

# CONCRETE

Journal of the African Cement and Concrete Industry

# trends

VOL 20 No 3 Aug 2017



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# Why can't we keep that Mandela Day spirit going...

Mandela Day has just passed and, regrettably with it that wonderful wellspring of goodness and generosity that gushes to the surface on this day to honour and remember a most remarkable man.

The news was full of uplifting stories about how people were answering the 'Mandela Day call' to do good for their less privileged brethren. All over the country people, individually or in groups, worked to make a difference on this special day. Hampers of food were packed for distribution by charities, books, clothes, linen and household goods were collected for creches and schools. Groups all over the country put their backs into cleaning public spaces and Initiatives to build houses and improve youth employability were launched.

Sun International partnered with Rise Against Hunger to participate in a meal packing challenge for feeding children at early childhood development centres across South Africa. To commemorate Madiba, their goal was to pack three million meals in seven cities across South Africa.

One of the most inspirational projects involving our sector was, for me, the PPC Mandela Day Challenge on behalf of the Devland Education Campus being built in Soweto by NGO Growing Up Africa. In addition to their already substantial contribution to this project, PPC challenged project partners to beat the PPC team in filling bags, donated by Carletonville company, Stitchwise, with sand to insulate the building's cavity walls.

Well, the response was tremendous – over 300 volunteers descended on the site armed with energy and high spirits and, within three hours, had packed 160,000 kg of sifted soil into 15,000 bags!

The day was a resounding success and, said Deborah Terhune founder and CEO of Growing Up Africa, "It seemed no one wanted to leave. Celebrating with good friends was just what a day of hard work and passion deserved – the Grand Finale, South African-style – a braai!"

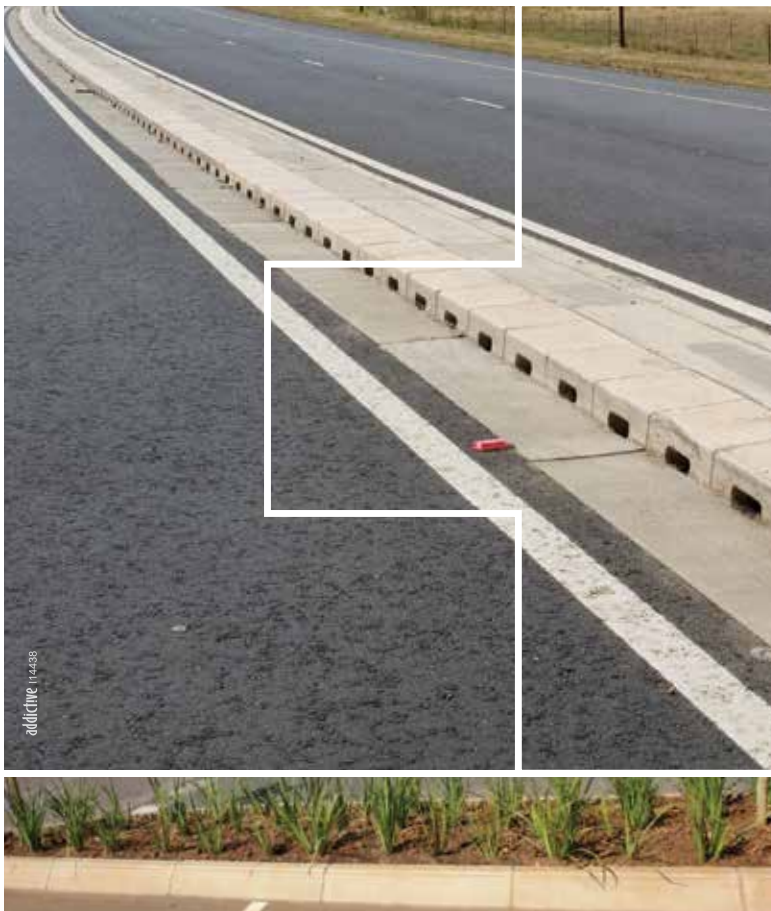
"All the negative world news was overshadowed by the power of love and commitment for a man who changed a country and a people who believe that coming together will be the change South Africa will enjoy," concluded Terhune.

However admirable as all these initiatives undoubtedly are, it seems to me that it would be a greater tribute to a very great man if the spirit of Ubuntu that is summoned for the 18th July each year became the norm.

Wouldn't it be wonderful if every day brought a continued outpouring of goodwill and caring for our fellow men?

If we can do it for one day, why not every day – or even every other day?

*Gill Owens, Editor*



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# CONCRETE trends

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Sasol's new headquarters is just one of the iconic structures which was built using PPC's cement. See page 16.

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26 Concrete Canvas installed and overlaps weighted.



38 Raubex created jobs at Clayville Ext 45.

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Published by HYPENICA (Pty) Ltd. 31 Bell Crescent, Westlake Business Park, Tokai | PO Box 30875, Tokai, 7966, South Africa | Tel +27 (0) 21 700 4300 | Fax +27 (0) 21 702 4340

Concrete Trends is the official quarterly journal of the African Cement & Concrete Industry and is officially endorsed by



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ISSN 1560-2710

# Committed to transformation and skills development

As part of the Chryso Southern Africa Group's on-going commitment to skills transfer and socio-economic development as well as transformation, the Group has awarded university study bursaries for 2017 to two previously disadvantaged students.



Members of Chryso SA Group's BBBEE Trust with the two university bursars. From left: Brian Matthee, Chryso SA Human Resources and Organisation GM and BBBEE Trust member; Wanda Moraka, also of the Chryso BBBEE Trust; bursars Benjamin Kumalo and Koketso Masemola; and Maj-Gen Keith Mokoape, of the Chryso BBBEE Trust.

The award of the bursaries to two BSc students at the University of Pretoria was made by the Chryso Group's Broad-based Black Economic Empowerment (BBBEE) Trust, which each year identifies and financially assists historically disadvantaged black students complete their construction and engineering-related tertiary education at Gauteng universities.

This year's bursaries were awarded to Koketso Masemola and Benjamin Kumalo at a special award function held at Chryso subsidiary, a.b.e. Construction Chemicals', premises in Boksburg.

Major-General Keith Mokoape, the non-executive director of the Chryso SA Group and a member of the Group's BBBEE Trust, said that Chryso believed the bursaries represented an investment in the economic future of South Africa. He urged the students to commit themselves to their studies and to making a significant contribution to the further advancement of construction technology after obtaining their university degrees.

Koketso Masemola, whose studies were also sponsored by the Chryso BBBEE Trust last year, told the meeting that she was

planning a career in analytical chemistry; and Benjamin Kumalo said he hoped his degree would enable him to make a meaningful contribution to improving concrete performance and durability.

Itumeleng Legodi, of the information and communications technology firm, System Wox, who facilitated the selection of the bursars for the Trust, and another Trust member, Wanda Moraka, of transformation consultants, Transcend Corporate Advisors, also attended the awards ceremony.

Brian Matthee, the Chryso Southern Africa's Human Resources and Organisation GM, said Chryso – which has operated in South Africa for 21 years – is constantly seeking ways to boost staff welfare and development. The Chryso Group supports the training of both young people starting careers in construction, as well as the upliftment and advancement of skills of older previously disadvantaged black people who are currently struggling financially. ■

**More information from Elrene Smuts,  
Tel: +27(0)11 306 9000  
[www.abe.co.za](http://www.abe.co.za)**

## New publisher for *Concrete Trends* magazine and *concrete.tv*

Vuyisa Mfobo has been appointed the new publisher for *Concrete Trends* magazine and *concrete.tv*. Errol Bryce, who previously held this position, has moved on to pastures new. Hypenica thanks him for his years of dedication and wishes him every success in his new venture.

Vuyisa Mfobo joined the *Concrete Trends* team on 1 July 2013 as a business development manager. Having studied Marketing at Cape Peninsula University of Technology, he decided to pursue the sales route. His responsibility was to grow revenue for the magazine increase its footprint across the continent and internationally.

As a result of good relations he formed with various industry associations in the built environment, he introduced the annual Quarry & Readymix maps for ASPASA & SARMA.

He is currently working with Johan van Wyk, director of SARMA to publish the Southern African Readymix Guide to benefit readymix producers in bringing their operations up to the South African standard as set by SARMA.

Mfobo's responsibility will be managing the day to day running of the built environment publishing department at



Hypenica (print and online). This includes forming partnerships with international associations and events. ■

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## PPC's community investment: beyond financial assistance this Mandela Day

As a responsible and contributing corporate citizen, PPC had committed to improving the lives of South Africans this Mandela Day through its participation in the Growing Up Africa Mandela Day Challenge, confirmed Kabira Akoob, Manager Group CSI at PPC.

As part of the PPC Mandela Day Challenge, staff members, including the PPC executive team filled bags with sifted sand, which would be used to pack into the cavity walls of the Devland campus building.

In keeping with the '67 minutes for Mandela' theme, PPC also undertook to make a donation for every bag they filled on the day. As an added layer to its contribution efforts to raise more funds, the company challenged other project partners to match or beat their teams, thereby helping to hasten the construction of the Campus – a project that will be of immeasurable benefit to the surrounding community.

The challenge drew more than 300 enthusiastic volunteers who attacked the sifted soil with gusto.

Within three hours 15,000 bags, donated by Carletonville-based company, StitchWise, had been filled. The response was such that even the local police popped in to participate and Base 5, who provide security for the Campus, packed over 3,000 bags.

Each year, PPC invests in excess of R10 million in community development initiatives aimed at empowering marginalised groups through upliftment and partnership programmes. PPC's Corporate Social Investment in South Africa includes, amongst others, Learner Focus Week and Mobile Science Labs.



PPC staff members, including the executive team attempted to fill 1000 sand bags which will be used to fill the cavity walls of the Devland campus building

"Building on our rich 125-year legacy, we remain committed to creating value for the company and our stakeholders. With this in mind, our CSI philosophy is designed across pillars of community infrastructure investment, regional socio-economic development and education – each aimed at benefitting South Africa and the rest of our African markets," Akoob concludes. ■

**More information from [www.ppc.co.za](http://www.ppc.co.za)**

## Google Doodle celebrates Zaha Hadid

By Adam Williams



Gone but definitely not forgotten: Zaha Hadid (Credit: Google).

Though she died over a year ago, Zaha Hadid remains an extremely important figure in architecture. With this in mind, Google has decided to honour her with one of its Doodles, which provides an opportunity to reflect on some of her amazing achievements.

On 31 May 2004, Hadid was the very first woman to be awarded the Pritzker Architecture Prize – arguably the most

prestigious prize in architecture – and she was also the first woman to be given the Royal Gold Medal by the Royal Institute of British Architects (RIBA), shortly before her death on 31 March 2016.

For an Iraqi-born Muslim woman to be lauded like this is no small feat in an industry largely dominated by men.

Hadid was always at her best designing big, showy public buildings and high points

include Rome's MAXXI: the Italian National Museum of 21st Century Arts, the London Aquatics Centre, and the Guangzhou Opera House, all of which showcase the architect's distinctive futuristic curving style.

The Google Doodle itself depicts what is, considered Hadid's greatest work, the Heydar Aliyev Center in Baku, Azerbaijan. Featuring a complex space frame system that supports the building's sweeping form and open interior, it represents a stunning break from Azerbaijan's impressive Soviet-era architecture.

Looking to the future, the Zaha Hadid brand looks unlikely to die with its owner. Her firm Zaha Hadid Architects continues to announce new projects regularly while led by partner Patrik Schumacher.

To look at her early work in further detail, Google's Cultural Institute has many of her drawings online and Google Earth's interactive exhibit includes several of her buildings. ■

**Source: <https://goo.gl/6sVcJo>**



# CHRYSO's acquisition by Cinven completed

On 24 March 2017, the international private equity firm Cinven entered into exclusive negotiations to acquire CHRYSO from LBO France. The acquisition was completed on 28 June 2017, making it the 4th investment from The Sixth Cinven Fund.

Thierry Bernard, President and CEO of the CHRYSO Group, comments: "Over the past three years, our Group has been conducting significant transformations and reinforced its presence in emerging economies, by acquiring local businesses with strong potential, and creating some new subsidiaries:

- Sri Lanka, November 2014: acquired Concrete Solutions Technologies, now CHRYSO Lanka Pvt Ltd;
- Algeria, November 2014: creation of CHRYSO Hydipco;
- Kenya, May 2015: creation of CHRYSO Eastern Africa;
- Sweden, July 2015: acquired the company Betongkemi AB, now CHRYSO Nordic AB;
- Qatar, December 2015: acquisition of Corrotech Qatar, now CHRYSO Gulf;
- The Philippines, April 2016: acquisition of Philprime Global Corporation;
- The simultaneous acquisition in France of Moderne Méthode and Béton Academy, in November 2016, which



*Thierry Bernard, President and CEO of The Chryso Group.*

has allowed the creation of a unique offering for decorative concrete. It comprises a certified training centre on the techniques of application, as well as a large and effective range for the New Construction and Restoration markets."

In parallel, CHRYSO has upgraded and completed its industrial footprint. Some new facilities were built in the United Kingdom and Algeria, while a third plant was built in Adana, Turkey. Moreover, the Group has maintained an important focus on innovation. Indeed, some new leading technologies, such as the concrete superplasticiser CHRYSO@Optima 1000 and cement activator CHRYSO@AMA EL 100 series, were launched recently to provide customers' materials with even more added value.

"Thanks to its enlarged geographic imprint and its portfolio of leading technologies, CHRYSO has participated in some exceptional achievements and prestigious jobsites across the globe: the new seaside road on the Reunion island, Sultan Yavuz Selim Bridge in Istanbul, the Greater Paris project, and many others."

Thierry Bernard concludes: "We look forward to continuing the development of our ambitious strategy to become a global leader with the support of Cinven." ■

**More information at [www.chryso-group.com](http://www.chryso-group.com)**

## Concrete Beton goes 'Open Access'

The Concrete Society of Southern Africa NPC, publishers of the DHET-accredited journal Concrete Beton, has announced that in future their publication will have open access through Google Scholar.

This means that the authors of Technical Papers in the publication will be accessible by any academic or engineer in the world – in fact by any person in the world.

"International researchers and practitioners will now have access to papers

from Concrete Beton which was previously only available to CSSA members", says Prof Billy Boshoff, Chairman of the Editorial Committee of the Concrete Society. The more exposure Concrete Beton gets, the better the articles it will attract for publication. A further benefit is that the Society will not be asking for a publication fee from authors," comments Prof Billy Boshoff.

"This is the first step in eventually registering our journal with the ISI (International Scientific Indexing), but this will take some time. Concrete Beton will get international exposure and all publications will be searchable and viewable in the search engine Google Scholar," Boshoff continued.

This move by the Concrete Society will benefit primarily the 'concrete public', i.e., those who are seeking information on concrete and the most up-to-date knowledge. In this sense, Society members will benefit as well. The authors



*Prof Billy Boshoff, Chairman of the Editorial Committee of the Concrete Society.*

benefit by having their papers read more widely – in fact internationally. ■

**More information from John Sheath,  
Tel: +27(0)12 348 5305  
email: [ceo@concretesociety.co.za](mailto:ceo@concretesociety.co.za)**



## Entries now open for prestigious CMA Awards for Excellence

**P**recast concrete will again take centre stage at the Concrete Manufacturers Association's bi-annual Awards for Excellence, which are scheduled to take place in Johannesburg in March 2018.

The glamorous occasion is a landmark event on the construction industry's calendar and attracts entrants from a wide spectrum of disciplines representing precast concrete projects ranging from building and construction to infrastructural projects.

"The countdown has now officially begun and we are calling on all our CMA members and their customers to enter any one of 15 award categories before **20 October 2017**. Entry packs are currently being sent out and members can enter as many projects as they like," says Henry Cockcroft, marketing manager of the CMA.

"Any technically outstanding project, small or large, can be entered provided one or more precast concrete products from a CMA member were used in its execution. It is not the size of the project that matters but rather the way it satisfies the requirements



*The Concrete Manufacturers Association Awards for Excellence is one of the most glamorous and prestigious events on the construction calendar*



*CMA awards for excellence.*

of the award categories – which have been structured to cater for all types of precast elements. Entries will be judged in two different groups, with specific categories according to the design, application and nature of those elements. Fifteen category winners will each receive a winning trophy and four floating trophies will be awarded to the two best entries from each entry group," Cockcroft explained.

"As usual the industry can expect a lot of publicity around the entries. Besides the chance of an award, many entries will be featured in articles in the construction media before the awards. Who wouldn't want their projects to be showcased in such a manner on the national stage?"

All the Awards entries will also be published in a web-based entry book posted on the CMA's website. The winning entries will be presented in a hard-copy winners' book that will be distributed nationally. ■

**To find out more or to enter,  
Tel: +27(0)11 805 6742 or go to  
[www.cma.org.za](http://www.cma.org.za)**

## Aspasa training to uplift an industry



*Aspasa office manager,  
Mary-Ann Sutton.*

**D**eepening skills shortages in the surface mining industry have led to the launch of several new training workshops by industry association, Aspasa, aimed at addressing the problem.

Just six months into the programme the education regimen is being praised by companies who have sent staff members to attend the workshops and requests are already being fielded for follow-up courses to further upskill staff who have attended.

Aspasa office manager, Mary-Ann Sutton, says courses are specifically aimed at areas of the industry where skills development is needed. They were developed following two

surveys conducted by the association to determine the most immediate needs of the industry.

"Trainers are sourced from within the industry and all have exceptionally strong training backgrounds. Many of the courses offered are fully accredited so that CPD points can be claimed and there has been a strong uptake for all courses.

"Wherever possible the courses are offered in all regions across the country if there is sufficient demand. Alternatively,

courses are offered in the major centres and can be arranged for individual companies. The courses can also be repeated if necessary. Also, if changes in legislation or working practices occur we may update the course and offer it as a refresher," explains Sutton.

She adds that Aspasa will again undertake surveys later in 2017 and encourages companies to submit their requirements. If there is sufficient demand for a new course, targeted and concise workshops will be compiled to provide relevant information in a short and succinct manner to minimise time out of the office.

The courses offered include Health and Safety and Fatigue Management, Crushing and Screening, G1 Base Training, Lockout Workshop, Total Quality Management for Skills Development, Section 54 Workshop, SHE REP, Blasting, PDS.

Aspasa is also willing to assist with a short course (three hours) for a company to familiarise senior staff with the MHSA and related information. ■

**More information from Tel: +27(0)11 791 3327 or  
[www.aspasa.co.za](http://www.aspasa.co.za) and click on the training link which  
has all the course details and online booking facilities.**



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## New SARMA Technical Guide announced

**C**oncrete Trends is pleased to announce an exclusive partnership with the Southern Africa Readymix Association (SARMA) to produce the 2017 Technical Guide for the South African readymix market.

**Why the need for a guide?** The Guide will benefit readymix producers in bringing their operations up to the South African standard as set by SARMA as well as assisting readymix users in specifying readymix concrete for specific applications.

This will educate readymix users on the correct technical applications for use and the correct handling and testing of readymix concrete. It also provides a list of responsible and reputable suppliers.

**Why advertise?** The Technical Guide will be the reference publication for all readymix technical enquiries, which includes the minimum standard as set by SARMA for readymix suppliers and specifiers for 2017.

Your company will be seen by prospective customers seeking these solutions and services your company provides.

SHOWCASE your company's products and solutions and be seen by key decision makers within the readymix concrete and construction market throughout South Africa – all of whom are looking for reliable suppliers and partners in their respective areas of operation.

