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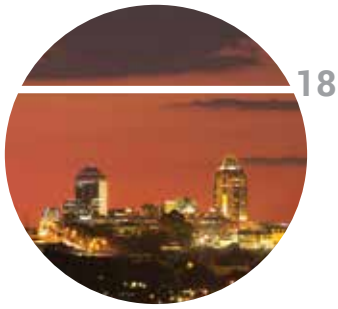
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COMMENT

CESA president, Lynne Pretorius, recently indicated that her theme for 2017 is for CESA to take the lead in transforming its membership and the industry.

There are various reasons why Pretorius decided on sustainable transformation as her theme. As of June 2016, 53% of the CESA membership was white. When only professional engineers are considered, this figure increases to 84%. Of the 533 firms on CESA's database, only 122 firms are black-owned, between 4 and 6% of the staff employed by CESA are woman and of these only 12% are actually consulting engineering professionals.

This, shockingly, after 20 years of measures to rectify the ills of the past – the most notable of these are Broad-based Black Empowerment and the Preferential Procurement Policy Framework. Brown says that such policies often resulted in 'fronting' and that true, sustainable transformation was often not achieved. As a result questions are being asked about the effectiveness of the BBBEE scorecard in realising transformation.

Driving transformation

The presidential theme for CESA this year is driven by CESA's transformation committee – this comprises members of both established and emerging firms. As its main aim, this committee will promote transformation as an ethical business practice and monitor progress made by its members. It will aim to increase the participation of black engineering professionals at various levels within member firms.

The transformation of individual firms will in time lead to the transformation of CESA as a whole. It has identified various



The fact that there are so few female engineers in the consulting engineering industry has raised serious concerns about transformation in general.

Construction World is publishing a supplement on behalf of the Southern African Light Steel Frame Building Association SASFA. The supplement will celebrate this building method and highlight how it is becoming increasingly popular.

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support programmes for small, medium and micro enterprises – such enterprises make up 95% of CESA's membership. It will furthermore partner with government departments to second young engineering staff in the public sector to the private sector, launch awareness programmes for women engineers, while BBEEE scorecards will be more detailed so as to measure and monitor actual transformation.

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Driving constructive and SUSTAINABLE TRANSFORMATION

This year will see Consulting Engineers South Africa (CESA) take the lead in transforming its membership and industry.

► This is a critical theme in the light of the many obstacles the country is facing more than 20 years after democracy, despite significant strides made by government to transform society, CESA President, Lynne Pretorius, told members of the media at a function, in Rosebank.

“Consulting engineering is experiencing similar challenges. Broad-based black economic empowerment (BBBEE) policies also gave rise to ‘fronting’, and questions are being raised about the effectiveness of the BBBEE scorecard in realising transformation,” cautioned Pretorius.

Change driver

This presidential theme for the year is being driven by CESA's Transformation Committee, which comprises of members from both established and emerging firms.

The committee will promote transformation as an ethical business practice and monitor progress made by its members beyond the requirements of the Construction Sector Scorecard.

In addition, it will help members understand that transformation is an ongoing process; facilitate sustainable BBBEE practices within the industry; and promote the practice through member's professional and business activities, among others. Pretorius noted that this intervention is essential considering that black ownership is still low at all levels of the industry.

“An overall assessment of employment by race indicates that the percentage of black employment has varied between 40% and 50% since 2007. There has also been no notable increase in black staff within CESA membership over the past four years,” she said.

Of the 533 firms on CESA's current database, only 122 firms are black-owned, with this ownership less than 51%, at present.

Women in the minority

Meanwhile, the percentage of women engineering staff employed by CESA members is between four and six percent of total consulting engineering professionals, and black women make up about 12% of this group.

Transformation of the consulting engineering profession is also being hindered by the limited number of learners competent in mathematics leaving the school system, while the industry has to compete with other sectors to attract talent from this small pool of engineering degree programmes.

She says the status quo has been extremely damaging to the profession, with these unconvincing statistics further eroding the credibility of the sector.

“Typical statements made in the country refer to ‘engineers being old white males’ and that ‘consulting engineering firms are only interested in making money,’” noted Pretorius.

CESA's interventions to drive real and sustainable transformation will include developing a pipeline of engineering professionals over the long term by identifying and then supporting learners with a technical aptitude at secondary school level.

It will also consolidate efforts to create and implement a process for supporting tertiary engineering students and mentor graduate engineering staff in the workplace to develop their skills and competencies required for professional registration.

CESA takes action

Meanwhile, the association has identified a host of potential support programmes for small, medium and micro enterprises, which constitute about 95% of CESA's existing membership.

Of this grouping, only 24% are black-owned with black ownership greater than 51%.

Pretorius said CESA is also offering to partner with government departments to second young engineering staff in the public sector to member firms where they will gain critical experience.

It will also develop awareness programmes to combat the barrier faced by women in the industry in order to attain a win-win situation for both employers and employees in our sector.

“Importantly, the thorough detailing of BBBEE in annual declarations of members firms submitted to CESA will definitely bolster this transformation agenda, as we will for the first time be able to measure and monitor transformation in our industry at a detailed level over overtime as opposed to being reliant on BBBEE scorecards, which are not always a true reflection of the demographic profile of our industry.” ◉

CESA's Christopher Campbell (CEO) and Lynne Pretorius (president).





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Making all the difference

Having a committed and proactive bargaining council is what makes all the difference to an industry sector. This is according to Nick Faasen, secretary general of the Bargaining Council for the Civil Engineering Industry (BCCEI).

During 2016 the BCCEI completed a programme of workshops in all the major centres, and Faasen says it still appears that many companies in the civil engineering industry do not understand the numerous functions of its own bargaining council.

"In fact, we have been inundated with questions regarding the role and function of the bargaining council," Faasen says. "Let me start by saying that a bargaining council is not just about collective bargaining for wage increases."

The BCCEI is a sector specific bargaining council created in terms of the Labour Relations Act, 1995 (LRA). Some of the main powers and functions of a bargaining council are to:

- make and manage collective agreements;
- prevent and resolve labour disputes;
- establish and manage an administration and dispute resolution fund;
- promote and establish training and education workshops;
- establish and manage schemes or funds to benefit its parties or members; and
- make and submit proposals on policies and laws that affect a sector or area.

"The BCCEI has a responsibility to the employer (companies) and the employees, and although it is a creature of stature, it is not state sponsored. It is funded through levies paid equally by employers and



employees. The BCCEI operates for the benefit of the industry itself," he continues.

Faasen and his team are determined to level the playing fields in the civil engineering industry, and ensure fair competition which is practically important specifically at a time when the industry faces uncertainty. He says that dealing with a bargaining council can be a daunting process, but it need not be. The team at BCCEI's various offices are well-equipped to assist with telephonic or face-to-face assistance and guidance. Significantly, the council has a comprehensive website which is kept updated and allows immediate access to information that both employers and employees may need.

Faasen says that registering with the BCCEI is mandatory under law, and the council conducts proactive educational audits to assist all those who fall within its jurisdiction. He hastens to add that where a company is genuinely experiencing difficulty in meeting its obligations in accordance with the agreement, there is a provision whereby the company can apply for exemption and include an appeal process. The consideration and granting of such exemptions and appeals are carried out by independent bodies.

The BCCEI has extended an invitation to all parties to make contact with one of its offices or via the website, and participate more fully. ●

Carrier announces sponsorship

Carrier, a global leader in hi-tech heating, air-conditioning and refrigeration solutions, has announced its category sponsorship of the Zeitz Museum of Contemporary African Art (MOCAA) at the V&A Waterfront in Cape Town. The sponsorship from Carrier, valued at R600 000, enables the museum to ensure a controlled-air environment critical for the preservation of certain valuable artworks.

Forming part of the new Silo District, Zeitz MOCAA will cover 9 500 m², making it comparable in size to the leading contemporary art museums in the world. It will consist of nine floors, of which 6 000 m² will be dedicated to exhibition space. An educational floor will help to foster a new art-loving, museum-going audience.

The task of repurposing the historic Grain Silo Complex at the V&A Waterfront, once the tallest building on the Cape Town skyline, was given to internationally-renowned designer Thomas Heatherwick. This provided the opportunity not only to appropriate a former industrial building to display art, but also to imagine a new kind of museum in an African context.

The R500-million redevelopment project was announced in November 2013 as a partnership between the V&A Waterfront and former Puma CEO and Chairman Jochen Zeitz. The key challenge has been to preserve the original industrial identity of the Heritage-listed building, and to retain choice pieces of machinery to illustrate



and maintain its early working character. Heatherwick Studio's final design reveals a harmonious union of concrete and metal, with crisp white spaces enveloped in light.

While the main goal of every museum is to make objects accessible to the public, researchers and other institutions, it also has to ensure the long term safety and preservation of the collections. Objects need one set of conditions, while people may need another. Achieving both is the ultimate aim of having a controlled environment.

Carrier is no stranger to the rarefied world of museums and art collections, having installed an innovative heating, ventilating and air-conditioning (HVAC) solution for the Sistine Chapel, developed to help preserve Michelangelo's masterpieces against deterioration caused by the increasing number of visitors. ●



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GO FOR GOLD strikes gold in Gauteng

Go for Gold was created to improve the number of candidates from disadvantaged communities eligible to study towards a technical profession and secure employment.

Through a unique partnership with companies in built environment and the Western Cape and Gauteng Departments of Education, Go for Gold's education-to-employment programme has already helped over 600 learners and enabled more than 24 companies to employ young graduate professionals from disadvantaged communities.

Four phase model

The organisation's four phase model is centred on the premise that in order to create future skilled graduate professionals, who also possess the self-belief to succeed, requires long term investment where the whole child is developed – i.e. both academically and emotionally.

Go for Gold works with students interested in pursuing careers in the built environment. Their four phase programme's success derives from placing major emphasis on extra maths and science tuition, starting in Grade 11 and continuing through to tertiary level studies.

The students begin in Phase 1 in Grade 11. Go for Gold provides students with after-school and Saturday morning additional academic tuition while simultaneously developing the learner's social and emotional development through regular Life-Skills and Leadership Development sessions. Originally operating solely in Cape Town and supporting the Western Cape Education Department, at the beginning of 2015 Go for Gold expanded its operation to Gauteng, working with students from schools identified by the Gauteng Education Department.

A success story

In 2016, as the new kids on the Gauteng built environment block, Go for Gold stakeholders keenly anticipated the first cohort of Phase 1 Go for Gold matric students' results. Impressively, one of many worthy mentions, is that of a 2016 Go for Gold matriculated students Morgan Bentley who attained 100% for science and 99% for mathematics. In 2017 Morgan enters Phase 2 of the Go for Gold



Solly Ledwaba from DOE handing over 'Go for Gold High Achiever Award' to Morgan in November 2016.

programme, a paid experiential work-readiness year working on site at one of Go for Gold's partner companies, Stefanutti Stocks.

Impressive results

Impressively all 30 Gauteng Go for Gold Phase 1 matric students obtained Bachelor Passes, qualifying them for tertiary studies and allowing them to pursue technical professions in the built environment. The 2016 year's Go for Gold class furthermore boasts eight distinctions in maths and nine distinctions in science with their class average impressively increasing by 8% in mathematics and 12% in science since June exams last year.

The 2016 cohort of matriculated future Go for Gold stars are entering Phase 2 this year at Go for Gold's partnering companies, namely Aveng Grinaker-LTA, Terra Strata, Murray & Roberts, NMC, Power Group, Stefanutti Stocks and WBHO. Going forward, Go for Gold looks to include vocations from the mining sector in Gauteng, a prominent sector in the region, as many students have expressed interest in mining-related engineering fields.

In the Go for Gold Phase 2 year, partner companies have the opportunity to harness talent from the pool of Go for Gold students and offer bursaries to students to study their chosen professions in Phase 3.

Go for Gold relies on the support of their partner companies and sponsors to tackle South Africa's youth unemployment problem while simultaneously addressing the shortage of young graduate professionals from disadvantaged communities in the built environment. ●



2017 Phase 2 Go for Gold students entering their experiential work year.



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Acquisition grows groundwater capabilities

JG Afrika, a leading multi-disciplinary engineering and environmental consultancy, has grown its groundwater division by acquiring Geowater IQ, a specialist in the field of geohydrology, water-resource management, research and other related disciplines.

Paul Olivier, managing director of JG Afrika, says the acquisition of the 100% black-owned consultancy comes at a time when the management of South Africa's scarce water resources and the upgrading of related infrastructure have been placed on top of the agenda.

This intense focus on water infrastructure is mirrored by the recent appointment of JG Afrika as the geohydrologist professional for a large water and sanitation project for schools in rural areas that is being driven by the KwaZulu-Natal Department of Public Works.

This contract, awarded to JG Afrika by the firm by Ramgoolam (formerly B. Ramgoolam and Associates), complements the company's already extensive portfolio of successful water-related initiatives. Just as importantly, it is also the first such project to benefit from the incorporation of Regan Rose's more than 20 years of management and technical capability in the field under the JG Afrika banner.

The founder of Geowater IQ will lead JG Afrika's existing team of six geohydrological specialists deployed on the water and sanitation upgrade, while managing the entire project, including co-ordinating the activities of the drilling, sustainable-yield testing and borehole equipping subcontractors.

The highly regarded geohydrologist has nurtured a long working relationship with JG Afrika's team in the Zulu Kingdom over the years, including as assistant director of Geohydrology in the Department of Water & Sanitation's (DWS) Durban office from 2002 to 2005.



TOP: Founder of Geowater IQ Regan Rose has joined JG Afrika's groundwater team in KwaZulu-Natal. Children enjoy the novelty of pumped groundwater for the first time.

Rose says that he has always valued JG Afrika's leading expertise in the engineering sector, one of the many drivers behind the acquisition.

"I am pleased to have merged Geowater IQ with such a reputable firm of engineers," he says, adding that it has also been gratifying to immediately start working on this important, but challenging project that forms part of the ongoing second phase of the Department of Education's Water Supply and Sanitation Programme.

As Rose notes, there is ample opportunity to deploy these specialist solutions, especially in KwaZulu-Natal, where site assessments undertaken in the Midlands Region in late 2016 confirmed that 88 schools require new groundwater resources, and a further 30 require a review and refurbishment of their existing infrastructure where possible or new groundwater resources will need to be found to supply their needs. ●

Handover of donated machinery

There was big excitement in Logagane Village on Tuesday, 31 January 2017 for community members of the Ratlou Municipality, as Social Development Deputy Minister, Hendrietta Bogopane-Zulu, handed over Hydraform International interlocking brick and blockmaking machinery, donated by the MTN Foundation and valued at R1,2-million.

Bogopane-Zulu challenged Ratlou community members with mud homes to take every opportunity of using the Hydraform brick and block machinery as a means of eliminating poverty, inequality and unemployment. She added, "Community

members will be able to make bricks and build their own houses. The initiative will reduce unemployment. However, we want them to understand the do-it-yourself (DIY) initiative. More people will be employed in this project after we have registered it as a non-profit organisation (NPO)."

"Those who will be working here will receive a stipend. However, the main objective is to ensure that the community stops relying on the government for RDP houses," said Tebogo Modise, Mayor of Ratlou Municipality. "The project came about after the discovery of more than 3 000 teenage mothers in the area. We want to address socio-economic issues and unemployment."

Executive manager of the MTN Foundation, Graham de Vries, said, "Our

partnership started in 2012 and we will continue to support the social development initiative. We will provide training for the Hydraform machinery."

Hydraform International's sales executive, Lusanda Zimase, attended the handover event in Logagane Village and said, "Hydraform's building system is different to the normal bricks that we know, in that it replaces regularly used bricks and cement with Hydraform blocks that interlock and are dry-stacked. A unique feature of the building system is that it uses soil, to produce an interlocking soil and cement block. By taking the world's oldest known building material, earth (soil) and giving it form and durability through Hydraform's innovative technology, the company has developed an earth brick that can reduce costs and construction times. Hydraform boasts other benefits such as: cost savings, empowerment of unskilled people (including women), a simple system, thermal insulation qualities, being three times as efficient as concrete block and twice as efficient as fired clay bricks, reduced transport costs, local soil used from project sites and bricks made where and when needed." ●



Trends in Southern Africa's construction industry in 2017

With 2016 bringing a year of unexpected developments across the globe, from Brexit to the election of the 45th President of the United States, and from falling commodity prices to waning GDP growth across Africa, there are now diverse global realities impacting the African continent as a whole and Southern Africa's construction industry in particular. Soren du Preez, programme director of the African Construction and Totally Concrete Expo, highlights the top trends to watch that will impact Southern Africa's construction industry in 2017.

Spatial transformation

South Africa's National Development Plan (NDP) identifies spatial transformation as one of its key objectives and neighbouring countries are following suit. At a technical level, changes in regulation and the introduction of many new building, planning and environmental regulations require expert technical and scientific input at the early stages of architectural design. The project design process is moving towards a cyclic and iterative rather than linear model, which will translate into the spatial transformation of the built environment in the medium to long term.

Building information modelling

Building information modelling (BIM) is an innovative technology and process that is transforming the way buildings are designed, analysed, constructed, and managed across the globe. "The time for us to rethink our quality control systems is now and for us all to benefit from information technology that is constructed and developed efficiently for a construction environment," says Vaughan Harris, executive director of the BIM Institute in South Africa.

3D Modelling is just part of the BIM process and will only drive transformation if it's combined with wider and deeper support

from the industry, including behaviour, culture, transparency and processes.

Demand for green cement

The global market for green cement is expected to grow to USD38,1-billion by 2024 from USD14,8-billion in 2015. Green cement reduces the carbon footprint of construction activities through the substitution of

cementitious industrial wastes, such as fly ash from coal-fired power plants and slag from the steel and iron processing industry as a replacement for traditional cement.

Demand for green cement in Africa will provide an increasingly lucrative market over the next few years due to growing trends in sustainability and energy efficiency for both buildings and infrastructure. 2017 will witness an increased demand from local African marketplaces for more sustainable products in the local built environment.

The Southern African construction industry is a growing market offering attractive business opportunities. The fifth annual African Construction and Totally Concrete Expo is taking place on 23 – 24 May 2017 at Gallagher Convention Centre, Johannesburg and will provide access to the African built environment. ●



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KEY to SOLAR PV industry boost

By Bevan Jones, Soltra Energy technical director

The module-level power electronics (MLPE) market is set to boom, according to reports, with compound annual growth figures touching the 20% mark, breaching one billion US dollars annually in 2019.

Keeping pace with the popularity and growth of decentralised system architectures, MPLEs will offer new benefits to many market segments, one of which is also in a rapid growth phase; the solar photovoltaic (PV) market.

Two examples of MPLE technologies geared to play key roles in the solar PV industry are power optimisers and micro-inverters. Responsible for optimising the yield of solar panels (or modules) these MPLEs are becoming vital components of modern solar PV installations.

