CONCRETE trends

Journal of the African Cement and Concrete Industry

VOL 17 No 2 May 2014

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A focused view on the cement industry

GOING GREEN
Sustainable construction trends across Africa

SHOWCASING
Concrete projects and machinery

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Cover:
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CONCRETE trends

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Host publication of Totally Concrete Expo and African Construction Expo

TOTALLY CONCRETE EXPO

AFRICAN CONSTRUCTION EXPO

Sandton Convention Centre: 26 - 29 May 2014

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Concrete Trends linked to key industry events

The *Concrete Trends* team is very excited. Not only are we bringing you a bumper issue – for the first time ever we have reached 100 pages – but we are delighted that our publication is closely associated with two very important construction industry events. *Concrete Trends* is the host publication of, and will be distributed at, the Totally Concrete Expo and the African Construction Expo, at the Sandton Convention Centre from 26-29 May.

Totally Concrete Expo is Africa's leading platform for contractors, engineers, quantity surveyors, architects, designers and property owners looking to identify viable project tenders and source solutions, technology and material options to help boost ROI on projects of all sizes.

Both events are attracting many visitors and stakeholders from across Africa and internationally, including Europe, the Middle East and Asia.

Concrete Trends was also distributed at a recent association event run by the South African Institute of Civil Engineers (SAICE) called The Civilution Congress, which took place in early April and was historic in gathering key thought leaders and movers and shakers in government and industry to debate the way forward for South Africa in the Civil Engineering space.

Widely regarded as the 'Infrastructure Codesa', Civilution, a play on the words 'civil engineering revolution,' is driven by the South African Institution of Civil Engineering and Ketso Gordhan, the CEO of PPC – who was the first to call for this 'infrastructure Codesa' in July 2013.

The construction sector has bemoaned the lack of work from the state despite continued undertakings by the government to stimulate economic growth and job creation through infrastructure investment programmes. Through Totally Concrete Expo, African Construction Expo and the likes of Civilution Congress, our hope is that the relationship between the private sector and government will heal the rift that now exists to allow for these all-important projects to roll out in a clear and transparent manner and help contribute to economic growth in a meaningful and stainable way that will be of benefit to all South Africans.

I hope to see many of our readers and contributors at the Totally Concrete Expo, and to meet many more potential 'members of the Concrete Trends family.'

Gill Owens, Editor

Lafarge, Holcim confirm $50 billion-plus merger talks

Reuters reports that the world's two largest cement makers, France's Lafarge and Switzerland's Holcim, are in advanced talks to merge into a company with a stock market value of over $50 billion and combined sales of over $40 billion, in what would be the industry's biggest ever tie-up.

In identical statements the two companies said the discussions are "based on principles consistent with a merger of equals". The companies said no agreement had yet been reached and there was no guarantee of a deal, but there was a "strong complementarity" and "cultural proximity" between the groups.

A merger would help Lafarge and Holcim slash costs, trim debt and better cope with the soaring energy prices and weaker demand that have hurt the sector since the 2008 economic crisis.

But any deal is likely to draw scrutiny from European competition watchdogs, as a Lafarge-Holcim entity would have a dominant position in both Europe and the United States. Regulators would probably require the companies to shed cement plants and distribution facilities before approving any merger.

Geographically, Lafarge and Holcim could complement each other well. Lafarge has a strong presence in Africa and the Middle East, while Holcim is strong in Latin America. Both companies have significant and overlapping capacity in France, Germany, Spain, Czech Republic, Romania and Serbia. In the past decade, both Lafarge and Holcim incurred substantial debt to expand into emerging markets, where rampant urbanisation has fed demand for building materials. With recent energy price hikes, many plants in this power-hungry business are now running at a loss or well below their capacity.

A Lafarge - Holcim merger would be the industry's biggest ever tie-up.

Lafarge employs around 65,000 workers in 64 countries and Holcim has about 71,000 employees in 70 countries. ■

Source: www.chicagotribune.com

Six PMR awards for Aurecon

Aurecon has once again excelled in the national survey of consulting engineers undertaken by the management journal Professional Management Review Africa (PMR.africa). The company achieved six awards in various consulting engineering sectors, all of which were Diamond Arrow Awards – signifying 'highest rated in sector'.

In determining the awards, PMR.africa conducted 135 interviews to obtain the opinions of key decision makers and professionals in South Africa's built environment, including architects, contractors, developers and quantity surveyors.

The interviews sought to obtain ranked perceptions of the performance of companies across a range of attributes, including Black Economic Empowerment; the Capacity to understand projects; Competitive pricing; Expertise/ knowledge; Problem solving; Quality management system; Reliability; Reputation; Resources; Responsiveness, Skills and qualifications of personnel; Technical competence; Timeous completion; and Understanding of and commitment to the clients' interests.

Based on this survey, Aurecon received the following awards:

Diamond Arrow Awards (highest rated in sector) for the following sectors (400+ employees):

- Civil consulting engineers
- Structural consulting engineers
- Combined civil and structural consulting engineers
- Electrical consulting engineers
- Mechanical consulting engineers
- Combined electrical and mechanical consulting engineers

"PMR awards are highly recognised in industry and are a good measure of both technical excellence and brand awareness."

"They are also a good measure of the level of service we provide our clients and Aurecon's ability to serve our clients' best interests," said Albert Geldenhuys, MD RSA.

"We are humbled by the fact that our dedication and commitment to these aims are being recognised by our clients," concludes Geldenhuys. ■

More information from Jody Boshoff
Tel: +27(0)12 427 2066 / www.aurecongroup.com

PPC goes from grey to green

PPC's new home, Eastgate 20 at 148 Katherine Avenue, Sandton, is a retro-fitted building strategically designed to reduce energy and water consumption. It has been given a four-star rating by the Green Building Council of South Africa (GBCSA).

GBCSA's Green Star rating system provides the commercial property industry with an objective measurement for green buildings and rewards environmental leadership in the property industry. A four-star rating recognises a building for its "Best Practices".

Eastgate 20 consumes less energy, and to achieve this the building utilises efficient lighting which is only activated when an area is occupied. Designed to maximise use of natural light, the building's electricity demand during office hours is reduced.

"We have also made considerable progress through our new air conditioning system. It uses inverter technology for the compressors – the speed is controlled so that only as much cooling is provided as needed and the motors do not stop and start," says Tshilidzi Dlamini, PPC's Group sustainability and environmental manager.

PPC Eastgate 20, has been given a four-star GBCSA rating.

A power converter changes supply voltage from a fixed 50 cycles per second mains AC waveform to a variable frequency and variable voltage waveform. This enables a standard fixed-speed AC motor to be run at variable speeds, and for the speed of the motor to be accurately controlled. AC motors not fitted with a power converter are only capable of running at full speed (switched on) or zero speed (switched off).

With a power converter, the output of the driven machine can be adjusted and controlled to deliver the exact output volume (water flow, airflow) required to meet demand, and energy is therefore not wasted.

"The cost of installing a power converter is significant, but so are the energy savings that can be achieved. The payback period from savings in electrical energy costs can be less than a year, making it an extremely viable option," says Chris Yelland, MD of EE Publishers.

Water preservation is crucial to the cement business. Eastgate 20 will substantially reduce usage of potable water through the installation of water-efficient fittings for taps, urinals and toilets.

Furthermore, PPC has also improved the quality of the water in the adjacent environs. PPC has a stormwater-treatment site, adjacent to Eastgate 20, where all stormwater from Eastgate 20's premises and that of the neighbouring sites is treated to ensure that it is clean before it flows into the river.

"Normally during a storm event, rainwater runs off hard surfaces into stormwater drains and is directed into the nearest river to avert flooding. In built up areas, the abnormally amplified increase in water flow during storms disrupts the natural balance of the eco-system and the river's ability to function as part of a healthy eco-system," says Dlamini.■

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Obituary
Victor Boardman

Victor Boardman, for many years a respected and well-known name in the South African construction industry, passed away suddenly.

Boardman, 50, was technical sales consultant at the Chryso Southern Africa Group's Gauteng Regional Office at the time of his death in January this year.

While with the Group – which he joined in 2008 – he spearheaded the launch of the Pareflo range, Chryso SA's silicone water repellant that eliminates efflorescence in concrete blocks, bricks and pavers; and also provided invaluable advice on a wide variety of lightweight precast concrete issues.