**Where will the Technical Guide be available?** The Technical Guide will be issued to all members of SARMA for distribution to current and potential customers. It will also be available from the SARMA offices nationally and through affiliate



associations like Concrete Society of Southern Africa, Concrete Manufacturers Association and The Concrete Institute.

In addition the Guide will be showcased at various SARMA partner events including Totally Concrete and African Construction Expo 2018, The Concrete Conference and the Master Builders Association of South Africa national event.

This means your advert/s and/or technical advertorial will be seen by a focused group of individuals who are seeking technical advice, direction or recommended products and services.

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**Booking deadline 13 October 2017**

**To book contact Vuyisa Mfobo, Tel: +27(0)21 700 4333,**

**Cell: +27(0)62 145 7767 or**

**email: vuyisa.mfobo@hypenica.com**

## Aspasa to go by acronym only

**T**he local quarrying and mining industry representative association, the Aggregate and Sand Producers Association of Southern Africa, will from now on be known only by the acronym Aspasa.

The association said the name change better reflects a growing and diverse member base.

The association has represented the sand and aggregate quarrying industry for almost two decades and has assisted the sector to navigate challenging times, in which "legislation has become considerably more challenging and pressures on the overall mining sector have increased tenfold."

Through its efforts, the industry is acknowledged as a leader in the fields of health, safety and environmental management locally, as well as globally."

"Our work to represent the industry has led to organisations outside the quarrying industry wanting membership.

"As a result, we have taken the decision to act broadly on the entire opencast and related mining industries, wherever operations are similar and face similar challenges," Aspasa chairperson Nico Pienaar said.

As a result, the association adopted the salt and dimension stone mining industries and incorporated the Coal Ash Association into its care. "We are also open to any other opencast mining operations applying for membership and agreeing to uphold our strict standards and be legally compliant with the legislation."



Aspasa chairperson Nico Pienaar.

Pienaar explained that when signing up, members will have to comply with all legal and statutory requirements, as well as undergo two yearly audits to affirm compliance with Aspasa's health and safety and environmental standards that are closely allied to International Organisation for Standardisation standards.

"Aspasa is a well-known brand name and one that is synonymous with action on behalf of its members. We will, therefore, retain the acronym only," said Pienaar. ■

**Source: <https://goo.gl/nL3rVt>**



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## Ghana: newly opened Kumasi City Mall already trading strongly

The \$95-million Kumasi City Mall, developed by South African property development and investment company Atterbury, has opened, becoming Atterbury's fourth retail development in Ghana.

Kumasi City Mall is the first and only mall in the northern sector of the country. It took 24 months to deliver the completed development to the city of Kumasi, which is acknowledged as the hub of Ghanaian tradition and culture.

The 18,500-m<sup>2</sup> Kumasi City Mall has given the city its first one-stop shopping and entertainment environment under one roof. It is built on a total land area of over 15 acres and has the potential to expand up to 28,000 m<sup>2</sup>.



On its first day of trade, 20 April 2017, the Mall recorded an unprecedented 60,000 shoppers. Then, on the mall's first trading public holiday, 1 May 2017, 75,000 shoppers came to experience its shopping and entertainment offerings.

The mall's opening was officially celebrated with a colourful launch ceremony on 10 May under the joint patronage of the President of Ghana, Nana Addo Dankwa Akufo-Addo and the Ashanti monarch, Otumfuo Osei Tutu II.

The mall's retail mix comprises a strong representation of local Ghanaian brands and is seen as a key future market for locally produced goods and a business opportunity for Ghanaian entrepreneurs. Hopes are that more and more products from the Ashanti region will be available on retailers' shelves as the mall becomes more established.

The mall has a superb central location with visibility and accessibility, and has 1,200 parking bays including what is believed to be the biggest basement parking facility in the whole country.

Commenting on the Kumasi City Mall development, Cobus van Heerden of Atterbury says: "We are optimistic about Ghana and Kumasi City Mall, notwithstanding the challenging economic climate of West Africa. There's a growing positive feeling about Ghana in the market, and with its new president, there is also a renewed confidence and positive sentiment about the country. Kumasi City Mall is perfectly timed for this upsurge in confidence." ■

**More information from Zahn Hulme,  
Tel: +27(0)12 471 1600 / [www.atterbury.co.za](http://www.atterbury.co.za)**

## Ohorongo appoints new plant manager

The Ohorongo Cement company has appointed Estelle Alberts to be the new plant manager at the company's plant in the Otjozondjupa region of Namibia. Alberts becomes the first Namibian to hold the post – and, at the age of 30, the company's youngest plant manager.

Ohorongo Cement is owned by the German company, Schwenk Zement KG and is the only cement plant in Namibia. Alberts first joined the company in July 2013 as divisional production manager: Grinding and Burning, responsible for clinker and cement production at the plant.

"It has always been the Schwenk family's intention to one day hand over the plant operations to Namibians," said Gerhard Hirth, Ohorongo Cement Board Chairperson. "That is why we are not shy to share expertise, knowledge and transfer of skills."



Alberts takes over the role from Manfred Pirker, who has been appointed as an executive advisor to the cement plant. Pirker managed the plant for three years and was one of the few expatriate employees remaining at Ohorongo Cement.

"We are very excited to have Ms Alberts as the new plant manager, we look forward to her continued impact on the Ohorongo family, and the mining and manufacturing industry in this new role," said Hans-Wilhelm Schütte, MD of Ohorongo Cement.

"She has shown great potential in her previous capacity especially in the process of alternative fuel and we will greatly support her in every aspect for her to bring out the best for Ohorongo Cement and Namibia." ■

**Source: <https://goo.gl/Dgmgfh>**

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## Shigeru Ban to design up to 20,000 new homes for refugees in Kenya

By Patrick Lynch

**P**ritzker Prize-winning architect Shigeru Ban has signed an agreement with UN-Habitat, the United Nations agency tasked with guiding sustainable development, to design up to 20,000 new homes for refugees in Kenya's Kalobeyi Refugee Settlement. Currently home to more than 37,000 refugees, the settlement is quickly outgrowing its original capacity of 45,000 – over 17,000 have arrived this year alone, with numbers expected to continue to increase.

“The key thing will be to design and construct shelter where no or little technical supervision is required, and use materials that are locally available and eco-friendly. It's important that the houses can be easily maintained by inhabitants.”

Ban will draw on his wealth of experience in designing humanitarian architecture, including over a dozen displacement-related shelter projects in countries including Rwanda, Italy, and Nepal, using unconventional building materials like cardboard and paper tubes. On a recent visit to the Kalobeyi Settlement, he also explained the importance of drawing from local construction traditions to provide familiar living spaces that are tailored to their environment.

“The shelter designs have to comply with the national regulations for housing while responding in a responsible manner to local climatic conditions and challenges, providing replicable sustainable solutions to shelter.” Yuka Terada, UN-HABITAT project coordinator, agreed. “UN-HABITAT's approaches are strongly participatory and the relevant county officers as well as the representatives from refugee and host community will have an input in the design process.”



*Shigeru Ban-designed housing on the coast of Sri Lanka, following the destruction caused by a 2004 tsunami. Image © Dominic Sansoni.*

Designs will be tested first on 20 prototype shelters. If successful, they will then be gradually rolled out to replace existing structures, many of which are already deteriorating. ■

**Source:** <https://goo.gl/EHWs8N>

## China to build Africa's tallest tower, in Morocco



**C**onstruction firms from China and Morocco will build Africa's tallest high-rise tower in Morocco's capital Rabat. The joint venture will be set up by China Railway Construction Corp and Morocco's leading construction company Travaux Generaux de Construction de Casablanca, reports China's news agency *Xinhua*, citing Moroccan news site *Alyaoum24.com*.

Building the 250-m-tall skyscraper will cost \$375m. The 45-storey tower will include offices and hotels luxury apartments.

It will be the focal point of a large-scale development in Rabat's Bouregreg Valley, part of the 2014-2018 Integrated Development Programme dubbed 'Rabat, City of Light, Moroccan Cultural Capital', master planned by Atkins.

The overall development involves building the Grand Theatre of Rabat, the Arts and Culture House, the National Archives of the Kingdom of Morocco, the Archaeological Museum, a multiplex cinema, a sculpture gallery, a marina, an art hotel, a marina hotel, a mall and a business centre. ■

**Source:** <https://goo.gl/pRjAo8>



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*Mall of Africa, Midrand.*



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*Maputo Bridge piers.*

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Political and social shifts including Brexit and Donald Trump's presidency, are redefining policies and lines of power as we know them – challenging the very assumptions many of us have made, clung to and based our planning around.

As an industry bound together by a common sector purpose and vision – namely to enable sustainable growth and development in the country and on the continent – all of us in the manufacturing and construction sectors should not underestimate the role we have to play. While radical change typically brings radical reaction, we also have an opportunity to stay the course; readjust our strategies and the implementation thereof accordingly; and continue to enable growth and development in our own circles and spaces of influence.

In grappling with so many of these shifts and their effects, it's imperative that we remember that – throughout all of this – the critical needs of South Africa and Africa have not changed. We still face a population surge and rapid urbanisation, the

likes of which the continent has not previously experienced, and one we have not planned for.

Between now and the year 2050 we will need to provide homes, schools, hospitals, roads and associated services for nearly a quarter (1.3 billion) of the world's urban population. This must be sustainable development, and not the kind we continue to see where poverty becomes systemic in our towns and cities. Together we must find ways to move our cities and regions forward despite lower growth rates and higher competition for investment.

PPC, a business with a rich 125-year history, is a true testament to how important it is to build structures that are sustainable and have longevity. Some of South Africa's oldest buildings such as the Union Buildings, the UNISA building, and the Parliament in Cape Town, were built using PPC cement. These structures are still standing and demonstrate how important it is to build sustainably.

More recently, PPC has been involved in projects like the Mall of Africa, SASOL headquarters in Sandton, The Maputo Bridge, Loeriesfontein Wind Farm, Kusile Power Station, the BRT



*PPC's newly opened plant in Harare by night.*



Johannesburg BRT building.



Kusile Power Station.



Loeriesfontein Wind Farm.

system around Gauteng and the Calgro Fleurhof Development.

These structures have been built upon a foundation of quality building materials, with the right technical expertise and partnerships. They bear testimony to expertise and excellence in the use of concrete in construction and infrastructure.

The evolution of industry has not only been friendly to the environment, but we have also seen sustainable green architecture coming to the fore, recycling and retrofitting of buildings and city deep rejuvenation. Successful examples are Woodstock in Cape Town, and Maboneng and Newtown in Johannesburg. Architecture has changed drastically, and much for the better – it is more humane and more sustainable. This reflects the spirit and views of today. It reflects the reality of today. When one looks at the buildings currently, they reflect

the era that they were built in. The buildings of today are more technologically advanced and very innovative.

With PPC's expansion into Africa over the last few years, including Habesha in Ethiopia and PPC Barnet in the DRC, we're excited about the prospects that the next century holds, as well as the opportunities to deepen our strategic contribution to the growth and development of the regions we have invested in. ■

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**More information from Siobhan McCarthy, email: [Siobhan.mccarthy@ppc.co.za](mailto:Siobhan.mccarthy@ppc.co.za)**

#### About PPC Ltd

A leading supplier of cement and related products in southern Africa, PPC Ltd has nine cement factories in South Africa, Botswana, Zimbabwe and Rwanda. In 2016 PPC commissioned its fifth milling depot, located in Harare, Zimbabwe, bringing PPC's current capacity to around nine million tons of cement products each year. As part of its strategy and long-term vision, PPC is expanding its operations in South Africa, and extending its footprint into the DRC and Ethiopia.

PPC's Materials business, comprising Safika Cement, Pronto Readymix (including Ulula Ash), and the recently acquired 3Q Mahuma Concrete, form part of the company's channel management strategy for southern Africa. As a result of these acquisitions, PPC's footprint has grown to include 26 ready-mix batching plants across South Africa and Mozambique and the capacity to produce half-a-million tons of fly ash.

PPC also produces aggregates, with its Mooiplaas aggregates quarry in Gauteng having the largest aggregate production capacity in South Africa. PPC Lime, one of the largest lime producers in the southern hemisphere, produces metallurgical-grade lime, burnt dolomite and limestone.



Union Buildings, Pretoria.



UNISA Buildings, Pretoria.



Union Buildings with the new statue of Mandela.



Parliament buildings, Cape Town.

# CSSA's 2017 Fulton Awards celebrate excellence and innovation



Buildings up to three storeys - **Winner:** Glen Crescent House.



Infrastructure - **Winner:** Mt Edgecombe Interchange upgrade.



Buildings greater than three storeys - **Winner:** Sol Plaatje University Library.

The Concrete Society of Southern Africa's Fulton Awards, often regarded as being the 'Oscars' of the concrete industry, recognises and honours excellence and innovation in the design and use of concrete.

Winners and recipients of commendations for the 2017 awards were announced at a gala weekend in June.

PPC was the Anchor Sponsor for the 2017 Fulton Awards which are a tribute to the late Dr. 'Sandy' Fulton, a world-renowned authority in concrete technology. PPC CEO, Darryll Castle said: "It is against the backdrop of the need to build for sustainability that PPC has again chosen to be the Anchor Sponsor of this year's Fulton Awards, celebrating the significant contributions made by key players across our industry value chain. We're proud to have contributed to many of the flagship projects entered this year.

Other sponsors of the Fulton weekend were AfriSam, Ash resources, BASF, Chryso Southern Africa, Go-Consult, Lafarge, Sika, Ulula Ash and Xypex.



Architectural concrete - **Winner:** Zeitz Museum of Contemporary Art Africa.



Innovation in concrete - **Joint Winner:** Innovative Integral Van Zyl Spruit Bridge.

In presenting the awards, CSSA President Hanlie Turner stated: "This year's entries once again showcase a fine regard for form, function and finish expressed in concrete. Inspired architectural and engineering design is supported by innovative construction practices, advances in material properties and an emphasis on meticulous finishing.

"This is all due to the vision, the commitment and proficiency of the project teams; the owners and clients, the designers, material suppliers and contractors."

This year there were 30 finalists and each project was visited by the judges. Judges for the 2017 awards were Bryan Perrie, MD of The Concrete Institute and a Non-Executive Director of the Concrete Society; Stephen Humphries, Executive Director, Nyeleti Consulting and Daniel van der Merwe, Professional Architect, PPC.

**CATEGORY: BUILDINGS UP TO THREE STOREYS**

**Commendation** – Rupert and Rothschild New Classique Winery

**Winner** – Glen Crescent House

Glen Crescent House is an excellent showcase of concrete. Not only is concrete the principal structural element, but it is the primary finish for walls, floors, roofs, ceilings, columns, staircases, fireplaces and water features. The wide range of architectural concrete finishes and formwork-induced textures demonstrates the versatility and the very superior finishability of concrete.

**CATEGORY: BUILDINGS GREATER THAN THREE STOREYS**

**Commendation** – Zeitz Museum of Contemporary Art Africa

**Commendation** – PWC Tower Including Slide

**Winner** – Sol Plaatje University Library

This bold and original project pushes the boundaries of architectural and engineering design, which required the concrete to perform not only as a structural but also as an aesthetic material. The result is a spectacular three-dimensional envelope which allows a 2.7-m-wide perimeter void between the external envelope and the floor plates. This resulted in an envelope as an integrated 'wall and roof' shell that is functionally, structurally and technically independent of the 'building' within it.

The contractor managed the unusually demanding staging and shuttering of huge areas of free-standing external envelope walling at the highest possible standards and delivered a highly refined, consistently silky off-steel surface finish.

**CATEGORY: ARCHITECTURAL CONCRETE**

**Commendation** – Sol Plaatje University Library

**Winner** – Zeitz Museum of Contemporary Art Africa

Concrete is the main finishing characteristic of this project which has innovatively retrofitted one of Cape Town's most iconic industrial relics, the Grain Silo at the V&A Waterfront.

This original redesign of the interior has created new functional spaces for galleries, foyer and pause spaces, exposed staircases, transparent lifts and an administration area. These areas were supplemented with a sculptural atrium carved from the heart of the silos' existing cylindrical concrete structures. New skylights flood the interior with natural light while the old basement and rooftop areas are activated with new uses.

Maintaining the integrity of the old concrete structures and blending it sympathetically with new stabilising concrete work and finishes, this project managed to uniquely reinvent a historical Cape Town landmark.



*Buildings up to three storeys - Commendation – Rupert and Rothschild New Classique Winery.*



*Buildings greater than three storeys - Commendation – PWC Tower Including Slide.*



*Innovation in concrete - Commendation – Pacaltsdorp Pedestrian Bridge.*



Innovation in concrete - **Commendation** – PY Track Slab.



Infrastructure - **Commendation** – Kusile Power Station Main Civil and Completion Works.



Infrastructure - **Commendation** – Concrete for Maputo Bridge.



Infrastructure - **Commendation** – Mndwaka Dam – Rubble Masonry Multiple-Arch Buttress Dam.

## CATEGORY: INNOVATION IN CONCRETE

**Commendation** – Pacaltsdorp Pedestrian Bridge

**Commendation** – PY Track Slab

**Joint Winner** – Innovative Integral Van Zyl Spruit Bridge

The unique Van Zyl Spruit Bridge is the first long integral bridge in South Africa and, at 90 m, one of the longest integral bridges in the world. The innovative use of integral bridges allows savings in materials, no capital cost for bearings and joints, lower maintenance costs, more durability and makes concrete bridges more competitive.

In addition, the installation of over 500 sensors in the bridge structure which are being logged automatically every 15 minutes to detect and quantify trends in strain, temperature, tilt and earth pressure, make this one of the first 'SMART' bridges in the country. The data obtained from these sensors will contribute to a better understanding of environmental loading on and performance of integral bridges in South Africa.

