We have invested time and money in ensuring that our team understands that service excellence is the foundation on which our company stands and our track record throughout the organisation speaks for itself,” Bloom concluded. ●



*Smith Power Equipment has announced the arrival of the Kubota KX080-3S Super Series 8-ton excavator - ideal for jobs requiring extra power and performance in confined spaces.*



# LEADING with TECHNOLOGY that works

For decades Potain has built tower cranes that are easy to assemble, flexible in configuration and simply to use, and the new Potain MDT 389 topless crane is no different.

► The largest in the new line of topless cranes from Potain, the MDT 389 is well suited to crowded construction sites where space is tight and multiple cranes are needed. Like other topless cranes it has been designed to allow more cranes to over swing in a smaller area.

Quentin van Breda, managing director of SA French, the sub-Saharan distributor for Potain tower cranes, says there are a host of features which make the Potain MDT cranes stand out from the competition.

The complete range, including the MDT 249, MDT 259, MDT 269, MDT 319 and the MDT 389, is equipped with Manitowoc's Crane Control System, or CCS. CCS is a standardised, user-friendly operating system that is being rolled out on all new Potain tower cranes.

"CCS assists users to enjoy the highest levels of comfort, flexibility, ergonomic control and, most importantly, improved lifting capacity. The enhanced productivity achieved as a result translates into a faster return on investment for Potain crane owners," Van Breda says.

In addition to having a fresh and modern design that allows for ultra-fast ground preparation and assembly, the Potain MDT range easily beats the competition when it comes to transportation.

"For example, the turntable, cab mast and Ultra View cab travel in a single compact package, while the counter jib can be folded and the winch platform can be sized to take up less space," Van Breda explains. Another advantage is that the mechanisms are grouped in a central technical zone for easier access and maintenance.

As part of its standard features, the Potain MDT 389 is equipped with Manitowoc's CraneSTAR, a GSM data transfer system that provides information on crane location and operation to support fleet management.

There are two versions of the Potain MDT 389, one with a 12 t maximum capacity and the other with a 16 t maximum capacity. Both have up to 75 metre (m) of jib available. The 12 t version can lift 3,4 t at its jib end, while the 16 t version can handle 3,3 t.

Potain also offers a smaller range of CCS equipped cranes, the Potain MDT City line, which includes the MDT 219. Other cranes in the range are the MDT 109, MDT 139 and MDT 189.

Like the Potain MDT 389, the MDT 219 is the highest capacity model in its range. There are two versions of the Potain MDT 219, one with an 8 t maximum capacity and one with a 10 t maximum capacity. All are evolutions of previous Potain MDT City cranes with jib lengths ranging from 55 metres to 65 m and hoisting capacities ranging from 6 t to 10 t.

Van Breda says the incorporation of CCS into the new range of Potain topless city cranes helps contractors get work done faster and with greater precision. "Aside from the enhanced levels of comfort and ergonomic control, this technology delivers more precise control in positioning loads as well as increased capacity," he says.

In fact, for the Potain MDT 219, the inclusion of CCS gives the



*The largest in the new line of topless cranes from Potain, the MDT 389 is well suited to crowded construction sites where space is tight and multiple cranes are needed.*



*The new Potain Topless cranes are equipped with Manitowoc's Crane Control System, or CCS which helps contractors get work done faster and with greater precision.*



crane a load chart advantage of up to 12,5% over the MDT 218 A, the equivalent pre-CCS topless city crane from Potain.

These cranes can be engineered to incorporate one of two new crane operator elevator solutions which provide fast and efficient transportation for the operator to and from the cab. Both systems comply with the highest levels of regulation as well.

One of the solutions, CabLIFT, exclusive to Potain cranes, has a slender design allowing it to fit inside all K-mast systems from Potain. It comes in three widths, 1,6 m, 2 m and 2,45 m. It is also compatible with all tower crane bases, fixing angles, chassis and cross-shaped bases. CabLIFT's intelligent design includes a service platform above the main car that provides comfortable access and safety for the erection technicians during the mast assembly process and crane erection. The other operator elevator solution is TCL, an externally-mounted system.

Potain has long been at the forefront of topless tower crane development, and with the introduction of CCS to its tower cranes, the brand is securing its market leadership position for years to come. ●

# Becoming a FORCE in the WESTERN CAPE

Report and photographs by Dale Kelly

Scania is committed to providing trucks and services that enable customers to drive their businesses forward. This was clearly shown at the company's recent Construction Day held at The Quarry in Durbanville, where it exhibited nine vehicles targeted for the construction sector.