A Benoni resident, Boardman's career included management posts at Concor Ready Mix, Brownbuilt Metal Section, Constantia Echo, Watson Concrete Products, and he was also a director of Inca Concrete Products, part of the Murray & Roberts Group.

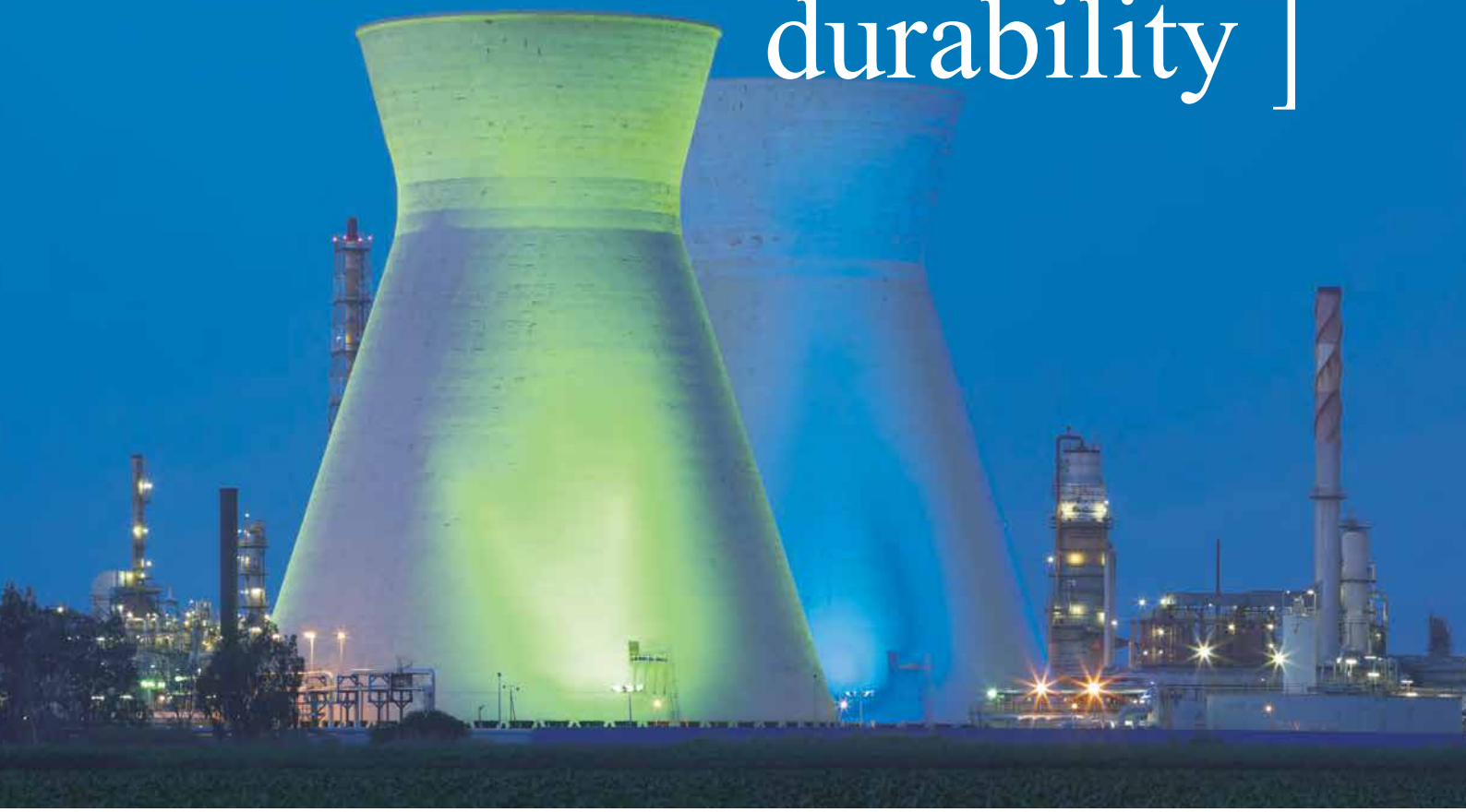
His duties for M&R included controlling on-site concrete batching operations.

Armand van Vuuren, Chryso South Africa's commercial manager exports, says Victor Boardman was undoubtedly one of SA's top authorities on lightweight precast concrete.

"His experience and commitment to duty are rarely found and Victor won the respect of clients not only in South Africa but in the entire African continent."

"He will be sorely missed by Chryso SA and our clientele."■

[Density leads to durability]



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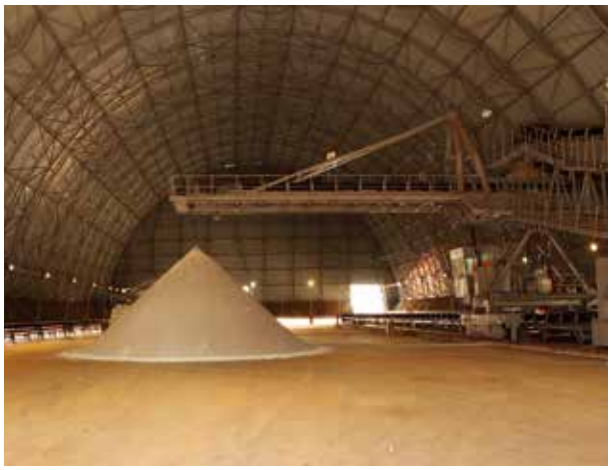
People first for Sephaku Cement

To bring quality to life calls for non-negotiable checkpoints," says Pieter Fourie, chief executive of Sephaku Cement. "High-quality product – consistency, strength and durability – is imperative, but equally important is to prioritise people. Customer service should never be an afterthought. It should be every employee's constant measure of great performance."

"Sephaku Cement emphasises delivery," says Fourie. "The cement industry is personal, with the need to be approachable and to find solutions through focus and energy. All our teams must demonstrate absolute commitment to these values."

For customers, a differentiating factor will be direct access to Fourie and his executive team, together with quick decision making. "Face to face customer service without red tape is timeless," he says. "It remains the most effective way to solve customers' challenges and meet their needs."



The gypsum storage facility.

Over their six-and-a-half-year journey, Fourie and his team have overcome serious challenges. "But we have never lost belief in why we are coming to market. Success is the only option. Sephaku is about the people who make producing cement a reality."

From its Sephaku 32, Sephaku 42 and Sephaku 52 cements to its technical support and customer service, Sephaku Cement is committed to delivering top quality.

"Building from scratch has given us the opportunity to use only the latest and most high-tech cement manufacturing equipment," explains Fourie.

"We want every customer to get the best from our product," he adds. "We will assist technically from start to finish. And our value-driven service is backed by product testing and mix design from our Technical Laboratory based at the Delmas plant."

The company is a 64%-owned subsidiary of Dangote Cement plc, Africa's most prominent cement manufacturer, and is an associate company of JSE-listed Sephaku Holdings. "We navigated our way through the global recession through sheer determination and belief in our ability to change the face of the South African cement industry," recalls Fourie.

"Ours is a team passionate about what cement makes possible. This project has been a once in a lifetime experience that made us better cement experts, but also better people. We learnt, first-hand, how incredible results can be achieved with committed teamwork," concludes Fourie.■

More information from Shalini Ammon,
Tel: +27(0)12 684 6337 / www.sephakucement.co.za

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Murray & Roberts sets up business hubs in East and West Africa

Murray & Roberts Construction has extended its reach into the African continent by establishing 50/50 joint venture (JV) partnerships with two key local construction companies in its target regions of East and West Africa. This follows the formation of two new companies, Murray & Roberts Kenya Ltd, situated in the Funzai Road Industrial Area, Nairobi, and Murray & Roberts Ghana Ltd, in the Movenpick Commercial Centre in Accra.

"The decision to form two business hubs in East and West Africa was taken about 18 months ago by Murray & Roberts Limited to address the vast geographical gap in our corporate presence between South Africa and Dubai," Murray & Roberts Construction's Leon Botha, says. "We realised that we can service the region far better from business sites closer to existing and potential customers.