**Joint Winner** – Zeitz Museum of Contemporary Art Africa (on previous page)

## CATEGORY: INFRASTRUCTURE

**Commendation** – Concrete for Maputo Bridge

**Commendation** – Kusile Power Station Main Civil and Completion Works

**Commendation** – Mndwaka Dam – Rubble Masonry Multiple-Arch Buttress Dam

**Winner** – Mt Edgecombe Interchange Upgrade

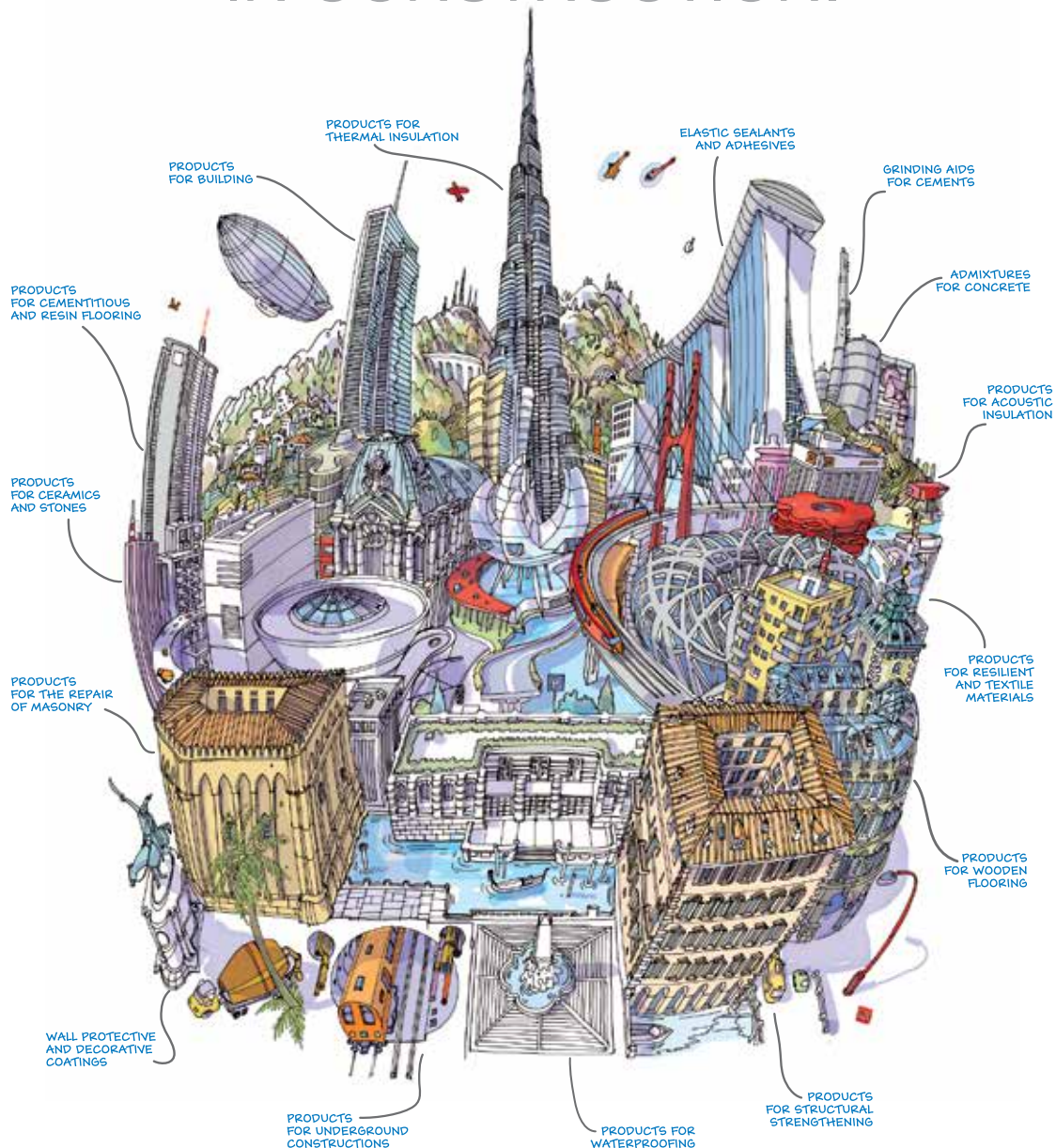
This project showcases the use of concrete in civil engineering infrastructure by encompassing nine new road bridges, one new pedestrian bridge, nine mechanically stabilised earth walls, and three soil nail retaining walls. It featured three simultaneous incremental launches with a combined deck length that exceeds 1.5 km, the longest incrementally launched viaduct in the southern hemisphere, and three incremental launches being constructed simultaneously. This is a South African first. It was constructed under difficult conditions – needing to accommodate heavy existing traffic within a congested site.

As a result of the vast scope, the wide variety of engineering disciplines and different construction elements, a total of 41 concrete mixes were designed for this project as well as three different grout mixes and two different sprayed concrete (shotcrete) mixes. ■

**Further info: John Sheath Tel: 012 348 5305 / e-mail: ceo@concretesociety.co.za / www.concretesociety.co.za**

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# Lafarge scoops acclaimed Fulton Award

Lafarge South Africa scooped a much sought-after award at the 2017 Fulton Awards ceremony.

The company won the award in the 'Innovation in concrete' category for the innovative integral Van Zyl Spruit Bridge. The project was jointly submitted by Lafarge South Africa, the main contractor (Aveng Grinaker-LTA) and specialist sub-contractor (University of Pretoria) – who is carrying out extensive research into the performance of the bridge structure.

This unique bridge, built on the N1 Freeway between the Trompsburg interchange and Fonteintjie in the Free State, is the first long integral bridge in South Africa and, at 90 m, one of the longest integral concrete bridges in the world.



The five-span road bridge has a continuous deck consisting of two spline beams, fully integral with the abutments and piers, eliminating the high installation and ongoing maintenance costs for bearings and expansion joints. The intermediate supports consist of pairs of reinforced concrete piers, one under each spine of the deck and the same width as the spines. The end supports are full height, reinforced concrete integral abutments with integral transition slabs.

In another first for South Africa, the bridge is supported on 66 x 900 mm diameter concrete Continuous Flight Auger (CFA) piles socketed into medium-hard rock. The fast, quiet and economical cast in-situ process worked extremely well and achieved high production rates, enabling the main contractor, Aveng Grinaker-LTA, to gain time on the project programme. The piling mix required a 400-mm flow with a 3.5-hour retention.

An attractive feature of the bridge is the high-quality finish concrete balustrades achieved using slipforming, with access to both sides of each balustrade provided by temporary cantilevered strongbacks. The process required close collaboration with Lafarge to ensure an uninterrupted supply of consistently formulated concrete. Lafarge were able to guarantee this by positioning one of the company's mobile concrete batching

plants on site. The company also standardised on the use of its premium technical cement Powercrete Plus CEM II 42,5R for all concrete production, which ensured mixes with excellent workability and pumpability, as well as contributing to good off-shutter finishes.

This pioneering project will significantly influence local concrete bridge design in the future by introducing an efficient and relatively quick to construct option that, without bearings or expansion joints, is largely maintenance-free. In view of the potential of the Van Zyl Spruit Bridge integral design for road infrastructure construction, the South African National Roads Agency SOC Ltd (SANRAL) commissioned the University of Pretoria (UP) to undertake a detailed assessment of the new bridge. UP designed, installed and are operating extensive monitoring instrumentation in the structure. The system employs over 500 sensors, which are being logged every 15 minutes to detect and quantify trends in strain, temperature, tilt and earth pressure.

Lafarge's ability to play a significant role in South Africa's infrastructure development is founded on its success with providing the local construction industry with the widest range of innovative, cost-effective building materials. With a strong presence in all of its construction related business lines of cement, aggregates, ready-mixed concrete and fly ash, it is in a unique position to meet the needs of the industry. The company's holistic solution-provider approach to customer service is proving to be highly effective, offering peace of mind with better quality control, as well as better value in a competitive marketplace.

Some recent southern African major infrastructure projects involving Lafarge have included water projects such as the Lower Tugela Bulk Water Supply scheme, De Hoop Dam and Lesotho's Metolong Dam; KwaZulu-Natal's Umgeni Road Interchange and the Eteza Diamond Interchange road project. Housing projects embrace the Christiana and Westonaria Borwa developments; and some of the various renewable energy projects have been the Khi Solar Tower and the Cookhouse Wind Farm.

"Lafarge South Africa responds strongly to the needs of construction contractor customers and their projects by offering fully-integrated building materials supply and management solutions. Efficient, well-developed infrastructure is vital to develop a growing economy and, in particular, is a prerequisite for helping to build better communities by providing good access employment opportunities and better services. We are proud to have been part of the project team on this important award-winning Van Zyl Spruit Bridge. ■

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# Engineering marvel at foot of Lions Head places JG Afrika in the limelight

It is more than just sheer magnitude and modern aesthetics that have placed a new residential development in a very affluent area of Cape Town in the spotlight. This new six-storey residence at 145 Kloof Road at the foot of Lions Head in Clifton is also a major civil- and structural-engineering feat that has showcased JG Afrika's skills and capabilities.

The project was awarded second place in the SAICE Western Cape Branch Awards as part of the build-up towards the prestigious annual national finals. The panel of judges was impressed with the unique design and intricate construction processes involved in developing a three-level basement for the structure in an extremely sensitive area.

The close proximity of existing properties to the building's boundary eliminated the possibility of using conventional soil anchoring systems, due to boundary restrictions, and an alternative design had to be developed. Working closely with geotechnical sub-contractor, Franki Africa, JG Afrika designed an alternative which eliminated the need for conventional ground stabilisation systems in restricted areas during the construction process.

JG Afrika's senior engineer, Bobby Jarratt, who was involved in the project from the early design stages in 2014, says that the system also had to be designed in a very short period.

"We designed the system in as little as three months so as not to delay Franki Africa which had already been appointed by the time we understood the true extent of the risk associated with crossing the site boundary using traditional stabilisation methods. Both the JG Afrika and Franki Africa teams were under incredible pressure to devise a workable solution," comments Jarratt.

A number of solutions were proposed and narrowed down to three potential systems, including constructing a conventional

cantilever retaining wall; a propped retaining wall using side-wall buttresses; and an anchored reinforced-concrete (RC) box system.

The JG Afrika and Franki Africa experts agreed that the construction of an RC box system, with tension anchors rooted within the property boundaries that would resist horizontal forces and conventional vertical piles that intercepted the slip-circle plane, was the best solution for this development.

However, the preferred solution also presented its share of challenges, with the consulting engineer and civil-engineering contractor well aware of meticulous attention that would have to be paid to the co-ordination of the construction sequence to ensure stabilisation of the back and side faces.

Construction of the structure was divided into four phases, starting with the establishment of a small working platform at second terrace level where a 13-m-high slope was excavated at 60 degrees (°), and then temporarily stabilised using soil anchors and covered with mesh and sprayed with gunite. The installation of temporary anchors during this process was carefully monitored to ensure that none crossed the property boundary.

This provided a secure three-metre-wide platform from which the contracting teams could commence building the RC box at the second terrace.

Drilling rigs were lifted and placed onto the platform, 14 m above road level, to insert the 300-mm-diameter rotary percussion soldier piles and tension ground anchors at 10° to the vertical, to form the temporary side walls of the system.

Within the platform area, vertical piles of up to 25 m in length and tension anchors at 60° to the horizontal were then socketed into hard rock to resist slip circle failure and the horizontal sliding forces generated from the eventual rear vertical retaining wall.

A 500-mm-thick foundation slab was then constructed and, using a compact excavator, the excavation of the rear face followed in controlled three-metre widths to mitigate the chance of slope failure. The retaining wall was then built up to the total 5 m retained height sequentially to ensure stability.

Jarratt says that the completion of this phase of the project was an important milestone as the professional team had now established a suitable construction sequence.

"Many important lessons were learnt by the consulting engineering and contracting teams that led to the continuous refinement of the design and construction processes. Over-and-above the technical complexities, we also had to consider the very tight working environment that provided limited space for the crane laydown area, requiring careful co-ordination throughout the first two phases," he says.

A technical director at JG Afrika, Tim Davidson, who led the firm's team on this project, adds that the successes achieved during the first two phases of the project resulted from excellent team dynamics between JG Afrika and Franki Africa.

"This is an essential factor for any successful project. We were fortunate to have the opportunity to work with a very experienced geotechnical contractor that brought immense knowledge and capability to the team, complementing our own known abilities, as well as experience working in this challenging area," says Davidson. ■



Development nearing completion with building structure supporting side walls.

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# Expanding stadium for Abu Dhabi's Yas Island

By Joe Quirke

**A**n international team of consultants has designed a futuristic variably-sized venue for an artificial island off the coast of Abu Dhabi.

The design team is led by Canadian engineer WSP along with architects HOK of the US and Pascall + Watson from the UK. The team was organised by Miral Asset Management, which is responsible for the development of much of the southern part of Yas Island. This includes a hotel cluster, a Formula 1 circuit and a theme park.

Yas Arena will be the first multipurpose indoor arena in the city, and can be expanded from a 500-seat theatre to an 18,000-capacity stadium. HOK says the project has an "illuminated lantern facade", and will be able to accommodate events such as community gatherings, concerts, performances, sporting events, as well as meetings and conventions. Premium spaces include a VIP lounge that can be transformed into a grand ballroom, and hospitality boxes and terrace bars for receptions and parties. HOK also designed the adjacent retail and dining destination along the Yas Island boardwalk.

Jonathan Brown, the development director of Miral Asset Management, commented: "The development of the UAE's



first 18,000-capacity arena will establish Yas Island among the leaders for performance and events venues."

According to *Construction Week Online*, Miral is investing \$1.1bn in phase one of the \$3.3bn development, which hopes to attract 15,000 residents and 10,000 professionals. ■

*Images courtesy of HOK*

**Source:** <https://goo.gl/rkUyPX>



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# Kaytech's 'Concrete-on-a-Roll' aids Mooi River Canal remediation

A unique class of construction material supplied by Kaytech not only solved logistical problems but also saved the Department of Rural Development and Land Reform time and money, due to its speed and ease of installation. The 22-km-long Mooi River Irrigation Canal, supplying water to the remote Keate's drift area of KwaZulu-Natal, was in dire need of rehabilitation. There were numerous badly cracked sections leaking untold volumes of water.



*Concrete Canvas installed and overlaps weighted.*



*Hydration of the installed Concrete Canvas.*

Realising the prohibitive transportation costs of a conventional concrete lining, Element Consulting Engineers sought an alternative solution from Kaytech, who recommended the patented product Concrete Canvas; an ideal solution for the areas inaccessible to vehicles. This led to numerous sections of the canal, totalling 5 km in length, being remediated using Concrete Canvas.

A state-of-the-art product, Concrete Canvas is a Geosynthetic Cementitious Composite Mat (GCCM) consisting of a three-dimensional fibre matrix containing a specially formulated dry concrete mix that simply requires hydration, either by spraying or complete immersion in water. Once hydrated, the concrete impregnated fabric hardens rapidly to form a thin, durable, fire-resistant layer. PVC backing on one surface of the mat ensures complete waterproofing. Since Concrete Canvas requires no mixing, measuring or compacting, less logistical complexity is needed.

Prior to commencement of the project, Kaytech supplied on-site training for the contractors. The correct installation methodology for Concrete Canvas CC5 (5 mm thick) was then implemented including the method for joining the 50-mm overlaps between each length. A sock of bidim A2 filled with river sand was used to temporarily weigh down each joint. Bidim is Kaytech's renowned nonwoven, continuous filament, needlepunched geotextile manufactured from 100% recycled polyester.

In total, 10,600 m<sup>2</sup> of Concrete Canvas CC5 was installed along numerous sections of the canal. For each section, the CC5 was pre-cut to the required length to line the canal. The jointing method used for the CC5 was a simple folded prayer overlap. With the Mooi River close by, water was readily available for water bowser trucks to hydrate the Concrete Canvas.

Compared to standard OPC concrete, Concrete Canvas has better abrasion resistance, while its low mass and low carbon technology results in an eco-friendly product that uses up to 95% less material. Once set, the fibre matrix serves to reinforce the concrete.

Further properties include excellent chemical resistance, root resistance, as well as good weathering and UV stability. The flexibility of Concrete Canvas prior to hydration provides unique drape characteristics that closely follow the surface of the canal.

With installation rates of up to 240m<sup>2</sup>/day, using Concrete Canvas drastically reduced construction time for this project. Due to the rapid installation and curing of Concrete Canvas, the canal could be re-opened within 24 hours, minimising disruption of the water supply to the surrounding communities. Transportation costs were considerably reduced since 1200 m<sup>2</sup> of Concrete Canvas can be transported on one 10-ton truck. In comparison, 19 truckloads of readymix concrete would have been required to line an equivalent area with a 100-mm thick conventional concrete lining.

The local community was overjoyed with their 'new' canal and the client and consulting engineer were very pleased with the performance of the product and have said they will consider it for future projects.

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# Murray & Dickson Construction Group breaks concrete boundaries



*M&D Construction Group provided critical expertise for the successful delivery of the very complex Sol Plaatje University library.*

This year's prestigious Fulton Awards have again showcased the extent of concrete expertise and capability enshrined within the Murray & Dickson Construction Group, a leading and black-owned contracting company.

This proficiency played a prominent role in the highly successful outcome of the extensive and complex concrete works associated with the Sol Plaatje University Library construction project, the overall winner in the category 'Buildings of more than three storeys' and commended in the 'Architectural concrete' category.

The expert panel of adjudicators described the project as "bold and original, pushing the boundaries of architectural and engineering design", while relying on "very high expectations from concrete to perform both as a structural and aesthetic material" with a refined surface finish.

Murray & Dickson Construction Group's building division has been closely associated with the Sol Plaatje University since 2014, when it was awarded its first contract by the institution of higher learning in Kimberley, Northern Cape.

Its stellar work on this aspect of the rapidly expanding precinct led to its appointment as the main contractor on the library build, which commenced in 2015.

Here, their building division continued working alongside Aecom, the principal agent. It was joined by Lafarge and Unispan, specialist suppliers, as well as OIK, a Kimberley-based emerging contractor that was trained in steel fixing and shuttering by Murray & Dickson Construction Group in line with its own Khula Nathi policy. Khula Nathi is Zulu for 'Grow with Us', and this policy was also applied in the extensive training of the Kimberley locals working on the contract.

The library is not only a central feature of the rapidly expanding Sol Plaatje University development, but also currently the most sophisticated building in the larger Kimberley CBD.

Located on the main pedestrian spine of the campus, the structure is immediately noticeable by the refined and consistent silky off-steel finish of the concrete façade. The latter is an impressive 'wall-and-roof' concrete shell that is functionally, structurally and technically independent of the 'building' housed within.

This structural engineering feat called for the construction of a three-dimensional envelope that allows a 2,7-m-wide perimeter void between the external envelope and the floor plates. The void acts as a thermal duvet between the non-insulated external shell

and its habitable building, and in which all vertical movement and services are located.

The walls were slid while supported off the ground on very slender columns, facilitating a ground level that is transparent and that can be used as a public space. Meanwhile, infill panels in the shell manage shrinkage stresses.

Murray & Dickson Construction's Renell Samuel says that the project relied heavily upon the group's long legacy on other complex building projects.

"We are acknowledged as an expert in the field of off-shutter concrete finishes. This is a reputation we have earned as a result of our very long association with the University of Witwatersrand, among other highly successful related builds. Certainly, this was one of the other reasons why Sol Plaatje University entrusted us with what was intended to be the showpiece of the entire precinct," says the group's building construction director.

Samuel and his team provided valuable insight right from the very early design phases, again bringing to the fore the uniqueness of a NEC 3 Target Cost Contract that was awarded to the Murray & Dickson Construction Group on open tender. He attributes many of the division's successes to this form of contract that transfers more responsibility to the contractor.

Not only did the contracting team transfer their essential knowledge on optimal shuttering and staging technology, sequencing and concrete lifts, but also paid meticulous attention to consistent colour variation, programme optimisation and costs that were aligned to the budget. Working closely with the energy consultant, the professional team also took into consideration climate and light-harvesting objectives, bringing a strong sustainable engineering aspect to the overall build.

Samuel concludes that he is proud of Murray & Dickson Construction's association with yet another successful building contract that has also received due recognition from a biennial event that is widely acknowledged by South African built environment professionals as the foremost platform for recognising excellence in the design and use of concrete! ■

**More information from Murray & Dickson Construction Group, Tel: +27(0)11 463 1962  
[www.mdconstruction.co.za](http://www.mdconstruction.co.za)**

## World's longest suspension bridge contract signed

A consortium of South Korean and Turkish contractors has finalised a deal to build a 3.6-km suspension bridge over the Dardanelles Strait between European and Asian Turkey. The team, composed of Daelim, SK, Limak and Yapi Merkezi will build the crossing for the sum of 10.35 billion Turkish lira (\$2.8bn).

Korean transport minister Kang Hoin, who was visiting Ankara to promote Korean companies' expertise in large-scale infrastructure projects, attended the ceremony. He also signed an MOU on railroad and road construction as well as on research and development.

The Korean team had been expected to win the build, operate, transfer contract since the end of January. Its main advantage was that it had offered to recoup its expenses and hand the bridge back to the Turkish government in 16 years, less than its rivals.