## More than a transport solutions provider

Scania South Africa's pre-sales, marketing and segment support general manager Alexander Taftman, explains that Scania started its foundation in South Africa with the long haul brand, but in the past decade has actively expanded into other applications and segments, particularly with its construction and distribution vehicles. "Our early success with our long haul vehicles and now construction is starting to take off, and this is why we run events like our Construction Day to target our construction customers," he says.

Regional General Manager for the Northern and Western Cape region, Marius Steenkamp agrees. "Today is based around product awareness. We have been actively marketing and selling our vehicles and in the last 10 years the focus has shifted from us being a niche supplier in the long haul segment to diversifying into other segments. It is about having the opportunity of inviting customers to share their experiences with prospective customers. We have our entire team here today not only from a sales perspective but people from the parts department, service, rentals and finance to talk to customers about what we consider to be a unique solution. The most important thing about a day such as this is that customers can see our products and experience them first hand.

"This is an opportunity to showcase more than one application within the construction sector," Steenkamp says. "If one looks at total volume, the bulk of construction vehicles sold is still the tipper and mixer applications. However, there are so many more



Photographed at the Scania Construction Day held at The Quarry, Hillcrest Estate, Durbanville: From left: Malcolm Olivier, Regional Sales Manager Scania Cape Town; Marius Steenkamp, General Manager Scania Cape Town; Alexander Taftman, General Manager Presale, Segment Support and Marketing, Scania SA; Theuns Naude, Key Accounts Manager Construction, Scania SA; and Dippenaar Smith, Sales Representative Cape Town.

applications on offer. Today is focused on some existing customers and also on prospective customers who we want to target."

Scania has a local assembly plant, with 95% of the vehicles coming into the country in kit form. The remaining 5% are fire trucks and fire engines which are manufactured in Sweden.

Malcolm Olivier, regional sales manager for Scania Cape Town describes some of the applications for the construction sector. "You have your normal tipping range of 10, 15 and 16 cubic metres, the compactor which is used for waste removal, the brick carrier which is proving to be very successful, the cement mixer and the water tanker. On the 8 x 4 bodies we also have a trailer which is a big add-on."

## Western Cape growth

Olivier says Scania hosted a similar day last year to create awareness. "In the past, the industry identified us as mainly a long haul provider. At that stage we only had five vehicles on



The heavy duty Scania P410 tipper and the Biodiesel refuse vehicle, which fulfils Euro 5 emission levels.





*Scania's classic concrete mixer is one of the lightest three-axle mixers on the market.*



*Diversifying into other segments: The Scania water bowser.*

display and today we have nine, which makes us very proud."

Discussing volumes in the construction sector, he says around 200 vehicles are sold annually in the construction sector and of that 80% is normally either the tipper application or mixer application. Then of course the water tankers, brick carriers, road sweepers, and compactors – all of which make up the remaining 20%. During 2016, we saw quite a big move towards the 8 x 4 tipper versus the normal 6 x 4, which historically has been the bigger mover."

"It's an important segment for us to compete in," Taftman points out. "Because 200 vehicles in our total volume (which is around 1 550 vehicles annually), is still a big portion. We managed to sell our first vehicle in 2015, and in 2016 we sold 24 vehicles, bringing us into second position in the market. This year, there are many opportunities in the tipper market but we are also focusing on the mixer segment, together with the other applications which make up the remaining 20%."

Steenkamp says it is worth mentioning that not an average Joe Soap can sell into the construction arena. "It is far more than just a vehicle; one is selling the body as well, all of which is part of the solution offered to the customer. Our sales team has been in the industry for many years; they have the knowledge, experience and understanding of the industry and the customer's specific needs."

### Training solution

A training solution is offered with every new vehicle sold. Scania offers many solutions from a training perspective including instructor-led training in the classroom to on-the-road training in various facilities.

"We are moving towards many solutions in terms of on-road training, and the vehicle itself is also a training tool," Steenkamp

explains. "There is information shared with the driver within the cab itself indicating his driving patterns and habits, and we also do a lot of data downloading from the vehicle which is proactively shared with the driver."

The Scania-developed in-house fleet management system consists of the entry package which is free of charge and then two higher performance packages aimed at increasing the productivity of the fleet. All that is required is a communicator unit installed in the vehicle and an email address for automatic reports.