Seated from left : Courage Dogbegah, CEO of Berock Ventures Ltd; Rockson Dogbegah, chairman of Berock Ventures Ltd and Leon Botha, business development director, Murray & Roberts Construction. Standing from left : Eugen van Jaarsveld, Murray & Roberts Construction operations manager for Ghana and Ivan Vos, country manager, Murray & Roberts Construction Ghana Limited.

"We elected to partner with appropriate construction partners in each region, which has provided us with established networks into which we can be introduced. In addition, this will enable our partners to access more complex projects."

In Kenya Murray & Roberts Buildings has partnered with H Young, one of East Africa's leading multi-disciplinary construction groups, which has operated in the country for the past 50 years. Although H Young has a strong focus on roads and earthworks, its design and manufacturing activities relate to all sectors including telecommunications, mining, power generation, petrochemicals, agriculture, process industries and cement. The new company will bid for tenders in JV with H Young where tenders call for a combination of both partners' skills and resources. Both parties are also free to tender on projects independently.

In Ghana, Murray & Roberts Construction has partnered with Berock Ventures Ltd, a leading local construction and civil engineering company. The JV agreement was drafted in December 2013 and its signing was followed by a visit by three senior Berock staff to Murray & Roberts in South Africa for a two-week familiarisation programme. Eugen van Jaarsveld, newly appointed Murray & Roberts Construction Africa operations manager for Ghana, also participated in the programme. Van Jaarsveld joins Ivan Vos, country manager for the Murray & Roberts Group who has been resident in Ghana since early 2013.

"We're now looking out for joint opportunities in and around Ghana and we feel very optimistic about these prospects," Botha says.■

More information from Stephanie Swanepoel, Tel: +27(0)11 590 5833 / www.murrob.com

Lake Cement to commission modern green-field plant

Tanzania's development blueprint has found a renewed strength as Lake Cement Ltd. is set to commission Tanzania's first fully-integrated green-field cement plant with an initial capacity of 500,000 tons per year. The plant is a one-of-its kind cement unit in Tanzania and is well poised to meet the rising demand for high-quality cement in the country.

Spread across 100 hectares in Kimbiji Village, 40 km south of Dar-Es-Salaam port, the plant is equipped with a 10-MW captive power generating unit to ensure continuous power supply and thereby uninterrupted production of consistent quality cement. The company, which also has its own high-grade limestone quarries to produce clinker and cement, is expected to roll out 42.5 Grade high-quality cement in Tanzanian markets.

The demand for cement in Tanzania is growing rapidly with infrastructural developments by both government and private sectors. The existing estimated installed production capacity of cement in Tanzania is 3.5 million tons per annum against the demand of 4 million tons. Lake Cement aims to help bridge this gap.

"Once commissioned, the plant will be the most modern, fully automated, and energy efficient cement unit in East Africa. This plant will not only establish Lake Cement's name as one of the most innovative manufacturers of cement in Tanzania but will also play an important role in the development story of the country," explained Kush Patel, director, Lake Cement Ltd.■

Source: http://constructionreviewonline.com

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Nigeria now Africa's biggest economy

Nigeria has 'rebased' its gross domestic product (GDP) data, which has pushed it above South Africa as the continent's biggest economy.

Nigerian GDP now includes previously uncounted industries like telecoms, information technology, music, online sales, airlines, and film production.

GDP for 2013 totalled 80.3 trillion naira (£307.6bn: $509.9bn), the Nigerian statistics office said. That compares with South Africa's GDP of $370.3bn at the end of 2013.

'Changes nothing'

However, some economists point out that Nigeria's economic output is underperforming because at 170 million people, its population is three times larger than South Africa's.

On a per-capita basis, South Africa's GDP numbers are three times larger than Nigeria's.

Economies are dynamic things; they grow, they shrink, they add new sectors and technologies and people's behaviours change.

And Nigerian financial analyst Bismarck Rewane called the revisions "a vanity".

He added: "The Nigerian population is not better off tomorrow because of that announcement. It doesn't put more money in the bank, more food in their stomach. It changes nothing."

Rebasing is carried out so that a nation's GDP statistics give the most up-to-date picture of an economy as possible.

Most countries do it at least every three years or so, but Nigeria had not updated the components in its GDP base year since 1990.

Then, the country had one telecoms operator with around 300,000 phone lines. Now it has a whole mobile phone industry with tens of millions of subscribers.

Likewise, 24 years ago there was only one airline, and now there are many.

International aid donors are keen for more African countries to undertake this process regularly because it enables them to make better decisions when it comes to aid.■

Source: www.bbc.com/news/business-26913497

Martin Engineering names Zambian distributor

In a move designed to broaden availability of high-performance bulk materials handling technologies in southern Africa, Martin Engineering RSA has named Fluid Base Industries as its full-service distributor in Zambia. Fluid Base will be a source for all Martin Engineering RSA products and services throughout Zambia, including conveyor belt cleaners, transfer point solutions, flow aids, safety products and training, belt support products, silo cleaning and other field services.

Fluid Base will be a source for all Martin Engineering RSA products and services throughout Zambia. From left: Trevor Bester, sales manager exports; Fanuel Banda, director Fluid Base; Mark Jarrett, sales manager.

Fluid Base will serve customers in the mining, material processing, cement and oil industries and stock a wide range of Martin Engineering products and repair parts at its locations in Kitwe and Chilanga.

"This will help us broaden our presence in Africa and create a customer base in key commercial regions in Zambia," observed Martin Engineering RSA sales manager Mark Jarrett.

"Companies here prefer doing business with local suppliers. We've had many interactions with Fluid Base and they are one of the few distributors capable of representing our brand with the technical expertise that ensures outstanding product support and service."

Since 1944, Martin Engineering's innovative products and services for solids handling have offered field-proven, cost-effective solutions for 'real-life' problems. Products are designed for tough industrial conditions, engineered for simplicity, safety and efficiency, and built to facilitate easy maintenance.■

More information from www.martin-eng.com. Global representative listings at www.martin-eng.com/rep-finder

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SAPMA objects to Government vilifying coatings industry

The SA Paint Manufacturing Association (SAPMA) has lodged its strongest objection to government's continuous condemnation of the paint industry for producing leaded paints while neglecting the prosecution of offenders for which SAPMA has been pleading.

Addressing a Department of Labour Health Accord in Pretoria recently, Deryck Spence, executive director of SAPMA, said: "The paint industry will continue to follow its Code of Conduct but we want - no, we demand – cooperation from the government to assist us in enforcing the existing legislation against offenders. We object to constantly being vilified for producing leaded paint and reading in the press that our industry is causing 'poison to drip from walls' – without the government keeping its promises to prosecute offenders."

Deryck Spence, executive director of SAPMA: "SAPMA now demands governmental prosecution of offenders who still illegally produce leaded paint."

Spence repeated his plea to government to 'name and shame' offenders, and take legal action against any party – whether a SAPMA member or not – who makes or sells paint with illegally high leaded content.

'SAPMA can coordinate our members – who represent a sizable proportion of the paint industry – but we cannot eliminate the use of lead in the industry without the assistance and cooperation of the appropriate government departments. That is the only way we are going to succeed in eliminating lead in paint."

Spence said SAPMA had also asked the government to investigate the supply and use of methanol in products sold to the public.

"The commonly used DIY product, lacquer thinners, sometimes contains up to 32% methanol which is poison that can lead to death if unwittingly consumed by a child. Yet again, there has been absolutely no action from government."

It was decided that the Department of Labour would arrange a special meeting to strategise a way forward. The COSATU representative requested that the organisation be included in this meeting. ■

More information from Deryck Spence,
Tel: +27(0)11 455 2503 / www.sapma.org.za

Sarma membership explodes

The large-scale uptake of readymix over site-mixed concrete has led to a massive increase in concrete suppliers seeking Sarma (Southern Africa Readymix Association) membership as they want accreditation from this well-respected industry body.

The association's adherence to international standards and Sarma's comprehensive accreditation process for members has impressed the country's leading construction firms who are increasingly insisting on using readymix from Sarma-accredited members only.

This has led to better levels of professionalism in the industry and is compelling readymix suppliers to improve service and product offerings.

Johan van Wyk, GM of Sarma.

Johan van Wyk, GM of Sarma, says the overall effect is positive for the construction industry, as professionally mixed and supplied concrete is convenient and gives clients the assurance that the quality of concrete remains consistent.