Kang said: "The Canakkale 1915 Bridge can facilitate the country's transportation. This major project will enable Turkey to show its geopolitical position, natural beauty and cultural richness to foreigners."

He added that Korea was ready to help Turkey improve its economic growth by improving its level of technological development and "modifying the structure of its industrial sector".

Ahmet Arslan, the Turkish minister of transport said Turkey was hoping to learn from Korea and then to use its knowledge to improve the competitiveness of the Turkish construction



*The Canakkale 1915 Bridge will be longer than Japan's Akashi-Kaikyo, present holder of the longest span record (Wikipedia Commons).*

industry. He said: "We will develop the technology, which is essential for these kinds of megaprojects, by constructing the world's biggest bridge.

"After completing this, we will be able to do similar projects in countries all around the world."

Three other consortiums were in the running for the contract for the Canakkale bridge. ■

**Source:** <https://goo.gl/gtv6xE>

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BUILDING TRUST



# Abland and Tiber join forces to develop Sandton Gate

**A**bland and Tiber have joined forces to develop the new Sandton Gate precinct by combining their respective strengths to deliver a carefully conceived, and ultimately well-executed, product.

The sizeable site on which the precinct will unfold, has been assembled over several years by Tiber. Therefore, when Tiber's CEO, Fernando Cardoso, was approached by Abland's MD Jurgens Prinsloo to consider a JV approach to develop a precinct incorporating properties Abland had purchased in the same area, discussions showed that the synergies and complementary experience and expertise could be combined to create a world-class mixed-use precinct – Sandton Gate.

"We believe that the strong complementary skills and expertise within our two companies can be harnessed to successfully deliver, execute and manage a development of this magnitude," comments Cardoso.

Prinsloo adds: "We have the opportunity to do something special here. This is an exceptional site on which to construct a strong nodal development."

Situated on William Nicol Drive between Sandton Drive and Republic Road, Sandton Gate will be easily accessible from Sandton, Hyde Park and the N1 freeway as well as being alongside the current S5 Sandton – Fourways Gautrain Bus Route. It is also located on a planned route for the extended Bus Rapid Transit (BRT) system, which will link it conveniently to Rosebank and Sandton Gautrain stations.

The site provides 130,000 m<sup>2</sup> of developable floor area, comprising ±80,000 m<sup>2</sup> of offices, 400 residential units and a variety of lifestyle and retail amenities.

The site is adjacent to the Braamfontein Spruit, which is a very popular mountain biking route. The entire stretch of river adjoining the site will be rehabilitated and upgraded as part of the project, thereby encouraging cyclists and local residents to make use of this open space and the other facilities provided.

The concept of a mixed-use precinct is strongly aligned with the new urbanist principles of creating pedestrian friendly, live-work-play environments. Such environments are also more eco-friendly, reducing people's commutes and carbon footprints. The intention is for every commercial building in Sandton Gate to obtain a minimum Four Star Green Star SA rating. "We are proud that the entire precinct will be Green Star SA rated and



that Sandton Gate is one of the sites being used as a pilot in the development of the precinct rating tool by the Green Building Council of South Africa," Prinsloo notes.

Engagement with the City of Johannesburg and with local residents has been very positive. The first phase of Sandton Gate will include all necessary infrastructure, plus 10,000 to 15,000 m<sup>2</sup> of commercial office space, and a residential component which will commence in the latter part of 2017. Thereafter, the development will progress according to prevailing market demand.

The commercial buildings will be developed as high-end A-Grade and P-Grade buildings offering maximum flexibility to accommodate large, medium and smaller users. The residential units will be available for sale and/or leasing while the commercial buildings will be available for leasing. The Abland / Tiber Joint Venture will manage all aspects of the development, from the initial planning, design, construction, leasing and ultimately the management of the entire precinct.

The JV's ability to manage the development process from inception to completion is a major strength. Tiber's track record is evidenced by some of South Africa's most iconic buildings in Sandton. This, together with Abland's pedigree in developing best-in-class, innovative and sustainable developments across the country, lays the foundation for the delivery of an inimitable world-class precinct.

"Having decades of experience in this environment and a solid understanding of the process, will enable the Abland/ Tiber JV to control the delivery from the outset right through to the professional management of the precinct. This lends great strength to our partnership and will ensure that we can roll out a well-conceived, value-engineered and efficiently managed product, ensuring the delivery of high quality but competitive pricing to the market," comments Prinsloo. ■

**More information from [www.abland.co.za](http://www.abland.co.za) or [www.tiber.co.za](http://www.tiber.co.za)**





# Permeable storm water infrastructure at Saldanha Bay IDZ

The days of slapping concrete and asphalt down to construct walkways, driveways or storm water channels may be numbered. Commercial properties, public spaces, and residential developments have upped the standard on what they require from a paved surface.

Land restrictions, storm water management, and other environmental regulations have turned the growing housing market and other land developers to seek solutions able to address these issues.

In 2013, the Port of Saldanha Bay was earmarked as an important resource for the sustainable growth and development of the West Coast region, and on the 31st October 2013 the Saldanha Bay Industrial Development Zone (SBIDZ) was officially designated as South Africa's fifth Special Economic Zone (SEZ).

As development took place at this SBIDZ in recent years, the need for effective storm water control arose, especially with new tenants taking up residence this year. Following the Integrated Development Plan (IDP) laid out by the Saldanha Bay Municipality, to address all issues pertaining infrastructure development with a sustainable solution in mind, Power Group, South Africa's largest family- and employee-owned construction company and the main contractor on site, stipulated a permeable, environmentally friendly solution.

Robbie Dreyer, senior agent, Power Group said: "Having considered all options, we eventually settled with the Terracrete block manufactured by Van Dyk

Precast in Vredenburg, confident to have found the best solution with the least environmental impact on the area."

The Terracrete permeable paving blocks or 'grass paver' blocks encourage water infiltration and prevent rain water runoff, to replenish our dwindling ground water reserves. The grass paver is ideal for areas prone to erosion, and the versatile blocks can be used for domestic, industrial, and agricultural applications such as drive ways, parking areas, vehicle tracks, hardstandings for trucks and machinery, attenuation ponds, embankment stabilisation, to name a few.

Installed in early 2017 by Keystar Trading and Cleophas Construction, the entire area has been supplied with a network of permeable storm water channels that will effectively collect any excess rain water and redirect it to the appropriate culverts, with some water passing through the large holes in the Terracrete blocks into the sub-terrain water reservoir. This effect encourages low shrubs to take root on the surrounding soil, to reduce wind and water erosion in the area.

Many industry experts agree that permeable pavers can offer a good solution to increased storm water run-off. Says Dr Sönke Borgwardt, a self-employed landscape architect and consulting engineer and leading expert on the subject in Germany: "The use of permeable paving is an important contribution to a sustainable and environmentally useful management of drainage systems. The handling of storm water runoff from sealed traffic areas is made less complicated and more affordable when it is decreased considerably by the application of filterable pavements."

This type of infiltration management, he adds, has the added advantage that the already overstressed urban sewer systems are relieved. A further advantage is that secondary drainage measures, such as channels or swales, as well as detention ponds, can be greatly reduced. ■

**More information from  
Terraforce,  
Tel: +27(0)21 465 1907  
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# Techmatik launches new concrete block traveller machine!



The new MULTI 300 traveller machine is designed to produce high-quality concrete blocks at an economical price. Expanding on Techmatik's industry-leading design and innovation, the company has developed a machine that is able to produce a range of products and sizes that is extensive enough to meet every customer's needs.

The machine is equipped with moulds connected to vibrators and has an integrated hydraulic station as well as an electrical switchbox with a console for the complete visualisation of the production process. In addition, it is fitted with proven solutions, such as the hydraulic cylinders for the fitted trays, mechanical compression heads and mould mountings as well as linear bearings.

With overall dimensions of 3800 x 2150 x 3520, this simplified compact design enables the machine to work in a small area with ease. An optional generator is offered for customers in remote areas without electricity. The machine is offered in Semi-Automatic or Fully Automatic versions and can even be fitted with a competitor's moulds. Flexibility combined with Techmatik's proven reliability makes this machine a great addition to the company's product line.

The TECHMATIK plant was built in the summer of 2004 in the Radom sub-zone of the Tarnobrzeg Special Economic Zone, in Poland. On 18th February 2016, it became part of the Columbia family of companies.

Columbia Machine was established in 1937 and today it is a third-generation privately held, world-wide leader in the design, manufacture and the provision of support for the equipment of a variety of industries, with customers in over 100 countries around the world.

Its primary business units include: batching and mixing solutions, concrete products equipment solutions, production equipment moulds, mechanical palletising machines, robotic palletising solutions, conveyor system solutions, pallet load transfer solutions and manufacturing services.

TECHMATIK's offering includes moulds for production of paving blocks and decorative concrete products, modern, high-performance concrete block machines, complete process plants, concrete mixing plants and various machines used for the manufacture of vibrated and pressed products, as well as for the ready-mixed concrete industry.

All production lines are equipped with advanced, state-of-the-art machines ensuring high output and repeatability of production and superior quality of products. Techmatik machines, devices and moulds are designed to give high performance and efficient production with the use of steel tabletops – a solution that ensures the best product properties by thorough compacting, and achieves a significant lowering of production costs by reducing the amount of cement used for concrete mixes.

The offering is supplemented by manufacturing process control systems that include control modules for individual process stages and integrated control systems for the entire manufacturing process. Moreover, TECHMATIK offers repair, regeneration and maintenance services for all machines and equipment.

TECHMATIK is a company living up to its aim of offering "Technology of the Future". ■

**More information at [www.techmatik.pl](http://www.techmatik.pl)**



# Precon Consulting Engineers



**A**lthough extensively applied in Europe and other parts of the world the full advantages that precast concrete can provide to high-value projects have to date not been fully utilised in the South African construction industry.

To date the focus has been on mainly minor elements and precast floor systems and this application has proven itself over and over again as an economical alternative to in-situ concrete.

By its nature the manufacturing process itself lends itself to a high level of quality assurance both with regards to material aspects and to finishing which cannot be obtained on a conventional construction site.

Precon Consulting Engineers has, in conjunction with Echo Precast, endeavoured to prove to the market that the successful application of precast concrete elsewhere can also be emulated in South Africa and has successfully provided designs in this regard to the market.

Recent project involvements entail especially the construction of multi-storey parking facilities with structures involving up to 80,000 m<sup>2</sup> constructed to date. These entail fully precast elements – with regard to columns, beams and hollow-core slabs.

Our exposure to these projects has provided us with valuable experience to provide clients with all the advantages of precast concrete. One of the major advantages that also needs to be considered is obviously the reduced construction period typified by fully precast concrete projects and the reduced 'on site' phase of projects.

Precon utilises specialised software during the design phase which provides the manufacturing contractor with detailed workshop drawings as part of the initial design phase. The software is designed to highlight any clashes between rebar and cast-in elements which is of the utmost importance when manufacturing precast elements and avoids time-wasting on-site adjustments and cutting of rebar on site.

Precon is furthermore the preferred importer of Peikko connector components. Peikko is considered to be a world leader in the supply of connectors for specialised precast concrete elements.

As such, in spite of our extensive experience in this specialised field, we are of the opinion that we have merely 'scratched the surface' of this vast field and are looking forward to providing the industry with more products and designs that will ensure that today's construction methodologies will soon be regarded to be 'outdated'. ■



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# Rocla SAR culverts for Limpopo road rehab project

**R**ecurring potholes from flooding in Limpopo Province over the last few years and damage from the constant weight of heavy articulated trucks made the rehabilitation of the D528 road in George's Valley near Tzaneen essential.

In addition to the quickly deteriorating road surface and bridge, a sinkhole had developed under the road's surface threatening a complete collapse of this section of the D528. Rocla's SAR culverts were selected for the rehabilitation of the bridge section.

Polokwane-based Batlagae Investments were awarded the contract to commence the rehabilitation of the D528 road in April 2016, with completion scheduled for November 2016.

Thapelo Chuene, project manager at Batlagae Investments said: "This 30-km section of the road had become known as the 'deathtrap' because of the disintegrating bridge and road surface. Many challenges faced us on this project such as the accommodation of fibre optic lines, bad weather, the development of a 'safe road' for the duration of the project and excavation of 30,000 m<sup>3</sup> of soil. The removal of old and collapsed pipes had to be conducted with cutting torches due to a bridge collapse on a section of the D528 road."

"Rocla's SAR culverts were chosen for their quality, longevity and capacity. Ninety three units of 2000 x 2000 SAR culverts (5-10 m fill height) were supplied for the flood-damaged bridge element of the project.

"Because the Rocla's SAR culverts were custom designed to our requirements they were loaded onto tipper trucks and then off-loaded individually to ensure that no damage was caused to each culvert," said Chuene.

"When handling any concrete products, it's important to remember that, as concrete is a heavy and brittle material, bumps or shock loads of any description are liable to damage

the product. When offloading custom-designed products such as our SAR culverts, whilst placing the product on the ground, no portion of the culvert should be suspended in the air. While off-loading individual culverts one-by-one for the D528 project took some time, it was essential to maintain the integrity of the culvert at all times," said Robert Hill, sales representative for Rocla in Limpopo.

Hill continued: "This particular project certainly threw up some challenges from inclement weather to traffic constantly trying to use the damaged and collapsed sections of the road, but nothing that could not be overcome by the contractors and our technical support team."

The SAR culvert is most suited to use in stormwater applications with high loadings, but can be applied in any application where excessive fills must be accommodated. Units consist of a deck and two legs which are placed on a concrete base. This base can be cast in situ or prefabricated.

Rocla is Southern Africa's leading manufacturer of precast concrete products for infrastructure which, in addition to culverts, includes pipes, manholes, poles and related products.

All Rocla products are ISO 9001/2008 certified and have the applicable SANS recognition. The company has a sophisticated Quality Management System which is continually monitored and upgraded to ensure standards are maintained.

Rocla is part of the IS Group of companies which includes Technicrete ISG and Ocon Brick. ■

**More information from Guinevere Thomas,  
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[www.rocla.so.za](http://www.rocla.so.za)**



# Trojan Squares chosen for Broadlands Estate residence

Upmarket residential estates like the Broadlands Estate in Polokwane require residents to ensure that any additions or refurbishments done to their properties conform to the Estate's high existing standards. Aesthetics and finishes have to reflect the lifestyle that owners have invested in, and Technicrete paving is considered to be the leading choice when it comes to paving at the estate.

Technicrete's Trojan paving, well known for its durability and appearance, was recently used at a Broadlands Estate residence for the driveway, house perimeter and carport areas. The home owner chose the Trojan design after looking at the quality of the Technicrete brick product that was installed at a neighbouring residence in 2016.

Andre Buitendach, the owner of Adri Projects said: "The random-shaped edge bevels of the Technicrete Trojan Autumn coloured 60-mm square paving has given an aesthetically smart final finish to the driveway and other paved areas. We installed 1,200 m<sup>2</sup> of the Trojan squares, which we had to install in batches due to time availability of the client."



"We appreciated the fact that Technicrete understood our predicament with delivery of product to the estate. The estate's Body Corporate does not allow vehicles over eight tonnes on the property. Technicrete salvaged the situation by supplying all the paving we required in more lightweight delivery vehicles in a series of shuttles to and from the estate," said Buitendach.

"Technicrete's Trojan squares and slab formations are ideally suited to residential applications as well as municipal parking areas and pedestrian walkways due to their durability and lifespan. So, we were pleased to have been contracted for further paving installation work at Broadlands Estate. The finish of the paving on this residence, and the previous five projects, is very elegant and befitting of this upmarket estate, and offers owners a long lifespan due to the innate quality of the product," said Peter Hilton, sales representative for Technicrete ISG in Polokwane.

Technicrete's Keystone paving was installed at five private residences at Broadlands Estate in 2016.

Technicrete ISG is part of the Infrastructure Specialist Group which also comprises Rocla and Ocon Brick. ■

**More information from Guinevere Thomas,**  
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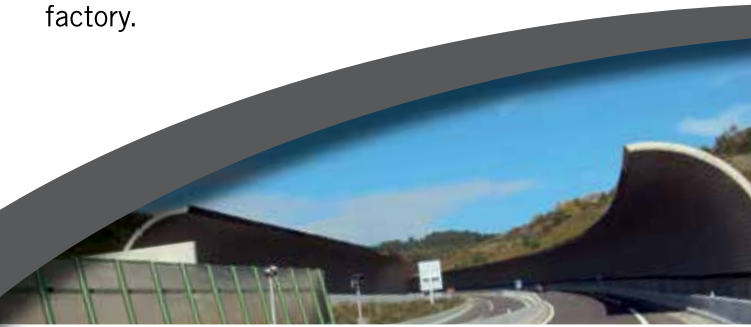
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# SPC, an innovator civil engineering

Operating in South Africa since 1965, SPC (Southern Pipeline Contractors), part of the French international construction groups, Sogea-Satom and Vinci, had been contracted by multiple consortiums and construction companies to produce standard as well as various specially designed and engineered precast products.

SPC is a precast concrete manufacturer that specialises in Spigot & Socket, IWJ pipes with various types of special inner and sacrificial linings for various applications, jacking and interlocking concrete pipes, box culverts and round and square manholes.

However, SPC prides itself in producing innovative precast concrete products, from concept, design and manufacture, to on-site delivery. Recent projects include the completed Gautrain project by Bombela Consortium, contracted SPC to design, produce and supply all the segments for the underground section from Rosebank to Park Station. In addition, 15,000m<sup>2</sup> absorptive and reflective noise barriers along sections of the Gautrain Rapid Rail Project were supplied. Both the segments and barriers were manufactured to a life-cycle standard of 100 years, the standard set for all precast elements on the Gautrain project. This had been the highest standards ever set for any engineering project in South Africa.

Noise Barriers are a basic construction requirement in all the major countries and cities of the world, and the design and

*Special precast segments in the foreground of Stefanuuti Stocks' Zuikerbosch Water Project.*



# in precast concrete structures

construction thereof are a first introduction of this essential technology against noise pollution in Southern Africa. SPC's highly effective noise barriers are visually and aesthetically pleasing.

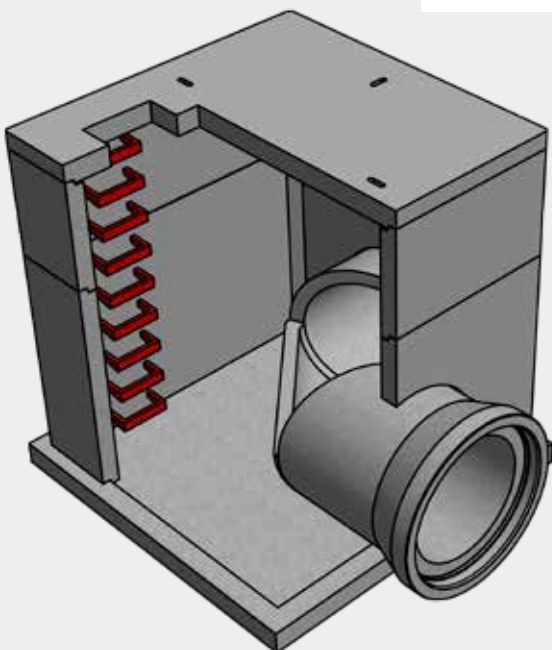
SPC is committed to effective waste management practices and the prevention of pollution. The company encourages efficient use of resources in order to reduce the impact on the environment.

A recent completed project by a long-standing client, Stefanutti and Stocks, is the Zuikerbosch Water Project, where SPC produced and supplied specially designed precast interlocking panels. The design and manufacturing of the special precast segments, has resulted in reducing this project by an astounding 28 months, from an initial 36 months, to just over 8 months.