In understanding the advantageous and strategic functions of these MPLEs, it might be useful to cover some of the basics. For instance, solar PV panels generate DC electrical power according to the amount of sunlight falling on them.

The voltage across each panel and the current that flows through it are interrelated. At any given level of irradiance, there is a point at which the power generated is at its highest. This is referred to as the 'maximum power point' or MPP.

A panel can be encouraged to run at its MPP by regulating the current

flowing through it. However, panels (like fingerprints) have slightly differing characteristics, so when a number of panels are connected in series, the MPP for the entire string is a compromise between the MPPs of all the individual panels; the lowest common denominator, in other words.

Within the solar PV arena, one of the most relevant MPLEs is the micro-inverter. In new-generation solar PV installations, small format, grid-tie inverters – generating 240 volts AC – are connected directly to each solar panel in the array. The AC output of all of the micro-inverters is then channelled into a single supply which is fed to the load.

The other MPLE set to boost the solar PV industry is the power optimiser which employs DC-to-DC converter technology to maximise the energy harvested from solar panels connected in strings. This is achieved by tuning the output performance of the panels to match the performance of the micro-inverter.

At first glance, the fitment of optimisers seems to be an 'overkill', particularly when it adds to the overall cost of a solar PV system. However, as any experienced solar PV practitioner will confirm, there are many potential pitfalls associated with the layout of solar PV panels which are reduced or eliminated completely with the use of power optimisers.

Major pitfalls

Shading is one of the biggest pitfalls.

When more than a third of the power producing cells in a solar PV panel are in the shade, the performance of the entire panel is compromised.

This has a choking effect on all of the panels in the same string, causing a significant loss of overall solar PV yield. When optimisers are used, the shaded panel performs to the best of its ability, and none of the other panels is affected.

Another pitfall is represented by power mismatches. Although all solar panels in a string should theoretically perform at the same level – all things being equal – there are nevertheless performance variations which can cause an overall degradation of the output of the



Bevan Jones, Soltra Energy technical director.

string. Power optimisers eliminate the negative effects of these mismatches, allowing each panel to perform at its best.

Challenges

One of the challenges faced by many solar PV system designers is the inevitability that not all roof or mounting surfaces face north – the optimal facing in the southern hemisphere. Varying orientations have to be accepted and accommodated.

When using conventional inverters, it is not advisable (nor is it common practice) to mix panels of different orientations in the same string – because of the problems associated with variance in individual performance as outlined above.

This constraint creates difficulties for architects, engineers and installers when it comes to positioning the string. With power optimisers in place, they have complete freedom in this regard, with panels at different orientations working efficiently, in harmony, side-by-side.

Panel failures and degradation are not uncommon in aging solar PV installations. Identifying the offending panels is often difficult in a large array where the only indication of the problem is an under-performing string.

The solution is panel-level performance monitoring and reporting, functions that will help to quickly identify a suspect panel. These features are now integrated in certain leading-edge power optimisers.

Finally, sourcing an exact replacement panel in terms of brand or specification to replace a damaged or degraded unit may be difficult – if not impossible – in the case of an aging installation. With a conventional string, mixing new and old panels will inevitably affect the combined MPP and result in lost power. With power optimisers in place, however, the new panel will perform at its maximum – as will the entire string. ●



Managing a 278 MW renewable energy portfolio

Ryan Hammond has been appointed CEO of Cookhouse Windfarm, Umoya Wind Farm and REISA Solar PV, a renewable energy portfolio totaling 287 MW.

He took on the responsibility of managing the facilities' operations, finance and community operations, with effect from 1 February 2017. He is well-known in the renewable energy sector as the co-founder and a board member of the South African Photovoltaic Industry Association (SAPVIA) and is recognised as a stalwart of the country's Renewable Energy Independent Power Producer Procurement Programme (REIPPP).

He brings 20 years of experience in the industry, both locally and internationally, to his new role as head of these three companies that form part of the African Infrastructure Investment Managers portfolio of assets.

"I am excited to join this highly professional team and look forward to driving growth, both in the scope of our service offering and the number of projects under management. The success of the team thus far is without doubt its proficiency, competency and value-added service to project shareholders," explained Hammond.

Hammond's experience ranges across engineering, business development, and start-ups in the United Kingdom and South Africa. He relocated back from the United Kingdom in 2009, to head the



Ryan Hammond has been appointed CEO of Cookhouse Windfarm, Umoya Wind Farm and REISA Solar PV.

African business of Solairedirect, as managing director, and led the successful award of two Round 2 projects under the REIPPPP.

He began his journey in the renewable energy industry in project development, in the United Kingdom, where he led a team that secured a pipeline of over 15 MW of waste-to-energy, 20 MW of biomass and 60 MW of onshore wind projects. ●

Exploring the future of renewable energy

Everything you want and need to know about renewable energy and the future of energy development and growth in Africa comes under the spotlight at Energy Revolution Africa 2017. This co-located event to African Utility Week will be hosted for the first time in Africa in Cape Town from 16 to 18 May 2017.

Located at the Cape Town International Convention Centre, Energy Revolution Africa will provide a dynamic meeting place for solution providers, consultants, renewable energy producers and the African and global energy minds of the future.

The vast majority of the over one billion people living in Africa are unserved by traditional grid supply. This energy landscape is changing as consumers, independent power producers and other stakeholders elect to change the way in which energy is generated and distributed. Green innovations and disruptive technologies are making it possible to quickly roll out integrated microgrid solutions.

"In this context it made sense for us to move with the market and introduce a platform focused on the future of green energy", said Evan Schiff, event director of African Utility Week and Energy Revolution Africa.

Focusing on community scale projects and innovation in the sectors of renewables, future technology, microgrids, energy efficiency and energy storage, Energy Revolution Africa will showcase the latest technology, practical solutions and examples from successful community and commercial projects.

"It will be a powerful opportunity for new energy purchasers and large power users, from commercial property developers and the agricultural sector to mines and metros as well as anyone interested in the exciting opportunities and technologies that are emerging in a fast growing renewable technology sector," Schiff said.

The programme for Energy Revolution Africa 2017 includes a three-day Energy Revolution Africa strategic programme as part of the sessions, three days of focused Continuing Professional Development (CPD) accredited technology workshops and case studies, freely available on the exhibition floor, real-life project experience and exhibitions by over 60 service and solution providers. ●



Royal Institution of Chartered Surveyors' GLOBAL MENTOR

Chartered Building Surveyor, Anil Singh Rana, associate project manager for UK-based Capital Property and Construction Consultants, was recently awarded the Royal Institution of Chartered Surveyors (RICS) Mentor of the Year 2016.



Anil Singh Rana, associate project manager for UK-based Capital Property & Construction Consultants.

Commended by RICS judges for his passion for going above and beyond to support and encourage the next generation of professionals while maintaining development of his own successful career, Rana has helped candidates to realise their potential through mentoring and nurturing talent, imparting the values of RICS and the vast range of opportunities available to RICS professionals.

Although based in the UK, Rana has managed to still effectively support candidates for the Assessment of Professional Competence (APC) in his home country of Mauritius, where he previously worked as a consultant, academic and contractor, assisting RICS Africa in promoting and raising the standards of the profession.

Says Rana: "With RICS being the world's leading professional status in land, real estate, infrastructure and construction, winning this award has marked the pinnacle of my career. I am humbled and privileged to win such a distinguished award and more importantly, to represent Mauritius and Africa on an international platform.

"The RICS qualification has enabled me to become an international volunteer mentor for RICS APC candidates across continents, using my own initiative to increase awareness and the significant benefits of being a member of RICS.

"I have had the opportunity to mentor APC candidates on different pathways in

Australia, Mauritius and South Africa in what is today a more interconnected and globalised environment than ever before. "In a technology-based internet society, despite the time differences, communication through various technological applications such as Facebook, Twitter, WhatsApp, Viber, WebEx and Skype has never been easier as support can now be provided via instant communication.

"Mentoring people through this process is extremely satisfying. Time permitting I would like to mentor more RICS APC candidates nationally and internationally, particularly where support is almost non-existent."

A passionate enthusiast of the built environment and a global ambassador for RICS for more than a decade, it was a watershed moment when in 2014 Rana became a Fellow of RICS aged 35 – at that time the youngest ever fellow in Africa.

He now works for one of the fastest growing and emerging multidisciplinary practices in London, Capital Property & Construction Consultants, where he started as a graduate.

Says Rana: "Never before has the profession seen clients demanding greater transparency and competency and trustworthy professionals.

"RICS has helped me reinforce those ethical values to ensure clients obtain the best possible advice and in the same vein, provide a service to the highest

professional and technical standards.

"The industry is always evolving at an unprecedented pace and there has been a paradigm shift in increased communication, integration, innovation and efficiency, with collaboration and ethics being at the heart of this."

He adds: "My passion for the profession, knowledge sharing and uncompromisingly giving back remain at the forefront of my surveying and project management duties. My advice to young people starting out and looking for a rewarding career is that the construction industry has a place for everyone with the right attitude, interest, hard work and dedication.

"In addition, the construction industry is one of the best industries to be in due to its unique technical challenges and opportunities because every building or project brings its own complexities and team dynamics.

"The networking opportunities on a global scale are immense, particularly if you are a member of RICS. Equally, it is an opportunity to make real changes to people's lives by shaping the environment in and around them." ●



Getting the mix right

There are many factors that contribute to the success – or otherwise – of a shopping centre, and getting the right tenant mix is right up there at the top of the list. The general manager of a major mall weighs in on what ‘tenant mix’ really means.

“First impressions count,” says Olive Ndebele, general manager of Pretoria’s Menlyn Park Shopping Centre, the largest mall of its kind in Africa following its two-year R2-billion redevelopment. “We want our customers to be blown away by what we’re offering. We want them to find not only everything they need under one roof but also to be absolutely thrilled by the many, many additional ‘nice-to-have’ and unique offerings they’ll find at Menlyn Park Shopping Centre.”

To achieve this objective, says Ndebele, you have to know the mall catchment area and exactly who your mall will be servicing, and that’s generally the community in which it is located – although the very popular Menlyn Park Shopping Centre is also a magnet to residents of the outlying suburbs of Pretoria, the large contingent of the foreign businesspeople and diplomats who live in South Africa’s executive capital city, and keen shoppers from the African diaspora including Sadec and sub-Saharan Africa.

“You have to ensure there’s as close a match between the needs of your target markets, their buying capacity, and the kinds of tenants present in your mall,” says Ndebele. For this reason, Menlyn Park Shopping Centre management conducted extensive market research in order to have insights the demographics, needs, size and disposable income of their target markets, as well as their aspirations and preferences.

But getting the tenant mix right isn’t important just to bring feet into the mall. It’s vital for the tenants themselves too. “Ideally, you want complementary stores feeding off each other, meeting shoppers’ needs and enhancing revenues,” Ndebele says.

The right anchor tenants

Niche retailers, which are the many little stores that provide the variety in a shopping centre, don’t usually have large marketing or advertising budget, so they rely on the larger retailers in the mall to bring in the customers. “Anchor tenants, which are generally grocery offerings in South Africa, bring the critical mass into the mall,”



Ndebele explains. “If, as a shopping-centre manager, you get the right anchor tenants, the smaller retailers will feel reassured that a certain type of consumer will definitely be visiting the mall, and that the foot count will therefore be assured to at least a certain degree, and that will probably encourage them to set up shop in your mall.”

These retailers include what Ndebele calls the ‘non-retail services’, such as (in the case of Menlyn Park Shopping Centre) a Fives Futbol, Fun company, a speciality store, a dry-cleaner, a barber, an internet-browsing store, a travel agent and an e-toll outlet. “These offerings ensure a more holistic approach to our tenant mix, and they do also contribute individually to the mall’s footcount,” she points out.

There are a couple of further important criteria when it comes to tenant mix: where your tenants are located, and how much space their shops take up are also vital.

The same applies, says Ndebele, to the mall’s Fashion Wing, where cutting-edge fashion brands are grouped together over three levels; and the new spacious food and entertainment area, with popular eateries clustered together, offering a very wide choice within a pleasant space where customers can linger.

The bottom line, says Ndebele, is finding the sweet spot for your customers between convenience and experience. “And mall management must never forget that all tenants affect footcount – both the big destination stores that anchor a mall, and the smaller ‘impulse-buy’ and ‘non-retail’ stores that make up the mix.” ●



Olive Ndebele, general manager of Pretoria’s Menlyn Park Shopping Centre.

Eight inspiring new co-working locations

Technology has changed the way people work and, as a result, office arrangements and work environments are changing too. This has led to the rise of co-working. Thanks to their cost-efficiency, flexibility, and often inspiring environments, co-working spaces are attracting a growing user base from businesses big and small, locally and globally.

Meeting the working needs of modern businesses, professionals and entrepreneurs, leading JSE-listed REIT Growthpoint Properties has partnered with local co-working space trailblazers OPEN in a 50/50 joint venture. Together they will grow an exciting network of co-working spaces across South Africa.

Co-working spaces allow entrepreneurs, consultants, service-providers, and corporate teams convenience and flexibility.

Businesses are afforded a means of growing and shrinking more easily as well as a way to house consultants and temporary staff.

Co-working spaces solve the need for space for meetings, working at a desk, audio-visual needs, and coffee and food for a more mobile business generation, while away from a head office.

The joint venture’s first new co-working space will open in Sandton Central this July at Growthpoint’s 138 West Street office building, across the road from Sandton Gautrain Station.

OPEN designs, builds and manages inspiring and comfortable spaces to work, meet, learn, collaborate and hold events. It has two existing co-working spaces – OPEN Maboneng in Johannesburg and Workshop17 at V&A Waterfront in Cape Town – which have redefined workspaces as flexible, multifunctional places for working, connecting, developing and creating.

For Growthpoint, the joint venture adds to the full range of workspaces it offers for all kinds of business to thrive in, from iconic headquarters for large corporates to collaborative spaces for entrepreneurs starting out on their business journeys.

Commenting on the joint venture, Norbert Sasse, CEO of →

Hatfield Square officially opens

Respublica is excited to announce that the new Hatfield Square redevelopment officially opened its doors on 1 February 2017. The first phase of the two-phase project is operational and ready for occupation for all students eager to kick-off the 2017 academic year.

Within walking distance from the University of Pretoria's main campus, the new development offers a mixed-use precinct that will include state-of-the-art student residences, retail and leisure facilities, specifically designed for Pretoria's large student community from various campuses.

"Our committed construction team worked around the clock to ensure that the student residence was ready for occupation at the start of the academic year, to provide students with the purpose-designed environment that they need to support their academic careers in what is often a first move away from home," says Craig McMurray, CEO Respublica.

The Hatfield Square development is vastly different to any other student accommodation offering, with its various room configurations and premium facilities such as unlimited Wi-Fi, gym, multiple recreation rooms, outdoor courtyards, communal pause areas on each floor, laundry facilities, study rooms, computer labs and a swimming pool.

With varied price points, the precinct offers options ranging from four-sleeper apartments that share a communal kitchen to single studios with an en suite bathroom and kitchenette, as well as more affordable bedrooms that have modern shared ablutions and kitchens. "We believe that this variety of amenities makes it possible for students with diverse resources to have access to the kind of environment they need to excel in their academic endeavours, and enjoy the social benefits of residence life," adds McMurray.

The residential component of the first phase of the Hatfield development opened on 1 February, and the retail component will open in March 2017. The development has secured top retailers including Rhapsody's, Studio 88, and Cross Trainer. Phase 1 will be completed for the 2017 academic year, with Phase 2 expected to be complete for the 2018 academic year.

Another Respublica residence in the area is Eastwood Village, which opened in 2016. Located a mere 2,8 kms away from Hatfield



Square, it provides a free shuttle throughout the day to and from the University of Pretoria.

Eastwood Village, which offers all amenities that are standard across the Respublica residences, recently saw its shared bedrooms transformed into techno-pods, with screens installed above each bed for ultimate convenience, and a gaming room has been set-up for students who love spending their down-time in a world of uninterrupted LAN-gaming. A professional in-door action cricket facility was also built in the basement. ●

→ Growthpoint Properties, says: "This partnership combines and amplifies Growthpoint's and OPEN's shared passion for nurturing and growing business in South Africa with innovative and sustainable property solutions. It creates incubator spaces for thriving businesses and tomorrow's office users."



Paul Keursten, co-founder of OPEN, comments: "Growthpoint is the leader in commercial property. It operates with integrity and has the matching values we believe are crucial for a successful joint venture. We look forward to growing by tapping in to the expertise and experience, portfolio and financing power of Growthpoint."

Mark Seftel, co-founder of OPEN, says: "What was a novel idea five years ago is now becoming mainstream. Even at 1% of the office property pie there is significant growth opportunity in South Africa. We are focused on creating spaces where people can thrive via a unique combination of design, technology and customer care, while ensuring that we take care of the environment. We feel truly honoured to be able to do this together with Growthpoint as the ideal partner with shared vision and values.

The eight – or more if demand is robust – new co-working locations planned for the next three years will each have a coffee bar with public access, meeting and seminar facilities, member areas with hot desking, dedicated desk and team spaces, and dedicated serviced offices. ●

Co-owners of OPEN (from left) Paul Keursten, Mark Seftel and Westleigh Wilkinson.



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SANDTON RESIDENTIAL

property market remains resilient

If Sandton, the financial centre of South Africa, has been impacted by the national economic slowdown, the city appears, at least physically, to show little sign of this. In fact quite the opposite; a number of modern office blocks, hotels and mixed use spaces continue to be developed across the Sandton centre, and infrastructure upgrades are ongoing.

Dr Andrew Golding, chief executive of the Pam Golding Properties group, says that the development of the Sandton city centre, and the fact that 'Africa's Wall Street' remains the place in the country to do business, have assisted to provide strong support to the local economy, as well as the residential property market in the area.

Impressive statistics

"Business people from all over the world visit Sandton, which continues to be seen as a commercial, financial and business gateway to South Africa. An estimated 10 000 businesses and head offices are to be found in the centre and it is home to the busiest Gautrain station," adds Dr Golding.

"The impressive Discovery and Old Mutual buildings are under construction, while the commissioning of the 11 storey, R2-billion Sasol headquarters building, with its 5 Star Green Star rating, commenced recently.

"The R1,3-billion Kgoro Gateway Development, consisting of six buildings with commercial, retail and residential components, was mooted during the middle of last year. The area is seeing a great deal of development of such mixed-use precincts, Central Square near the corner of West and Rivonia streets being a further example. These initiatives speak to the considerable confidence that investors of various kinds have in the area," points out Dr Golding.

A matching residential market

"While there was an easing in the local Sandton residential property market in 2015, particularly at the higher end of the market, the region remains an important centre of business and commerce, and residential property within the Sandton city centre itself, as well as surrounding suburbs such as Morningside and Sandhurst, remains at a premium."