"The construction industry has been under pressure lately and has finally realised that quality materials and speed of construction make the difference between good business and bad, or profit and loss," explains Van Wyk.

"While readymix concrete is becoming the construction material of choice, we are finding more entrants coming into the market, many of whom are ill-experienced while others are looking to make a quick buck. For this reason we feel it is important for professional suppliers of readymix to be accredited and join our association.

Van Wyk continues: "It is in their best interest as Sarma is engaging with all professional bodies and educating them about the benefits of dealing with accredited suppliers. It is thus becoming increasingly difficult to sell readymix unless you have Sarma accreditation."

"Government and the private sector are also being made aware that Sarma accreditation means that members adhere to all local legislation, as well as our internationally vetted quality, health, safety and environmental standards.

Members also choose to conform to our own policies and procedures and are regularly audited to prove compliance," he says.

"The Sarma-accredited logo on a member's stationery, or the Sarma sticker on a concrete mixer, is a symbol of professionalism and assures the industry that they are buying professionally mixed, quality concrete." ■

More information from Sarma,
Tel:+27(0)11 791 3327 / www.sarma.co.za

Fulton Awards 2015: call for nominations

The Concrete Society of Southern Africa is calling for nominations for its prestigious biennial Fulton Awards which recognise and reward excellence and innovation in the design and use of concrete.

The awards continue to celebrate the legacy of scientific and technological advances in concrete in the built environment, and the late Dr. 'Sandy' Fulton's life and achievements in the industry.

The 2015 awards take on a new look with revised categories, a new approach to judging and a new Anchor Sponsor – PPC Ltd.

The categories for nominations and entries are:

- Civil Engineering Structure
  a) Project up to R100 million in value
  b) Projects in excess of R100 million in value
- Building Structure
  a) Project up to R100 million in value
  b) Projects in excess of R100 million in value
- Architectural Concrete
  a) Project up to R100 million in value
  b) Projects in excess of R100 million in value
- Innovation in Concrete

The awards are made symbolically to the structure and are presented to the entire team responsible for its construction, including the owner/developer, all specifiers and contractors.

The Innovation in Concrete category is included to attract new ideas in projects or Initiatives where totally new materials / techniques / technologies / applications / design and/or analysis concepts or procedures, using concrete as the principal material, have been developed and utilised.

Deadline for nominations is 31st August 2014, while the completed Entry Packs have to be submitted by the end of November 2014. The 2015 winners will announced at a special gala dinner on 6 June 2015.■

Full details of the 2015 awards are available on the Concrete Society website at www.concretesociety.co.za

NHBRC reviews its Technical Requirements and Home Building Manual

The National Home Builders Registration Council (NHBRC) recently embarked on reviewing its Technical Requirements and the Home Building Manual to ensure alignment with current legislation and industry needs.

Updating NHBRC's home building standards provided an opportunity to address issues identified as offering a significant risk to the NHBRC Warranty Scheme.

This review will result in three new documents: a set of Technical Requirements for issue as regulations by the Minister in terms of the Act; a Home Building Manual containing the technical requirements prescribed by the Minister and the means by which home builders must comply with the technical requirements; and a guide to the Home Building Manual, explaining the content of the Manual and locating the manual in the context of sustainable human settlements.

A major revision of the Technical Requirements and Home Building Manual will affect home builders and may affect the rights of housing consumers and those in the housing supply chain.

Housing consumers and key players in the housing industry will, therefore, be afforded an opportunity for comment.

Proposed approach

The Technical Requirements and the Home Building Manual will be drafted in plain language and in a manner enabling easy amendment in future. The revised Technical Regulations will include:

- definitions of the categories of dwelling units that are included in the definition of a home and any structure which is included in the definition of a home;
- performance descriptions and performance parameters for structural strength and stability, serviceability, materials, behaviour in fire, drainage and storm water management and water installations in relation to the warranty scheme, considering overlaps in requirements with functional regulations contained in the National Building Regulations;
- requirements for satisfying requirements for performance-based methods;
- requirements for geotechnical investigations dealing with individual stands and townships development, taking into account the provisions and needs of the housing subsidy schemes after consultation with the Council for Geoscience; and
- requirements for managing geotechnical risks during construction.

Consideration will be given to a certification scheme for sites, designs and installations.

The revised Home Building Manual will also set out compliance methods and procedures for home builders to satisfy performance-based methods, including:

- not replicating the content of South African National Standards;
- making reference to South African National Standards e.g. SANS 10400, SANS 2001, SANS 1936 and SANS 634;
- addressing gaps in the current South African National Standards;
- establishing requirements for testing materials and components.
- the Technical Requirements and the Home Building Manual will not contain any forms that need to be lodged to demonstrate compliance or procedures relating to the administration of the scheme. These will be issued separately by NHBRC in terms of the Housing Consumer Protection Measures Act.

The guide to the Home Building Manual will explain the philosophy behind the manual and its content; it will locate the Manual in the broader context of Sustainable Human Settlements and provide design and construction rules derived from the home building manual for typical subsidy homes.

Revision of the NHBRC Technical Requirements and Home Building Manual should be completed by June 2014. Housing consumers and individuals involved in the housing supply chain are invited to provide comment on the draft Technical Requirements and Home Building Manual. Draft Technical Requirements and Home Building Manual are available in print from provincial NHBRC Customer Service Centres, and electronically from www.nhbrc.org.za■

More information from Dr Jeffrey Mahachi, Tel:+27(0) 011 317 0075 / www.nhbrc.org.za

50 YEARS AGO WE BEGAN BUILDING THE FUTURE

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Form-Scaff is proud to have contributed to the development of our nation for the past 50 years. Through our products and expertise we have played our part in many of the country's iconic construction and civil engineering projects.

From highways to high-rise, power stations to football stadiums, dams to airports, we were there. Perhaps our greatest achievement is the development of our people into a world-class team that is respected both locally and internationally. They are the foundation on which we will build the next 50 years.

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Bringing improved quality to the African market

TECHMATIK SA is a leading manufacturer of the most modern and efficient solutions for the production of vibropressed precast concrete elements. The TECHMATIK plant was built in 2004 in the Radom sub-zone of the Tarnobrzeg Special Economic Zone, Poland. The company designs and produces its machines, devices and moulds based on over 20 years' experience in paving block production with Jadar – a leading producer of pavers and concrete elements in Poland.

All production lines are equipped with advanced, state-of-the-art vibropress machines, that ensure high output and consistent manufacture of superior-quality products. By using steel pallets, the machines, devices and moulds are designed for high performance and efficient manufacture. Vibropress machines, with their thorough compaction, produce concrete units of the best possible quality. This also lowers costs by reducing the amount of cement used for the concrete mix by about 20%.

One of Techmatik's high-performance machines.

Construction of the equipment is based on knowledge and experience of people who spent many years working in a Jadar company producing concrete units using block-making machines. Therefore, TECHMATIK's Design Department, based on Jadar's own expertise, has introduced new solutions to enhance the ease of operation to manufacture the highest quality concrete products. Jadar provides enormous backup and support. Having extensive experience, TECHMATIK is also an ideal advisor in the after-sale period. Moreover, the company willingly offers support and assistance in solving problems related to the production of paving units. It is extremely important to avoid mistakes which, in the long term, may be expensive. A fast-reacting service team is another advantage – particularly useful in times of increased production when every minute is critical. A range of mould shapes and sizes is designed to meet the customer's needs.

Highly competitive features, easy operation and readily available spare parts are important factors determining a client's choice. All TECHMATIK's sub-assemblies are fully controlled because the company has its own machining, heat treatment and quality control departments. These divisions are equipped with the most advanced technological CNC milling machines and measuring and heat treatment equipment which guarantee the highest levels of manufacturing precision. Linear bearings used in the machines ensure precise positioning, extend the life of die cavities and shoes and facilitate quiet operation. Hydraulic blocks,

The new Techmatik plant in the Tarnobrzeg Special Economic Zone, Poland.

A paved area showcasing the range of products manufactured using Techmatik's equipment.

toothed belts for drive transmissions, bearing housings, hydraulic cylinders contribute to longer service life, reliable operation, precise positioning and more advantages which have a strategic impact on machine's operational life. An interesting solution is that every hydraulic station integrated with the concrete block machine frame is compact, saving more space – an attractive and useful feature for customers. The innovative vibration table has individual table construction and limits the vibrations of the concrete block machines. Moreover, using servomotors from a well-known manufacturer extends service life. These solutions reduce energy consumption by 30%.