Looking at the construction industry from a vehicle perspective, Taftman says the South African commercial vehicle market is based on four segments: light commercial, medium, heavy and extra heavy. "The extra heavy starts at 16,5 tonnes and upwards and this is the vehicle and the load; in other words the weight of the complete vehicle as it stands on the ground.

"Trucking is a tool to make money, and the vehicle that can generate the highest profit back from the investment is the winner." He believes it's a numbers game.

"It is slightly different in terms of a construction vehicle," Steenkamp asserts, "because the driving factors are different. Payload is crucial with uptime also being important."

### Increased payload

This was confirmed by Christiaan Fourie from Fourie Sands who has just purchased his first new Scania Twinsteer. The man is modest and says the machine has been on trial for the last three weeks and is doing phenomenally. He has second-hand Scania horses which have more than proven their worth. "I have one operation where I use my sliding bins but where they can only manage five loads, I am now able to do about nine or 10 loads with my new Twinsteer. My turnaround time is much faster."

Asked about the general feeling in the industry in terms of Twinsteers, he says "everyone is going for the twins with the trailer. One can move about 40 tonnes where one can only move 30 tonnes with the sliding bins.

"The new machine is lighter on fuel and guarantees a higher payload with minimal cost. There is also a lot less wear and tear than with the larger sliding bins."

The last person *Construction World* spoke to was Theuns Naude, key accounts manager for construction, who is upbeat about the construction industry in the Western Cape in particular. "We have grown over the last two years, we have loyal customers and our product is good. Uptime is key and this is the same in the readymix industry.

"We recently handed over two Cone Mixers to Chris Tate at Haw & Inglis, and he is saving about R30 000 a month on fuel. "Scania has always been known for its fuel consumption and it is fantastic to have our customers coming back to us with positive feedback." Haw & Inglis has also purchased eight Twinsteers.

He says there is a buzz in the air. "Providing unique solutions for our customers is just a formality; there is nothing we can't do. We are out there, we are supplying and I believe things are turning around in the Western Cape."

Judging from the many people attending the onstruction Day and eavesdropping on some of their comments, Scania is well on its way to becoming formidable force in the construction equipment market. ●



*Loyal customer: Christiaan Fourie from Fourie Sands has purchased his first new Scania Twinsteer.*

## Misunderstandings about fire door legalities

**An alarming level of misunderstanding about fire doors exists among specifiers, manufacturers and installers, says Bob Vollmer, director of Bitcon Industries in Jet Park.**

Bitcon – one of the oldest manufacturers of fire, transformer, radiation and security doors in Africa – is this year celebrating its 50<sup>th</sup> year of operations.

Vollmer states: “The current regulation SANS 1253 2003 require all fire doors to be supplied as factory pre-hung door and frame units and to be labelled, confirming compliance with the relevant fire rating. Legislation calls for specific information – such as the manufacturers’ name, serial number, date of manufacture and the fire classification rating – to be legibly and indelibly displayed on the labels. It must be clearly conveyed to developers, contractors or sub-contractors – such as painters – that these labels must not be removed or painted over,” Vollmer cautioned.

“In the case of Class E fire doors – often installed in ‘low risk’ areas, such as between a garage and a domestic dwelling – all too often the fire door is not supplied as a unit and is hung on unsuitable wooden frames. This completely negates the fire insulation qualities of the door and puts the owner or tenant at risk as they have no assurances and recourse when supplied with doors that are not capable of fulfilling the function for which they were intended,” he stated.

If clients are in any doubt regarding the legitimacy of their fire door, they should request the manufacturers to supply their test report for the specified fire rating for the type of door to supplied – be it a single, double or sliding door. A single door test report does not automatically cover the full spectrum of fire doors: each type, whether single, double, or sliding, has to be tested. Manufacturers should also supply a test report in respect of doors fitted with viewing panels, which are permitted in certain door classifications.

“Above all, the test report should be issued in the manufacturers’ name and be a true reflection of the door supplied – especially in respect of the core material used in the construction of the door. Should a manufacturer change the core material of the doors, the producer cannot continue using the previous door test report and the doors with the new core material have to be re-tested.



*One of Bitcon’s renowned double fire doors. The company is this year celebrating its 50<sup>th</sup> anniversary.*

“The use of test reports in the name of other manufacturers is not permitted even when similar core material is used.