"The recent decision by the South African Reserve Bank to keep interest rates at current levels is likely to be positive for the local residential property market and, given economic stability at the national level, we expect the Sandton property market to experience a solid first quarter in 2017."

Pam Golding Properties regional head of Gauteng Rupert Finnemore concurs, stating that some owners of luxury apartments and penthouses, valued at R10-million or more, are adopting a more considered approach to the market, but there remains a strong demand for well placed homes offering good value between R1,7-million and R3-million.

"In addition to being the centre of business on the sub-continent, Sandton offers a range of property options and an incomparable Manhattan-style café street lifestyle. A studio apartment in Morningside can be purchased for around R1,2-million, while a top end luxury penthouse offering every modern convenience may fetch R25-million or more.

"Some of the best and most exclusive shopping, entertainment and hotels in the country are located in Sandton. The area is, furthermore, situated at the very heart of Johannesburg's north, and residential property here is always likely to be popular among those looking to be situated close to the wealthiest mile in the country in order to take advantage of the myriad facilities on offer in this mega business city."

Within the centre itself

Within the Sandton city centre itself, the continued demand for accommodation has created a situation where densification is becoming increasingly evident, says Finnemore.

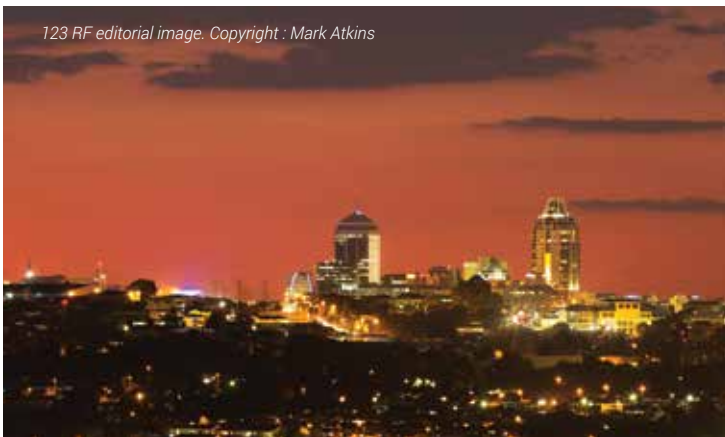
This has resulted in the development of large high-rise executive apartment blocks such as Michelangelo and Sandhurst towers. In some instances, more wealthy individuals own family properties in upmarket Gauteng suburbs or on the Atlantic Seaboard and own a second home within the Sandton city centre, which they use during the week.

"Today it is hard to imagine that Sandton with its bustling streets, towering office blocks, commercial enterprises, speedy trains and high rise buildings was once a vast open land, and that the municipality was only established in 1969," adds Finnemore.

"We are seeing a growing demand for apartment properties enabling a highly convenient 'live, work and play' lifestyle. Residents want to be able to live free of concerns, and while easily taking advantage of the café street lifestyle and commercial opportunities offered within the greater Sandton area."

"Luxury serviced apartments, offering a wealth of amenities including concierge services, air-conditioning, outstanding security, high quality fittings, fitted kitchens, basement parking, meeting rooms, high speed internet, health spas and gyms, are currently proving particularly popular. A Sandton address remains a prestigious one and properties here are considered an excellent investment. Indeed, the greater Sandton area remains home to some of the wealthiest individuals in South Africa. Those professionals who seek a fast-paced urban lifestyle with every amenity at hand find it a highly desirable location," concludes Finnemore. ●

"Some of the best and most exclusive shopping, entertainment and hotels in the country are located in Sandton."



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TUBULAR PLANT HIRE cleans up in local market with GOSCOR ACCESS RENTAL

The modern fleet maintained by Goscor Access Rental, combined with its high availability and uptime, has resulted in Tubular Plant Hire enjoying an important rental relationship with the company since April 2013.

Tubular Plant Hire is a division of Tubular Technical Construction, wholly-owned by Tubular Holdings, the driving force behind a diversified group, representing one of the largest and most respected privately-owned construction companies in South Africa at present. To date, the company has utilised Goscor Access Rental products successfully at the Kalagadi Manganese Mine in the Northern Cape, and at the Kusile Power Station in Mpumalanga.

“Our focus, both abroad and within the local marketplace, is aimed predominantly at the manufacturing and construction sectors. The group, together with its competent motivated management teams, is responsible for an array of specialist services,” Craig Schneiderman, Tubular Holdings, Group procurement manager, comments.

The access equipment from Goscor results in significant time and cost-savings over traditional construction methods.



Turnkey projects

These services focus on mining processes, planning management and execution of turnkey projects, and the supply, installation, and commissioning of electrical and instrumentation infrastructure.

“Our rental relationship with Goscor Access Rental focuses mainly on the hire of telehandlers and cherry pickers,” Schneiderman explains. This relationship was established as long ago as April 2013, with the hire of two cherry pickers, namely a Genie S85 RT and a Z135 RT.

The long term association between the two companies commenced with Tubular Plant Hire conducting a comprehensive evaluation to assess Goscor Access Rental’s BBBEE credentials, its SLA contracts and tender documentation process, together with word-of-mouth recommendations from other highly satisfied customers in the marketplace. Needless to say, the company passed all of these criteria with flying colours.

Modern fleet

Schneiderman cites the main benefit of standardising on Goscor Access Rental equipment for its rental needs as the company maintains a modern fleet, ensuring it has the latest technology on

Goscor maintains a state-of-the-art fleet, giving its customers a competitive edge in the marketplace.



hand. This also means that the machines are replaced constantly and therefore virtually brand-new, translating into high availability and uptime, which are critical for increased productivity.

“What sets Goscor Access Rental apart is also that it is able to provide comprehensive service and support across its countrywide footprint. In addition, we enjoy a good relationship with the senior management, which is always available to offer any assistance or advice. The company also has fully-trained and skilled technicians on hand to facilitate any repairs or maintenance,” Schneiderman elaborates.

Excellent accessibility

Commenting on how Goscor Access Rental has benefited Tubular Plant Hire in achieving and maintaining its own business goals, he points out that the telehandlers and cherry pickers provide excellent accessibility in awkward-to-reach areas. “This allows for a continuity or flow of production, which is important in adhering to strict timeframes and deadlines.”

Schneiderman adds that the rental rates are extremely reasonable in the context of a highly competitive and price-sensitive plant-hire sector and the company has an intimate understanding of Tubular Plant Hire’s specific requirements, in addition to its commitment to full support and service.

About Goscor Access Rental

Goscor Access Rental, part of the Goscor Group of Companies, was established as a specialist rental company focusing on the rental of mobile elevated work platforms, also known as powered access. Its technology provides temporary aerial access in a range of applications. In reaching the heights of excellence, it never loses sight of the fact that aerial access is a potentially hazardous business. The company continues to strive to eliminate risk and maximise safety at every opportunity. Strict international standards of safety and quality form the basis of its service, maintenance, and operator training programmes, allowing it to deliver the high-performance platforms and service levels needed by its clients.

Tubular Plant Hire is a division of Tubular Technical Construction, wholly-owned by Tubular Holdings, one of the largest privately-owned construction companies in South Africa.



Tubular Holdings focuses on mining processes, planning management, and execution of turnkey projects.

Time and cost-savings

"The access equipment we have on hire from Goscor Access Rental results in significant time and cost-savings over traditional construction methods which, in turn, gives us a competitive edge. Not only is it important for us to retain our competitive edge in doing so, we also cannot afford to be left behind in introducing the latest innovations to our customers," Schneiderman comments.

Tubular Plant Hire's relationship with Goscor Access Rental to date has been characterised by a willingness on the part of the latter to become involved in the nitty-gritty of its daily operational challenges. "What facilitates this excellent two-way communication is that Goscor Access Rental is capable of falling in line with our requirements and internal procedures and communication channels."

Strategic partnership

Schneiderman highlights that a strategic partnership such as the longstanding one that has been forged between Goscor Access Rental and Tubular Plant Hire is peace-of-mind that both companies can rely on each other. "This is in addition to the obvious networking potential from a business point of view that is unlocked by such a relationship."

Commenting on the current state of the mining and construction industries, Schneiderman is confident that tenders for major projects will begin to see the light of day from July this year. "There is significant potential for actual work in the pipeline, which means the market will be busy again by year-end. There is a much more positive outlook at the moment than there has been for the past two years," he concludes.

"I salute my team for always going the extra mile and exceeding customer expectations, as amply demonstrated with Tubular Plant Hire.

"The years of 24-7-365 from every team member has resulted in such successful partnerships, and we look forward to growing this fruitful relationship," comments Goscor Access Rental managing director Andrew Kendrick. ●

The cherry pickers and telehandlers hired by Tubular Plant Hire comprise these models:

- JLG 1350
- Genie S85
- Genie SX150
- Genie S105RT
- Genie S125RT
- Genie Z135/70
- Genie Z45/25JRT
- Genie Z60/34JRT
- Genie GTH3007 Telehandler
- Genie GTH4013 Telehandler
- Genie GTH4017 Telehandler

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Three CONSTRUCTION GAME CHANGERS for 2017

Huge tower blocks built in weeks under one roof; automated bridge-building behemoths; bricklaying robots. No it's not science fiction. These are all real solutions here and now doing business. And soon there will be more. So what are the big trends in construction in Europe, the US and Asia, and how can we turn them from opportunities into business benefits? *Kenny Ingram*, global industry director of construction and contracting at IFS, outlines three trends and opportunities for companies to leverage in 2017.

Within five years, 35% of asset owners will move over to outcome and performance-based contracts

According to a 2015 report from Transparency Market Research the global market for Product Lifecycle Management will reach over USD75-billion by 2022 – forecast to grow at a Compound Annual Growth Rate (CAGR) of 8.1% from 2015 to 2022.

As with other industries, it means that contracts in the construction sector too will become increasingly complex and service-based. It's not a new idea. Famously, Rolls Royce's pioneering 'Power-by-the-Hour' concept, invented in 1962, supplied a complete engine and accessory replacement service on a fixed-cost-per-flying-hour basis.

Recently Rolls Royce added Engine Health Monitoring, which tracks on-wing performance using on-board sensors and Lease Engine Access, which supplies clients with a back-up engine during off-wing maintenance – clearly connecting assets using the Internet of Things (IoT) with the enterprise applications that manage them will accelerate the innovation of business models.

But the key takeaway for construction companies is that they need to be crystal clear about the core purpose of their asset.

If a company is building a hospital, for example, it might win its contract through

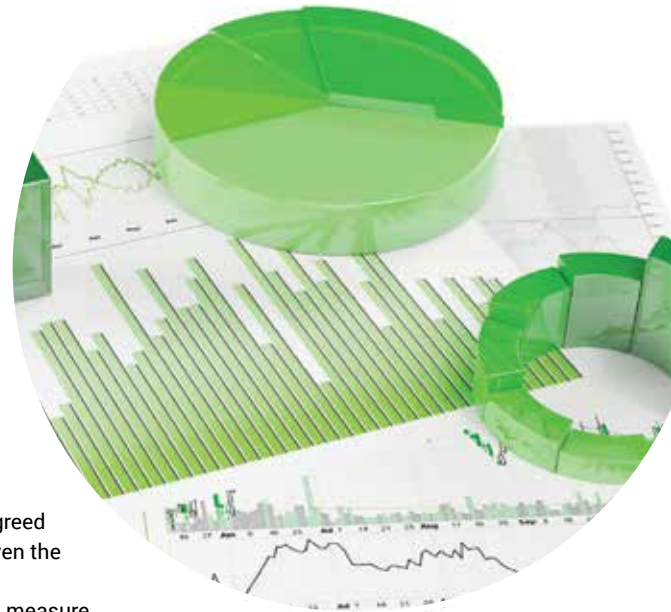
guaranteeing provision of an agreed number of beds over time, or even the health outcome of patients.

And it will need to be able to measure both. For the client, everything outside these core metrics could just be extra expense.

How can companies leverage this? Today IoT enables construction companies to measure things in detail and quality that has never been possible before. Essential key metrics to keep in mind are availability, reliability, maintainability, supportability, cost of ownership, and end result. Technology functions within construction firms need to empower business analysts with assets' performance indicators so that they can find the most profitable models that will enable them to turn service into an opportunity. Ultimately construction companies will operate more like service industries acting on a performance-based model.

Within five years over 50% of all construction projects will use offsite modular construction and 3D printing.

I recently visited an Irish construction company constructing beautiful, durable, high-quality schools throughout the UK. But they built them at their plant in Ireland and shipped them across the UK for assembly onsite. Each school module took a few months to construct. These were extremely high quality builds. If you had seen one in its



Performance-based contracts.

finished state you would never have guessed it had been built in a factory.

Modular constructions are all around us. In fact we probably don't spot them precisely because they have become so usual. Modules are the new bricks and mortar in airport terminals and rail stations (Heathrow Airport and Birmingham New Street in the UK are just two examples). And they're built to last. These assets have upwards of a 30-40 year life, lasting as long as they are designed for. Globally we are seeing modular move into residential housing too.

In Singapore recently PPVC (prefabricated, prefinished, volumetric construction), a new type of modular construction, appeared. Complete apartment blocks were PPVC manufactured in a factory. Each separate unit contained internal finishes, fixtures and fittings, all manufactured en masse, transported and assembled onsite as modules. According to a McKinsey report the companies using PPVC report 50% savings in staffing and time. The new method produced minimal air and noise pollution, and improved site safety.

In a world where the global population increases by a billion every 12 years, the speed and high-volume capabilities of modular construction and 3D printing means they will emerge as leading solutions. 3D printing is now becoming the

"Since 2013, the number of shipments of multipurpose industrial robots in China has roughly doubled to an estimated 75 000 in 2015 ... forecast to double yet again to 150 000 by 2018, according to the International Federation of Robotics."



Modular construction.

rule not the exception for many companies, and wider social take-up is booming.

Many high schools, universities and colleges in the UK and Germany now own 3D printing machines as a matter of course for students. Last year, 2016, Gartner has forecast particularly strong growth for 3D printing in the enterprise sector – their five-year CAGR for 3D printers priced at more than USD2 500 is 57,4%. Worldwide, the shipment of 3D printers to enterprises in 2016 more than doubled its 2015 total.

“We forecast the total enterprise and consumer 3D printer worldwide shipments will expand at a 98,5% CAGR through 2020. Total spending will grow at a 66,5% CAGR to 17,7 BUSD in 2020,” says Gartner.

For businesses who have traditionally built everything onsite, the move to modular requires a different business model and a new skills set. They are in effect no longer construction companies – but a hybrid of construction and manufacturing.

Bringing in new graduates and business expertise, learning from manufacturing companies about lean, agile, integrated processes – all these are vital for seizing the opportunity. Plus, they need these skills in-house. Clients in this new arena would not choose to go to a firm that outsourced its modular construction when they could choose one that had it all under one roof.

Opportunity: In the next five years 25% of work in the construction industry will be carried out by robots

Driverless cars, battalions of self-driving trucks – for most of us, these are now firmly on the technology agenda. Yet for many in the construction industry it still seems some time away. It isn't. A 2016 PwC report



Robotics.

pinpoints China as a prime example of booming demand driving huge growth in industrial robotics: “Since 2013, the number of shipments of multipurpose industrial robots in China has roughly doubled to an estimated 75 000 in 2015 ... forecast to double yet again to 150 000 by 2018, according to the International Federation of Robotics.”

A new remotely operated bridge building machine in China, the SLJ900/32, operates, without any conventional crane technology. It travels across the bridge constructing a temporary track as it goes and towing each new segment with it – extending between the bridge's columns and dropping the segment into place. Bridge building is dangerous, time consuming work with high insurance premiums. An automated solution may already be with us.

Engineers are now exploring solutions for high-skilled, precision crafts in construction too. US firm Construction Robotics' SAM100 bricklaying robot is currently being marketed as “assisting the mason with the repetitive and strenuous task of lifting and placing

each brick”. But as the system gets more sophisticated, how long will it be before the mason disappears and the robot remains?

How can companies leverage this? Perhaps the most urgent action is to actually recognise the change, and start establishing a strategy for digital transformation.

Again, reskilling and bringing on board tech-curious, tech-savvy younger professionals will pay dividends. Graphic design, augmented reality, virtual reality – all these will be hugely important in keeping companies competitive. Daring to experiment too is vital.

Prototyping, trying out solutions on a small scale, gets companies ready to seize the opportunity. Digital transformation is going to be an enormous game changer. Its effects will be as powerful and epoch-defining as the invention of mass production at the beginning of the twentieth century. ●

Ingram is the Global Industry Director for the following industries: Construction, Contracting, Engineering, Infrastructure and Shipbuilding. In addition he is heavily involved in other Project and Asset Lifecycle industries including Oil and Gas, Energy, Utilities and Defence. Ingram's main responsibilities are to promote the IFS solution to the external marketplace and to educate the IFS workforce on the business issues and challenges these industries face. He is also a key member of the IFS Product Direction



Board who are responsible for making decisions on the IFS product strategy. Ingram has been with IFS for 16 years and has worked in the business systems marketplace for over 20 years. He is now regarded as one of the top specialists in Project Based Business systems and has been heavily involved in driving the IFS strategy in this area for the last 16 years. Prior to this Ingram worked in Industry in various positions covering Management & Project Accounting, Supply Chain and Logistics.

OUR CITIES ARE FULL – we need new ones

By Matt Coetzee

By 2050, the UN predicts that cities will somehow accommodate a massive 2,5 billion more people than the 4 billion that already live there. The big question is, where are they all going to go? How do we make sure these places are fit for the continued influx of people? By walking a mile in their citizens' shoes, could we simply replace imperfect cities with improved ones?

People must live and work somewhere. Given ructions in the world economy, evidence shows that more people believe their best bet for a better life is in cities. This is especially true in developing countries. And they're right. According to the UN Habitat, urban areas generate 70% of global GDP.

With people sold on the idea of cities, where are they going to go? Existing cities have developed for good reason, but always piecemeal, forever behind the rising curve of practical need. Demand outstrips supply many times over.

Cities can expand upwards or downwards, but this is a finite solution. More often, cities sprawl sideways, the centres de-densifying in favour of suburbanisation.

Inhabitants often discover that, at the periphery, there is no public transport, forcing them into cars which worsens congestion, pollutes the air and ups the per capita carbon footprint. Life becomes stressful, with residents more prone to

ill-health. New arrivals intent on bettering their lot face problems. Native inhabitants intent on protecting their advantages face problems. And no one is consulted about the change.

Is better urban governance part of the solution? City leaders do organise, driven by a worthy ambition to provide shelter for all citizens. However, they suffer the same fate as the city's infrastructure. They are unable to keep up with the real issues.