SPC is ISO certified to the highest, and latest, regulations and specifications - ISO 9001:2015. This, together with the fact that SPC hugely benefits from proven expertise through solid European partnerships on design and technology, make the company an invaluable partner to all its South African clients. Our specialists are eager to assist in your current or next project, with tailor-made solutions for your individual needs.

Contact SPC at Tel: +27(0)11-914-8500/1/2/3

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# Raubex builds houses for the people with AfriSam concrete

**R**esidential units are going up apace in the Clayville Ext 45 area near Tembisa – between Pretoria and Ekurhuleni – as Raubex Building constructs houses for private sale as well as RDP flats, each with a solid raft foundation of AfriSam readymix concrete.

The developments, by the well-known developer Valumax, include bonded standalone houses for private sale and also government-funded blocks of RDP flats.

Work has just been completed on 822 private residential houses in a project that began in early 2015, where AfriSam's readymix concrete was required for the 'waffle raft' foundations under each unit. Between eight and nine cubic metres of concrete was poured per house, depending on the floor space, which are 45, 52 or 56 m<sup>2</sup> in dimension, according to Raubex Building quantity surveyor, Renier Rossouw.

For this project, AfriSam delivered about 36 m<sup>3</sup> of concrete a day, amounting over the full project duration to about 7,000 m<sup>3</sup>, says AfriSam sales manager Adele Wentzel. This was sourced from the company's Olifantsfontein plant, just 11 kilometres from site, enabling cost and logistical benefits.

Raubex Building also recently completed the first phase of a government-funded project for RDP flats, in close proximity to the private housing development.

"In February, we handed over eleven three-storey blocks, comprising a total of 237 flats with a 40-m<sup>2</sup> footprint each, to the client," says Rossouw. "Here, we contracted AfriSam to provide readymix both for the raft foundations – which used 1,100 m<sup>3</sup> of 20 MPa concrete – and for the rib and block slabs between the flats, which consumed about 500 m<sup>3</sup> of the stronger, 25 MPa concrete."

A second phase of RDP flats is now underway, also with readymix supplied by AfriSam, and is scheduled for completion by Raubex Building in March 2018. This larger contract is for 484 living units in 18 four-storey blocks, with each block comprising 20, 28, 32 or 36 units.

Wentzel says: "By the end of this phase, AfriSam will have delivered 1,800 m<sup>3</sup> of readymix concrete for the raft foundations of these blocks, as well as another 1,200 m<sup>3</sup> for the rib and block slabs."

Due to the highly structured planning of the work cycle on these contracts, a reliable supply of readymix is vital, emphasises Rossouw. For this reason, he says, AfriSam's capacity as a large supplier is important so that supply can be re-routed from its other operations if anything affects production at one plant.

"As a contractor, you are always constrained by budget and time, so we need partners that deliver as promised," he says. "We have built a good working relationship with AfriSam over the past four years or so, and have always been impressed by their reliability, as well as the quality of their product. AfriSam is also able to ensure the necessary quality requirements, as each pour must be tested independently in terms of company policy and contract requirements."

The depth of expertise in cement and concrete technology also allows AfriSam to offer support to customers in regard to testing and quality issues, according to Wentzel. The company can even train customers' employees on the various procedures to be followed for testing on site.

She also highlights the importance of good systems and constant communication on both sides of this partnership, ensuring that each party knows what to expect. Rossouw says Raubex Building appreciates the quick response from AfriSam's control centre, which monitors readymix trucks and responds to customer queries.

On the site itself, there are about 260 workers in this phase, mostly local people who are engaged and trained by Raubex Building. The construction methods are deliberately labour intensive, to allow a high level of job creation and skills development. For example, the AfriSam readymix for the raft foundations is moved on site mainly with the use of wheelbarrows, while manually operated power floats are used to achieve the necessary smooth surface.

Local sub-contractors are engaged to provide electrical installations in each residential unit, as well as to install plumbing, glazing and ceilings. ■

**More information from Barend Badenhorst,  
Tel: 10 140 0302 / email: BarendB@raubex.com  
www.raubex.com**



Raubex Building's Renier Rossouw with some of the local labour used to create job creation and skills development during the project.



AfriSam readymix concrete is playing an important role on Raubex Building's project at Clayville Ext 45 near Tembisa.



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# Doka Ventures starts with mobile 3D construction printing on an industrial scale

**D**oka Ventures GmbH is a sister company of the Doka Group, one of the world's leading manufacturers of formwork technology for the world construction sector with headquarters in Austria. They are joining forces with the inventor of deployable 3D construction printing, Behrokh Khoshnevis. His company will start delivering the first series-ready robotic 3D construction printers early next year.

These robots will reduce the time it takes to construct buildings to mere hours or days. This will help meet the rising global demand for socially acceptable accommodation and infrastructure. The company is already generating revenue by offering technology and solutions to some major entities such as NASA.

The Earth's population, according to scientific forecasts, will rise to eleven billion by 2100 and, by 2050, about 75% of the world's population will live in cities. These developments pose huge challenges for the building industry. Affordable accommodation and its related infrastructure will have to be built rapidly. Conventional methods of construction will be unable to deliver.

As the first in the field, Contour Crafting Corporation from the US is poised and ready to start series production of first-generation deployable robotic 3D construction printers. The man behind the high-tech company is none other than the pioneering inventor of this technology, Behrokh Khoshnevis.

Doka Ventures is taking a 30% stake in Contour Crafting Corporation. Doka Ventures' role of core shareholder is long term and is reflected in personnel appointments to the positions of Chief Financial Officer (CFO) and Chair of the Board of Directors. Behrokh Khoshnevis remains majority shareholder and CEO of the company. Khoshnevis, a professor at the USC Viterbi School of Engineering, developed the Contour Crafting technologies at the University of Southern California. He worked with the USC Stevens Center for Innovation, the technology transfer office for the university, to obtain a license for the technologies to further develop them within his own company.

Deployed in the field, the robot 3D printer will be able to initially print building shells layer by layer and so construct entire developments. The process massively reduces the time needed for erecting an entire building to mere hours or days. Depending on the model, the first-generation commercial construction robots will have a reach of between eight to twelve metres and a user selectable length which could have a substantially larger



*Pioneering inventor of robotic 3D printing, Dr Behrokh Khoshnevis (Copyright: Contour Crafting Corporation).*



*Werner H. Bittner, Chairman Board of Directors Contour Crafting Corporation and Member of Executive Board Doka Ventures (Copyright: Barbara Nidetzky).*



*Contour Crafting Corporation's robotic 3D printer is designed for use where buildings need to be provided quickly and affordably (Copyright: Contour Crafting Corporation).*

size. Tipping the scales at less than 400 kg in all, it is very light for a large construction machine. It is also very simple to put together and take apart, remarks Khoshnevis. An ordinary truck or a standard marine-freight shipping container has ample space for several of the robots. Only one or two operators, who are certified by Contour Crafting Corporation, are needed to monitor progress on the build.

These robotic 3D construction printers are designed for use wherever accommodation and infrastructure need to be provided rapidly and also affordably. Alongside social housing construction, that also covers disaster relief, for example 3D print-building the new structures needed in a hurry after an earthquake.

"The first orders are already in the books", confirms Werner H. Bittner, newly appointed Chairman of the Board of directors of Contour Crafting Corporation. Their future customers include construction companies and real estate developers.

The robots are manufactured in El Segundo, which is a district of Los Angeles, USA. The first series-ready 3D construction printers are scheduled for dispatch at the start of 2018. As well as manufacturing and selling robotic 3D construction printers, Contour Crafting Corporation also intends to provide on-site building construction as a service.

## Contour Crafting Corporation sets its sights on space

Dr. Khoshnevis invented the technology for deployable 3D construction printers capable of automated construction of structures and infrastructure in the field. Since 1996 he has held numerous globally effective key patents on virtually all the technical aspects of 3D construction printing. In 2014 he won the international competition grand prize awarded by the US National Aeronautics and Space Administration, NASA. In 2016 he won another grand prize awarded by NASA, this time for his patented Selective Separation Shaping (SSS) 3D printing technology. Contour Crafting Corporation sees correspondingly wide horizons for its future activities. Alongside terrestrial 3D construction printing, the firm has been working with NASA on the construction of infrastructure elsewhere in the solar system, particularly on Mars and on the moon. ■

**More information from Pia van der Merwe,  
Tel: +27(0)11 310 9709 / pia.vandermerwe@doka.com  
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# Reducing plastic shrinkage cracking using micro fibres

Plastic shrinkage cracking (PSC) is one of the earliest forms of cracking in concrete and can be a major headache for engineers, contractors and property owners. These cracks occur within the first few hours after the concrete has been cast and are not only unsightly, but also reduces the durability and serviceability of a concrete structure, by serving as pathways whereby corrosive agents, for example: air, water and chloride can enter the concrete. PSC is caused by the loss of pore water from the concrete surface due to evaporation resulting in an internal capillary pressure build up. Environments with high evaporation rates increase the capillary pressure in the concrete and are characterised in South Africa

by conditions with a low relative humidity, direct sunlight as well as high wind speeds and high ambient temperatures. Concrete elements with a large exposed surface, for example: slabs or pavements, are especially vulnerable to evaporation and therefore also PSC. The process of capillary pressure build up due to evaporation and the consequent cracking are illustrated in Figure 1.

The position of cracks depends on the geometry of the slab. If the slab has a uniform thickness, cracks patterns are mostly random. However, if the slab has a non-uniform thickness, as a result of a varying depth or rigid inclusions such as reinforcing steel, crack patterns are normally linked to the positions of these slab non-uniformities.

There are several external and internal measures that can be applied to prevent or reduce PSC. External measures influence the external environment of the concrete slab and are aimed at minimising water loss through evaporation. These include: casting during favourable conditions with low evaporation rates, shielding the concrete from wind and direct sunlight, spraying a fine mist of water continuously above the concrete surface as well as cooling the concrete aggregates and/or mixing water.

Internal measures influence the internal structure and behaviour of the concrete. The most common and successful internal measure which has been shown to reduce PSC through various tests at Stellenbosch University is the addition of a low volume of polypropylene micro fibres to the concrete. The fibres reduce crack widening by transferring the stress induced by capillary pressure across the crack. Figure 2 shows a direct tensile test on plastic concrete, which clearly shows the fibres bridging the crack even after extensive crack opening. In general, the higher the dosage of fibres the less severe the cracking will be. However, it should be kept in mind that the addition of fibres also influences fresh concrete properties such as bleeding and workability. It is therefore important to conduct trial mixes, especially at higher dosages, although a typical dosage of 0.6 kg/m<sup>3</sup> can be prescribed as a proven dosage that effectively reduces PSC without negatively influencing to workability of the concrete.

Finally, although fibres provide resistance to PSC, they do not always result in a 100% crack reduction and the addition of fibres do not justify neglecting the application of external preventative measures. Another common and worrying practice in the construction industry is the use of steel mesh to reduce PSC. This is a misconception as the steel mesh may in certain cases even aggravate the PSC of concrete by providing vertical and horizontal restraint. The steel mesh is meant to control cracking due to drying shrinkage which occurs long after PSC has finished.

In conclusion, although PSC remains a problem with concrete slabs, the addition of a low volume of polypropylene micro fibres has proven to be an effective method to reduce the severity of these cracks. ■

*This article was supplied by Prof Billy Boshoff and Riaan Combrinck, Unit for Construction Materials, Stellenbosch University.*

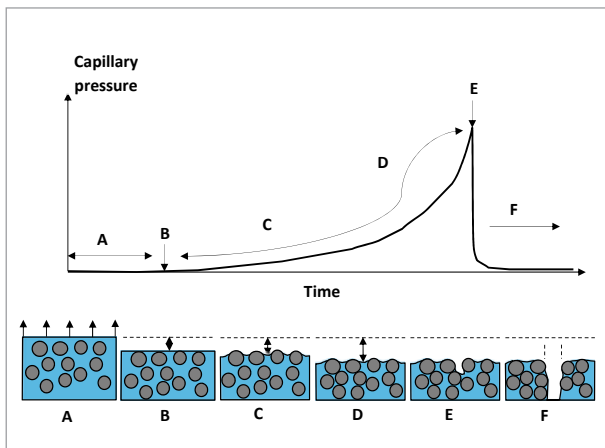


Figure 1: Typical capillary pressure build-up before the onset of plastic shrinkage cracking in concrete



Figure 2: Direct tensile test on fresh concrete clearly showing the fibres bridging the crack even after extensive crack opening.

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### More information from Maxine Nel,

**Tel: +27(0)11 670 5893**

**email: maxine.nel@za.afrisam.com / www.afrisam.com**

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Ciolti Readymix's distribution plants in Cape Town CBD, Philippi, Stellenbosch and Durbanville, along with a fleet of 42 Mercedes mixer trucks, are capable of delivering over 1,000 m<sup>3</sup> of readymix concrete daily. This is complemented by a team of highly qualified and experienced staff, who target the supply



of high-quality concrete and a premium, personalised service.

Ciolti Readymix has a customer base ranging from major contractors to smaller household construction companies and prides itself on building close relationships with all its customers.

Major contractors to whom the company regularly supplies concrete include Murray & Roberts, WBHO, Steffanutti Stocks, Grinaker LTA, Group Five and Rawson Properties. Recent projects include Table Bay Mall, Tsogo Sun CBD, Palm Brook Century City, Alan Grey Silos Waterfront and many other major sites.

Current projects include 117 Strand Street, Battery Park V&A Waterfront, Oasis Palmbrook Century City and many more.

A proud member of SARMA, Ciolti Readymix batching plants are annually audited to ensure compliance with the highest standards and quality. ■

### More information from Tel: +27(0)21 557-1111

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## Mapei South Africa

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MAPEI boasts a wide range of products for a variety of applications and invests more than 5% of its annual turnover into research and development, Mapei ensures its success through quality products, total system solutions and technical support from local and international sources.

MAPEI South Africa distributes products throughout the SADEC region with the wide-ranging benefits that exist through the backing of the group's unparalleled knowledge, technical experts, research capabilities and product specialists.



MAPEI South Africa supplies the following solutions:

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We have an extensive footprint in South Africa with three manufacturing plants and seven branches.

A responsible company, CHRYSO Southern Africa complies with ISO 9001 and OHSAS 18001.

CHRYSO Southern Africa can give daily technical support to its customers while ensuring high levels of quality control



through our concrete laboratories at our various production sites and also the excellent relationship we enjoy with local commercial laboratories countrywide.

In addition, CHRYSO has many academic partnerships with universities as well as an international network of technical specialists who can provide technical advice.

The CHRYSO GROUP has 29 industrial sites and a presence in over 100 countries. CHRYSO SA is one of 20 subsidiaries. ■

**More information from one of our local branches on sharecall 0861 CHRYSO or email Elrene Smuts (elrene@chryso-sa-abe.co.za) za.chryso.com**

## BIBC INCREASES COMPLIANCE FORCE BY 80%

The **Building Industry Bargaining Council** (Cape of Good Hope) (BIBC) has put drastic measures in place to increase compliance to its Collective Agreement, by increasing its Compliance enforcement permanent workforce by more than 80%. The primary focus of this enforcement team is to ensure that all contractors in the building industry adhere to conditions laid down in the Collective Agreement as provided for in the Labour Relations Act. These conditions are legislated to become applicable to all contractors (including sub-contractors i.e. painters, plumbers, etc.) in the Building Industry. Please refer to the relevant Government Gazette available on our website under "Collective Agreement".

The Compliance Department will further be supported by nearly thirty interns from a local college to assist with the administrative and enforcement duties. The Council aims to create a level playing field in the industry whereby all contractors compete with the same labour costs and conditions, and this strategy will significantly increase their visibility in the industry and speed up the enforcement process.



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### IS YOUR CONTRACTOR COMPLIANT?

When choosing a contractor you have a civil obligation to check that the contractor is compliant with the minimum employment conditions as prescribed and administered by the BIBC.

Before you hire a contractor please:

- Contact the BIBC at 021 950 7400 and ask whether the contractor is compliant: or visit [www.bibc.co.za](http://www.bibc.co.za) – click on "Looking for a contractor?" on the home page and enter the name or part of the employer's name under the heading "Employer name search" to check if the builder is compliant.
- The website also lists compliant employers by trade – simply choose a trade from the drop down list under the heading "Employer Category Search".
- Check work done at the builders' previous sites and obtain references from previous clients.

### CONTRACTORS IN THE BUILDING INDUSTRY TAKE NOTE

If you are active in the building industry:

- Your company must be registered with the BIBC.
- All employees working for you must be registered with the BIBC.
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- You are required by law to pay your employees a minimum wage and provide certain minimum social benefits for them as administered and enforced by the BIBC.
- If you do not comply, you will be liable for penalties in addition to the benefits payable.
- If an employee passes away whilst in your employment and you are not up to date with the employee's retirement contributions, you will be liable to pay the death benefit of four times the employee's annual salary as well as the funeral benefit.

For details on how to become compliant with the BIBC's Collective Agreement, contact 021 950 7400 or visit [www.bibc.co.za](http://www.bibc.co.za)



# Green answer for readymix returns at Jukskei Quarry

**A**friSam's Jukskei Quarry in Midrand has cracked the problem of returned concrete with an environmentally-friendly solution that even pays its own way.

Every provider of readymix concrete must expect a certain amount of material being returned as a result of unforeseen circumstances on the construction sites for which it is destined. Production superintendent at Jukskei Quarry, Mohamed Docrat, finally found a sustainable solution: to re-use the concrete in the company's G5 sub-base product for road building.

Docrat and his management team focused on the idea of adding the recycled concrete to the quarry's G5 product, as this was a product category that was permitted to contain material from multiple sources. By contrast, products within the G1 classification can only be from a single source.



*The return concrete has also been used around the readymix plant to pave large areas.*



*Waste at the facility that will be recycled.*



*Mohamed Docrat, production superintendent at AfriSam's Jukskei Quarry.*

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

A suitable process was devised and tested, in which an excavator-mounted hydraulic hammer breaks up the dry returns into 250 to 400 mm sizes, after which it is loaded by excavator into a dump truck and hauled to a secondary stockpile. The plant operators check that the material is within specification, and the blended material is then fed into a jaw crusher. The crushed material goes onto a production stockpile where it is homogenised, and it is taken by dump truck to a set-back stockpile where it is ready for sale.

Between 15% and 20% of recycled concrete is added into the G5, according to Docrat. "This gives us a good mixture of decomposed material and returned concrete," he says. "During our G5 run to produce the material for sub-base layers in roads, we began testing by trickle-feeding a small portion of returned material into the G5, and found that it worked well."

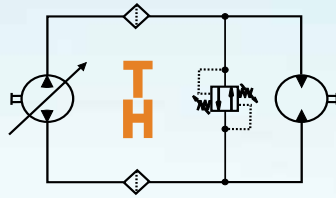
In line with AfriSam's compliance with the South African Bureau of Standards' COLTO (Committee of Land Transport Officials) material grading specifications, the G5 product containing the recycled concrete must pass all the relevant tests. The material is sampled first from the production stockpile, and then fully tested – from the set-back stockpile – for compliance with the final G5 specification.

According to Docrat, the final test of the idea was a trial on the Gauteng Freeway Improvement Project's N1 extension, where the contractor tried the G5 product with recycled material and confirmed it was perfectly suitable.