“Bitcon believes the professions have the responsibility to verify that the fire door installed by contractors is, in fact, the fire door that was specified. Too often, alternate and cheaper fire doors are installed, ignoring the original specification. No attempt is then usually made to obtain specifiers’ approval for the cheaper door installed. The result invariably is either costly legislation or expensive remedial work in the event of a fire,” Vollmer added. ●

## New standard for road-marking paint

**Kansai Plascon’s BTP brick and concrete paint product is available in different colours, and adheres to notoriously difficult substrates. It also outlasts competitor products by a significant margin, setting a new benchmark in the road-marking sector in particular.**

This is according to a successful two-year performance study conducted on behalf of an established customer. PC & Industrial Technical consultant Anita Bunn comments that such is Kansai Plascon’s confidence in the performance and quality of this product that “we were willing to undertake the study”.

She elaborates: “The client wanted a technical report to submit to their engineers to validate the performance of the product for their own use. The study

would also assist in securing new business, while obtaining valuable performance results on this particular product in real-time practical conditions.”

Kansai Plascon’s BTP product is a solvent-based brick and concrete marking paint, designed specifically for cementitious and other surfaces such as kerb stones and interlocking bricks.

“These are all surfaces notoriously difficult to paint with a coating that will last for longer than six months,” Bunn points out.

The performance review focused on a range of high-traffic sites. One such site was the entrance to the parking garage at N1 City. Here about 250 cars traverse old exposed aggregate paving daily.

An undiluted single coat of BTP was applied on 19 February 2015. A subsequent inspection in September 2015 and again in September 2016 found the road markings to be virtually unaffected.

“The long term performance study enabled us to determine how well this product performed under normal and abnormal traffic conditions,” Bunn explains. “This product outperformed even my expectations. We now have a thoroughly tried-and-tested alternative to traditional road-marking paint on difficult surfaces.” ●



## New responsive website launched

CASE Construction Equipment launched its new website designed to deliver seamless support and information to customers when they need it, wherever they are and on any device.

The new site delivers a clean, modular layout with pages that are easy to navigate and product information that is readily available. A distinct, vertical navigation allows for easy browsing and opens up the main area of the screen to view more information at one time.

Responsive design detects the device being used and automatically adjusts the page layout and resolution for screen size. The same experience is delivered on desktops, tablets and smartphones.

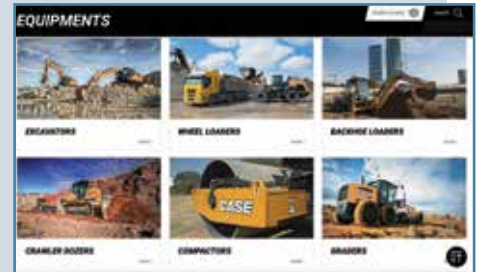
The product configurator, now also available for tablet and mobile, lets customers explore all options available on equipment and request a quote. The seamless integration between equipment and attachments allows customers to

easily identify the complete solution that matches their requirements.

A social media feed on the homepage offers an interactive digital experience, with a seamless integration between the website and CASE's social media presence. Customers are also able to stay up to date on the latest CASE news and events with designated areas for both.

Marcello Fortunato, marketing director CASE for Europe Africa and Middle East, said: "We live in a digital era where life is fast paced and information is needed in an instant, right at our fingertips.

With the new website, we aim to offer our customers an efficient and interactive digital experience that will deliver practical solutions for their business." ●



## Geared to meet the needs of the 21<sup>st</sup> century

The world is clearly getting warmer. 2016 was recorded as the hottest year since records have been kept. This trend will no doubt continue over the years to come.

With this situation, the demand for water amenities like swimming pools is bound to increase. People want to keep cool, and swimming pools are seen as one way of doing so.

However, at the same time as the world heats up, the availability of water supplies to meet water needs is coming under pressure. Currently, large parts of South Africa face drought conditions, and the scarcity of water makes it problematic for individual families to maintain the swimming pools they have at their homes.

"Current conditions suggest that shared facilities make far better sense than individual swimming pools," comments Alastair Sinclair, regional director for Africa at multinational water innovation company Crystal Lagoons. "But, even conventional swimming pools serving communities can be problematic because of the amount of water and energy they use and the costs related to keeping the water clean."

Crystal Lagoons, The World's Top Amenity, takes swimming to a whole new level. Crystal Lagoons technology enables the construction and maintenance of unlimited size crystal-clear bodies of water, at low cost. There are 600 projects in various stages of development and negotiation in 60 countries.