The American academic Benjamin Barber, author of *If Mayors Ruled the World*, is optimistic. He sees city governance as the model for a post-national, interdependent political landscape. In his words, "The road to global democracy runs through cities". It's already happening. Mayors are meeting the challenges pragmatically and, by virtue of their semi-autonomous power base, are able to share these lessons with other mayors below-the-radar of national governments. By splicing out their city's good genes, they can be recombined elsewhere to beneficial effect.

South African urbanist Edgar Pieterse, though, is not so sanguine. City leaders are not adequately representative or responsive. He argues for the reinvigoration of civil society to include the everyday concerns of marginalised people, especially of cities in the developing world.

Alessandra Orofino, based in Rio de Janeiro, has the tools to enable that engagement. She's the compelling force behind Meu Rio, a digital platform for grass roots civic participation. Her tools are being used to air local grievances, rally support and change policy in Rio. Her battle cry is, "It's our city: let's fix it".

These efforts tackle symptoms. They do not reconcile clashes between old infrastructure and new technologies, or between native and newly arrived citizens. Is there a more radical solution? Is there a circuit-breaker to halt the downward development spiral?

Paul Romer, an American economist, thinks there is. In his view, attempting to expand existing cities is doomed, especially in developing countries. Instead, he thinks we should build new charter cities. Charter cities – cities that operate to their own set of special rules – have the unique quality of allowing experimentation by recombining good urban genes imported from more economically mature corners of the globe.

Modelled in part on Shenzhen in Southern China, his idea is that these experiments must be brand new, with the rules drawn up beforehand by the host country. That way, investors, companies, workers, and families actively opt-in to migrating there in preference to other cities. The infrastructure and public services are planned for 21st century conditions. Opportunity for citizens is equal. And if the experiment works, the rules can be adopted across the country.

Of course, success is in the detail. Setting rules that reform poor governance is a tall order. But by matching the common experience to expert knowledge, and integrating our findings with tech and good governance, perhaps we can walk the extra mile in citizens' shoes – so that they don't have to.

*This is from Aurecon's futuristic blog, *Just Imagine*. ●

Traffic against Shanghai cityscape. Shanghai is the largest Chinese city by population and the largest city proper by population in the world with over two million vehicles.



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LEADING THE WAY in East Africa

MML has been operating from its headquarters in Nairobi for over 30 years, building a reputation as the largest and most respected project and construction management business in East Africa.

► MML has not stood still during this time, it continues to innovate, drive value and maximise returns for its clients, helping them turn vision into reality.

In 1987, MML created the first project management business in East Africa. In 2011, sub-Saharan Africa's most experienced private equity real estate investor, Actis, acquired a controlling interest in the firm. Actis, drawing on its CDC history, promotes best-in-class real estate projects across the African continent with a portfolio spanning Ghana, Nigeria and Mauritius, as well as the three main East African economies.

This new ownership structure has supported the rapid expansion of the MML business, enabling it to offer complete end-to-end management services.

About MML

MML understands that all building activity will have a marked impact on the environment whether through carbon emissions or consumption of resources. It is possible to minimise environmental impact by reducing the water and energy consumption of the completed building and avoiding unnecessary use of non-renewable materials. MML is developing the first LEED certified commercial buildings in East Africa, is Green Star SA certified and proud to support the establishment of the Kenyan Green Building Society in developing its first certified project. The experienced and professional Mentor Management team transforms empty or under-

utilised land into valuable, high-quality real estate assets which enhance the social and economic growth of the region.

Project & Construction Management

'Delivering quality on time and to budget'

MML's team of experienced Project & Construction Managers ensures that projects both in building and civil engineering sectors are planned, procured and executed on time and to budget with a constant eye on creating the best quality developments in the market. Although the firm will often draw on the services of selected third-party advisors, It has the expertise to manage the entire development process for a client who simply wishes to obtain the best possible product delivered on time and to budget.

Commercial fit-outs

'Creating top quality interior environments'

MML has built a strong brand in commercial fit-outs, offering Project Management, Management Contracting or Turnkey Services. Its commitment to quality ensures its clients that it works with the best of subcontractors and tradesmen, all of which are managed by experienced MML staff.

The last few years have seen fit-outs completed for the likes of HSBC, Heineken, MasterCard, ICEA, Pfizer, Coulson Harney, Unilever, FSDA, Cavendish-Uganda. ●

Fit out work done at Remax offices.



MML's MD, John Rogers.

MML did project and construction management for Swissport and Garden City (BELOW RIGHT).





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**● HR4013C
Rotary Hammer**

Unrivalled low level of vibration makes a substantial difference to both user and project alike, enhancing operator comfort and productivity.

Specifications:

| Continuous Rating Input | Capacity | Impacts per min (i/min) | No Load Speed (r/min) | Net weight |
|-------------------------|---|-------------------------|-----------------------|------------|
| 1,100W | Concrete (with T.C.T. bit): 40mm Concrete (with Core bit): 105mm | 1,450 - 2,900 | 250 - 500 | 6.8kg |

2 Operation Mode:

- Hammering with rotation (for drilling)*
- Hammer only (for chipping and breaking)*

**● HR4003C
Rotary Hammer**

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



Creating attractive HOUSING DEVELOPMENT

More than three million of Corobrik's quality face brick products were used in the construction of The Junction @ Forest Hill in Centurion, Pretoria.

► The 440-unit rental housing development, based in Heuweloord, will be completed by Central Developments in February 2017 to meet the growing need for well-constructed housing in the R5 000 to R7 000 rental price range.

"There is a huge demand for affordable, rental properties in the Centurion area," explained Schalk Eagar project manager for Central Developments. "The site was selected because of its proximity to Forest Hill Mall as well as major highways in the vicinity."

The Junction @ Forest Hill consists of 20, four-level blocks with a total of 440 apartments. Each unit has two bedrooms, one bathroom with modern, interior finishes letting from R5 600 to R6 200. The development also includes three children's play areas, a laundromat and 24-hour security for all residents.

Construction of the building's exterior was completed with 1 268 000 Moroccan Red Travertine and 1 807 000 Nebraska Travertine face bricks supplied by Corobrik.

"We decided to go with Corobrik's face brick range because of the product's low maintenance qualities as well as the superior aesthetics," said Eagar.

Gert Claassen of Gert Claassen Architect, expanded on the use of face brick in the development: "The deep red face brick was used throughout on the ground level as foundation walls and as a dado of five-courses high, while the rest of the ground storey and the three higher storeys were constructed in the lighter Nebraska Travertine."

He explained that the lighter brickwork in the upper levels was broken up by a horizontal line of two red brick courses placed above the windows.

"These horizontal blocks were further broken by strong, vertical elements such as stairwells, balconies and pipe ducts in the red bricks which interrupted the monotony of long walls," said Claassen.

"Furthermore, the red bricks were used as window sills and brick-on-edge lintels over the windows."



The Junction @ Forest Hill in Centurion, Pretoria.

Musa Shangase, Corobrik's commercial director, said the finished development was testament to the face brick's high quality visual appeal.

"The end result is always striking and there is no need for further plastering or painting later on," explained Shangase. "In addition to the low maintenance cost-saving benefits, face brick has outstanding thermal efficiency which allows for natural cooling in the hot summer months and retention of warmth in winter."

Shangase said face brick was also increasingly popular for the construction of apartment blocks and close proximity buildings where noise could be an issue.

"The sound insulation offered by each brick means a more comfortable living environment for all residents," he said. "The bricks are extremely durable, fire-resistant and the perfect product for any housing. ●"

Corobrik's Moroccan Red Travertine and Nebraska Travertine face bricks were used in the construction of The Junction @ Forest Hill, a Central Developments' rental housing development based in Heuweloord, Pretoria.



Summit sponsor

Hypenica, the organiser of the Smart Buildings and Infrastructure series of Summits, is pleased to announce that Vodacom has signed up as the presenting sponsor for 2017.

"Vodacom positions itself as the fibre access provider of choice to property developers by providing fibre enabled smart mall platforms, with the aim of improving and optimising their retail proposition and improving the overall consumer experience while simultaneously increasing foot traffic. Vodacom is proud to partner with Hypenica in sponsoring the Smart Building & Infrastructure 2017 series of Summits," says Khaya Ngcakani, executive head: FTTX Large-Scale Development, Vodacom.

"This year's summit theme of 'Transforming the future of Africa's infrastructure through smarter planning, design and delivery' aligns with our fibre deployment proposition for property developers. Vodacom plans to enable the smart transformation of large-scale

RESTORING AILING Durban apartment block

February 2016 marked the start of an estimated 15-month restoration project on one of the largest apartment blocks in the Southern Hemisphere. The site was the T-shaped Bencorrum Towers in Durban's beachfront precinct, comprising 334 units and housing over a thousand people.

Built in the early 1930s, the once well maintained Bencorrum Towers, one 16 storeys high, the other 23 storeys high, had deteriorated to a state of total disrepair. Sika's technical sales consultant, Mark Duckham, is advising onsite.

With the scope of works, which includes moderate to severe concrete repair, refurbishment and protection; Curasure KZN, a building maintenance consulting company, specified products from Sika's renowned MonoTop range of ready-to-use mortars. The Ikusasa Group undertook quantity surveying for the project while the application contract was awarded to Coating Worx KZN.

Sika MonoTop-610, a cementitious, polymer-modified, one-component bonding slurry and primer is applied for protection of the reinforced steel. Active corrosion inhibitors in Sika MonoTop-610 meet international standards for corrosion



protection while its excellent adhesion to concrete and steel provides high resistance to water and chloride penetration. Sika MonoTop-612 is a cementitious, polymer-modified, low permeability mortar containing silica fume and synthetic fibre reinforcement, and is used as a high strength repair and reprofiling system. Its excellent slump resistance allows for easy application on overhead and vertical surfaces.

For thick layer concrete repairs, Sika MonoTop-615 HB was used. This is a high build, cementitious, polymer-modified, one-component repair and reprofiling mortar containing silica fume and Ferrogard corrosion inhibitors. It displays excellent thixotropic behaviour. For thin layer rendering on horizontal and vertical surfaces, Sika MonoTop-620 was the

product of choice. A cementitious pore sealer and levelling mortar containing silica fume, it provides excellent adhesion to mortars and concrete. All Sika MonoTop products are sprayable by the wet spray method and provide several advantages including adjustable consistencies, excellent workability characteristics and good mechanical strengths.

As with all high rise buildings undergoing external renovations in densely populated areas, public safety takes priority. Since Bencorrum Towers is situated on an extremely busy street, a mere stone's throw from Durban's famous beachfront, and due to its level of dilapidation, falling debris is of major concern. To exacerbate the challenges facing the contractor, the body corporate of Bencorrum Towers imposed a restricted working schedule; 9:00 to 15:00 Mondays to Fridays, with no work permitted on weekends and public holidays.

Every window in the block will be sealed with Sikaflex-11 FC, a one-part, moisture-curing elastic joint sealant and multi-purpose adhesive based on polyurethane. Its non-sag consistency greatly facilitates sealing of overhead and vertical joints. Solvent-free and odourless, Sikaflex-11 FC provides high quality adhesion, bubble-free curing, good mechanical resistance and importantly, high quality weathering and ageing resistance.

While before-and-after photographs of completed sections at Bencorrum Towers bear testimony to the quality and ease of application of these outstanding Sika products, the ensuing years will prove their durability and efficacy. When the project is completed, long suffering residents, who have endured years of mal-administration and are now personally managing their building, will once again feel proud to reside at Bencorrum Towers. ●

property developments by providing fibre-enabled solutions which will pave the way for end to end converged telecommunications and enable customer-specific turnkey solutions."

The Smart Buildings and Infrastructure series of summits are aimed at the building fraternity (architects, developers, engineers, facility managers, government, municipalities, interior designers) and is Africa's only platform designed for decision-makers and analysts from the public and private sectors responsible for the design, construction and operation of infrastructure assets and or the specification and procurement of major infrastructure assets.

The first in the 2017 series is taking place at the Durban Exhibition Centre, KwaZulu-Natal (KZN) on the 22 February 2017.

"Some 65% of South Africa's population already live in urban areas and this number is growing by 1,2% annually. We also know that

infrastructure demands in most African cities are expected to almost double by 2030.

It is therefore not surprising that smarter approaches to city infrastructure are non-negotiable," says Daniel Claassen, programme director.

The Summit will not only showcase new and better ways of working together with project stakeholders, but will equip delegates with tools to improve urban planning and drive sustainability.

"We have structured the Summit in such a way delegates will be given the opportunity to influence discussions, access a large pool of experts who are tackling similar challenges and to learn about new technologies that are suitable for the South African market. There are also some great networking opportunities with key industry stakeholders," concludes Claassen. ●

COMMENDATION FOR WORK

on AMD treatment plant

AECOM received a 'Highly Commended' award at Construction World's Best Projects Awards 2016 for work on the Eastern Basin Acid Mine Drainage (AMD) treatment plant on behalf of the Trans-Caledon Tunnel Authority (TCTA). This is one of the largest high-density sludge (HDS) plants in the world, with a maximum treatment capacity of 110 Ml/d.

AMD poses a major environmental threat on the Witwatersrand. The depletion of gold reserves in the area has meant a cessation of mining activities and related dewatering operations, which has resulted in the flooding of mining voids. AMD is generated when ore and other sulphide-containing mining waste is exposed to oxygen and water. The water in the mining voids thus becomes acidic and contaminated with heavy metals.

TCTA was mandated by the Department of Water Affairs to implement the necessary AMD water management and treatment infrastructure. The project encompassed treatment plants in the Randfontein Estates area (Western Basin), the ERPM South-West Vertical Shaft area (Central Basin) and the Grootvlei Mine Shaft No. 3 area in Springs (Eastern Basin).

The Eastern Basin plant designed by AECOM (in association with Golder Associates) followed typical industry practice for water/wastewater treatment works, says Claire Hurrell, senior civil engineer, Africa for AECOM. "Some aspects of the detailed design were verified and optimised using state-of-the-art techniques, which not only added value to the engineering, but also ensured cost-savings for the client."

Hurrell explains that, due to the size of the project, AECOM decided to standardise on tried-and-tested technology, as this has been proven to work best globally. "However, we were able to improve on the standard abstraction method."

The three 20-m-long by 1-m-diameter super duplex stainless steel deep-level abstraction pumps selected were installed from ground level down into the 370-m-deep shaft, allowing for the abstraction of the AMD without having to re-establish underground workings.

Construction began in June 2014, and was completed in August 2016. The total construction cost was just under R1-billion. The main contractor was the CMC/PG Mavundla Eastern Basin Joint Venture, with Andritz supplying the deep-level abstraction pumps.

Prior to construction, an underwater camera was lowered into the flooded mine shaft at the Eastern Basin to check for any blockages or significant damage to the shaft. A modified underwater sonar system was also deployed to provide a wider field of view in order to reduce the potential risk of damage to the abstraction pumps.

Such preliminary investigation was essential as the mine shaft had been in disuse for several years, and had seen a lack of maintenance, as well as vandalism by illegal miners. Properly equipped and experienced professional mining rescue teams removed debris and cleared any obstacles from the mine shaft.

Additional constraints were posed by a railway on one side and a wetland on the other. Therefore the plant design allowed for the deep excavations for the thickener recycle pump station to be moved as far as possible out of the wetland area for ease of construction.

However, these excavations still posed a considerable construction challenge, as the excavated material was silty clay prone to shear failures. Hence extreme care had to be taken during excavation.

"A decision was taken to use self-drilling anchors, which flush the area with grout while drilling takes place. This allows the hole to remain open while the voids are being grouted and stabilised in the same operation," Hurrell highlights. "The solution was implemented successfully, allowing for the necessary lateral support to be installed in the large thickener excavations."

Environmental considerations were also paramount on this project. It was essential to adhere to the programme dates to avoid AMD rising in the mining void, and reaching a point where it threatened to pollute natural aquifers and decant at surface.

The plant, which has been operating successfully since August 2016, is reducing the AMD level in the mine shaft by significantly reducing the iron and manganese levels and increasing the pH to an acceptable level for discharge into the environment.

Hurrell indicates this project signifies AECOM's commitment to balancing not only South Africa's, but the world's, need for safe, reliable water, while protecting this critical natural resource. "Combining our knowledge of local African markets with a global network of creative engineering and technical expertise, our sustainable, multi-disciplinary approach to water engineering produces high-quality, cost-effective, energy-efficient, functional and visionary solutions."

In fact, AECOM has water professionals who work in and across the major markets of drinking water, wastewater and conveyance to deliver comprehensive solutions to safeguard human health and the environment. Worldwide, including Africa, AECOM designs, builds, finances, operates, and manages projects and programmes that unlock opportunities, protects the environment and improves people's lives.

The company works with clients across the entire project lifecycle – from initial planning studies through final construction and operations and maintenance services – on both traditional and alternative project-delivery options (design-build, public-private partnerships, and financing). ●

"A decision was taken to use self-drilling anchors, which flush the area with grout while drilling takes place."



SPRINGS MALL to open on 16 MARCH

World-class in every way, the R950-million Springs Mall at Blue Crane Eco Park, which opens on 16 March, will introduce the latest in shopping as well as a generous and exciting leisure experience.

At Springs Mall, its leisure options will come to life with a sensational selection of restaurants, coffee shops and fast food outlets, in a magnificent food court setting.

Springs Mall is a joint venture between Blue Crane Eco Mall, Flanagan & Gerard Property Development & Investment, JSE-listed retail focused REIT Vukile Property Fund and Murinda Investments, which is part of the Giuricich Bros Group.

The unmissable 48 000 m² Springs Mall already enjoys deep roots in its community. The idea for Springs Mall originated with the Springs-based D'Arrigo family, who envisioned developing a large mall for this Ekurhuleni city.

"Today, people's perception of what a shopping mall should be has evolved with the hectic pace of modern lifestyles. They want to be able to get more from a visit to the mall, besides shopping," says Paul Gerard of Flanagan & Gerard Property Development & Investment. As the only major mall in Springs, we felt it was important to give its customers a complete experience in a first-rate retail environment. The Springs Mall retail mix creates a place where people can shop, socialise, workout, eat and unwind, all under one iconic roof."

The eagerly awaited new mall includes a distinct area dedicated entirely to entertainment and leisure.

The upper level of this area will feature Springs' first and only major branded gym, Planet Fitness JustGym. The lower level belongs to the mall's animated food court, which will serve up a mouth-watering choice of menus.

Springs Mall shoppers will be able to enjoy a splendid selection of seven restaurants, cafes and coffee shops, including Spur, John Dory's, Ocean Basket, Cappuccinos, Wimpy, Mugg & Bean, and Café Alegretto.

For food-on-the-run, it will also offer a great line-up of popular quick service restaurants, including McDonald's, Steers, Debonairs, Fishaways, Pizza Hut, Milky Lane, King Pie and Macau Sushi. Also, Platinum Fitness will open directly next to the gym and includes a smoothie bar.