This environmentally-friendly solution also means there is no slush around the Jukskei Quarry plant, less potential for contamination, and a smaller carbon footprint, he says; at the same time, it contributes to the recycling levels demanded by AfriSam's stringent Environmental Management Programme. ■

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# AfriSam : Growing, innovating despite tough climate

**A**true sign of customer trust and capacity to deliver is a company's ability to continue building its customer base and its brand strength in the current difficult economic climate.

According to acting CEO Rob Wessels, AfriSam has managed precisely this. "Poor market conditions and the associated lower consumer confidence has led to less home building and slower than expected infrastructure spending roll-out by government has negatively impacted construction. But this has not deterred us from delivering to our customers," he says.

"Our technical excellence and our continuous innovation is really the cornerstone of our offering, and this drives our performance, even in the hard times," says Wessels. "Together with our reliable service, this is what makes customers come back to us time and time again."

The tough economic climate has driven down profit margins among contractors, so it is vital that they complete projects on time and within budget.

AfriSam sales and marketing executive, Richard Tomes says the smaller margins often come with tighter deadlines which raise the risk of failure, so customers rely on AfriSam to help them keep projects on track. AfriSam is today the largest readymix and aggregate player in South Africa, with over 40 readymix plants and 17 aggregate quarries located in main centres around the country.

The company's Centre of Product Excellence collaborates with customers to develop products for specific applications, and also analyses and tests products to ensure that they are fit-for-purpose.

"Our advanced composite cements deliver excellent performance and have low carbon footprints, which are significant advantages for customers who want to make responsible purchasing decisions," says Tomes.

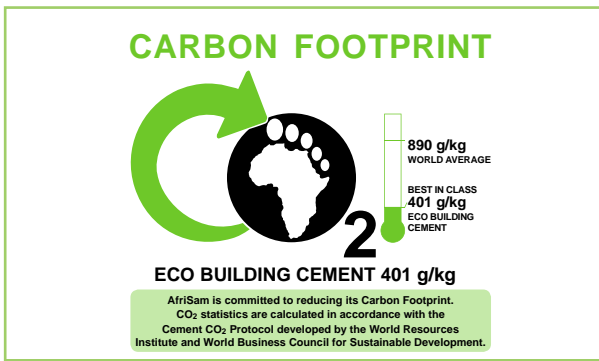
Due to the nature of its production processes, the cement industry is responsible for about 5% of the global greenhouse gases released into the atmosphere. In response, AfriSam has



*AfriSam was the world's first construction material supplier to measure the carbon footprint of all its cement, aggregate and readymix products.*



*AfriSam is today the largest readymix and aggregate player in South Africa.*



AfriSam took a leading role in the industry in terms of its environmental impact and introduced a carbon footprint measurement system in 2009.

taken a leading role in the industry in terms of its environmental impact by introducing a carbon footprint measurement system back in 2009.

This tracks the carbon footprint of each cement product at every AfriSam plant and compares it to the footprint of ordinary portland cement, making AfriSam arguably the world's first construction materials supplier to apply such a measure to all its cement, aggregate and readymix production operations.

AfriSam is also urging The Concrete Institute to encourage other producers to adopt a common system, in the interests of improving the environmental reputation of the whole cement and concrete industry.

These moves have put the company in a strong position to leverage industry trends among South Africa's architects, property developers and contractors, who are adopting greener practices in their designs and implementation strategies. The use of standardised green rating tools is also becoming more entrenched in industry best practice, according to AfriSam marketing manager Victor Bouguenon.

"Ratings systems such as those certified by the Green Building Council of South Africa (GBCSA) allow for the evaluation of the environmental performance of a building, and encourage market transformation towards sustainable design," says Bouguenon. These systems are having a growing impact on the sector as adoption steadily increases, he says. For instance, while GBCSA had only 28 projects certified in South Africa by 2012, this number is expected to rise to 2 500 certified projects by the year 2020.

Composite cement products developed by AfriSam, in line with its green efforts, include Eco Building Cement and Eco Readymix, which have been specially engineered from mineral components and pure cement to achieve best possible performance and a lower carbon footprint.

"We have managed to cut the carbon footprint of our Eco products to half that of ordinary portland cement, as a result of our decades of experience and knowledge of composite cements and admixtures," he says.

AfriSam further promotes the mutual reinforcement of design and sustainability by partnering with the South African Institute of Architecture to present the AfriSam-SAIA Award for Sustainable Architecture and Innovation. Introduced in 2010, the award is held biannually to recognise buildings that have followed an integrated approach to architecture, natural systems and technology. The next award cycle is scheduled to open in the last quarter of 2018. ■

**More information from Maxine Nel,**  
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**www.afrisam.com**



AfriSam further promotes the mutual reinforcement of design and sustainability by partnering with the South African Institute of Architecture to present the AfriSam-SAIA Award for Sustainable Architecture and Innovation.



The company's Centre of Product Excellence collaborates with customers to develop products for specific applications.

# The Plug&Burn®: a new addition to Cemengal's modular solutions

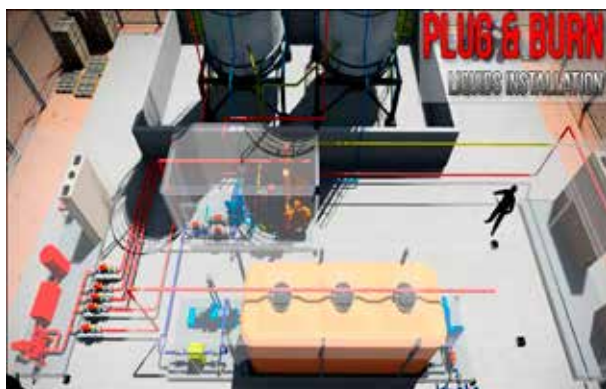
By Moisés Rodríguez Núñez, sales manager, Cemengal

Following its development of a range of portable, modular grinding stations, Cemengal has introduced a totally new product to satisfy clinker line clients.

**Plug&Burn®** – This new model follows the concept of the original Plug&Grind®, but is fully designed to use alternative fuels in the clinker lines.

## Plug&Burn® comes in three models

1. Liquids and Waste Oils. This installation has a storage capacity of 2 x125 m<sup>3</sup> and it is equipped to inject these liquids into the kiln at a rate from 1 tph to 5 tph.
2. Sludge. This second model is designed to inject sludge at the precalciner. This model can work with different sludges, for example with paint sludge, waste oil sludge and water treatment sludge.
3. Impregnated Fuel. The third model has been designed to be very flexible in using an impregnation support like sawdust, paper or carton and mix this solid support with a liquid, oil and sludge.



The best solution for every clinker line is established with the client in consultation with Cemengal technical experts.

Three main different wastes can be used – solids, liquids and sludge. Two different prepared alternative fuels will be ready to be injected to the main burner < 10mm or a lump fraction < 50 mm to be injected in the kiln inlet.

## How does Plug&Burn® work?

**The Research:** Alternative fuels manager, Jean Pierre Blondiau, with the specific plant manager will study what alternative fuels can be used. Long-term supply and quality are established as well as the type of fuel used at the site (coal, petcoke, etc), and the possibility of starting or increasing the percentage of alternative fuels in the clinker line.

**The Order:** As soon as an order is received, the Civil Engineering Department prepares the site for the arrival of the Plug&Burn®. A specific layout will be prepared, adjusting the Plug&Burn® and accessories to the client's piece of land.

The Procurement Department also begins purchasing the components and machines that have longer manufacture lead times. The containers and modules are specifically manufactured and homologated for Cemengal and delivered to the workshop in Madrid.

**The pre-assembly:** The order of container assembly has been carefully studied, considering the delivery time of the equipment and resources required for its installation. The experience acquired with the 25+ Plug&Grind® units produced and sold has enabled Cemengal to reduce, by several weeks, the lead time on all product ranges,

When the mechanical and modules arrive in the workshop, the mechanical work starts, followed by the electrical components of the Plug&Burn®.

When the mechanical and electrical works are complete, cladding is placed and the containers are prepared for road and sea transportation. Homologated containers with standard measurements save time and cost of transportation.

In parallel, the elements to be set up on site, like ladders, platforms, handrails and belts, which connect the equipment between containers, are packed. Everything is labelled to enable the client to start erecting the Plug&Burn® himself, reducing supervisor's expenses.

**The transport:** Once ready, containers and modules are moved from the workshop in Madrid to a port in Spain.

**The buildup:** The buildup of the Plug&Burn® on site lasts a few weeks. When containers are levelled and fixed to the concrete slab, mechanical technicians join the containers to each other and platforms and ladders are installed.

After the mechanical and electrical assembly is complete, cold tests and verification of the correct running of all the equipment takes place.

Now, and only few months since the start of the project, the Plug&Burn® is totally commissioned and ready to yield enormous profits by reducing the consumption of traditional fuels, and by contributing to a cleaner environment. ■

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# Packaging cement the sustainable way

In some cases plastic packaging is more environmentally friendly than other materials. A recent study shows that woven plastic sacks are the most sustainable packaging solution for cement: AD\*STAR cement sacks made of coated polypropylene tape fabric achieve considerably better results than sacks made of paper or recycled polypropylene tape fabric.

The effects on the environment, a much discussed topic regarding plastic bags for everyday use, also play an increasingly important role for industrial packaging. A new study which compares different types of cement packaging now proves that welded sacks made of polypropylene tape fabric are the most environmentally friendly solution for this application.

The results of the life cycle-analysis, carried out by the German PE INTERNATIONAL AG (now thinkstep AG) and commissioned by the Austrian machinery supplier Starlinger & Co. Ges.m.b.H., clearly show that AD\*STAR sacks – welded block bottom valve sacks made of coated polypropylene tape fabric – have lower global warming potential (carbon footprint) than paper sacks or sewn PP sacks which are widely used, especially in Asia.

For comparison, sewn sacks made in China as well as Kraft paper sacks made in Saudi Arabia were analysed; all sacks had a filling capacity of 50 kg cement. The results are clear: The AD\*STAR sacks developed by Starlinger do not only show the

lowest values regarding global warming potential, they are also the most environmentally friendly packaging in terms of acidification potential (acid rain), ozone depletion potential, photochemical ozone creation potential (it causes summer smog), as well as energy and fresh water consumption.

Low breakage rates – smaller CO<sub>2</sub> equivalent: A decisive factor for the positive results of AD\*STAR sacks are the low breakage rates in the course of the life cycle of the sacks. For the production of the AD\*STAR sacks analysed in the study, 100% virgin material was used both in China and Saudi Arabia. Due to the special production process AD\*STAR sacks are extremely robust despite their very low weight. Their strength and resistance results in breakage rates below 1% over the entire life cycle, while paper bags and sewn sacks have breakage rates of between 2.3% and 4.4%. This means that if AD\*STAR sacks are used, less cement is lost and must be replaced, and less packaging is needed – consequently, less greenhouse gases are produced.

Great savings potential for greenhouse gases: The study analyses the environmental impact of the sacks during their entire life cycle – from raw material to the disposal of the sack. Raw material production, sack production, filling, transport and storage until disposal – by means of landfill, recycling or thermal utilisation – were analysed. Starlinger has commissioned the study with comparable products from China and Saudi Arabia because the type of cement packaging analysed forms the biggest share on the cement market in the respective country.

In China, the world's biggest cement producer, around 20 billion sewn cement sacks made of polypropylene tape fabric with recycled content are produced. In the study, sacks made of 50% virgin material mixed with 50% recycled material, and sacks made of 100% recycled material were analysed.

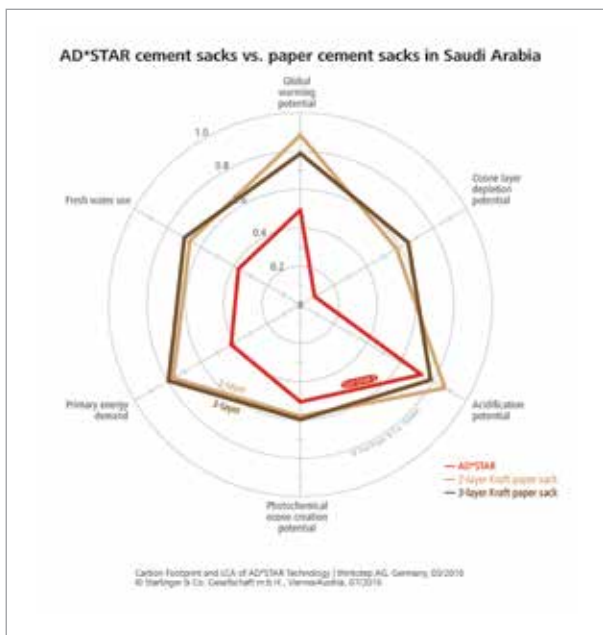
The quality of the sacks is comparatively low because the recycled material used to produce the sacks is in most cases severely degenerated, i.e. the necessary level of strength can only be achieved by increasing the fabric weight. In addition, the sewing process further weakens the material by up to 50%. Sewn cement sacks have significantly higher breakage rates and thus cause considerable cement loss which has to be compensated by additional production.

Changing over to AD\*STAR sacks does not only reduce CO<sub>2</sub> emissions caused during production and relieve the environment, it also helps to automatise the entire cement filling and transporting chain – a process that is already under way considering the current investments in modern equipment on the Chinese cement sector.

In Saudi Arabia, one of the biggest producers and exporters of plastic granulates worldwide, imported paper is used for cement packaging. Thus, two- and three-layer Kraft paper cement sacks were analysed in the study. In this case, switching over to the more robust AD\*STAR sacks would not only prevent the loss of countless tons of cement caused by sack rupture, but also greatly reduce raw material input for sack production and avoid long transport routes. In addition, the entire value created by both raw material and sack production would remain within the country. ■

**Note:** AD\*STAR® is a registered trademark. AD\*STAR® sacks are exclusively produced on Starlinger machinery.

**More information from Starlinger & Co,**  
Tel: +43 1 59955 0 / email: [sales@starlinger.com](mailto:sales@starlinger.com)  
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# FUSO introduces the indispensable FJ 26-280C

**F**USO, a brand of Daimler Trucks & Buses (DT&B) Southern Africa, has expanded its already comprehensive family by introducing the indispensable FJ 26-280C at its plant in East London. The heavy-duty truck proved those at the launch that it was built for maximum profitability, a trait that any business in the construction sector will appreciate.

FUSO trucks have always been renowned for their reliability, quality, value for money and for being the pace-setters when it comes to service support. The newest member of the family goes even further by ensuring a tough and durable chassis, extended service intervals from 15,000 to 20,000 kilometres and a wide-reaching southern African dealer footprint.

The robust FUSO FJ 26-280C boasts a direct-injection diesel engine, rated at 205 kW/2,200 rpm with the torque levelling out at 1,100 Nm between 1,200-1,600 rpm. This makes it the engine of choice for power-hungry applications.

The unit fuel injection and higher boost pressure on the turbocharger ensure complete burning of fuel, thus reducing emissions and increasing fuel efficiency. In addition, the vehicle's durability is increased while wear is reduced by the oil-lubricated fuel pumps.

This workhorse ticks all the necessary boxes for the construction sector, including a nine-speed transmission with a crawler gear that provides the flexibility required to negotiate complex terrain for off-road applications. The capable truck also proves its mettle as it offers a Power Take-Off (PTO) as one of its standard features. This is a regular requirement in the construction industry, as the PTO serves to supply power to other equipment.

The expertly built FJ 26-280C enhances its functionality by offering multi-leaf bogie-type rear suspensions that are robust, resulting in longer life and the ability to haul heavier loads.

Safety was also paramount when the truck's designers were putting pen to paper. The standard front and rear anti-roll bars

increase the vehicle's stability, while the differential lock assists to reduce one wheel from spinning, making the truck safer and easier to operate in conditions that offer little or no grip.

The truck was built to remain rugged for a longer product lifecycle, thanks to the thicker and deeper long members in the chassis. The chassis' cross members add additional strength and they are shot-peened and powder coated to increase surface strength and to prevent corrosion.

While the truck is tough on the outside, the comfortable interior was built to reduce driver fatigue, complete with three-way adjustable seats, as well as a tilt-and-telescoping steering wheel that allows the driver to choose an optimum driving posture, for added alertness on long journeys.

The extended day cab includes a fold-down bunk where the driver can rest during breaks. Occupants also benefit from the standard air-conditioning and rear windows that open for ventilation or to shut out noise.

FUSO Southern Africa also used the launch to expand its contribution to the Southern African economy by announcing the increase of Completely Knocked Down (CKD) production of its trucks at the state-of-the-art Mercedes-Benz South Africa (MBSA) plant in East London.

"By producing the FUSO FA and FJ series trucks in our East London plant, we are simply putting into action what we promised would be the next logical step after we launched the Regional Centre Southern Africa last year. We are building FUSO trucks in southern Africa, by southern Africans, for southern Africa," said Jasper Hafkamp, executive director for Daimler Trucks Southern Africa.

"This is irrefutable proof that further reiterates our commitment to the southern African market, as part of our overarching brand growth plan. The construction industry is one of the key indicators for economic growth, and what better way to underline our intentions than by launching what



*FUSO has expanded the family by introducing the indispensable FJ 26-280C for the construction sector and increases Completely-Knocked-Down production at the East London plant.*





*FJ 26-280C is ideal partner for any business in the construction sector.*

will soon be an icon in this industry, the FUSO FJ 26-280C," Hafkamp added.

MBSA invested in excess of R3 million into the East London plant to ensure it was ready for the increase in FUSO CKD production, and this positively impacts the community as well as small, medium and micro enterprises as some of the vehicle's parts used will be sourced locally.

Gladstone Mtyoko, the divisional manager for Commercial Vehicles at the plant said: "Our East London manufacturing plant continues to build from its proud heritage and long manufacturing footprint of almost 70 years in the region. Through our commercial vehicles manufacturing division, we have built reliable trucks and constantly set and maintained high standards in safety, quality and future-proof technologies.

"It is exciting to expand our product portfolio to where we increase the CKD production of FUSO trucks from our shores. This includes the new and dynamic FJ 26-280C, the FA 9-137

and the FJ 16-230 into our production line and thus adds to our long list of achievements. We further intend to keep our status of being a pioneer and a benchmark commercial vehicles manufacturer through our various brands, innovative solutions and inspired people," said Mtyoko.

**FUSO at a glance**

FUSO is one of the brands of Daimler Trucks, covering nearly all regions around the world such as Asia, Africa, Latin America, Europe and the Middle East. FUSO's light-duty to heavy-duty trucks (GVW 3.5-49 tons), vans, industrial engines and buses are sold in more than 160 markets. The FUSO brand is based on the four core brand values; Trusted Quality, Economic Efficiency, Solid & Functional Design and Committed Services. ■

***The recommended retail price for the FUSO FJ 26-280C chassis cab is R925,000. Please visit [www.fuso.co.za](http://www.fuso.co.za)***



*FUSO Trucks demonstrates its commitment to the southern African market.*

## Sika system strengthens Dishaba Silos

**S**ika's world-renowned carbon fibre structural strengthening system, CarboDur, was specified by Anglo Technical Division for a silo structural strengthening project in Limpopo. The project commenced in June 2016 at the Dishaba Platinum Mine situated between Northam and Thabazimbi, where two coal storing silos required structural strengthening. Teichmann Structures (Pty) Ltd was contracted to externally bond the Sika CarboDur M plates onto the silos.

Sika CarboDur M consists of pultruded carbon fibre reinforced polymer (CFRP) laminates designed not only to strengthen concrete, but also timber, masonry and steel structures. Supplied in lightweight rolls, Sika CarboDur M is easily installed, especially on overhead applications such as soffits of beams. The laminates are a combination of standard or high modulus (high stiffness); they are non-corroding and provide excellent durability and fatigue resistance.