Before such improvements are delivered to our clients, they are checked and tested in real operating conditions in our testing facility. The client receives ready-to-use and tested machines. Moreover, TECHMATIK provides operators' training in its own testing facility and helps in selecting raw materials and mix designs. Direct contact with operators at the company's testing facility enables constant enhancement of individual manufacturing processes. The new TECHMATIK line is compact; therefore it takes much less space than lines delivered by competitive vendors. Full automation and visualisation of all technological process stages allows quick identification of all possible problems. The above-mentioned features, together with attractive pricing, gives the TECHMATIK line a huge advantage on the market.

The Company delivers its solutions directly to customers in many European and Asian countries and, following the contract signed with the American company Columbia Machine Inc., the moulds marked with a COLUMBIA-TECHMATIK logo are distributed to manufacturers of vibrated concrete products in both Americas as well as in Australia and New Zealand. In addition, TECHMATIK is strongly positioned in Africa. Recently, the company built a complete state-of-the-art plant in Libya for Corinthia Co., designed to meet their specifications and needs. Corinthia has become the most modern and efficient manufacturer of concrete elements in the whole of North Africa. Of the 14 competitors who submitted tenders, there was only one winner – TECHMATIK. The main factors which the

Techmatik's vibropress machines fabricate concrete products of the highest quality.

investor considered were TECHMATIK's 'homemade' machines and equipment produced with full control of every step in the manufacturing process. A brand new, fully automated factory for vibropressed concrete elements has become a reality in Tripoli. Thanks to the efficiency of TECHMATIK technical staff who started with a totally empty site, the paving block plant was installed and commissioned in under three months. This project is the result of the commitment and effort of TECHMATIK's managers, designers, installers and many other people who worked extremely hard to make this a reality. And now, Corinthia Co. employees work on the most advanced technological equipment and gain new African markets. TECHMATIK's technological plant will introduce new levels of product quality to Libya, which are a testament to the manufacturing quality that vibropressed products can bring to the local market. Talks with a number of other investors are currently under way. ■

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Architects play a pivotal role in sustainable design

THE South African construction industry is acknowledging its environmental responsibilities by increasingly embracing green construction methods. This trend also recognises that sustainable design will soon be considered a non-negotiable industry requirement. A great deal of time and investment has already been channelled into exploring ways to improve building processes to make a meaningful contribution towards sustainable development in the region.

However, this kind of change begins in the design phase where sustainable or green design methods ensure that a structure complies with the principles of social, economic and ecological sustainability. Architects have a pivotal role to play in implementing sustainable design that considers all aspects of a project, from design to the ultimate occupation of the building. The aim is to ensure that the building continues to be environmentally friendly throughout its lifetime.

This can be achieved by innovative design in such areas as energy efficiency, reduced water use, water conservation, reduced waste, lower waste emissions, less use of natural resources and re-use after service life.

Although green design in domestic construction is still in its infancy in South Africa, there has been a noticeable shift towards green construction in the corporate and commercial world. The government has also started enforcing several green principles into law and, with time, this trend is set to continue in line with global trends.

To fill the deep piles underpinning the Nelson Mandela Bridge the special self-compacting AfriSam Flowcrete was designed with extended workability. This was pumped into the 47-metre-high pylons — from the bottom up — a process never before attempted.

"One of the most successful outcomes of AfriSam's R&D programme has been the development and production of a range of advanced composite cements that supports the company's focus on product performance and environmental responsibility."

As local consumers become more aware of these trends and commit to mitigating damage to the environment, the demand for sustainable design will also grow. Local architectural researchers, academics and professionals are being presented with an opportunity to help the country realise the long-term socio-economic and environmental benefits associated with sustainable construction. As they invest in this opportunity, these professionals will pioneer the green movement at the design stage, including specifying environmentally friendly materials throughout the project.

With this trend towards erecting environmentally responsible green buildings, 'green' cements will play a vital role in ensuring that the property industry meets the requirements for green buildings.

Introducing sustainable building materials is a core driver influencing AfriSam's research and development programme. Central to the company's ethos is sustainability and this reinforces two of its core values — product performance and environmental responsibility. Using innovative technologies has enabled the company to reduce its CO_2 content per ton of cement produced by over 34% in the last 20 years. AfriSam was also the first in the industry to measure and publish the carbon footprint of all its products and develop a range of products with the lowest carbon footprint in the market.

One of the most successful outcomes of AfriSam's R&D programme has been the development and production of a range of advanced composite cements that supports the company's focus on product performance and environmental responsibility.

AfriSam is committed to advancing the influence of the local architectural community on the sustainability of the construction industry. To this end the prestigious AfriSam-SAIA Award for Sustainable Architecture was first introduced in 2009 as a vehicle to recognise and promote projects in the South African architectural arena that are ecologically sustainable and which also uplift the community.■

More information from Maxine Nel,
Tel: +27 (0)11 670 5893 / www.afrisam.com

Over 6,000 entries confirm sustainable construction's global status

The fourth cycle of the USD 2 million International Holcim Awards competition attracted over 6,000 projects and visions in sustainable construction from 152 countries. The diverse geographic spread of entries and growth in submissions from developing countries highlights the importance of creating a more sustainable built environment. Entries will be screened for compliance before evaluation by independent juries in five regions of the world. The results will be announced at prize-handover events in the last quarter of this year.

The Holcim Awards recognises innovative projects and future-oriented concepts, and is conducted in parallel across five regions. The broad range of submissions includes Main category projects at an advanced stage of design and 'Next Generation' visions and ideas in architecture, building and civil engineering, landscape, urban design and infrastructure, as well as materials, products and construction technologies.

The 6,103 entries registered within the competition period reflect the growing importance of sustainable construction in emerging markets as well as a high awareness of this critical topic among young professionals and university students. Compared to previous cycles, the largest increase in participation was registered in Africa Middle East and the highest volume of entries came from Asia Pacific. The growing number of submissions in the 'Next Generation' category for the first time balances the distribution of entries between the two competition categories. All fully-completed entries will be formally checked. Valid entries will then be presented to an independent jury panel in the region where the project is located. The Holcim Awards juries consist of internationally-renowned representatives from science, business and society. A list of members of each jury is available at: www.holcimawards.org/juries

Holcim awards
for sustainable construction

The Main Author of each project nominated for a prize will be contacted after the jury meetings as part of the validation process. The results of the regional Holcim Awards will be announced at prize-giving events and communicated to the various regions between September and November 2014.

The Holcim Foundation's initiatives are supported by Holcim Ltd, a global leader in manufacture and distribution of cement and aggregates as well as in other activities, including readymix, asphalt, and associated services. ■

More information at: www.holcimawards.org

Reimaging history

By Daniel van der Merwe, Architect, PPC Ltd

I'm wary of the word 'inventing'," says British designer Thomas Heatherwick, "because in the British psyche the word 'inventor' is immediately linked with 'mad'. For me, inventing is problem-solving."

Thomas Heatherwick is called the Da Vinci of our times because his work is both practical and aesthetic. Part architecture, part product design, with dashes of sculpture and urban planning, his body of work defies definition. The London-based designer has completed nearly 200 projects since establishing Heatherwick Studio in the mid-nineties, and with each new commission, merges engineering and design, giving his projects a magical, transformative feel.

His studio's work reflects a profound commitment to finding innovative design solutions with absolute dedication to artistic thinking and the potential of materials and craftsmanship. Projects include the Olympic Cauldron for the 2012 Olympic Games, the New Bus for London, and the award-winning UK Pavilion for the Shanghai World Expo 2010.

Heatherwick's Seed Cathedral at the Shangai World Expo 2010.

The Seed Cathedral is a box, 15 m high and 10 m tall. From every surface protrude silvery hairs, 60,000 identical rods, 7.5 m long, which extend through the walls of the box and lift it into the air. Cast into the glassy tips of the hairs are 250,000 seeds.