Setting the scene for its socialising and dining attraction is the stunning Springs Mall's food court, a vibrant space that is a stand-out highlight of the mall's design.

Crowning the food court are three prominent triangular ceiling lights that create a beautiful glow of natural sunlight in the court during the day. They also form part of Springs Mall's striking roofscape, which is infinitely visible when approaching the mall from the nearby highway.

The two mall entrances to this leisure area will be illuminated, creating a sense of vibrant energy as shoppers walk inside. At night, these entrances, and the lit-up ceiling lights, will become beacons of light that set the mood for entertainment, in fitting with the mall's restaurants and gym, which can be found inside.

Of course, as well as its comprehensive leisure options, Springs Mall will introduce spectacular shopping when it opens on Thursday, 16 March 2017.

All in all, Springs Mall will offer nearly 170 shops, restaurants and services, as well as its gym, supported by ample, secure parking and easy access off the N17 highway and Wit and Jan Smuts Roads. ●



Adding value to Middelburg WATER RECLAMATION PROJECT

The Aveng Water operations team working on the Middelburg Water Reclamation Project (MWRP) with an initial five-year Operations & Maintenance (O&M) contract for South 32, has since its inception not recorded a single lost time injury (LTI), proving that the project team is dedicated to upholding high safety standards.

Commenting on this significant achievement, Suzie Nkambule, general manager of Aveng Water, said: "The team is doing an outstanding job; both from a safety as well as a technical operation perspective."

The MRWP Project was awarded to Aveng Water on an EPCM contract by BHP Billiton Energy Coal South Africa (BECSA) – now South 32 – in April 2012.

The project entailed the detailed design, construction and commissioning of a 20 Ml/d mine-impacted water treatment plant. Ground was broken on the site soon after the contract was awarded, and the first concrete was poured in December 2012.

Careful planning allowed commissioning of the plant to start in November 2014, while construction was still active on the site. This allowed the commissioning team to reach a crucial milestone for the client by achieving first water at the end of February 2015. The performance test and practical completion was achieved on 1 June 2015.

This entailed operating the plant at

over 20 Ml/d for five consecutive days. However, the feed water to the plant has a very different make-up to the original design basis, which adds complexity to keeping the plant stable.

"This project has opened up numerous opportunities for Aveng Water to help South 32 upgrade the infrastructure of the MWRP to handle the higher salinity water, and to increase capacity in line with their mining ambitions," added Nkambule.

The MWRP is the most recent HiPRO® mine water treatment plant installation by Aveng Water. The in-house HiPRO® technology allows acid mine drainage (AMD) and mine affected water to be treated to potable drinking standard through a series of reactors and membrane-based separation technologies, at class-leading water recoveries of 98%.

"To date, the three Aveng Water HiPRO® plants have treated over 70 billion litres of AMD water to drinking water quality," shares Nkambule.

The remaining liquid waste that typically remains from a membrane plant is

exceptionally difficult and expensive to deal with. The MWRP is the first AMD treatment plant that does not produce a liquid brine waste stream. This technical edge ensured far lower operational costs for South 32, and confirmed HiPRO® as the technology of choice for this project.

Importantly, the MRWP has created employment for the surrounding communities. To date, 15 local community members have been hired and trained – of which one person has already been promoted and moved to the Optimum plant when a vacancy became available. A total of 40 Aveng operational staff are currently involved with the day-to-day operations of the plant.

"The MWRP is a great showcase for what Aveng Water is capable of, and dispels doubts as to whether there is a robust technical solution available locally for the AMD legacy that threatens our drinking water supply in South Africa," concludes Nkambule. ●

About Aveng Water

Aveng Water offers a complete range of water treatment solutions with expertise in design, construction, operations and maintenance of permanent and modular water treatment plants. Aveng Water provides services to the mining, municipal, water utilities and industrial water sectors. Aveng Water's treatment service offering includes:

- Mine water treatment (AMD)
- Municipal water and wastewater re-use
- Seawater desalination
- Industrial effluent treatment

Aveng Water Middelburg Water Reclamation Project.



Safety milestones on wind farm projects

Murray & Roberts Infrastructure's Loeriesfontein Wind Farm and Khobab Wind Farm projects passed the 1,3 million LFTI Free man hours milestone in January 2017. This significant achievement followed on the project reaching one million LTI Free man hours in September last year.

This is no easy feat for a construction project that is being undertaken in a remote area of the Northern Cape, and where much of the labour force is taken from within the local community.

Situated in the Hantam Municipality in the Northern Cape, when completed each of these wind farms will feed 563 500 MWh of clean renewable energy into the national grid each year. Each wind farm will comprise sixty one 99 metre high turbines.

Murray & Roberts Infrastructure is responsible for the construction of all 122 wind turbine generator foundations and the adjoining hard stands as well the construction of gravel access roads to these.

In addition to this, the contractor also took over the upgrading of the Granaatsboskolk Road which allows access from the main road to the sites, some 60 km away. Stephan Venter, project manager for Murray & Roberts Infrastructure, says reaching such a significant



Murray & Roberts Infrastructure celebrates the one million LTIF milestone achievement on its Loeriesfontein and Khobab wind farm projects.

safety milestone is testament to what can be achieved through thorough planning and training.

"We have a focus on skills development and ongoing training for our workforce, and this includes competency as well as safety training. Safe work is paramount to the success of any project, and we are very pleased with this achievement," Venter says. ●

New leader for building engineering team

Effective 1 February 2017, Andersen will be the new Leader for Building Engineering at Arup South Africa.

Andersen said, "This role focuses on identifying and facilitating business opportunities for the Building Engineering team in Johannesburg while ensuring the development of a cohesive and integrated Buildings team across the various engineering disciplines at Arup SA.

Arup Southern Africa Leader, Poya

Rasekhi added, "I am pleased to announce this new role for Heath. He has a passion for developing people, and he will be responsible for the welfare and social enrichment of the Buildings team while still contributing to his role as Mechanical and Building Services Lead for our Buildings, Johannesburg Group".

Heath Andersen has been appointed as Leader for Building Engineering at Arup.



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JOHANNESBURG'S NEW ICON

The horizon of Midrand, north of Johannesburg, is set to change with the construction of the new high-rise head office for PricewaterhouseCoopers (PwC). The R1,5-billion project will be a focal point in the up and coming Waterfall City development and comprises 45 000 m² of modern offices, designed to house 3 500 PwC employees in an efficient and optimally designed workplace.

It is set to become a structure of iconic proportion due to its distinctive twisted form designed by LYT Architecture for Attaccq Waterfall Investment Company and their developer Atterbury, and realised through close collaboration with consulting engineers Arup. The structure is a concrete frame with post-tensioned (PT) floor plates and each floor of the 28-storey office tower rotates 1,2 degrees relative to the floor below. Many of the design challenges and innovations on this project relate to this twist.

Richard Lawson, project manager and associate at Arup adds: "As the 26th tallest twisted building in the world, and the only twisted building in Africa, the PwC Tower has 26 twisting office floor plates, five basement levels and two plant floors. Our scope on the project is for structural, civil, façade, wet services and transport design".

Construction innovation technology

Slip forming

The core of the building was constructed using a method called slip forming, where the concrete is poured continuously within steel shutters – creating a structure with no joints - which moved up at a pace of 2,5 m a day (+ 100 mm an hour). With this particular project, the sliding team worked continuously in two 12 hour shifts, 24 hours a day. At any given time, there was a minimum of 62 workers on the slide shutter itself, and the sliding team had their lunch/dinner on top of the slide. The core wall was constructed in 43 days with an average of 90 m³ concrete placed per day (roughly 3,7 m³ per hour). Due to the duration and intensity of the contract, there were three planned weekend stops to give the sliding teams a break.

"By erecting the core in one operation early in the project, construction time was reduced as the floors and columns could be built without waiting for construction of the walls. It also allowed more time to install the lifts and central services. Internationally this construction method is relatively common for buildings over 10 storeys, but in South Africa it has most recently only been used for forming chimneys and cooling towers," explains Lawson.

Façade details

The Arup façade engineers worked closely with the façade contractors Geustyn & Horak on a new suite of extrusions specifically for this project, which is the first curtain wall in South Africa with twisted unitised panels. The twist caused design challenges at the façade intersections as the frames needed to be warped, but the glass needed to be flat. An aesthetically pleasing solution was achieved by adjusting the setting out of each mullion precisely to create parallel straight profiles on a warped surface. With this approach, any geometric abnormalities are hidden between levels below the sills.

Cleaning and maintenance gondola

At some points along the façade, the curvature causes overhanging



floors, which means that a conventional cleaning gondola could not be used. Rope access may have been possible for cleaning, but for glass replacement, a suspended gondola is necessary. Arup thus worked with specialists, Riggers Steeplejacks, to develop an integrated system where a guide channel is incorporated into the mullion extrusions to guide a cleaning gondola over the height of the building.

Design innovation

Parametric design

Parametric modelling can be described as modelling a structure or object in an n-dimensional space, where certain chosen parameters of the structure are adjustable. In other words, it makes it possible to explore the impact of any of the input parameters on the design and cost of a structure.

Explains Lawson: "The biggest structural challenge was that the spiralling form of the tower causes the gravity loads to create naturally a clockwise torsional load on the building. The traditional

“Because tall buildings of this scale are no longer the norm in South Africa, the team had to consider appropriate current methodologies and technologies throughout design. We believe this project highlights one of Arup’s founding principles – that of holistic design. The PwC tower is being made possible through industry collaboration and the embracing of technology to facilitate that collaboration”.



solution to this would have been a very thick core wall – initial calculations showed that with this scheme a 2 m thick core wall would have been required to resist this torsion. A solution was sought in which the structural columns could reduce or counter this torsional load. Due to Arup’s advanced parametric modelling software and systems, a number of different structural geometries were quickly assessed and an optimised solution found.”

The final scheme incorporated structural columns on the façade of the building that slope in a counter clockwise direction around the core, balancing the gravity loads on the corner columns and reducing the torsion on the core of the tower. This meant that the

stresses on the core wall decreased by a factor of four and a 450 mm thick wall could be used – which is not much thicker than a typical straight tower of that height would need.

“One of the early questions faced by the design team was the type of façade to be fitted to the concave twisting surfaces of the building, so we also used parametric modelling for the design of the façade,” explains Rudolf le Roux, engineer in Arup’s Façades team. “Various solutions were considered at the conceptual stage with factors such as glass utilisation, aesthetic integration with the structure and integration of blinds with a sloping, slanting façade. Building a concave, twisted façade out of straight aluminium profiles and flat glass was a challenge overcome through parametric modelling. As part of the process, we were able to sit down with the architect and make real-time adjustments to things like the column spacing and angles that they could see instantly in 3D. It made collaboration easy, and resulted in far less exchange of correspondence back and forth.”

Environmental considerations

The building is designed to be a Leadership in Energy and Environmental Design (LEED) Silver Green building and the environmental impact due to construction activity is strictly monitored. The building itself will comply with all latest sustainable and energy-efficient requirements in terms of the air-conditioning system, the light fittings and the selection of glass used in the façade. The following sustainable design features were implemented within the Arup scope:

Structure

- The concrete for the superstructure is specified to reduce the absolute quantity of Portland cement by an average of 60% for in-situ concrete, 40% for precast concrete and 30% for stressed concrete. →





→

- Where possible 60% of all reinforcing steel and steel products should have a high-recycled content.
- The building will have post tensioned concrete slabs, as opposed to conventionally reinforced concrete slabs. Post tensioned slabs are substantially thinner and have less reinforcing steel in them than conventional RC slabs. This not only reduces the material used in the slabs but also reduces the size of the columns, foundations and the concrete core walls. This will reduce the amount of concrete and reinforcing steel used in the project by more than 10%.
- The same principle applies in reducing the size of the core wall through parametric optimisation.

Façade

Performance glass is used to minimise the mechanical plant requirements and reduce operational costs.

Infrastructure and wet services

- Rainwater harvesting is future enabled. Rainwater will be drained from the building roof using a Pluvia type system. The downpipes will run vertically in the core and connect in a network in the basement levels to storage tanks that could be filtered and used to supplement the supply of water for flushing of toilets and urinals in future.
- A sump in the lowest basement level collects ground water seepage through the retaining walls and is pumped out by means of a submersible type pump to irrigate the PwC gardens and the neighbouring park. This water would have otherwise connected directly to the storm water system and been lost.
- All excavated material has been locally reused on the rest of the Waterfall City site.

Quantifiable time, cost and quality

Optimisation and collaboration

The tower has complex geometry and various options have been reviewed, with the help of parametric modelling, to identify the most efficient way of supporting the structure that complies with the architectural intent. "Close alignment with the façade design has allowed a seemingly difficult form to be achieved with a reasonable degree of repetition and coordinated detailing. Buildability and maintainability have also influenced the structural and façade design," adds le Roux.

Construction programme reduction

Programme reduction was taken into account when completing the design of the project. To reduce lead time before breaking ground on site, Arup issued earthworks as a separate package ahead of the rest of the building. For a tall building the programme is governed by the floor to floor cycle time. Slip forming the core adds an early activity to the programme but then allows each floor to be completed more quickly, saving time overall. The use of bonded PT slabs also allowed the floor cycle time to be reduced without compromising the future flexibility of the building.

Façade

The curtain wall is constructed using the unitised principle in which complete glazed panels are made in a factory and then installed onto pre-set brackets on the building. This means that:

- No scaffolding is required, which would have been very costly for the almost 100 m height and 20 m overhang of the top floor over the ground floor.
- Curtain wall installation can proceed before all concrete floors are cast
- Quality is better controlled in a factory than on site.
- Panels can be installed quickly, typically 20-30 panels per day.
- Panels are watertight as soon as they are interlocked in position, allowing following trades to commence immediately.

Risk management

Concentrated solar reflections

Le Roux comments: "The PwC façade is concave and twisting. Considering several high profile cases beset with concentrated solar reflection problems (notably those at 20 Fenchurch Street in London – the 'Walkie-Talkie' – where plastic fittings on a Jaguar on the street melted in 2013), concentrated solar reflections were identified as a risk for the tower and needed careful study. At the time of design, no general analytical software existed for calculating the intensities of solar reflections. A purpose-built script was developed for this analysis, with the results benchmarked against other Arup studies globally."

Using this script, Arup was able to calculate the magnitude of the solar concentrations in the open areas surrounding the tower and provide feasible and practical solutions to mitigate the impact of the solar reflections. Solutions considered were sunshades on the



Project information

- **Client:** Attacq Waterfall Investment Company
- **Property developer:** Atterbury
- **Civil, structural, façade, wet services and transport engineers:** Arup
- **Architect and project manager:** LYT Architecture
- **Quantity surveyor:** Brian Heineberg and Associates
- **Mechanical engineer:** WSP
- **Electrical engineer:** Claassen Auret
- **Fire engineer:** SFT
- **LEED consultant:** Ecocentric
- **Main contractor:** WBHO
- **PT contractor:** Amsteele
- **Steel contractor:** Cadcon
- **Façade contractor:** Geustyn & Horak

façade, randomly scattering façade panels and making spandrels non-reflective. In the end, it was decided that the best solution was to use a less reflective glass in the spandrels that was further enhanced by acid etching. Landscape shading addressed any remaining concentrations over limit.

Stormwater management

Careful consideration has been given to mitigate the risk of flooding. Utilities provision has been considered and a storm

water management plan has been prepared to inform the SDP submission as well as the LEED assessment.

Conclusion

The PwC Tower, when complete, will be exemplary. Not only will its striking profile be recognisable from many kilometres away, it will also stand testimony to the skill and innovation found in South Africa's built environment fraternity.

Lawson gives Arup's highlights of the design: "Our use of parametric modelling software on a project of this scale is unique within South Africa. By taking this approach we realised both time and cost efficiencies and a better integrated and well considered design, with all architectural and construction factors in sync.

"Because tall buildings of this scale are no longer the norm in South Africa, the team had to consider appropriate current methodologies and technologies throughout design. We believe this project highlights one of Arup's founding principles – that of holistic design. The PwC tower is being made possible through industry collaboration and the embracing of technology to facilitate that collaboration". ●



RELIABLE, NETWORKED partners to depend on

“When you’re contracted as a concrete supplier on a 500 000 m³ project you can comprehend the importance of reliability from each and every partner in your ‘team’.

► Afrimat Ready-Mix Division forms part of the larger JSE-listed Afrimat Limited group which is active nationally and moving into neighbouring states, with the view to moving strategically into the Southern African region.

Ricus van Heerden who is responsible for Afrimat Ready-Mix Division’s Western and Northern Cape region, emphasises how crucial logistics, planning, collaboration and trust are in a business such as theirs.

“While we concentrate on our core product, its quality manufacture, we also rely on our outsourced transport teams to uphold our customer promise and thus our reputation.”

“The example of 500 000 m³, could be a substantial mall or huge multi-storey building in the heart of a metropolis. On such sites an on-site concrete batch plant is not feasible, so it has to be driven in from one of Afrimat’s fixed batch plants in the region. This is when you may see a row of seven or more FAW 33.330FC mixers with 6 m³, or 35.340FC mixers with 8 m³, waiting in line to drop their loads, each load with only around three hours margin between them to place the concrete in a specific sequence.

“Let me assure you, it is in situations like this that you do not want one of those trucks to suddenly have mechanical problems,” explains Van Heerden.

Van Heerden cites this example to show how critical the collaboration is between the clients normally represented by a chief contractor of the project and Afrimat on the one hand, and between Afrimat and its subcontracted transport suppliers on the other.

“We make use of a large variety of transport subcontractors, from big transport company mixer truck fleets, to smaller two to six truck operations, to LODs (lorry owner driver). In this way we put together the most cost-effective team for each individual project we get.”

“In the case of the smaller subcontractors and the LODs we partner very closely, from providing surety to finance their vehicles, to providing business skills support.

He says that one of the requirements for all their transport

subcontractors is that they buy FAW mixer trucks because not only does this brand offer the combination of one of the lowest cost of operation and the one of the highest records for uptime, but they have the actual manufacturer, FAW Vehicle Manufacturers SA’s full service and maintenance backing.

“The construction industry is extremely price sensitive. This is why the entire logistics chain has to be 100% networked, have to collaborate on best solutions for our client and then with the greatest precision implementing the plans.

“This is one of the many reasons we advocate that our transporters run FAW mixer trucks. FAW SA is prepared to engage with us, and listen to ever-changing demands from our clients and regulatory bodies. If certain clearances and protective adjustment needed to be made on the mixer trucks, FAW didn’t hesitate to work with us on solutions. A partner like this is a partner we can trust,” says Van Heerden.

Afrimat subcontractor

Situated in Worcester is one of the Afrimat’s subcontractors, RUKO Investments that runs 13 FAW mixer trucks and one tipper, six 33.330FC 6 m³ mixers and seven 35.340FC mixers with 8 m³ capacity.