In the heart of the Egyptian desert, at Sharm El Sheikh, for instance, a sought-after residential development with a 12-hectare man-made lagoon with a sandy beach, has turned otherwise unusable land into prime property.

"A big positive for us in South Africa is that the water usage of a Crystal Lagoon has far less impact than a swimming pool," Sinclair explains. "Most significant is that any type of water can be used to



fill the lagoon, not only water of the quality needed for a swimming pool, which is essentially the water we need for human use. The evaporation of water from a Crystal Lagoon is insignificant because of the use of a microfilm technology that can reduce evaporation by up to 70%, which means that the lagoon does not have to be topped up with water regularly as with a swimming pool. In fact in some areas, rain water alone fulfils these requirements."

Sinclair explains that 100 times less chemicals are needed to clean and disinfect the water in a Crystal Lagoon than for a swimming pool. The crystal clear lagoons are monitored and operated from a centralised location via the internet. The Control and Monitoring Centre (CLCL) guarantees water quality 24/7.

Sinclair is upbeat about the prospects for the adoption of this unique new water feature by the South African market. ●

## Revolutionising rescue at height

Any safety-related incidents when working at height often necessitate self-rescue as the front-line or most rapid-response tactic. In this regard, MSA Africa is introducing its Latchways Personal Rescue Device (PRD), an integrated harness system.

This lightweight, unobtrusive rescue device is contained in a small backpack attached to a full-body harness. It has been designed to be used in conjunction with a fall protection system or anchor point, Suraksha Mohun, product marketing manager, MSA Africa, notes.

The patented components of the Latchways PRD fit neatly into the backpack, allowing workers to carry out their daily tasks unhindered. Indeed, the backpack becomes part of the daily Personal Protective Equipment (PPE) required for those working at height.

"There is a legal obligation to have a comprehensive rescue plan in place when individuals are working at height," Mohun stresses. In the event of a fall, the MSA Latchways PRD suspends the worker, who is then lowered to the ground gently in a controlled descent.

The device features a 20 m spool of Aramid rope, released at a controlled rate via an integral braking mechanism. The innovative design of the MSA Latchways PRD only uses quality components and a limited number of moving parts so as to guarantee 100% mechanical integrity.



Unlike competitor rescue kits, the MSA Latchways PRD requires no specialist training, as it is simply worn in conjunction with a standard fully-body harness, and is activated by simply pulling the release cord. Its user-friendliness is enhanced by the fact that pre-use checks are minimal.

"Periodic inspection is required at least annually, or more frequently, to comply with corporate PPE inspection schedules," Mohun highlights. The descent device, harness, and backpack should be checked for any signs of damage, corrosion, or chemical attack.

The Latchways PRD range from MSA Africa includes a Workman Premier and Workman Utility full-body harness. A rescue pole is also available, which can be used by a third party to activate the Latchways PRD in the event of a worker at height being incapacitated. The rescue pole is 800 mm when retracted, and 3 400 mm when extended. ●

## Tagged green by global certification

In the world of green, claims of eco-friendliness and biodegradability abound. Sadly, however, these claims can often not be substantiated, the products and services are not truly green, and consumers and businesses are duped into harming the planet in a different way.

For this reason, the Global GreenTag certification entails a stringent approval process that requires the substantiation of all green claims. This month, local manufacturer, Green Worx Cleaning Solutions, was certified by Global GreenTag as having truly green products.

Global GreenTag is one of the world's most robust, trusted and widely recognised ecolabels. "We independently assure that every product is fitness tested and certified under one of our two leading certification programmes that use world's best scientific methods," confirms the Global GreenTag website. "That's why we have earned the

reputation and trust of thousands of buyers, hundreds of companies and numerous green building councils, certification bodies and governments around the world."

John J Coetzee, CEO at Green Worx, is proud of this achievement. "This certification is the culmination of many years of hard work. We don't believe in 'greenwashing' – which not all South African manufacturers can claim. Our products, and all of the ingredients used to create them, have a great impact on dirt, and no impact on the environment. That's our commitment to creating a world that is cleaner, greener and smarter."

Consumers and businesses are assured that Global GreenTag certified products have passed the world's toughest standards to protect them, their employees, and their families' health and safety. The focus is placed on minimising the impact on a finite planet, putting the power of selection back into the hands of well-informed consumers.

The GreenTag Programme is intended to fill a current void, nationally and internationally, for a consistent green product rating scheme that is scientifically derived, life cycle assessment based, and includes appropriate assessment of whole of life and holistic sustainability.