Sikadur-30, a thixotropic, structural two-part adhesive based on a combination of epoxy resins and special filler, was used to bond the Sika CarboDur M plates onto the silos. Designed for use at normal temperatures, high-strength Sikadur-30 is easy to mix and apply, with no primer required. It provides excellent adhesion, high creep resistance under permanent load, as well as high initial and ultimate mechanical resistance. Sikadur-30 hardens without shrinkage and is impermeable to liquids and water vapour.

By completion of the project in July 2016, 950 m of Sika CarboDur M614 (60 mm wide x 1.4 mm thick) laminates had been bonded onto the silos. Sika CarboDur systems can be used in a wide variety of applications including increased load bearing capacity, repairing damaged structural elements, improving serviceability and durability, changing structural systems and providing increased resistance to possible earthquakes, impact or explosion.

As a final protective coating on the silos, Sikagard-550 W Elastic, a highly elastic, thixotropic coating available in various shades, was applied. Based on UV-curing acrylic dispersion, with excellent crack-bridging properties even at low temperatures,



Sikagard-550 W Elastic provides high diffusion resistance against CO<sub>2</sub> as well as high resistance to weathering. Solvent-free and water vapour permeable, Sikagard-550 W Elastic has a reduced tendency to dirt pick-up and contamination.

A prohibitive time schedule and some adverse weather proved challenging for Teichmann Structures, nevertheless the project was completed successfully and the efficacy of these world-renowned products will be confirmed in the course of time. ■

## Sika introduces Sikaflex Crystal Clear

**S**ika is proud to announce the launch of the new Sikaflex Crystal Clear, an optimum transparent sealant that can be utilised for all DIY and Contractor projects. Sikaflex Crystal Clear is a one-component, transparent adhesive and sealant. Solvent-free, this multipurpose product complements the industry-renowned basket of Sikaflex-11 FC, Sikaflex Pro-3i and Sikaflex AT Façade.

### Various Applications

Sikaflex Crystal Clear is suitable for use on most surfaces including metal, glass, concrete, plaster, plasterboard, wood surfaces, painted enamel, polyester and plastics. It is ideal for use on transparent surfaces such as glass, plastic or acrylic, due to its crystal clear application, but will invisibly blend into any coloured surfaces as well.



Sikaflex Crystal Clear is a joint sealant that offers excellent workability on vertical and horizontal joints, connection joints as well as for caulking between partitions, sealing of metal and wood constructions, ventilations and soundproofing of pipes. The versatile product can be used whenever a transparent bond line is needed.

### Unique Characteristics

Sikaflex Crystal Clear is 100% crystal clear and transparent. It offers good workability and low shrinkage during cure. Especially designed for the home improvement sector, it is the ideal product to keep at home for most sealing or bonding jobs, but is perfect for contractors needing a transparent multipurpose adhesive. ■

**For more information on Sika products and systems, visit [www.sika.co.za](http://www.sika.co.za)**

# Chryso: perfecting the concrete mix for plaster and mortars



The volume of water required in the concrete mix for plaster and mortars could be substantially reduced through the addition of Chryso Stab, a retarding admixture from Chryso SA.

The volume of water in the concrete mix for plaster and mortars could be substantially reduced through the addition of Chryso Stab, an admixture from Chryso Southern Africa, formulated specifically for the retardation of mortars and plasters.

Chryso Stab will not only increase workability but also has a built-in stabiliser that will permit retardation and produce pot lives of as long as eight to 36 hours for mortars, and four to six hours for plasters.

Chryso Stab acts as an air entrainer, adding micro-bubbles into the plaster or mortar to reduce the volume of water in the mix and thereby lowering the risk of shrinkage and cracking. Chryso Stab also makes the mix light and fluffy, thereby achieving optimum workability.

In addition to Chryso Stab retarder, the mix for plaster and mortar could be improved by the addition of Chryso Fibrin Fibres, a New-Generation polypropylene micro fibre for the reinforcement of concrete.

Once the plaster has been applied, curing the surface with fog sprayers, as well as a curing agent from the Chryso Cure range, should be carried out. A bonding agent, such as Chryso Cim will improve the bond if the substrate has been properly prepared. Products from the Chryso Fuge range can also be added to mortar or plaster to block the pores in the plaster or mortar and thereby sealing the surface from moisture ingress. ■

**More information from Elrene Smuts,  
Tel: +27(0)11 306 9000 / [www.chryso.com](http://www.chryso.com)**



Chryso Stab makes the plaster mix light and fluffy, optimising workability.

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# Designed for any on-site challenge

By Werner Nuss, business development manager, STIHL South Africa

**D**esigned for all the demands of the construction site, STIHL power tools have impressive versatility and the necessary power for on-site work, with a diverse range of options for a broad range of tasks.

**Smooth cutting:** STIHL concrete cutters and cut-off machines slice through concrete, stone, masonry, pipes and asphalt. There are various cut-off machines to meet the requirements of any job, all including STIHL's innovative features. All units are either petrol or battery-powered, obviating the need for any power source or the inconvenience of cables as long as the tank is full or the battery remains fully charged.

The STIHL TS range of petrol-powered cut-off saws is designed for hard work, with an outstanding cutting ability, a standard long-life filter system, sophisticated operating convenience and easy servicing. As these tools have particularly long maintenance and servicing intervals and uncompromising reliability, operating costs are low.

The STIHL TSA 230 cordless cut-off machine is the first battery-powered model with a 230-mm cutting wheel. Despite weighing less than 4 kg without the battery, the TSA 230 has a powerful cutting performance and slices through tiles, bricks, pipes and metal. It starts at the touch of a button and the ergonomic handle allows it to be smoothly guided to a depth of 70 mm for precise cuts. The standard-fitted water connection and optional vacuum adapter ensure dust-free cutting, while the cordless design offers the convenience of battery power plus zero emissions and reduced noise levels, making the TSA 230 ideal for working in enclosed, confined spaces or noise-sensitive areas.

**Working together:** STIHL concrete saws are often used in conjunction with the STIHL GS 461 concrete cutter, which has been specially designed for free-hand cutting of concrete with reinforcing, natural stone, sewage pipes (concrete, ductile iron) and masonry.

The GS 461's impressive power-to-weight ratio and smooth handling add to its manoeuvrability, making it ideal for cutting in tight angles or when working against a 90-degree corner. It can plunge cut to a depth of 400 mm and delivers clean, neat corners. One of the larger TS units can be used to make the longer cuts, meeting the plunge cuts at the corners.

The GS 461 is equipped with the low-emission, fuel-efficient and environmentally-friendly STIHL 2-MIX engine, and features an anti-vibration system for user comfort. The guide bar

features nozzles that precisely provide water to the chain, while standard fittings include side-mounted chain tensioning and a long-life HD2 filter to catch even the finest dust particles. This serves to extend operational life and also increase the duration between servicing.

Significantly, all these cutting tools use water to reduce dust volume and silica exposure. With the prioritising of operator health and awareness of the occupational lung disease silicosis, this is a major advantage that goes beyond user comfort.

Water can be supplied from a tap, a pressurised water tank on a vehicle, or smaller hand-held pressurised tanks where space is an issue.

**For fast, clean boring:** STIHL also produces augers for fast, clean boring of holes, including the BT 131 one-man auger and the BT 360 two-man auger – both lightweight and powerful. Both models have been specially designed for premium handling comfort and user safety.

The engine controls for the BT 131 are fully integrated into a multi-function handle for easy access and control at the touch of the fingers, without removing hands from the working position. The STIHL QuickStop® drill brake plus a release lever interrupts the power flow if the bit connects with a blockage and can easily extract the drill in the event of jamming. Added comfort is ensured through the low vibration handle, with its anti-vibration rubbers that serve to help reduce fatigue.

STIHL's two-man BT 360 is a robust, portable machine built to withstand the high stresses in medium to heavy soils. It has a high-power high-torque 3 kW petrol engine delivering a spindle speed of only 50 rpm, ensuring enhanced drilling efficiency. As with all STIHL power tools, ergonomics plays a key role in the design, with the distance between the handles and the machine making it easier for operators to position the drill precisely, while the throttle trigger is located so that the machine can be controlled without moving the right hand. The carrying frame can be quickly folded up so that the auger fits into a standard car boot.

**An assured purchase:** STIHL products are available through a nationwide network of over 180 specialist dealers, who offer expert advice and after-sales service. STIHL also offers a guaranteed 10 years' spares availability. ■

**More information from Werner Nuss,  
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www.stihl.co.za**



# The world's most effective system for concrete and plaster waterproofing

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KIM® lowers the permeability of concrete, and is used in place of surface applied waterproofing membranes. By stopping the transmission of water through concrete, KIM® adds durability and longevity to concrete by protecting it against chemical attack and corrosion of reinforcing steel.

**Uses: Below-grade parking, Basements, Sewage plants, Swimming pools, Dams, Foundation wall slabs, Pits, Canals, Water containment tanks**

Krytol Mortar Admixture™ (KMA) is a hydrophilic crystalline admixture used to provide long-term protection of masonry mortars and concrete masonry units against water and waterborne contaminants by reducing permeability and absorptivity of the mortar.

KMA simplifies installation by removing the need for surface applied sealers and is easily incorporated into the existing mix-design and application processes. KMA provides superior waterproofing performance that lowers building maintenance and repair costs.

**Uses: Rendering and plastering mortar (including stucco and other thin topping mixes) over concrete masonry walls or other prepared substrates. Concrete masonry units (i.e. bricks and blocks when they are manufactured)**

## Features & Benefits

- Protects from water penetration
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- Minimises the chance of debonding
- Preserves aesthetics by resisting stains and discoloration caused by efflorescence, mould and mildew, and rust
- Enhances workability for ease of use, improved adhesion and reduced cracking
- Self-seals minor cracking
- Withstands water under pressure ■

**More information from Sanika, Tel: +27(0)11 425 3061  
email: [info@sanika.co.za](mailto:info@sanika.co.za) / [www.sanika.co.za](http://www.sanika.co.za)**

## TRANSFORM YOUR PLASTER AND CONCRETE INTO A WATERPROOF BARRIER



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**KIM®**



**KMA**



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All AfriSam Aggregate operations, including the plant laboratories, have ISO 9001 certification, ensuring that our aggregates are fully compliant with the relevant specifications and with the customers' requirements.

As a member of the Aggregate and Sand Producers of South Africa (ASPASA), our plants are subject to regular inspections and our awards are on display in the relevant plant offices. We are also fully committed to complying with the relevant statutory and regulatory requirements as well as our own AfriSam Environmental, Health and Safety, and B-BBEE policies.

Planning and foresight govern our surface mining, and the subsequent rehabilitation of mines is a land use transformation that not only contributes to current needs for construction materials, but also allows the return of the mined land to a new land use once mining operations end. A Trust Fund provides for rehabilitation on closure to a positively useful or self-sustaining landform.

**More information from Maxine Nel,**  
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**email: maxine.nel@za.afrisam.com**  
**www.afrisam.com**



## Booyco Electronics



**B**ooyco Electronics offers the quarrying industry a turnkey, fully integrated surface safety solution for machinery and personnel.

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The PDS delivers a specific warning, controlled slow-down and stopping zone alerts around a vehicle when detecting pedestrians or other vehicles

Information is transferred between users via Booyco Electronics' Human Machine Interface. It is simple to use and easy to understand as communication with operators uses icons. Messages can also be provided via a pre-recorded voice programme and can be customised to any language.

**More information from Tel: 0861 266926**  
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## HPE Africa: solving your earthmoving challenges



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**More information from Stan Fischer,**  
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Martin offers an expansive selection of blades, tensioners, mainframes and accessories to effectively meet the unique demands of any material handling challenge you may encounter.

**More information from Tel: +27(0)13 656 5135**  
**www.martin-eng.co.za**

### Malleo Equipment to maximise profitability



Malleo Equipment is a local company that offers the Sangdo range of hydraulic breakers and specialist attachments in South Africa and has designs on becoming an industry leader. Sangdo, an established South Korean brand, includes hammers and attachments for specific applications in a number of industries including quarrying, mining, smelting, blasting services, demolition, civils and construction.

Along with the hammers that are sold through Malleo Equipment we provide the associated parts and spares, as well as the necessary repairs and maintenance services associated with this product.

At Malleo Equipment we can provide the appropriate solution by focusing on our customer's objectives of minimising costs and maximising profitability. We do this with the long term in mind as our ambition is to be Southern Africa's preferred and most trusted supplier in this industry.

**More information from Kyle Diedericks,**  
**mobile +27(0)76 583 9599**  
**email: sales@malleogroup.com or Luke Cameron,**  
**mobile: +27(0)72 111 4169**  
**email: luke@midmargroup.co.za**  
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## Meka Crushing & Concrete Batching Technologies: meeting customer needs



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At Meka, we aim to establish strong relationships with our stakeholders and to ensure complete client satisfaction by producing plants of the highest quality. We are committed to building an expert labour force, to keeping our technological infrastructure on the cutting edge, and applying an innovative management approach in order to realise our corporate vision.

**More information from Tel: +90 312 397 91 33**  
[www.mekaconcreteplants.com](http://www.mekaconcreteplants.com)  
[www.mekacrushers.com](http://www.mekacrushers.com)

## Osborn Engineered Products SA (Pty) Ltd



**O**sborn is a member of the Astec Industries Inc. group of companies, a leading American manufacturer of plant and are able to supply the full range of equipment for the aggregate market.

From design concept and manufacture to installation and commissioning, Osborn provides the African mining and quarry markets with a complete range of crushers, feeders, screens and conveyors. Osborn also specialises in mobile and fixed crushing and screening plants and conveyor systems.

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- Cone Crushers
- Double Roll Crushers
- Rotary Breakers
- Processing and Conveyor Systems
- Conveyor Idlers
- Vibrating Screens and Feeders

**More information from Tel: +27(0)11 820 7600**  
**email: [osborn@osborn.co.za](mailto:osborn@osborn.co.za) / [www.osborn.co.za](http://www.osborn.co.za)**



## Modern Magnetics cc



**M**odern Magnetics, established in 1995, manufactures a complete range of separation magnets for the quarry and mining industries. Removing deadly tramp iron contamination from the rock or ore before it causes extreme and very costly damage to the crushers is our speciality.

Our range of equipment:

- Electro magnetic separators
- Permanent crossbelt self-cleaning magnets
- Magnetic head pulleys
- Permanent suspended magnets
- Magnetic sweepers

In order to protect the crushers and screens during the production of aggregate, to ensure that any and all tramp iron capable of severe damage to the crushers and no stray nut or bolt, piece of metal, spanner etc finds its way into the finished product, the following magnets have to be installed in the plant:

- Post jaw crusher > electro magnet
- Before primary crusher > magnetic head pulley
- Before screening > suspended magnet

Typically, the tonnage per hour, depth of material, width and speed of the conveyor belt determines the strength of the magnets.

**For the protection of your multi-million rand plant from tramp iron devastation, contact Colin or John on Tel: +27(0)11 315 3270 or email: [colin@modernmagnetics.co.za](mailto:colin@modernmagnetics.co.za) / [www.modernmagnetics.co.za](http://www.modernmagnetics.co.za)**

### Raumix Aggregates



Producers of Aggregate for Construction

**W**ith a strong national footprint and operations in three provinces, Raumix Aggregates is producing quality construction aggregates and sand for the construction and civil engineering industries.

Formed through the consolidation and rationalisation of various commercial quarries when Raubex Group Ltd listed in 2007, the company has eleven operations strategically positioned throughout South Africa. Further acquisitions strengthened the company's position.

Capable of servicing the need for a wide variety of products manufactured under exacting best practice quality control conditions, Raumix Aggregates offers aggregates for road construction, readymix concrete, precast products, asphalt, metallurgical products and general construction aggregates.

Pursuing the most exacting quality standards, Raumix Aggregates also has a strong focus on protection of the environment.

Safety is a cornerstone at all its quarries, with emphasis not only on the safe operation of facilities, but also on the upskilling of personnel to ensure the requisite level of operational capabilities are present.

**More information from Tel: 086 194 8333**  
[www.raumix.co.za](http://www.raumix.co.za)



### SPH Kundalila materials handling solutions



**S**PH Kundalila is a materials handling company operating in the surface mining industry.

Its services include

- Mobile crushing and screening
- Bulk earthworks
- Plant hire
- Haul road construction
- Rehabilitation and maintenance
- Produce and supply of sand and aggregates
- Civil engineering
  - o Township infrastructure
  - o Pipelines
  - o Synthetic sports fields
- Surveying - Drone

The company is focussed on safety and reliability, and believes in value-add through efficiency.

SPH Kundalila is a full subsidiary of the Raubex Group Ltd, a JSE listed company.

**More information from Tel: +27(0)21 527 5200**  
[www.sphkundalila.co.za](http://www.sphkundalila.co.za)

### Weir Minerals Africa



**W**eir Minerals Africa is a global supplier of excellent minerals solutions, which includes pumps, valves, hydro-cyclones, wear-resistant linings and dewatering solutions, as well as high-pressure grinding rolls, crushers, centrifuges, screens, hoses and rubber products, all backed by a superior technical service which enables customers to achieve significant improvements in their process efficiencies.

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Weir Minerals Africa prides itself on providing its customers with application-specific products that are tailored and customised to cope in often demanding and arduous conditions.

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hypenica

# Winners of the fifth Women in Construction Awards announced

Recognising excellence in Africa, the winners of the 2017 Women in Construction Awards were announced at a gala dinner at the Gallagher Convention Centre on 24 May 2017.

The prestigious event was hosted alongside the African Construction and Totally Concrete Expos with Standard Bank and the NHBRC as gold sponsors. It united over 200 guests from the cement, concrete and construction industries.

More than 60 nominations were received and the panel of judges, composed of 19 industry experts, identified 44 finalists representing four African countries.

The awards categories recognised women who are 'Pioneers in Innovation' within the built environment as well as identifying those 'Young entrepreneur/rising stars' – who have put themselves out there and have been identified as the ones "to watch" as they gain a foothold within their sectors.

Athi Myoli, director of the Women in Construction Awards, says: "The Women in Construction Awards are crucial for high-

lighting the strides women are making in the industry and the organisations supportive of their endeavours as this encourages more women to follow in their footsteps and other organisations to contribute to their success."

Gender empowerment coupled with industry transformation is key to unlocking the future potential of the construction industry and ultimately closing Africa's infrastructure gap. The fifth annual Women in Construction Awards enabled the industry stakeholders to demonstrate their commitment to empowerment, transformation and the celebration of its women, pioneers and rising stars who have made a vital contribution to development.

Runner-up Mpilo Ntuli from Tiber Construction, added: "As a young woman in the field I find it encouraging to witness and be a part of such a successful event, thank you for celebrating the contributions and achievements of women in the built environment."