Kobus Smit, one of the partners, says that they enjoy a great relationship with Afrimat, who provides them with the majority of their contract work.

“Wherever our drivers have to collect and dispatch the Afrimat concrete we have a single mantra ‘be ready, do it right’.

“Our drivers love the FAW mixers because they’re easy to drive – quite something when you have up to 15 tons of concrete churning in the drum behind you. As we have our own inhouse technicians, they too praise the simplicity and speed with which we can service, maintain or repair one of our units.

“Being a mid-sized operation we need our vehicles out and working. Our margins are tight and our customer like Afrimat takes no prisoners when it comes to staying on plan.”

Smit concludes, “What we like best about FAW is that their vehicles are evolving. We see continuous improvement and this assures us that they are customer-centric.

“FAW makes the time to understand the construction industry and is prepared to collaborate with everyone involved to find the best transport solutions.” ●



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Seamless fleet MANAGEMENT for CONTRACTORS

By Paul Crankshaw

As part of its total solution for fleet owners, Scania's Connected Services offer systems and tools to gather and transfer vital data from trucks to their owners – presenting the information on a variety of platforms for easy accessibility.

Scania's Connected Services harness diagnostic and communication technology to give contractors real-time feedback on their truck performance, helping to raise the skill level and efficiency of their drivers.

Intelligence on various indicators – ranging from fuel consumption, location and speed, to frequency of hard braking, coasting and idling – is transmitted from the trucks directly to dedicated Scania servers, which make the data available on web-based applications.

The customer – as well as relevant Scania experts and workshops – can view and download the information they need, either on computer, mobile phone or the Scania Black Griffin wrist-watch.

The Griffin looks like a standard watch and connects to Scania's Fleet Management System – providing the most useful vehicle metrics such as fuel data, driving support score and trend analysis. According to Connected Services Manager Faried Arnold, the FMS device that gathers the data – similar to a 'black box' on an aircraft – is fitted with every Scania vehicle and enhances the value of the financial return earned from the asset.

He emphasises that an important part of that value emanates from the quality of the driver. "The skill and professional behaviour of the driver in any construction vehicle is vital to ensuring high productivity, improved uptime and long asset life," said Arnold.

"Through Scania's Connected Services offering, contractors can monitor how well their drivers are doing – on a daily, weekly and monthly basis. This creates the foundation for more effective driver training, and leads to better drivers who enjoy their work while achieving higher output on site."



Driving real-time data for better hauling productivity: Scania's Connected Services Manager, Faried Arnold (right), and Theuns Naude, Key Accounts Manager for Construction.

"The construction environment is very demanding on the driver's expertise, so it is vital they get as much support as possible to hone their skills and keep them sharp," said Theuns Naude, Scania Key Accounts Manager for Construction. "The data that we collect as part of our Connected Services to customers, allows us to develop an accurate picture of how the vehicle and the driver are performing over time."

According to Naude, the driver can select one of a few different driving modes, which assist in adapting the vehicle's performance to the specific application. The off-road mode, for instance, provides for changes like raised revolutions per minute for better traction, and quicker shifting between gears.

"The driver's ability, however, is still the most important factor in getting optimal performance while being economical with fuel and maintenance requirements," he said. "This is why we tailor our driver training to individual needs, and provide the tools to monitor and score each driver's behaviour according to indicators that will improve overall business performance."

To facilitate this focus on individual drivers, Scania has developed a Tag Reader for driver identification and monitoring. Each driver has their own ID Button which interacts with an ID Button Reader in the cab of the vehicle.

This is very useful on construction sites, where trucks change hands at the end of each shift – perhaps three or four times per day. Individual driver behaviour can then be tracked and analysed according to indicators such as gear-changing (on manual configurations) and braking styles. Employers can then link driver scores to company incentive schemes, an effective strategy for promoting safe and responsible driving.

Scania is even going a step further than driver training, by developing a driver coaching programme that will further improve the contribution that a good driver makes to the success of a company.

"Another valuable benefit of the on-board system is its ability to calculate the truck's average load," said Arnold. "Our Connected Services make that data quickly available for contractors who want to optimise their site performance by tracking tonnage."

Remote diagnostics is also central to the value that Connected Services brings to contractors' operations, he said. By collecting and transmitting detailed technical data from a vehicle to the Scania workshop or support staff, it reduces downtime by ensuring accurate diagnosis and parts selection. By the time the technician arrives on site, he will have insight into the issue at hand, and will be equipped with the appropriate tools and spares.

The service also transmits details of any faults identified, so that issues can be reported on the Fleet Management Portal; this allows early, proactive response before faults can escalate and disrupt production. ●

The Scania G460 8x4 tipper fitted with the Scania Fleet Management device.





TOP JAPANESE OEM

Since the inception of Isuzu Truck South Africa in 2006, the Company steered towards a clear objective – to be the Number 1 Japanese original equipment manufacturer (OEM) in South Africa, an objective that first became a reality in 2013.

2013 was also the first year in the Company's history that over 4 000 Isuzu trucks had been sold in South Africa – 4 019 units to be precise – which moved the then market leader into second position.

"We remained focused once we achieved the Number 1 position, but we were aware that it was not going to be an easy task staying at the top" says Craig Uren, Isuzu Truck South Africa's director and chief operating officer.

Isuzu Trucks had a solid performance at the end of 2014, exceeding the 4 000 units' sales mark for the second year in a row and remained the leader in the cab-over-chassis and medium commercial vehicle (MCV) segment of the industry, with a market share of 12,8% of the total truck market.

N-Series products accounted for 21% of the MCV market, giving Isuzu Trucks market leadership of the segment while the F-Series range of trucks achieved 23,4% of the heavy commercial market (HCV) market. Since the introduction of the FX-Series the range continued to grow.

In 2015 Isuzu Trucks aligned strategies, expanded the business model and coupled with solid sales efforts totalling 4 550 units from across the Dealer Network, hit a new high and increased its market share by 2% to 14,9%. Equally the Company's share in

the MCV market increased to 27% while the share in the HCV market added four percentage points to a total share of 33%.

The acquisition of Port Elizabeth based companies Kanu Commercial Body Construction offers the opportunity to deliver ready-built trucks to Dealers faster, while chassis modifications are done by Automotive Chassis Technologies (ACT) where required. Both Kanu and ACT still service the local market and are not dedicated to Isuzu Trucks in entirety.

Although 2016 was a trying year, despite certain challenges, Isuzu Truck South Africa held onto its Number 1 position for the fourth consecutive year and ended with a 14,6% market share from the total park of 3 952 units.

With 1 971 units sold across the 19 N-Series model derivatives totalling 50% of total ITSA volume for 2016, Isuzu Trucks claimed 23,3% of the total MCV market (8 451 units including AMH). However, in the HCV market of 5 460 units, 28,3% or 1 545 units were Isuzu's. The EHCV segment take up the bulk of the volume (11 860 out of 27 047 units) and in this segment ITSA achieved a 3,5% share. ITSA's share in the Bus segment was 1,8%.

When comparing the market excluding Van and Bus – the segments that Isuzu



Craig Uren, Isuzu Truck South Africa's director and chief operating officer.

Trucks don't actively compete in – the Company's share is 16,7%.

"We wish to thank our dealers and Isuzu Trucks' Partners for their contribution to our continued success" says Hiroaki Sugawara, CEO and Managing Director of Isuzu Truck South Africa. "Achieving the Number 1 position is no mean feat and to do so for four consecutive years is commendable".

What is in store for 2017?

Isuzu Trucks will continue to expand its business into Africa and investment in the local Dealer Network as it aligns long term strategies while offering Customers and Fleets the best suited truck and aftersales service for their requirements.

"Will Isuzu Truck South Africa be the top Japanese OEM for a fifth year in a row? 2017 is not going to be an easy year, but with product, parts and aftersales service back-up, there shouldn't be a reason why not. But time will tell," concludes Uren. ●

CONFIDENCE IN THE PERFORMANCE

Terex Trucks goes all out as it reveals the new Gen10 TA400 and launches a new warranty offering for customers at CONEXPO-CON/AGG (7 to 11 March)

Dedicated to building machines that withstand the test of time, Terex Trucks draws on more than half a century of design innovation to create its reliable and robust haulers. The Generation 10 TA400 is revealed to visitors at CONEXPO/CON-AGG 2017 in Las Vegas. With confidence in the performance of its products, the Scotland-based manufacturer is also upping the ante with the launch of an extended warranty package. To ensure customers benefit from a low total cost of ownership, Terex Trucks will unveil its new 6 000-hour warranty on all Factory-Approved Terex Trucks parts.

"Listening to what customers want, Terex Trucks has made various progressive moves over the last few years to make certain the machines and products not only maximize uptime but also provide a significant return on investment," says Paul Douglas, director and general manager at Terex Trucks.

New generation

Terex Trucks' show-stopping Generation 10 TA400 will take center stage at the company's stand at CONEXPO/CON-AGG. The EU Stage IV/Tier-4 Final emissions-compliant machine is the new generation hauler that the Scotland-based company has produced. It offers durability and quality to ensure that customers benefit from lower operating costs and increased performance – even in the toughest of terrains. The 38-tonne capacity articulated hauler is also the first product to be launched by Terex Trucks since its acquisition by Volvo Construction Equipment.

Made in Motherwell, the Gen10 TA400, which is the largest in Terex Trucks' articulated hauler family, features upgraded hydraulic and electrical interfaces, new drop box and improved aesthetics in order to maximize the uptime of the dump truck.

Customer advantage

With a manufacturer-client relationship that goes beyond the point of purchase, Terex Trucks understands the significant investment customers put into acquiring machines and the company is committed to offering the very best aftermarket support available to maximise operational output. To back this commitment, Terex Trucks will introduce a two-year or 6 000-hour warranty – whichever comes first – on all Factory-Approved parts.

Designed with precision engineering to work in tandem with all other core components of the off-highway machines, the genuine parts are manufactured to achieve continuous optimum performance and a longer service life.

Versatility for arduous environments

Also on display at CONEXPO/CON-AGG will be Terex Trucks' proven performer, the TR60 rigid hauler. With a payload of 55 tonnes, the versatile dump truck is designed to haul through arduous environments.

Fitted with the Cummins six-cylinder 19-litre engine that boasts gross power of 522 kW (700 hp) and maximum torque of 2 981 Nm, the TR60's drivetrain gear reduction provides excellent rimpull, powering the rigid hauler up the steepest of gradients, while a high capacity haul body makes for low retention carry-back and cleaner dumping. A popular model, the TR60 offers solid performance in a wide range of hauling applications – from mining sites to large construction and earthmoving projects.

"CONEXPO-CON/AGG will see Terex Trucks make its Las Vegas debut as a stand-alone brand so it's only right to do it big – it's the ideal platform to launch the extended two-year warranty on Factory-Approved parts.

"Our commitment has always been to ensure customers are satisfied with the performance of our haulers, which is why we have made major investments in building our products to the highest standard and we're continuously making them easier to support," says Paul Douglas. ●





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Going the Extra Mile



An alternative look at the COST OF THE BUILD

There are some very good reasons why alternative building methods aren't that feasible in the South African market. They can potentially be more expensive than traditional methods, don't inspire customer trust and may not be as aesthetically pleasing. Alternative building methods also come with a hidden price tag that can impact on quality and finish.

“There is a resistance to alternative methods in South Africa,” says Bert van den Heever, Immediate Past President of the Association of South African Quantity Surveyors (ASAQS). “Most of the alternative construction methods have concentrated on providing alternative walling and roofing systems, the two largest elements you see when looking at a building. “Trying to save money on walling using alternative building methods is sometimes a futile exercise as walling normally comes in at less than 10% of the total project cost,” Van den Heever said.

The use of clad walling systems has resulted in a negative perception in the lower end of the housing market called the Knock Factor Effect. People knock the walls, if they sound hollow they instantly perceive the build as not solid or secure. They want to solidity of brick – the traditional

The use of clad walling systems has resulted in a negative perception in the lower end of the housing market called the Knock Factor Effect.

materials – over the perceived flimsiness of panels – the alternative ones.”

In addition to the impact of perception, alternative building materials are not always readily available in South Africa and often have to be imported. This pins on a price tag that few can afford. As a result, there is some growth within the high-end market, but limited uptake in the lower end of the market.

“The value of using alternative building methods is hard to quantify,” says Van den Heever. “We can show a client how using method B compared to method A will affect costs and often the answer isn't in favour of alternative solutions. What we do is look at is every aspect of the building and assess exactly what the costs are going to be from the start. We bring clarity – you may not like the answer, but you will know exactly where you stand.”

Whether adopting alternative or investing in traditional, the method and materials of the build are not the questions that the customer should be asking. Instead, they should be looking at the impact of cost right from the planning stage of the project to ensure that every part of the project, from the meters to the materials, are assessed and evaluated.

“People often complain that there are hidden costs in their build; that the project price is stacking up in spite of a clear quote at the start,” adds Van den Heever. “That's the pitfall that the quantity surveyor helps you avoid. We can put figures down that show you what you can get, from what you want, in the budget you have. You want to invest in alternative building methods? With that kind of clarity into spend and capability, you can, and you can do it without unpleasant surprises.”

“We can show a client how using method B compared to method A will affect costs and often the answer isn't in favour of alternative solutions. What we do is look at is every aspect of the building and assess exactly what the costs are going to be from the start. We bring clarity – you may not like the answer, but you will know exactly where you stand.”





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Redefining the **IMPACT** of project **DELAYS** on cost

by Dr Hendrik Prinsloo, course facilitator, The Association of South African Quantity Surveyors (ASAQS)

Project delays can have a significant impact on trust and budget if not handled adeptly from the start, and now there are tools which can help to transform the challenge

When it comes to delays and the assessment of delay claims, there is limited guidance available. In fact, there is no clear path in terms of managing the issue, establishing process or determining who is ultimately responsible. The result is that many unexpected delays end in disputes which can potentially impact on relationships and the success of a project. There has long been a need for the industry to have access to a simple, standardised process which walks all parties through the claim and finds equally simple answers to the problems.

Inspiring a tool

This need inspired the development of the Decision Support Framework, a tool designed to assist in the assessment of claims from the start, eliminating indecision and uncertainty and providing users with a clear route to resolution. The framework was crafted over a number of years, and was designed to be easy to understand and capable of managing claims across industry and incident. The Decision Support Framework is currently being integrated as part of the Association of South African Quantity Surveyors' (ASAQS)

member toolkit via continuous professional development (CPD) training courses which are being offered around the country. The intended outcome is to assist quantity surveyors in making accurate assessments, determining root causes and, ultimately, saving customers money.

Alongside supporting the more accurate and efficient assessment of delay claims, the tool adds a sense of fair play – the standardisation of process and procedure allowing all parties equal say. Often, there is no small measure of uncertainty when it comes to claim assessments, so if all parties are using the same resource, it ensures that both client and contractor have the same input, see the same results and have their concerns acknowledged. This can also have a positive impact on time spent with claims, reducing disputes and saving on costs.

The goal is to complete the project, not become embroiled in lengthy debate or lose money as the days tick by and the build remains dormant.

In any industry, time is money. More so in the construction industry where time delayed decisions can result in a cost per day impact. Likewise, a delay in the delivery



of materials to site, can impact costs. By identifying delays and ensuring swift resolution, the Decision Support Framework can have immediate and long-term cost savings. The quantity surveyor can assist in determining the delay far more efficiently and this can significantly lower the financial implications which normally come hand in hand with any delay claim.

Sidestepping the usual problems

The Decision Support Framework sidesteps the usual problems by taking the user through four primary decision making processes. Each of these has been carefully researched to fit alongside the extension of time claims, and each one uses a process to allow for deliberation and careful resolution. The tool helps to arrive at the easiest conclusion as users follow the steps to a solution and find a mutually beneficial agreement.

For those who are cost conscious and who always keep a keen eye on the bottom line, this Decision Support Framework methodology will add another metaphorical arrow to the professional quantity surveyors quiver. By virtue of the work that quantity surveying professionals undertake, they regularly find themselves at the centre of cost related misunderstandings, while being ever mindful of bringing the project home within budget.

The ASAQS's EduTech Division has identified the need to bring clarity to both the construction industry and to the associations QS professionals, by offering bespoke training that provides the participant with a broad understanding of the principles and best practice around this sensitive issue. ●



Emphasising SANDF's interest in LSF

The Southern African Light Steel Frame Building Association (SASFA) reports that there has been an encouraging growth in Southern Africa in the past two to three years in the awareness of light steel frame building as an environmentally friendly and sustainable building method and that training has been fundamental to this growth.

SASFA director John Barnard says that the successful training programmes undertaken by SASFA have been key in the promotion and growth of light steel frame building (LSFB) in Southern Africa. "Education is the foundation for getting the advantages of a new method understood as well as for protecting and enhancing quality of building through the growth phases and beyond," says Barnard.

The latest to come on board is the SANDF to whom, on their request, SASFA presented a five-day training course for LSF contractors at the Old Fort Rd Military

Base in Durban. The intention of the course was to qualify their foremen and artisans in LSF, in preparation for a building project comprising five three-storey blocks of flats and offices.

The students of Regional Works Unit KwaZulu-Natal – under the command of Capt S. Mashigo – who enrolled for the course included, amongst others, plumbers, electricians, and project managers. Col E Jacobs coordinated arrangements for the course from the SANDF's side, while the SASFA members who supplied support for the course and made it possible were Saint-Gobain, Martin and Associates, and Simpson Strong-tie. Bosch Tools illustrated its wide range of equipment suitable for use in the LSF industry.

The course was in two parts

Steel frame materials, components, and erection (3,5 days), covering introduction, the steel making process and properties of coated steel sheet, followed by sections on foundations, manufacturing of light steel frames and trusses, construction tools, wall

frame set-out, handling, loads, floor framing, wall framing, roof structures, planning and the installation of services, and

Internal lining, external cladding and insulation (one day), covering the properties, manufacturing and benefits of glasswool insulation, acoustics, energy efficiency, environmental issues, storage and handling of glasswool and tools and installation methodology.

This was followed by a section on gypsum plasterboard, covering properties, storage and handling, cutting, tools and application for walls, ceilings and finishing.

Fibre cement board for external cladding was addressed, including the installation of the vapour permeable membrane, sizes and availability of fibre cement – boards and planks, fixing accessories, installation guidelines, and door and window frame installation detail was presented.

As part of the course, the students had to write two tests to assess their understanding of the subject matter. Certificates of successful completion were issued to those who passed the tests. ◉

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MIDAX HOUSE PROJECT

House Midax in Zinkwazi beach is a magnificent illustration of how structural steel can be used to effect complex builds where light weight, complex shapes and accuracy are required in construction.

Midax Investments acquired a beachfront property in Zinkwazi Beach in June 2013. At the time the 1970s designed house was somewhat run down, but the location right on the beach and the sea views offered warranted the investment.