The pavilion sits on a landscape, cast in ultra-lightweight high-performance precast concrete panels, that is crumpled like a sheet of paper, suggesting that the pavilion is a gift from the UK to China, still partly enclosed in wrapping paper. With inclined

Pillowed glazing panels in the silo at the V&A Waterfront will bulge as if gently inflated.

surfaces and lifted edges forming a gentle amphitheatre which invites you to sit, lie down or even roll down the slopes. It enables people to treat the space like a village green, invoking the UK's record for pioneering the modern public park.

The Silo in the V&A Waterfront, Cape Town

The existing silo building was cast entirely of in-situ concrete in the 1920s. PPC Cement originally supplied the cement and assisted with the concrete mix design and casting technology to create what was then Cape Town's tallest structure.Almost 100 years later, the structure has survived remarkably, remaining structurally virtually intact and needing minimal repair work. This is because concrete is a no-maintenance, low-cost, efficient structural material with a long lifespan. This enabled Heatherwick to intervene structurally with bold cut-always into the existing tubes, which required only stabilising with additional concrete reinforcement placed in the spaces between the existing tubes.

The designer also decided to celebrate the beauty of the existing and the new concrete work by stripping the surfaces of old paintwork. Abrasive sandblasting will add a textural dimension by exposing and revealing the colour palette of the local aggregate, quarried from the surrounding mountains nearly a century ago.

The silos will be repurposed to be the largest collection of curated African art on the continent. Under the name Zeitz

Heatherwick Studio's rendition of the Zeitz MOCAA building created from the old Silo structure.

Bold cut-aways of the existing tubes create a dramatic, cathedral-like central atrium.

MOCAA, Mark Coetzee will curate the personal collection of the ex-CEO of Puma, Jochen Zeitz, one of the world's foremost African art collectors.

Zeitz MOCAA ticks all the boxes regarding contemporary heritage, and architectural and sustainability concerns. Not only does it respect existing heritage by allowing the building to retain its historical industrial integrity, but it imbues one of Cape Town's oldest landmark structures with new functions in the most original way. It is a brilliant example of what can be achieved through clever design intervention and retro-fitting that is sensitive yet dramatic, bold yet in its conceptual statement, makes perfect logical sense. It is a good example of how retro-fitting existing buildings is a sustainable and financially viable choice, and that demolishing structures is no longer a viable option. Utilising some of the existing tubes as natural ventilation ducts and light shafts to illuminate the newly created and very sculptural interior spaces, adds another environmentally conscious, energy-efficient angle.

Worldwide, cities try to replicate the successful Bilbao experiment where Frank Gehry's Guggenheim Museum transformed the city from an industrial backwater into an exciting top tourist destination. Billions have been spent on new sculptural landmark buildings in countless cities, as cities and countries try to outdo one another. Cape Town is leading the way by demonstrating how a low-cost retro-fit can turn an obsolete structure into a world-class cultural destination.

Design

Imagine forty-two 33-m-high concrete tubes, 5.5 m in diameter, with no open space to experience the volume from within. Imagine redesigning this into a functional space that pays tribute to its original industrial design and soul, but will become home to the most significant contemporary art collection from Africa and its diaspora.

Explaining his conceptual approach, Heatherwick questioned how to turn 42 vertical concrete tubes into a place for contemporary culture?

"Our first thoughts wrestled with the extraordinary physical facts of the building. There is no large open space within the densely packed tubes, making it impossible to experience these volumes from inside. Rather than strip out the evidence of the building's industrial heritage, we wanted to celebrate it. We could either fight a building made of concrete tubes or enjoy its tube-iness."

Unlike many conversions of historic buildings which have grand spaces ready for repurposing, this building has none. Heatherwick explains: "The project became about imagining an interior carved from within an infrastructural object. Our solution was to carve galleries and a central circulation space from the silos' cellular concrete structure, creating a cathedral-like central atrium filled with light from a glass roof. The other silo bins will be carved away above ground level to create gallery spaces for Zeitz MOCAA's permanent collection and international travelling exhibitions."

Heatherwick says: "From the outside, the greatest visible change to the silo's monumental structure will be pillowed glazing panels inserted into the existing geometry of the upper floors, which will bulge outward as if gently inflated. By night, this will transform the building into a glowing beacon in the harbour.

Project facts

The new museum, part of the 123-ha V&A Waterfront site, will have 80 galleries, 18 education areas and a rooftop sculpture garden. The art collection will occupy 9,500 m^2 of custom-designed space spread over nine floors, of which 6,000 m^2 will be dedicated exhibition space. Heatherwick Studios has designed all necessary amenities for a public institution of this scale: bookstores, a restaurant and bar, coffee shop, orientation rooms, a donors' room, fellows' room and various reading rooms. The building's collection of old underground tunnels will be reengineered to create unusual education and site-specific spaces for artists to dialogue with the original structure.

Heatherwick is working with local practices Van Der Merwe Miszewski and Rick Brown Associates. Jacobs Parker will be the lead designer for the fit-out. Zeitz MOCAA is due to open in 2016.■

Photographs of Zeitz MOCAA courtesy of Heatherwick Studios
Photograph Seed Cathedral courtesy Daniel van der Merwe

More information from Daniel van der Merwe on email: daniel.vandermerwe@ppc.co.za

Recycled concrete can aid sustainability

Concrete derived from demolished structures can be recycled and reused as construction material, says The Concrete Institute.

The many benefits of using recycled concrete as a construction material are generally overlooked and not by any means fully utilised in South Africa, says Bryan Perrie, MD of The Concrete Institute.

Perrie says the use of recycled concrete could reduce the carbon dioxide emission of concrete as well as lower the depletion of natural resources and dumping of concrete at landfill sites.

"The demolition of in-situ, precast and tilt-up reinforced concrete can be achieved relatively easily using modern cutting, breaking and lifting equipment. Once demolition of reinforced concrete has been completed, the concrete and reinforcing steel can be separated for recycling."

"Recycled concrete can be used as aggregate for bricks, blocks, layer works in road construction, or land reclamation, thereby reducing the amount of material sent to landfills. Thus recycling also reduces use of new virgin materials – saving resources and the energy required to process them. Crushed concrete also absorbs carbon dioxide."

At readymix plants, wash water can be collected and reused in fresh concrete, and aggregate from returned concrete can be screened out and reused. This would reduce the amount of waste generated at the plants.

Perrie says precast components from structures can also be reused in new buildings instead of demolishing and recycling the concrete. Structures using precast elements can be designed for such reuse.

In former industrial areas and inner city precincts, there are many old factories or old warehouses that can be converted into acceptable dwellings.

Concrete buildings can often be adapted relatively easily for new uses; unused office space can be retrofitted as residential accommodation.

The benefits of reuse and retrofitting include:

- Saving natural resources, including raw materials, energy and water required for new structures
- Reducing the quantity of solid waste sent to landfill
- Lowering the energy consumption and pollution emanating from the extraction, manufacturing and transportation of virgin materials.

"The durability of concrete structures is a key factor in their suitability for reuse. The architect or designer needs to ensure that the structure is sustainable in terms of its environmental and social impact, to minimise the use of energy, to minimise the use of water, and the generation of waste during the life cycle of the building. All this can only be assessed by carrying out a full life-cycle assessment of the structure," he adds.

Perrie believes recycled concrete has a significant role to play in creating a sustainable and ecologically responsible built environment.

He says when considering a building that has reached the end of its first life, the order of decision making should be: reuse of the building, reuse of the components and then – as a last resort – demolition with recycling of materials.

Recycled concrete aggregate made from crushed concrete has proved viable and makes economic and ecological sense. As a coarse aggregate, it is particularly appropriate as bedding material in concrete roads and pavements, floors, reinforced concrete, precast and masonry elements, and foundations.■

To obtain copies of The Concrete Institute's publication, Sustainable Concrete, email: info@theconcreteinstitute.org.za or call the Information Centre on Tel: +27(0)11 315 0300.

National Zoo receives a generous 'green' donation

Draco Demolition has donated truckloads of material salvaged from the demolished historic Munitoria Building to the National Zoological Gardens of South Africa (NZG). The material, which was salvaged prior to the building's implosion last year, includes lights and fittings, doors and bricks, and more, which will be used to upgrade the facilities and enclosures at the zoo.

Through the demolition and implosion of the building, Munitoria achieved a four-star status on the Green Star South Africa rating system.