## The 2017 Women in Construction Award winners

### Individual Awards



**Woman in Architecture Award sponsored by South African Institute of Architects**

*Karuni Naidoo, Director / Pr. Architect CNN Architects*



**Woman in Concrete: Lifetime Achievement Award**

*Deborah Terhune, Director, Growing Up Africa*



**Pioneer of Innovation Award sponsored by National Home Builders Registration Council**

*Riefqah Abrahams, Director / Pr. Architect Archi. Cape Town, right*





**Woman in Media and Communications Excellence**  
 Mapule Mphaki, Marketing and Communications Director,  
 Growing Up Africa



**New Starter of The Year Award (Under 30 years)**  
 Halima Simtitu, Graduate Engineer, National Housing  
 Corporation, Tanzania



**Young Entrepreneur / Rising Star Award (Under 40 years)**  
 Bianca Shakinovsky, Director, Penta Floor (Pty) Ltd



**Organisational Awards**



**Most Innovative Women Training Programme**  
 Robus Engineering Training Services (Pty) Ltd



**Excellence in Career Development**  
 NHBC Women Empowerment Programme

**More information on the Women in Construction Awards and the judges at [www.womeninconstruction.co.za](http://www.womeninconstruction.co.za)**

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Construction Computer Software

## ROADMAC SURFACING CASE STUDY

Preventing unnecessary spend on projects

Roadmac Surfacing Pty Ltd., a major road construction company based in South Africa, identified a need for an ERP system that could help streamline its processes and maximise efficiencies. The key objective was to limit unnecessary spend from procurement and operational costs and help achieve contract cost accuracy across multiple complex projects.

The business implemented the Construction Computer Software (CCS) projects cost management solutions specifically designed for the construction and engineering projects industry. Designed to work together seamlessly, the CCS products address issues faced by the industry daily, such as accurate contract costing and downstream control of projects, in order to improve project efficiencies and profitability. Identified by Roadmac Surfacing as best value for money in the industry.

After conducting a business assessment, CCS implemented its seamless, real-time operations and cost management solution resulting in improved project efficiencies and expenditure for Roadmac Surfacing.

### ABOUT THE CLIENT

Founded in 1997, Roadmac Surfacing Pty Ltd is an operating subsidiary of Raubex Group Ltd and has an annual turnover of more than R1billion.

The Raubex Group provides expert services in infrastructure, roads and materials covering all aspects of road construction. The group focuses on new road construction and heavy road rehabilitation as well as road maintenance the laying of asphalt, chip and spray, surface dressing and slurry seals.

The group have been using CCS Candy for five years and CCS BuildSmart for three years.

### INDUSTRY

#### Construction:

Currently, Roadmac Surfacing is working on several large-scale government projects to rehabilitate key arterial roads around South Africa including; N3 Warden Asphalt R317m, N1 Bloemfontein Bypass Asphalt R267m, and various others across South Africa.

### THE BUSINESS CHALLENGE

#### Situation:

A key challenge of the construction industry is that supplier invoices are often issued a long time after project completion. Given the high annual turnover of Roadmac Surfacing, it found there was rarely 'one version of the truth' in the budget reconciliation between projects and accounts. Therefore, its greatest challenge was to reconcile procurement and operational costs with the financial ledger.

The CCS solution needed to offer a committed and seamless accrual cost functionality that could reconcile and reflect invoices and payments in real-time. In so doing, this would improve cost management against the original BOQ tender pricing from small to large scale complex projects, and have the added benefit of updating productivity worksheets as projects evolve.

#### Findings:

The Roadmac Surfacing project sites did not have the tools to manage their expenditure on a daily basis. Therefore, the solution needed to provide project teams with a real-time cost management solution that could run at every site 24hrs a day.

#### The challenge:

The challenge was to implement a tailored seamless solution during the financial year that could seamlessly adopt the old system without any disruption to the current business projects or its cost management function.

### THE CCS SOLUTION

#### How it worked:

The CCS consultants installed both Candy and BuildSmart to streamline business processes and enable real-time management of projects with seamless cost versus allowable, and financial reporting. Until this installation, the length of time taken for invoices to reach the procurement office meant it was difficult for Roadmac Surfacing to effectively manage site-based costs, such as orders and deliveries. Therefore, the committed and accrual cost functionality in BuildSmart was critical. The result is that the team now have one source of truth of site costs through to project financials.

The implementation of BuildSmart as a seamless cost and operations management solution took just three weeks. As part of the implementation process, the CCS team conducted live on-site training on actual data, using live software on a demonstration database.

Roadmac Surfacing implemented the complete CCS solution to manage their projects from estimation to site plan and valuations through operations management with automated site costing reconciled to final account.



## How it helped:

The CCS solution was implemented to accurately manage the dynamic link between time and money, enabling real-time information at all stages of a project. The CCS products are designed as a seamless solution; Candy for estimating, site plan and valuations and BuildSmart for accounts, site costs and operations management, it is possible to monitor each stage of a project in detail, and holistically. The depth of accuracy provided through dynamic monitoring of projects provides deeper insight into project expenditure control resulting in a more favourable financial outcome of projects run on the CCS solution.

From a short-term perspective, the implementation of the BuildSmart solution has resulted in the following:

- Order-driven procurement and immediate approvals vs allowable are now a reality
- Immense improvement on cost control, bringing unnecessary expenditure down by more than 75%
- Real-time contract cost vs allowable reporting
- Contract costing: accuracy is no longer an issue
- Automated Reporting; reducing admin saving time and money
- Monthly reporting pack now completed a week earlier than when previously using the non ERP financial system
- Sites are now run as their own business and must show profits throughout a project

From a long-term perspective

- Allowable versus contract cost comparisons are now a reality, and the live management of sites and site finances have provided exceptional data and process value to the Roadmac Surfacing business.

## THE BUSINESS IMPACT

### Main advantages:

Due to the effectiveness of the CCS solution, project sites are now able to receive the monthly costing from head office on time. This has had a positive impact on project planning, delivery and, quick rectification on projects when required resulting in improved financial success of projects.

- Scenario planning: Planning has been significantly improved; pre-plan meetings are based on the Candy allowable adjusted to the actual situation. This has resulted in quick, accurate data that highlight problem areas more quickly.
- Data analysis: Roadmac Surfacing now has 'click of a button' effectiveness 24 hours a day. The team also receives user defined reports and access to data directly to the sequel tables without disrupting the live data.

- Account entries: The team can replicate a debtor certificate and a subbie certificate to facilitate entries to the accounts, which is a big advantage with significant time-savings for construction based entries.
- Implementation: This can take place at any point during the year and implementation times are greatly reduced thanks to a mature solution developed by CCS over the past 37 years. The solution can be customised to the client's requirements from setup with no additional development required. Implementation is supported with highly experienced CCS staff who ensure knowledge transfer to the client team enabling instant usage of the system, and everyone has access to 24hrs support.

## CLIENT TESTIMONIAL:

"We adopted the CCS product suite because both Candy and BuildSmart had achieved successful results in other companies in the Raubex Group and it is an ERP system offering best value for money in the industry. The implementation was exceptionally quick and the team are very happy with the product, support and service which is consistently reliable. Because of the effectiveness of the seamless solution, and its ability to align cost functions across the business, it has become integral to the Roadmac Surfacing management of contracts."

CHARL VAN SCHALKWYK,  
Financial Manager, Roadmac Surfacing (Pty) Ltd.

"Thanks to the Candy and BuildSmart suite of products, our project sites are able to receive their monthly costing from head office on time. Now the team never misses a deadline as the month ends are predictable and easy to plan. Managing a project without CCS is extremely time consuming, so it makes scenario planning a breeze."

WIMPIE KOCH,  
Contracts Manager, Roadmac Surfacing (Pty) Ltd.

## OVERVIEW OF CCS:

CCS provide dedicated cost management software solution to the Construction and Engineering industries. All CCS products are designed with the help of experienced construction industry professionals which means they are built with a deep understanding of the industry and the problems that typically occur.

Candy and BuildSmart provide a seamless solution from first estimate to final accounts in real-time. Used together, BuildSmart ERP Operations Cost Management and Accounts, and Candy Estimating and Project Management tie the financial processes to the physical processes of your enterprise construction projects. This means that an accurate and real-time financial appraisal of each construction project of your enterprise is available for analysis at any time.

Launched in 1982, CCS is headquartered in Gauteng, South Africa and has further offices in the Middle East, United Kingdom, Portugal and India, Australia and North America. CCS has more than 19 000 users in over 54 countries including many of the world's largest construction companies.



# Scanning the market

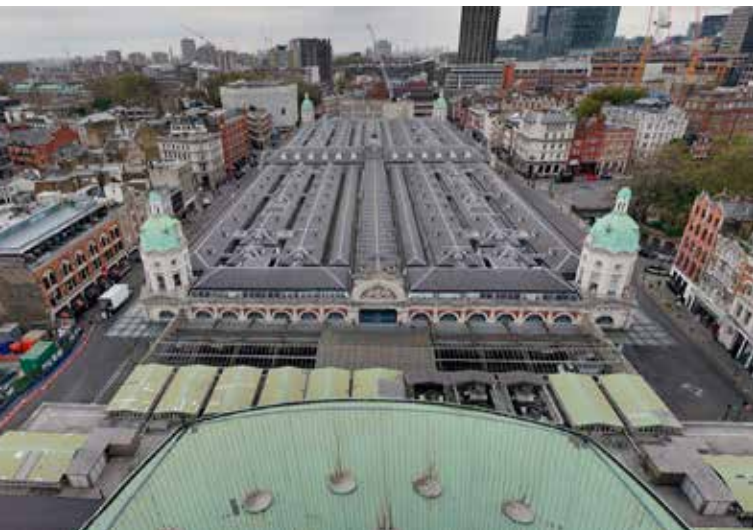
Case Study: Poultry Market, Clerkenwell, East London, UK.

- **Client:** City of London Corporation,
- **Lead Designer:** Arup
- **Surveyor:** Plowman Craven
- **BIM Tools:** UAV, Leica P40 and Faro laser scanners

The Poultry Market is a Grade II-listed building, constructed in 1953, which forms part of Smithfield Market, the UK's largest wholesale meat market, located in Clerkenwell, East London.



Plowman Craven used drones to provide 3D imagery for the restoration of the market.



An aerial view of the Smithfield Market.

A renovation programme was initiated by the building's owner, the City of London Corporation, to address the market's general state of disrepair, replace a number of services and refurbish MEP and structural elements.

The project was designed and scoped out by Arup and includes the refurbishment of an iconic roof, originally designed by Arup and thought to be the largest concrete shell structure ever built. The roof is notable for its large 225-ft span, in relation to the shallow dome. Plowman Craven was contracted to laser scan and model the entire building and its surroundings, as well as complete condition and MEP surveys.

The surveys of the roof were a significant challenge, a traditional laser survey would have required the erection of a seven-metre-tall mast fitted with a scanner (there were no taller buildings in the vicinity to scan from) but it was not possible to fit the mast up a back staircase to the roof. Similarly, a condition survey would have meant working from a cherry picker, which wasn't feasible.

The use of a UAV would overcome these issues, and provided technical advantages, says Marta Wren, technical specialist at Plowman Craven: "The drone could provide both survey grade geometrical data, in the form of point clouds for use in the project BIM model, and high definition visual photographic panoramas, that enabled our surveyors to assess the condition of the roof."

The UAV was flown about 40 m above the building, on a combination of manual and pre-programmed flight paths, to

*"Before this project, the client didn't even have 2D information on the buildings, so our survey will provide them with a comprehensive 3D record that includes BIM and 360-degree photography"*

**– Marta Wren, Plowman Craven**

capture the dome and a lower roof, located 11m below the top of the dome, featuring numerous canopies. Control points were positioned on the roof to assist with the survey.

The drone was unable to access certain areas, between the canopies and at some 'tight corners', so its data was stitched together with data from Leica P40 and Faro laser scanners used for the rest of the survey work.

Plowman Craven employed a team of four to run the drone operation – a pilot, a camera operator, and two ground support officers tasked with checking flight clearances and notifying the public on the street of any potential danger.

Wren comments: "It is a very congested area of London and we had to have someone at street level to communicate with the team on the roof."

The UAV survey took less than a day and the entire scanning process, covering the interior and exterior of the building and everything from communal public areas to hard-to-access ventilation inverts, took almost three weeks.

"Before this project, the client didn't even have 2D information on the building, so our survey will provide them with a comprehensive 3D record that includes BIM and 360-degree photography," concludes Wren. ■

**Source:** <https://goo.gl/L3ZLVR>



# Beware of the bargains – why cheaper is not always best

By Rhys Evans, Managing Director of ALCO-Safe

**W**ith the South African economy struggling to grow and many companies tightening their budgets, it is very easy for businesses to fall into the trap of choosing price over quality when making purchase decisions. On the surface, cheaper equipment may offer most of the features and benefits that the more expensive model offers, without the steep price tag and be labelled 'a great bargain.' But is it really a bargain? Or are we unwittingly deferring full payment, costing the business more in the longer-term? When it comes to practical equipment have you ever wondered why one option is so much cheaper than another?

This doesn't suggest that procurement managers should not consider price when purchasing business equipment. However, it is equally important that the bargain of today does not turn out to be the money pit of tomorrow. As Benjamin Franklin brilliantly put it: "The bitterness of poor quality is remembered long after the sweetness of a low price."

Substance abuse related accidents cost companies hundreds of thousands of Rands every year. So, considering something simple like a breathalyzer, what is it that makes one brand cost significantly less than another brand with similar features? In addition to build quality and quality of materials used, the more expensive products go through various accreditation ratings, which include, for example, vibration, moisture, humidity, dust and drop testing. These accreditations and tests are expensive and the instrument will cost more to manufacture in order to meet and pass those tests. The cheap product is cheap for a reason, and the cost of the product over its lifespan can easily be triple that of the initial outlay.

It is therefore more prudent to consider business equipment purchases as an investment and to educate the people who make purchasing decisions to ensure they consider the overall impact of choices. Some of the issues to consider when buying business equipment:

- Does the model we would like to choose offer all the features needed to efficiently execute the intended tasks to the best quality we can afford?
- What is the expected lifespan of the equipment? This includes manufacturer guarantees, warranties in place and anecdotal history from previous users.
- What is the projected cost of ownership of the equipment over its lifetime, when including estimates for repairs and estimated maintenance costs? Based on this, do you still believe that your cheapest buy is the most cost-effective option?



Rhys Evans, Managing Director of ALCO-Safe.

- Is this particular model accredited and well-respected by the industry? Does the use of the equipment or the results from it have legal or life-saving implications?
- Can the business afford to operate for more than one day without the equipment in the event of the equipment failing?
- Would equipment failure directly hurt the business operations or even its reputation among employees, clients and where relevant, affected legal and regulatory bodies?

The biggest benefit of purchasing quality equipment is that, once the investment is made, you can focus on other aspects of the business with the assurance that your equipment will do what it's supposed to, when it's supposed to. You also have peace of mind knowing that your budget allocation is unlikely to be derailed by unexpected repair costs.

Quality equipment is also good for employee morale, as they don't have to waste time with faulty equipment or waiting for someone to repair the instrument, which ultimately impacts their project schedules. ■

**More information from Rhys Evans,**  
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# Two hundred crazy concrete creations in Kansas

An obsessed Sam Dinsmoor just kept on sculpting until he went blind, writes **Jan de Beer**.

**H**elen Martins' Owl House in the Karoo is weird to some, wonderful to others. But long before Miss Helen and her faithful helper, Koos Malgas, started building their myriad of sculptures in the dry and dusty village of Nieu-Bethesda, continents away in America a decidedly far more eccentric man from Kansas was creating concrete sculptures that are today also still drawing thousands of visitors every year. The Garden of Eden is one of the Eight Wonders of Kansas and contains some of the most fascinating – and bizarre – concrete sculpture gardens in the world.

In 1907, at the good age of 62, American Civil War veteran, Samuel Perry Dinsmoor (perhaps just a little shell-shocked), began construction of this unusual site by building a structure of limestone logs – some up to seven metres long – for the family home. The cabin on a plot that he named the 'Garden of Eden' was constructed with limestone 'logs' quarried from the nearby Wilson Lake.

Once settled in the cabin, Dinsmoor designed his landscape and spent the rest of his life creating the garden, which contains over 200 concrete sculptures. Dinsmoor charged visitors admission while he worked several years on his concrete sculptures: money that helped sustain his family. Using 113 tons of concrete,



Dinsmoor built 40-foot-tall trees to hold his larger than life figures and only stopped working on the sculptures in 1929 – because he went blind!

Tour guides point out to visitors that that every part of every cryptic sculpture has a meaning about populist politics, modern civilisation, and the Bible that connect like a dot-to-dot puzzle. The sculptures include a Labour Crucified figure that is surrounded by the people whom Dinsmoor felt had put Labour on the Cross: a doctor, lawyer, preacher and capitalist.

In the garden, the spotlight shifts to the Bible. The devil with a pitchfork lurks behind Adam and Eve. Dinsmoor put glass behind Satan's eyes, ears, nose and mouth and lit Lucifer up at night. "The darker the night, the more like the devil he looks," he always maintained.

Then there's the eternal circle of life. In another set of sculptures, a soldier is shooting at an Indian, who is aiming an arrow at a dog, which is chasing a fox, which is chasing a bird, which is hunting down a worm with a leaf in its mouth. Now that makes even Helen Martins' work look mundane.

But wait, there's more to come...

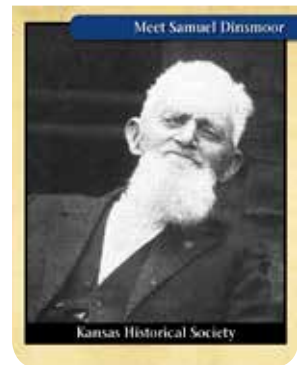
The final resting place created for Dinsmoor and his first wife, Frances A. Barlow Journey, is inside a mausoleum in one corner of the lot. As part of a tour, visitors are allowed to view Dinsmoor in his concrete coffin, which is sealed behind a glass wall. Inside the mausoleum is also a double-exposed photo of a live Dinsmoor viewing his deceased body inside the coffin. In case he was banished to a warmer afterlife, he made a water jug out of concrete for the trip. It stands next to his coffin. Look up and you'll see a concrete angel on top of his mausoleum, ready to carry Dinsmoor to heaven if that were to be his more fortunate fate.

He started a second family after his first wife's death. He was 81 when he wed a 20-year-old in 1924. Clearly the sculpting kept Dinsmoor virile and fit: the couple had two children together. "An old man needs a nurse, a young man wants a companion. I got both," he said.

Now he is in his mausoleum, laid out in his coffin behind glass, relegated to bones with his bounteous white beard just a tuft of dusty tumbleweed scrub on his chin. Visitors are not allowed to take photos. Mercifully, one would think – but then today's kids see far worse things on movie screens, social media or even TV trailers.

Dinsmoor put in his will: "No one but my widow, our descendants, their husbands and wives shall go in to see me for less than \$1. That will pay someone to look after the place and I promise everyone that comes in to see me that if I see them dropping a dollar in the hands of the attendant, I will give them a smile."

Only a dollar? This weird sculptor clearly did not factor in that development called inflation. ■





**scaw**

METALS GROUP

# A trusted industry leader

For more than 90 years, Scaw, a South African industry leader, has been a preferred supplier to the construction industry. Whether it's hoisting, reinforcing or excavating, Scaw produces an extensive range of products that drive safety and productivity in construction projects.

From wire & strand products, Haggie® Steel Wire Rope, chain products or construction specific steel, Scaw continues to design and deliver the highest quality products to customer specifications.

Highly qualified teams with extensive experience in all aspects of the application of our products are on call to advise and support the selection, handling, installation and maintenance of products vital to driving safety, productivity and profit in the construction industry.

[www.scaw.co.za](http://www.scaw.co.za)

*More than steel.*



Your concrete  
ready for the  
toughest challenges

## CHRYSO® Quad 20

IMPROVES THE COHESIVENESS OF CONCRETE WITHOUT IMPACTING FLOWABILITY

### It allows for:

- the use of a wider range of aggregates (i.e; manufactured/crushed aggregates),
- reliable quality control of concrete, since it does not impact the slump,
- forgiving high flowability concrete (i.e. SCC)
- unprecedented level of robustness to bleeding or segregation