Environmental limitations forced planning to consider the addition of a second level. In addition, the existing cement tile roof was very dilapidated and as it was considered to be unsafe, the plan for replacing the very heavy roof (some 20 tonnes) with a second level living area became very appealing.

Structural engineer Rob Young who, at the time was involved in another Zinkwazi project, was approached as consulting engineer on the re-build. Following soil testing and inspection of existing foundations, Young advised that it would be possible to add a second level provided that the design stayed within 25-30 odd tonnes of weight on the existing foundations.

Architect David Mealin, a Zinkwazi resident, was appointed to design the largely 'new' house. He produced a very modern concept which maximised the views, contained large open plan living areas and some quirky features such as overhanging 'glass box' bath rooms. He also incorporated the client's wish for a large veranda at ground level, the roof of which doubled as a large (100 m²) deck for the upper levels.

Challenges

The structural engineers were therefore faced with the following challenges:

- Engineering a reasonably light weight structure which would allow the uninterrupted sea views, large open plan areas and quirky design elements
- Engineering a very corrosion resistant structure capable of withstanding the highly corrosive KZN North coast environment
- Fitting the structure to a fairly complex existing ground floor wall layout.

Rob Young suggested a steel structure with light-weight wooden floor and light-weight aluminium roof for the new upper level. In essence the structure consisted of the following elements:

- A concrete ring beam cast onto the existing ground floor walls at the rear of the house
- Fabricated steel girders spanning window openings on the seaward side of the building and serving as the seaward portion of the ring beam
- An array of steel I-beam floor beams spanning from the concrete ring beam (where they are anchored), cantilevering over the forward fabricated steel girders to form the deck
- Steel roof support columns
- I-beam front and rear roof carrier beams
- Wing style roof consisting of pointed I section steel trusses and lip channel purlins
- Thin skinned box girder 3CR12 sections forming overhanging bathroom structures
- GRP 'sandwich' side walls closing off overhanging bath room boxes
- A 'floating' steel staircase
- A mezzanine portion of the floor suspended from the roof to give clear view lines in the entrance

Most of the seaward fabricated beams were not clad externally so as to express the nature of the structure. Where cladding was used the following materials were employed:

- Plaster board on internal surfaces
- Brick walls on the rear wall
- Brick infill on some seaward fabricated girders
- Nutec board

C.I.S Engineering (a Structa Group subsidiary) was appointed as manufacturer.

In order to achieve an 'exact' fit to the existing ground floor walls, these were measured up using sophisticated laser measurements (performed by Richard Logan Surveyors). The layout model developed from the laser measurements was imported into TEKLA and the structural steel layout super imposed to ensure proper fit up. An anchor bolt drilling template was developed on the same layout.

The TEKLA model was also used to fully integrate the building, structure and services. Where possible the structural elements were modified to incorporate additions such as:



- Facia mountings
- Service channels
- Gutter recesses
- GRP sandwich mountings
- Channels for deck and mezzanine frameless glass balustrades

Corrosion protection was achieved by employing a duplex coating of hot dip galvanising and a two-part epoxy paint.

On site

The first component to arrive on site was the anchor bolt drilling jig. This was assembled and put into place on the existing walls and concrete ring beam. Key anchor bolt positions were marked and drilled, thus ensuring proper fit up of the steel structure.

Construction of the steel structure and logistics had to be carefully planned and synthesised with mobile crane presence on site which had to be minimised (55 t mobile crane with 30 m reach). The structure was delivered in three loads from Gauteng. The loads carried items prioritised to suit the build.

The owner's satisfaction with the project is illustrated by their entry of the project in the SAISC Steel Awards Competitions, where the project was awarded with a 'High Recommendation'. ●



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Replacing traditional wooden and concrete poles

Steel masts manufacturer Structa Technology has unveiled its new utility steel pole as part of its 200/240 range and has supplied these poles to state-owned power utility Eskom and various mining companies.

► The patented oval steel utility pole was designed and developed over two years as an alternative to the traditional wooden and concrete utility poles available in South Africa.

They were produced for 11 kV to 66 kV distribution circuits and for distributing electrical and telecommunications services in rural and township areas.

Why steel poles?

The steel poles were designed to alleviate the shortage of the 11 m wooden poles and help solve the problem of cable theft, as the cables run inside the steel pole.

Eskom has tested and accepted the poles and these are listed on the service provider's system. Structa has, to date, supplied about 6 000 poles to Eskom.

The poles have also been tested by the Guangdong power utility in China and approved for use there.

Structa Technology MD, Hercules Rossouw, says there were challenges in designing and testing the pole and getting Eskom and the global market to accept the product.

However, the response from companies has been positive and Structa now plans to also export the poles.

"We have already supplied poles to mines in the Democratic Republic of Congo and Namibia and these were used as lighting poles," he says. The 200/240 range is designed for universal application and allows for different configurations of phase carrier and for stay cable attachments. Companies in the mining industry have approached Structa to specifically design 12 m and 13 m utility poles, with a thickness of 6 mm and a tipload of 8,5 kN.

Structa has supplied Sasol Mining's Thubelisha mine, near Secunda, in Mpumalanga, with three hundred 13 m poles, which were used for the distribution of power and fibre optics for telecommunication lines.

Steel pole's advantages

The advantages of the steel poles range, compared with wooden poles, include an earthing advantage, owing to the steel material; no shortage of raw materials; being lighter and allowing for easier handling; no on-site preparation is required;

and very little maintenance is needed during the product's life cycle.

Another advantage is that the poles are fire and rotproof. They are also difficult to cut down, which assists in preventing cable theft. "Structa is happy about the positive feedback we have received, taking into consideration the wood shortage currently experienced, as well as the cable theft issue," says Rossouw.

The universal transformer pole with internal cable ducts and cable locks is another product from Structa Technology that is aimed at ensuring cable security.

Other products designed and manufactured by the distributor include its Electrotower electrical distribution Mono Poles for single and double circuits for between 11 kV and 220 kV distribution lines and the H-type termination, strain and suspension structures, which are also available as double poles for between 22 kV and 132 kV lines.

Power utilities throughout Africa have successfully used the company's 259 and 265 electrification poles. ●





Steel Awards 2017: call for entries

The Southern African Institute of Steel Construction (SAISC) has called for entries for the AVENG Trident Steel Awards 2017 and CADEX Systems SA Photo Competition.

SAISC CEO Paolo Trincherio says that after the high standard of the 2016 Awards there has been extraordinary expectation throughout the steel construction industry in relation to this year's Awards.

"In short," says Trincherio, "the primary criterion for Steel Awards is: Does the project illustrate what can be achieved with steel?"

- AVENG Trident Steel is the main sponsor for the 2017 Steel Awards
- The Awards will take place on 13 of September 2017 in Gauteng, Cape Town and KwaZulu-Natal.
- Project nominations for the awards are now open
- Any project team member involved in a construction project can nominate it, provided that a Southern African steel constructor played a significant role in the project.
- Project categories are determined by entries received, but set categories for the 2017 Steel Awards include: ASTPM Tubular Category, Global Roofing Solutions Metal Cladding Category, Safintra Factory and Warehouse Category, MiTek Light Steel Frame Category and the SAFAL Innovation Category
- The best photograph of an entered project also wins an award

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Simpson Strong-Tie South Africa works closely with SASFA by providing product training to contractors and improving construction methods in the Light Steel Framing Industry.

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SURFACE COURSE REHABILITATION

VORO, a milling contractor based in Kassel, Germany, brought the versatility of the W 100 CFi Wirtgen compact milling machine into play when rehabilitating the surface course of a federal highway.

► The B3 extends over a distance of 755 km from Buxtehude in the north of Germany through to the Swiss border in the south. The job involved milling areas of damaged asphalt on one side of the highway in the vicinity of the municipality of Jesberg in the federal state of Hesse. As the project progressed, a free flow of traffic had to be maintained on the opposite lane. A total of 1 200 m² asphalt surface course had to be removed to a depth of 4 cm. The entire milled area was divided into 13 individual sections, each 3,50 m wide and located at intervals of 50 to 100 m.

Manoeuvrable and versatile

“We used a type W 100 CFi Wirtgen compact milling machine for this job, as it achieves a high area output with low fuel consumption and, with its compact design and maneuverability, can be easily transported from one job site to the next,” explained Alexander Emde, operations manager of VORO Straßenfräsdienst GmbH.

In the Wirtgen Compact Class, customers can choose from no less than eight models with standard milling widths ranging from 1 m to 1,5 m and milling depths of up to 330 mm. Combined with the Flexible Cutter System, milling widths of 8 cm to 1,5 m are possible. The entire machine range – encompassing the W 100 CF/W 100 CFi, W 120 CF/W 120 CFi, W 130 CF/W 130 CFi and W 150 CF/W 150 CFi – delivers on performance and economic efficiency. It covers classic small milling machine applications such as partial road repairs as well as the removal of entire road pavements – a task which is normally the preserve of large milling machines. Wirtgen compact milling machines are therefore not only extremely versatile. In combining the advantages of the large and small milling machine classes, implementing a uniform operating concept and, in particular, incorporating pioneering control technologies, the Wirtgen compact class is now one thing above all: The next step in the development of cold milling.

Benefits

- The diesel engine of the Wirtgen W 100 CFi is equipped with both an oxidation catalytic converter and an SCR catalytic converter for effective exhaust gas treatment and meets the stringent requirements of the highest current exhaust emissions category EU Stage 4.
- The operator's stand, which can be hydraulically displaced 200 mm beyond the edge, provides a perfect view ahead of the milling drum assembly and onto the front right-hand crawler track.
- Working on the job site while traffic is flowing in the opposite direction is no problem for the Wirtgen W 100 CFi. The considerably narrower chassis that also provides the driver with an optimum view of the milled edge is an additional advantage here.
- The ergonomic multifunctional armrest of the Wirtgen W 100 CFi features four ‘favorites’ buttons that can be programmed with any of 20 functions as well as a color operating display. All important information is shown on a small screen – for instance the compilation and visualisation of job data.

Effective operation and increased performance

The Wirtgen W 100 CFi is equipped with a powerful, 257-kW diesel engine and, despite its high capacity, meets the stringent requirements of the exhaust emissions standards EU Stage 4/US Tier 4 Final. The drive unit is designed for a maximum milling depth of 33 cm. The mechanical milling drum drive transmits the engine torque to the milling drum with a high degree of efficiency.

“Wirtgen's Generation X point-attack cutting tools cut through the 4-cm surface course with ease and produced very smooth and excellent milling results,” reported Sigbert Werner, milling machine operator with VORO. “The noise insulation on the machine is also good. The engine runs very quietly at full load,” commented Werner.

In addition, the driving dynamics package supports a travel speed of up to 7,5 km/h, enabling the machine to move swiftly to the next surface to be milled. As the entire job site extended over a 1,2-km stretch, this was essential to ensure a fast milling procedure.

New control technology sets standards

The new operating concept with a multifunctional armrest and fully integrated LEVEL PRO PLUS leveling system guarantees optimum milling results. After all, it leaves the operator free to focus almost entirely on the milling work itself.

“After a brief induction on the brand new control system, the machines are a great deal easier to use than ever before,” commented Sigbert Werner, describing his experiences with the new operating concept. One highlight is the ergonomic multifunctional armrest. This is used to show all important information – including the compilation and visualisation of job data – in color on the operating display. Four ‘favorites’ buttons integrated into the armrest can, for example, be programmed with any of 20 different functions. In addition to the steering wheel, the operator also has access to an extremely sensitive, fingertip steering function in the multifunctional armrest.

The large number of added and automated functions make life easier for the operator and also save time. For example, the automatic button-activated folding in of the compact milling machine's right rear crawler track also speeded up the milling work on the B3. The track can be folded in without lowering the milling drum or manually loosening a bolt. In addition to the ‘basic position’, the new ‘outside’ position – in which the right rear crawler track is located within the cutting diameter of the drum, enabling the machine to be easily positioned along the right-hand milled cut – and the ‘folded in’ position are possible. The first milled cut on the B3 ran alongside a safety barrier. For this reason, Werner moved the crawler track into the ‘folded-in’ position to be able to mill along the outer edge of the roadway with the zero-clearance side.

To prevent the side plate from sinking into the surface when working on loose substrate – for example gravel or on the adjacent grass verge as in Jesberg – it has an active floating position. It ensures that the side plate is lifted at specific intervals.

To support the leveling and milling process, the milling machine operator Werner was also able to use an automatic lowering function when positioning the W 100 CFi in the milled cut. When the milling drum unit reaches the surface to be milled, the lowering



With its compact dimensions and low weight, the Wirtgen W 100 CFI can be transported easily and without requiring additional permits. This is ideal for working on several sites on one day.



Working on the job site while traffic is flowing in the opposite direction is no problem for the Wirtgen W 100 CFI. Additionally, the narrow chassis provides the driver with an optimum view of the milled edge.



With the increased steering angle of the front axle, the Wirtgen W 100 CFI can describe very small turning circles. What's more, the hydraulically operated folding discharge conveyor can be swiftly folded up, making this machine an excellent choice for tie-in milling jobs in confined conditions.

The ergonomic multifunctional armrest of the Wirtgen W 100 CFI features four 'favourites' buttons that can be programmed with any of 20 functions as well as a color operating display. All important information is shown on a small screen – for instance the compilation and visualization of job data.

speed is adjusted automatically so that the milling drum slowly penetrates the material down to the set depth. In addition, the height of the crawler units can be adjusted in steps of 1 mm or 5 mm using the new millimeter height function to precisely set the milling depth. The most frequently used height settings can be stored in three height-adjustment memories and called up quickly at any time.

Safe working on confined construction sites

As traffic continued to flow on the opposite side of the highway during the rehabilitation project and the job called for frequent machine relocations, the Wirtgen compact milling machine was the ideal candidate for these job sites. The sophisticated visibility concept enables the operator to maneuver with millimeter accuracy. The chassis of the W 100 CFI is distinctly narrower and affords the operator a better view to the front. In addition, the operator's

stand can be hydraulically displaced 200 mm beyond the edge, thus providing a perfect view ahead of the milling drum assembly and onto the front right-hand crawler track. Thanks to the camera system, the left-hand milled edge or material discharge is always clearly visible to the machine operator on the high-resolution display. "The dust extraction device on the discharge conveyor also makes work very pleasant," Werner adds.

Best quality at top speed

The milling work was completed within a few hours. Alexander Emde was satisfied with the results: "The W 100 CFI not only created a very smooth milled surface over the entire area, but also worked with minimum wear." It was possible to pave the new surface course immediately after the milling work had been completed. This job was done by a Vögele road paver. ●

Full array on display

There will be a full array of Bobcat equipment at the CONEXPO-CON/AGG Exhibition being held in Las Vegas in Nevada, USA, from 7-11 March 2017.

Bobcat will exhibit a variety of equipment on two booths – G4476 and G4876 – located in the Gold Lot at the Las Vegas Convention Center, including skid-steer, compact tracked and all-wheel steer loaders; compact excavators, telescopic handlers and attachments for use with these machines.

Bobcat offers 12 skid-steer loader models and the A770 all-wheel steer loader covering operating weights from 1 268 to 4 643 kg and rated operating capacities from 343 to 1 850 kg.

Complementing these wheeled machines, the company also offers the MT55 mini-track loader and a comprehensive range of compact tracked loaders comprising six models from the T110 to the top-of-the-range T870 model.

The Bobcat compact loader range appeals to customers in many sectors from construction, demolition, landscaping, agriculture, horticulture, equipment rental to recycling and general industry.

The Bobcat compact excavator range comprises 15 models with operating weights from 1,1 to 8,5 tonne, designed for a wide variety of digging and trenching applications such as cable laying, foundations and footings for buildings and installation of drainage and sewerage systems.

New range of rigid frame telescopic handlers

Bobcat has just launched a new range of rigid frame telehandlers for applications in construction, rental, agriculture, recycling and



industry, covering maximum lifting capacities between 2,6 and 4,1 tonne with lifting heights from 6 to 18 m. The company also offers a range of four rotary telescopic handlers, providing maximum lifting heights of 15,7, 18,7, 20,5 and 24,1 m, respectively.

There are more than 70 specialised attachments for the Bobcat loader, excavator and telescopic handler ranges, from hydraulic breakers, crushers and planers and other construction and demolition attachments to scarifiers, graders, flail mowers, mulchers, stump grinders and woodchippers for turf and forestry work.

The usefulness and productivity of Bobcat equipment is continually being extended with the growth in the attachment range, saving time, effort and cost in carrying out an increasing range of applications. ●

New head of sales

Bell Equipment Sales Africa is excited to welcome Mark Hughes to the senior management team. Hughes is to be based at the company's Jet Park head office and his sales and marketing responsibilities stretch across the BESA region, which includes South Africa, Namibia, Mozambique, Zambia, Zimbabwe and the Democratic Republic of Congo (DRC).

The appointment is a return to Bell for Hughes, who previously worked with the Richards Bay-based heavy equipment manufacturer in the 1990s through his involvement with their excavator supplier at that time. "I am very pleased to be back in the Bell fold after all these years. I've always admired the Bell brand, the company and its culture. It's a family business with a respectful and highly professional working environment. It's also a world-class company with a strong entrepreneurial spirit and the tenacity to never back down from a challenge. Over the years this has seen Bell grow in physical size as an organisation as well as in the maturity of its products to industry leading standards," he said.

Hughes is especially upbeat about the impact his role will have on the Bell business going forward. "I am particularly confident that our new range of E-series ADTs is as good, if not better, than what the rest of the market has to offer. This, backed by Bell Equipment's industry leading support, will most certainly see Bell consolidate its dominance of this sector."

"After a very tough couple of years, the industry is starting to see green shoots again and I would like to believe that we are through the bottom of the cycle. This bodes well for Bell with our full line of products for the various industries we serve," he adds.

In welcoming Hughes to the Bell family, MD of BESA, Menzi Dumisa says: "Mark



Bell Equipment Sales Africa welcomes Mark Hughes as head of sales.

brings a wealth of industry and leadership experience to the team and our region, and his past experience in our industry will greatly assist in meeting both our customers and our business objectives.

"We look forward to his contribution and wish him a long and satisfying career with Bell." ●

Rock drill for varied construction jobs

Finding a rock drill that is versatile enough to work in all areas, regardless of space constraints and underfoot conditions, is a top requirement of construction fleet owners who additionally require power and reliability to ensure uninterrupted drilling when the pressure is on.

In this type of application, the Furukawa PCR200 rock drill is the perfect companion. It is compact, yet powerful enough to undertake heavy drilling jobs in terrain that would be inaccessible to larger rigs. Simultaneously, due to its smaller footprint, it is also able to operate in the type of comparatively confined spaces that are often encountered in geotechnical and civils-types of applications.