This is designed primarily to recognise and reward environmental leadership in the property industry. The donation is in line with Draco Demolition's commitment to protect the environment during their operations and forms part of their assurance to recycle 75% of the Munitoria Building.

"This generous donation to the National Zoological Gardens of South Africa will go a long way in assisting them to continually improve their facilities. Draco Demolition is proud to be associated with this initiative," said Teddy Habib, managing director of Draco Demolition.

Draco Demolition is a well-established, full-service demolition company that successfully, safely and routinely carries out turnkey demolitions for South Africa's largest construction contractors. Established in 2007 on the basis of decades of industry experience, Draco Demolition has become one of Gauteng's leading demolition experts.■

Draco Demolition - National Zoological Gardens of South Africa (NZG) Handover, L-R Dr Nxomani, NZG and Shaun Fahry, Draco Demolition.

More information from Tel: +27(0)11 791 6600, www.dracodemolition.co.za

Social and environmental sustainability in construction projects

The success of a project can now hinge on how environmental management is approached.

The environmental management of all construction, especially on complex, large-scale projects, has become a specialised activity that is multi-disciplinary in its approach. Hatch Goba Environmental Services Group (ESG) regional director for Africa, Max Clark, says the range of environmental, social and sustainability issues that need to be dealt with during the construction phase has grown tremendously over recent years.

Clark explains that no longer is the focus on just preventing environmental impacts at the construction site, but also outside the site with a great deal of emphasis on cross-disciplinary matters. "Hatch Goba's ESG has developed an approach, which has been piloted internationally, to integrate environmental management with construction services in order to manage issues within and outside of the site more effectively," explains Clark.

He adds that as unlikely as it may have seemed years ago, currently the success of a project can now hinge on how environmental management is approached. Hatch Goba's ESG approach, manages the sustainability work stream, including environmental and social components, throughout the project lifecycle. Hatch Goba ESG becomes an integral part of the construction team long before site establishment by getting involved from concept and prefeasibility stage – both of which set the scene for construction.

The ever-increasing scope of construction environmental management has resulted in the management of social issues and the fostering of sustainable development taking centre stage on any project.

"Through our experience on mega-projects of different kinds, we have identified several aspects that are important in construction environmental management, including: local procurement, selection of construction materials, job creation, workforce planning and training and community engagement. Furthermore, typical impacts that would require management on a construction site include: the removal of vegetation, relocation of animals, relocation of rare species and plants noise management, air quality management and meeting permit conditions during construction," explains Clark.

Projects are often delayed or sometimes even stopped during construction due to environmental or social issues that have been neglected prior to site establishment. Clark stresses that the cost impact resulting from these delays is usually considerable. Hatch Goba's ESG makes use of risk and opportunity assessments to develop an approach for each aspect and impact, while consultation with the client and communities is used to refine it.

The approach is multi-disciplinary with the environmental objectives being integrated into the roles of the construction team. Hatch Goba's ESG works closely with the overall project team to help manage each component of the Construction Environmental Management Plan (CEMP).

Speaking on the social aspects that need to be considered in a construction project, Clark points out that the biggest

shift has been seen in community engagement, which is no longer confined to the Environmental Impact Assessment (EIA). "Ongoing community participation during construction is important to identify and create opportunities for the community. In order to determine how much a community is benefitting from a new development, Hatch Goba ESG conducts a comprehensive baseline of a community's socio-economic status against which it measures impacts and programmes that are developed through community consultation.

"Through our experience on mega-projects of different kinds, we have identified several aspects that are important in construction environmental management, including: local procurement, selection of construction materials, job creation, workforce planning and training and community engagement."

The sooner these programmes are established, the sooner benefits will start to be realised and project benefits to the community will be realised by all. It takes time to develop links with Non-Governmental Organisations (NGOs) working in the area and to establish a level of trust with the affected community. Interaction with local communities is of utmost importance – maintaining a good relationship with the local communities and the construction site workforce is critical. Imported workforces may be regarded as stealing jobs or not paying due respect to local customs. This education is integrated into awareness programmes, which are carried through to the induction process and implemented throughout the project lifecycle.

Job creation is an important aspect of the CEMP in that a construction project can benefit affected communities by providing employment to unskilled and semi-skilled community members. Community members are provided with the opportunity to get work experience and develop new skills to improve their standard of living. This requires cooperation among social specialists from Hatch Goba ESG, the recruitment team and the industrial relations practice.

Clark concludes by saying that an integrated, multi-disciplinary approach during construction involving the environmental management team together with the other project disciplines is important in order to maximise environmental and socio-economic opportunities, to manage risk and to ensure successful project delivery. ■

More information from Hatch Goba on
Tel: +27(0)11 239 5300 / www.hatch.co.za

Environmental management of projects has become a specialised activity.

PPC Imaginarium Awards unveiled

In previous years, PPC Ltd has been rewarded for its innovation, and support of the Arts, and 2014 is no different, as the company launches its inaugural PPC Imaginarium Awards. Supporting the annual awards, confirms PPC Ltd as one of the largest promoters and patrons of the Arts and Design in South Africa.

Evolving from its longstanding PPC Young Concrete Sculptor Awards, which was established in 1992 in partnership with the Association of Arts Pretoria, the PPC Imaginarium Awards is a platform for designers and artists to freely express their artistic talents using portland cement-based concrete as a primary inspiration or material. The PPC Imaginarium Awards comprises six categories that recognise innovation and design in architecture, film, sculpture, fashion, jewellery and industrial design.

Mandy Johnston's YCSA sculpture.

The competition boasts over half a million rand in prize money - each category winner will receive R50 000 and the runner-up walks away with R15 000. The winners further stand a chance to receive the grand prize of R100 000 at the winners exhibition in February 2015. To alleviate the financial constraints, the finalists in the film category will receive a R35 000 stipend with which to produce their winning work.

Gavin John Risi's intricate work.

Vusi Sithole's bracelet.

"Through the PPC Imaginarium Awards, we aim to maximise opportunities for young emerging artists and creatives in art and design disciplines in South Africa. We are excited to launch this competition and hope to unearth and support our local design talent. Cement may be a grey powder, but the magic of its potential lies in its application through innovation and creativity," said Daniel van der Merwe, PPC's technical specialist and qualified architect.

Evert van Engelenhoven's winning ring.

The awards are open to South African citizens, resident holders as well as foreign students with study permits, who are not professionally established in their respective fields. Entries may be submitted by individuals or team collaborations, and artists and designers may enter as many categories, with an original artwork for each category.

To up-skill artists and designers on the medium of concrete, PPC will host one-day workshops across the country from April to June. Each session demonstrates

best practices in working with concrete, judging criteria and technical tips that are essential to facilitate the level of entries.

In addition to the monetary incentives, the winners will also receive exhibition opportunities and mentorship from various thought leaders in the respective industries, nurturing them for their career.

The thought leaders include trends analyst, Dion Chang; Hanneke Schutte, writer and film director; Diane Victor, renowned artist and printmaker; architect, Mokena Makeka; Adriaan Hugo, industrial designer; and Verna Jooste, jewellery designer.

From international travels, Chang has observed that concrete is becoming a 'must have' in terms of design trends. "Concrete and metal were very visible in many of the collections at Paris and London Design weeks," he said.

Zyma Amien's YCSA artwork.

Bongani Dlamini and Ncedani Fobo

Van der Merwe reiterates Chang's sentiments and calls concrete the 'liquid stone' of the 21st century.

"We experience aesthetic pleasure in the sensuous combinations of materials; in their unfamiliar assemblage of colours and textures. Yet it is often in the honesty and rawness of materials such as concrete from which we take the most pleasure. The popularity of concrete is indicative of its creative appeal, versatility and adaptability. Portland cement lends itself to great innovation and experimentation in practically any design discipline. I encourage artists and designers to explore their creativity for this year's PPC Imaginarium Awards," he concluded.

The finalists in each category will be exhibited at the PPC Imaginarium Awards exhibition in Gauteng in January 2015 and the overall PPC Imaginarium winner will be announced in Cape Town in February 2015.■

Regardt van der Meulen's concrete shoes.

For more information about the PPC Imaginarium Awards, visit http://ppcimaginarium.com

Speedy cement delivery helps Jeffreys Bay Wind Farm team

The Jeffreys Bay Wind Farm site spans 3,700 hectares on which 60 wind turbines will be erected. The project will supply the Eskom 132kV grid line and generate 460,000 MWh per year, supplying enough clean renewable electrical energy to power more than 100,000 average South African households.