"This is essential to real credibility in the industry, avoiding fly-by-night organisations that play on the need to retain precious resources in order to make a quick profit," states Coetzee.

GreenTag strives to simplify the green product sector research and help consumers and procurement professionals to make their decisions in full light of the ecological quality, health, resource and social impacts of their product or supply chain selection. "We're proud to display the GreenTag logo on our labels, and are committed to continue manufacturing products that are worthy of the certification," concludes Coetzee. ●

John J Coetzee, CEO at Green Worx.





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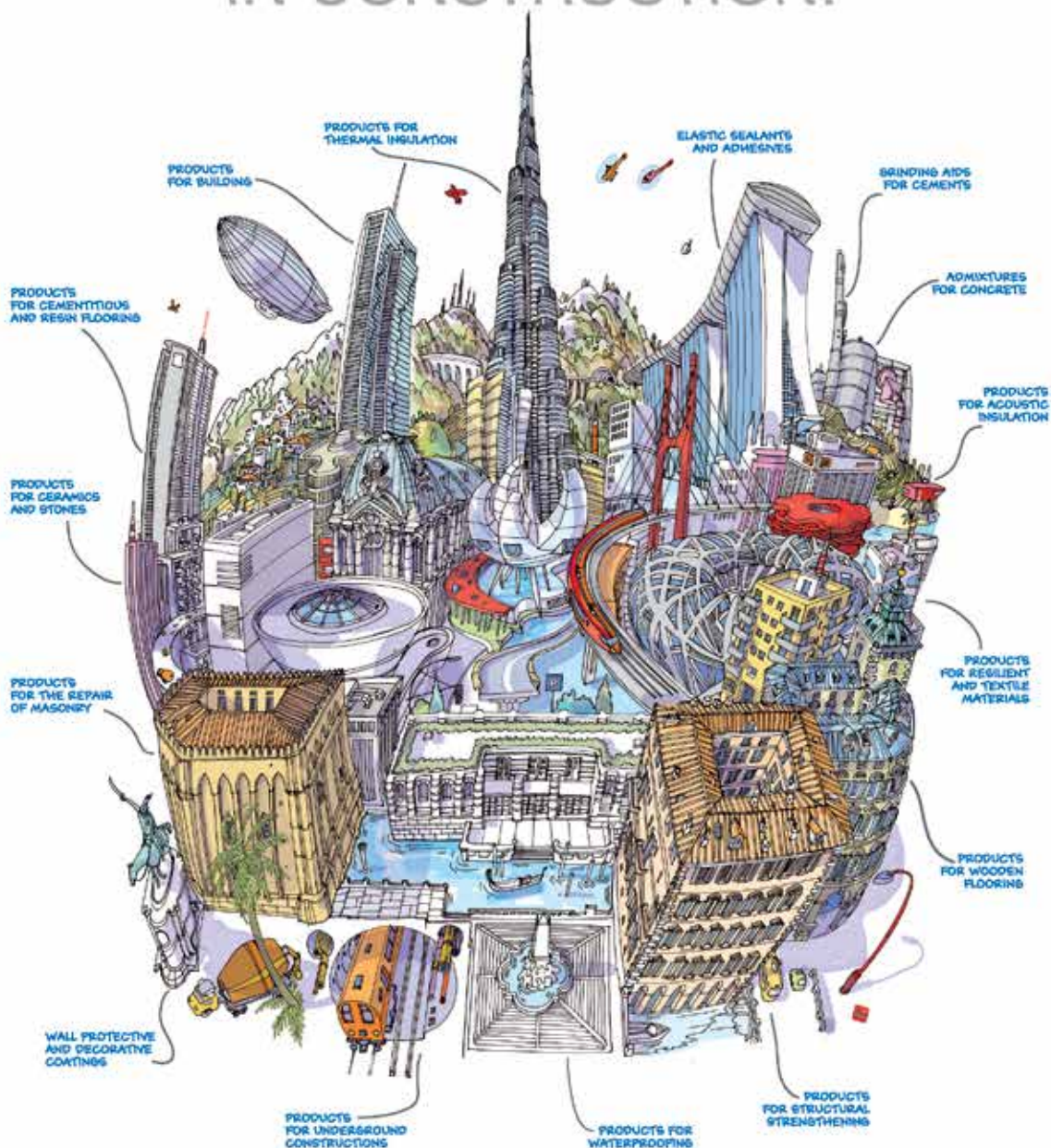
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