According to James Linton, national product manager for ELB Equipment, the sole distributors of Furukawa Rock Drill in southern Africa, the reason for the success of the rig is its go-anywhere versatility and simplicity. "Today a contractor might be drilling for foundations in an urban environment and tomorrow may require drilling to be done on top of a rock outcrop in a rural environment.

"The Furukawa PCR200 therefore provides them with an opportunity to tow it behind a vehicle across the roughest terrain where it can be pneumatically driven to the end-location where drilling will take place. This has earned it the nickname, Klipspringer, which is a small and agile antelope that can jump from rock-to-rock while maintaining speed and stamina to elude predators. This is exactly what the Furukawa PCR200 is capable of."

He adds that the rig is a fully pneumatic crawler drill with a top hammer operation. Despite its size, it is a very powerful machine that has the ability to drill up to 102 mm holes up to 20 metres in depth which is ideal for smaller-scale blasting. It also has a manual rod feed up to 20 m with the ability to swing the boom horizontally and drill holes for foundations work and for pin bolts in ground stabilisation etc.

The Furukawa PCR200 also features dual control systems, on the platform and on the mast, which enables the operator to control drilling without an assistant. This makes it ideal; for civils, small opencast blasting, pipeline installations, geotechnical, oversize boulder drilling, electric pylons or wherever holes are required.

"Furukawa filled the niche for this type of drill so well that the PCR 200 has been around for 40 years. In its latest guise, it provides the perfect mix of ruggedness with ongoing technological improvements that make it more productive and even more reliable than ever before. It is sold and comprehensively supported by ELB Equipment throughout Southern Africa. What's more, we have the accumulated knowledge locally and abroad to assist customers to find solutions to their every drilling requirement," concludes James. ●



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Known for its proactive stance in meeting the market's specific lifting requirements, Johnson Crane Hire recently acquired a new hydraulic crawler crane. Specifically manufactured to handle lifts within wind farm applications, the crane was sourced for a specific project.

“Johnson Crane Hire is known for working closely with its customers to provide optimum lifting solutions and this is a perfect example of how we were able to implement an application specific solution,” Cornelis Grotius, general manager – heavy lift division at Johnson Crane Hire, says.

The most significant feature of the 1 200 t Liebherr LTR 11200 is that it is a large hydraulic boom crane mounted on a narrow track crawler crane undercarriage making it possible to relocate the crane in a short space of time without having to dismantle the crane. This is a major advantage over lattice boom crawler cranes which usually have to be dismantled to be relocated over large distances.

“It is the ability of this crawler crane to move along a fairly narrow road between the wind turbines that made it most attractive,” Grotius says. When the crane arrives at the installation site, the outriggers are fully extended which then provide it with the stability and capacity to lift the wind turbine components. Components include the tower sections, nacelle and rotor consisting of the hub and the three blades.

The prime advantage of being able to relatively rapidly relocate the crawler crane between installation pads will result in significant savings in time and associated costs. The move between locations can be done within six hours, because it is as simple as retracting the hydraulic boom, crawling the machine to the next pad and extending the boom again, ready to install the next turbine's components.



Known for its proactive stance in meeting the market's specific lifting requirements, Johnson Crane Hire recently acquired a new hydraulic crawler crane specifically manufactured to handle lifts within wind farm applications.

This is a major time saving when compared to the ten to 20 hours required for the relocation of a lattice boom crane that would have been used previously for this type of project.

Grotius says that with the addition of the new crawler crane, the Johnson Crane Hire fleet is more versatile than ever in terms of lifting machines. The new crane is currently working on a wind farm outside De Aar in the Northern Cape.

“As always, safety forms an important component of all heavy lifts with this culture ingrained in every Johnson Crane Hire employee. In addition, our fleet incorporates well maintained cranes with current technology and our team of operators are highly skilled and technically competent,” Grotius says.

Johnson Crane Hire's philosophy of providing a holistic lifting package, referred to as the 'SMART' (Safety, Maintenance, Availability, Reliability and Total cost effectiveness), underpins its approach to working closely with industry to provide fit-for-purpose lifting solutions. ●



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New backhoe loader series launched

HPE Africa's newly launched H940s backhoe loader series, which replaces the H930s, has been well received by the local market.

"Customers are impressed with this machine's unequalled value in terms of fuel efficiency, low operating costs and powerful loader performance, even in tough operating conditions," states Alex Ackron, managing director, HPE Africa, part of the Capital Equipment Group (CEG) of Invicta Holdings Limited. "We have also had positive feedback about Hyundai's new features for improved operator comfort and simplified maintenance, as well as technical advancements for precision control."

"The robust H940s backhoe loader series is perfectly designed to meet growing demand from businesses that need compact machines for smaller projects, without having to make a substantial capital investment in large excavators and loaders.

"Central to this machine's exceptional backhoe performance, is an integrally welded high strength loader boom that allows for clear visibility when the operator is digging around buried constructions like water mains, sewer pipes and utility lines. Optional features include pilot controls for improved precision when excavating and an extendable dipper enhances this machine's versatility.

"What's also notable about the H940s, is after extensive onsite testing and analysis over 750 hours, fuel consumption was recorded at an average 5,5 litres per hour. Another benefit is these machines are supported by HPE Africa with a two year/ 3 000 hour warranty."

Critical features for optimum performance include a rigid loader frame



for greater lifting capacity and an optional return-to-dig function that reduces loading cycle times. Front and rear axles ensure dependable operation in challenging, rough terrain conditions and a differential lock system improves traction. A four wheel drive system is standard.

The 'ride control system' – also optional – improves productivity, safety and operator comfort. A shock absorbing accumulator minimises loader arm bounce, reduces material spillage and improves travel with a full bucket. Standard power shift transmission provides fast, easy and efficient operation.

Hyundai's load sensing hydraulic system distributes optimum power to

hydraulic components based on the load demand required. Sufficient flow is provided, whether the machine is operating in a trenching application, for fine control digging, or when suitable speed is needed for high productivity applications. An adjustable flow control system (AFCS) is particularly useful when travelling on roads.

Taking a look under the hood of the H940s is a fuel efficient, low noise, environmentally friendly turbo charged Perkins 2 tier diesel engine. For easy serviceability and reduced maintenance time, the tilt-up hood provides convenient access to the engine compartment, with ground access to critical services and grease points. ●



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Accredited BIM companies



Graphic courtesy: <http://www.lr.org/>

The BIM Institute announced its intention to put in place a company listing page on their website for companies that are internationally certified or BIM accredited – at no cost.

“We want to give companies in South Africa public awareness and create a platform for public and private companies to start engaging with BIM-compliant organisations” explains Vaughan Harris, executive director of the BIM Institute.

In recent developments there has been discussions among various private and public sectors to list companies that have or are in the process of upskilling their internal resources around BIM best practice.

The long term vision for this strategy is to create public awareness of the companies who are not only optimising the technical operation side of its business, but are also creating a platform for private and public companies to start engaging with BIM-compliant organisations.

The BIM BAM BOOM workshops run by the BIM Institute are in partnership with White Frog in the UK. The White Frog team of authors is a group of independent consultants and recognised experts-in-practice pushing the boundaries of BIM.

The White Frog international training content is set out to create new training material for the processes around BIM and to break down several of the preconceived rules surrounding training delivery. Their training courseware takes the stance of teaching BIM methodology and processes using the available tools in task-based modules. In this way, delegates and students learn best practice in tandem with a design application.

BIM Institute accreditation

- Removes the requirement for the employer

Be water wise

Climate change means irregular rainfall is here to stay. In many parts of South Africa, severe drought and water restrictions have transformed once green lawns into dusty patches while, in others, flash floods have resulted in massive wash aways and even sink holes.

Trigger Truniger, the national accounts manager for Easigrass South Africa, says that Easigrass is the perfect alternative to thirsty natural grass – or grass that has shrivelled and died when it couldn't be watered. Gardeners can counter the effects of freak weather patterns by installing quality artificial grass with the advantage of saving on water bills.

Easigrass, which is low maintenance and requires no watering, provides the best of both worlds – meaningful water savings together with an aesthetically pleasing garden that remains lush and green year round allowing homeowners to just keep their shrubs and trees alive.

Easigrass also blends with indigenous and drought tolerant plants to produce attractive contemporary outdoor areas.

He points out that Easigrass is the world's leading artificial grass brand and is based in the United Kingdom. All Easigrass is fully UV protected, with Easigrass and Van Dyck Carpets offering the highest warranties on artificial grass of 8 years. Locally, it is backed by flooring giant, Van Dyck Carpets which applies the same high international standards when it comes to quality, design excellence, product back up and guarantees.

Because European and South African grasses are completely different, Van Dyck has researched, designed and launched nine artificial grasses that resemble popular local varieties.



According to Truniger, although Artificial grass is not yet the first choice for South African home owners who are trying to cope with either too little or too much rainfall, it is becoming an increasingly popular alternative to natural grass. As homeowners are left with options of either gravel, paving or wooden decking in the areas where grass is not growing, Easigrass is slowly becoming the preferred option.

According to the Department of Water Affairs, the majority of South Africa's water goes to irrigation (66%) followed by domestic use (27%).

Truniger says that, while different lawn size and the dedication of gardeners to irrigating their gardens mean usage will vary from property to property, studies indicate that up to 60% of a household's water bill could be saved through replacing natural with artificial turf.

Although switching to Easigrass means an upfront investment, it will quickly be offset by reduced water bills and savings on garden services, and consumables. With the current increase in water tariffs in various SA provinces, this time has been drastically reduced to about 1 – 2 years. ●

- to carry out a BIM capability assessment.
- Demonstrates compliance with international BIM standards and the ability to meet certain BIM requirements for tenders.
- Speeds up the tendering process, saving businesses time & money.
- Helps your company to stand out from the competition, showing you are ready for business.

Accreditation covers:

- Basic understanding of Building Information Modelling, its benefits, technology and protocols.
- Understand BIM terminology.
- Foundation to establish and execute

a BIM Execution Plan (BEP), Common Data Environment (CDE) and Employers Information Requirements (EIR).

- Strategies for engaging and motivating employees to foster new ideas, identify solutions in the workplace.
- Review of local project case studies

A recent discussion with Ralph Montague, managing partner with Arcdox, Ireland, summarised it:

“A lot of what the BIM process is trying to do is not really that new. It is stuff we have been doing, or should have been doing anyway, as part of good design or project management. It might just have a fancy new name or standardised acronym that you need to get used to.” ●



Concrete canvas repairs steel culvert

This unique project was the first time in Africa that a steel culvert was repaired using Concrete Canvas, a revolutionary new type of construction material distributed in South Africa by Kaytech.

The site was on the N4 National Road, at Watervalboven, Mpumalanga where a galvanised, corrugated steel culvert measuring 48 metres in length and 900 mm in diameter, was in need of remediation.

Invented by two British Industrial Design Engineers, Concrete Canvas is a flexible, concrete-impregnated fabric that hardens on hydration to form a thin, durable, waterproof and fire-resistant concrete layer called a Geosynthetic Cementitious Composite Mat (GCCM). Comprising a three dimensional fibre matrix containing a specially formulated dry concrete mix, Concrete Canvas has a PVC backing on one surface to ensure complete waterproofing. After hydration, either by spraying or complete immersion in water, Concrete Canvas sets rapidly.

Gradual degradation of the galvanised layer of the culvert had led to corrosion of the exposed steel, particularly at the invert level where water had become trapped in the corrugations. The culvert was situated between steep side slopes with its inlet lying approximately six metres below road level and the outlet a further six metres lower.

Culverts with a diameter such as this one are notoriously difficult to repair by conventional methods and present several challenges including inaccessibility as well as occupational health and safety issues. Besides the impracticalities in repairing the culvert, the economic implications were excessive.

With the only other feasible option being to completely replace the degraded pipe with a new one, WBHO, one of the largest contractors in South Africa, with years of experience installing Kaytech's top quality products, approached Kaytech for a possible alternative. The result was Concrete Canvas CC5 being proposed by Kaytech's Christiaan van Wyk for remediation of the invert level of the culvert. Since this was the first project of its kind, WBHO obtained invaluable advice from Simon Lester, the Business Development Manager for Concrete Canvas Limited in sub-Saharan Africa.

Prior to installation of Concrete Canvas CC5, WBHO cleaned the culvert of all debris and standing water. The head wall at the inlet end, was chipped away in order to create an exposed edge for attachment of the GCCM material. Man-portable rolls of Concrete Canvas were cut to more manageable lengths of eight metres and simply carried down the slopes where they were manually drawn through the culvert. Once in position, each length and its 100 mm overlap were pop riveted onto the existing steel culvert. To complete installation, the Concrete Canvas CC5 (50 m² in total)

New offices for Echo Floors

The sales and marketing, engineering and accounting arms of Echo Floors have been relocated to the Echo Group's headquarter premises in Chloorkop, Gauteng.

The Echo Floors factory will continue to operate from Muldersdrift with a full administrative and management staff complement. Echo Group sales and marketing director, Melinda Esterhuizen, explains that incorporating Echo Floors' sales and technology arms into Echo's headquarter structure means that Echo Floors' clients will enjoy improved levels of technical input and quicker turn arounds.

"Echo Floors project enquiries are now being channeled through our HQ engineering department which means we are better able to advise which product or combination of products is best suited to each project.

"Echo Floors has always produced the traditional reinforced slab which is generally used for building houses, townhouses, clusters and high-density housing, where the floor spans tend to be shorter. When deployed correctly, it is more economical than the prestressed hollow-core slab.

"Offering longer spans, prestressed slabs are designed to support heavier loads and can be used without internal load-bearing walls. In addition to the residential market, prestressed slab applications also include commercial and industrial structures which vary between three-to-seven storeys, and are used on community structures such as schools, clinics, office buildings, car parks and shopping centres.

"Merging the engineering function of Echo Floors into the Echo Group structure has made it easier for us to provide input on the design, engineering and construction phases of our Echo Floor clients through what we call our Total Solutions approach.

"The success of any hollow-core slab project essentially rests on the pre-planning and if we get involved in the planning stages, we are better able to bring our specialised knowledge to bear, matching the quality of our product offering with an equally high level of engineering input. This realises better buildings design, cost-efficient slab deployment and savings for our clients.

The Echo Group's prestressed slabs have several other applications besides flooring. These include: basement parking walling; warehouse walling; culvert covers for attenuation tanks; reservoir construction; and security walling. ●

was well hydrated by hose. Within 24 hrs, 80% strength (30 MPA) was attained and after ten days, the Concrete Canvas was fully set.

The PVC backing on Concrete Canvas provides excellent impermeability while the fibre reinforcement prevents cracking, absorbs energy from impacts and provides a safe plastic failure mode. Concrete Canvas is twice as abrasion-resistant as standard OPC concrete, provides excellent chemical resistance as well as good weathering and UV stability. Its flexibility provides easy drape characteristics and any unset material can be simply cut or tailored using basic hand tools.

TRAC (Trans African Concessions) N4, a company operating under licence to the South African National Roads Agency Limited (SANRAL) manages the approximately 650 km long N4 National Road that runs from the Botswana border through to the Mozambican border. The decision to use Concrete Canvas for this project instead of completely replacing the culvert, greatly benefitted TRAC N4, since neither heavy equipment nor disruptions to traffic were incurred.

Multiple award-winning Concrete Canvas ticks so many boxes that it is truly in a class of its own, and although this was the first project of its kind in Africa, it will, undoubtedly, not be the last. ●

Releasing agents for every concrete purpose

Releasing agents are a valuable part of any construction project, ensuring that concrete does not stick to formwork or moulds; the CHRYSO® Dem range takes this technology another step forward with a brand to suit every application.

According to Hannes Engelbrecht, general manager: inland at CHRYSO Southern Africa, getting the best results requires choosing the appropriate release agent, as there are specific formulations for all options including timber formwork, manmade formwork and decorative concrete, as well as wet or dry precast.

"It is false economy to just use the cheapest releasing agent available," says Engelbrecht, "as the cost is relatively low when compared to the value of the formwork or mould. The CHRYSO® Dem range ensures easy, clean release of the formwork or mould from the concrete, without damaging either."

The products reduce the likelihood of any imperfections and surface damage to the concrete, such as blow holes, creating more durable and attractive concrete surfaces.

"It is important to remember that the quality of the CHRYSO® Dem range ensures there is no adverse effect on the adhesion of subsequent finishes and coatings," he says. "This allows plaster, paint or other coatings to be applied to the concrete with

no associated problems; the release agents are also water repellent, so are not affected by rain."

These products do not have any negative effect on the hydration of concrete as it cures, and they are inoffensive to apply as they have very little odour.

The range even includes a vegetable-based, environmentally friendly release agent – CHRYSO® Dem Bio 10 – which is biodegradable and non-toxic, making it safe to use in confined applications such as mining and tunneling, or any other poorly ventilated area.

Reducing blow holes is the specialty of CHRYSO® Dem Elio LSM, with its low viscosity oil lowering the surface tension against the sides of mould and allowing air bubbles to escape. CHRYSO® Dem Elio SP is designed for dry precast spun pipe production with the added benefit of the release of dry concretes that have been exposed to the high temperatures of steam curing. CHRYSO® Dem Oleo FW is a mineral-based release agent suitable for all types of formwork on site.

"The CHRYSO® Dem range is a fundamental change for an industry that is accustomed to a one-size-fits-all approach when it comes to release agents," says Engelbrecht. "It is also raising the bar among users, who will now start to expect better results." ●

Releasing agents are a valuable part of any construction project, ensuring that concrete does not stick to formwork or moulds; the CHRYSO® Dem range takes this technology another step forward with a brand to suit every application



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New NDT manager

Leading rope-access specialist Skyriders has appointed Gerhard Kemp as the Non-Destructive Testing (NDT) Manager at its eMalaheni branch in Mpumalanga, tasked with overseeing the NDT/inspection division.

Kemp has an NDT qualification from the South African Institute of Welding (SAIW), where he completed modules in Magnetic Particle Inspection (MPI), Penetrant Testing (PT), Ultrasonic Testing (PT) and Radiographic Testing (RT).

He is accredited in terms of Welding Inspections PCN Level 1 from the African NDT Centre. Kemp's experience has been gained on BS EN (British European) and AWS (American Welding Society) standard NDT codes. Kemp commenced his career in 2002 as an NDT assistant, progressing to Site Supervisor and Site Manager at Eskom's Tutuka Power Station, and then Site Manager at Kusile Power Station.

He has worked in a range of industrial sectors, from power generation to mining, steel, chemical plants, paper mills, and cement and sugar factories.

His role as NDT Manager at Skyriders is focused on constantly upgrading and expanding the company's inspection service offering. Kemp is also involved in training Skyriders personnel to become multi-skilled in various NDT methods, researching the latest developments and technology, and maintaining and sourcing new client relationships. ●



Gerhard Kemp.

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