The Wind Farm is an extremely fast-tracked project. A consortium to provide civil and electrical infrastructure was formed by Murray & Roberts Construction companies, Concor Civils and Concor Roads & Earthworks, in joint venture with Consolidated Power Projects (Conco). The project commenced in November 2012.

Murray & Roberts Construction's role included constructing 50 km of gravel road, the 60 concrete wind turbine foundations, N2 highway route modifications, building an operations and maintenance structure, and trenching for 200 km of MV cabling to the substation.

Each turbine foundation required 335 m^3 of concrete and, says Joe Nell, project manager for the consortium: "We chose AfriSam due to our longstanding relationship with the company, the quality of their cement, its suitability for the project, the pricing and their ability to deliver timeously."

Globeleq, the majority shareholder, is jointly managing the Jeffreys Bay Wind Farm project. The company is an independent power industry leader in emerging markets, participating in nearly 14,000 megawatts (MW) of generation capacity in over 25 countries. Consortium partners include Old Mutual, Thebe Investment Corporation, Mainstream Renewable Power South Africa, Jeffreys Bay Community Trust, Enzani Technologies and Usizo Engineering.

Each of the turbine foundations at the Jeffreys Bay Wind Farm project required approximately 335 m^3 of concrete and AfriSam was selected as the supplier of choice for this project.

Aerial view of part of the huge site.

The Wind Farm's civils and electrical infrastructure consortium selected AfriSam's HSC 52.5N cement for its early strength properties. "The customer required cement that was able to provide the high strengths required for the turbine foundations and also expedite the fast-track construction programme. This cement is cost effective, and has good workability, strength and durability properties," Meredith Jordan, AfriSam sales manager: Building, Civil and Manufacturing (BCM), explains.

"Delivery of the 4,000 tons of cement began in March 2013 and the last consignment was delivered in December 2013. The bulk of the product was sent from our Ulco factory 80 km outside Kimberley. This equates to a lead distance of 1,000 km each time we made a delivery. Our depots in Queenstown and East London were on standby as backup and we were able to meet all our deadlines," Jordan points out.

Nell says that the civils and electrical infrastructure project consortium was given ten milestone dates with which they needed to comply. "We were under extreme pressure but we have managed to meet the first nine milestones timeously and we are on track to achieve the final milestone in the first quarter of 2014. The seamless and expeditious delivery of cement by AfriSam has played a large role in the successful attainment of the turbine foundation deadlines".

Murray & Roberts' Concrete Centre of Excellence was tasked with developing the optimum concrete mix for the high temperatures generated beneath the turbines. The mix also needed to be extremely durable, so the concrete had a fair quantity of fly ash added to accommodate the demands of the end application.

"We established a concrete batching plant at a commercial quarry close to the project and the concrete was transported to various locations on this 3,800-ha site. It was critical to micro-manage the interface with all parties, including AfriSam, Conco and Siemens, to ensure that the specified delivery periods were concluded without incident. Apart from the huge physical extent of the project's footprint, at peak we had 650 people on site from the civil and electrical consortium and Siemens, leading to complex logistical planning," Nell adds.

Nell says all the roads and the foundations are now completed and the environmental rehabilitation process is under way. "Of the cabling installation, 97% has been completed and the substation was energised on 6 December 2013. Siemens erected 70% of the turbines and the first two circuits were commissioned prior to the December 2013 shutdown. All component deliveries were completed in February 2014 and the erection of the remaining turbines will be completed before the handover in April 2014."

"Joe Nell and his team made the logistics very easy for AfriSam by having all the necessary documentation in place prior to deliveries. Our healthy and collaborative relationship with the project team was a huge enabler in the smooth workflow process" Jordan concludes.■

More information from Maxine Nel,
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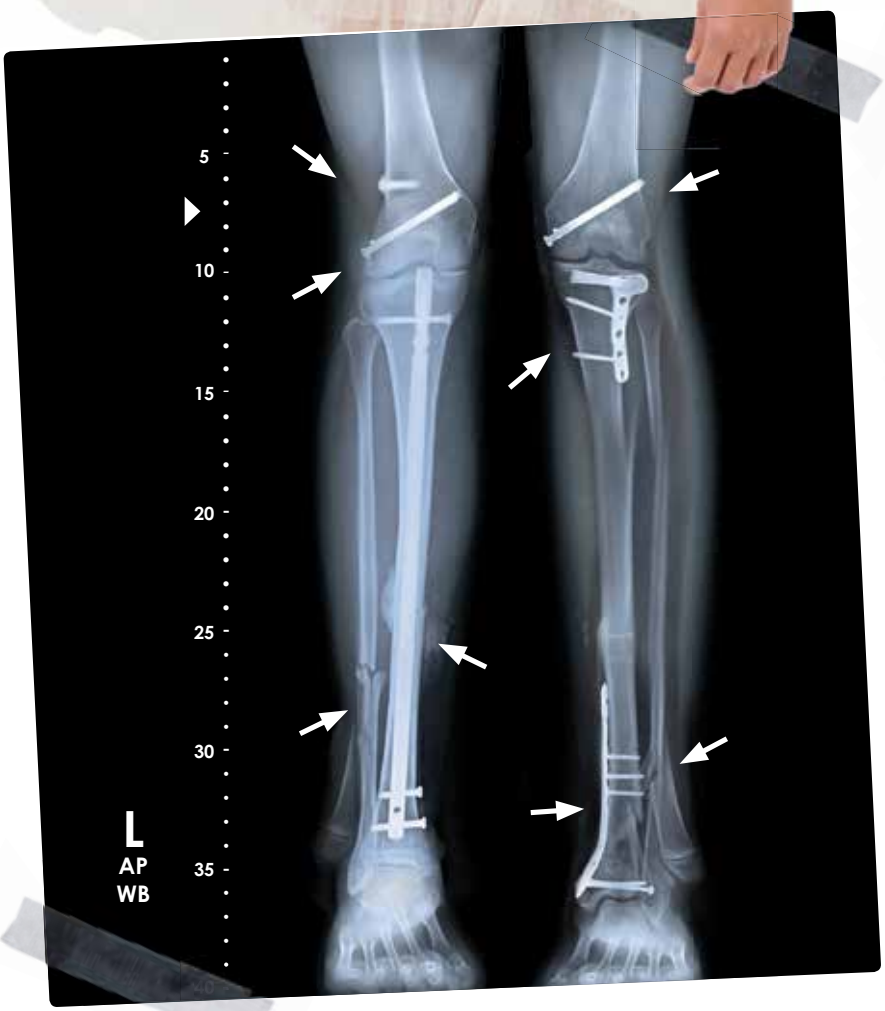

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Two Oceans Aquarium extension and refurbishment

Aurecon has been appointed as structural, civil and wet services engineer on a new large-scale exhibit as well as the complete refurbishment of the two existing main exhibits at the Two Oceans Aquarium at the V&A Waterfront in Cape Town, South Africa.

The aquarium opened its doors in 1995 and prides itself on welcoming visitors for 365 days a year. It is one of the top tourist attractions in Cape Town and houses over 3,000 living sea animals, including sharks, fishes, turtles and penguins.

Major refurbishment required

The walls of the existing I&J Predator Exhibit and the Ocean Basket Kelp Forest Exhibit were built with a waterproof lining intended to provide defence against water ingress.

Soon after opening, this waterproof lining started coming away from the concrete in certain areas and, in 1999, aquarium staff started monitoring the ingress of chlorides into the concrete. By 2013, contamination in some areas was found to be beyond acceptable levels.

"Aurecon was contracted to develop a strategy that rendered the tanks structurally safe for the short term (3-5 years). This involved reinforcing critical areas by attaching custom-shaped steel plates. This strategy was implemented in 2013 in order to ensure that the aquarium remained operational and open to the public. To extend the tanks' life for at least a further 30 years, however, a complete refurbishment of the tanks is necessary," says Henry Herring, Aurecon project manager.

Aurecon will be drawing on the design experience they gained when working on the Ushaka Marine World Aquarium in Durban and their wide-ranging experience in designing water retaining structures to ensure that the material specification and design of the new tanks is water-tight in the aggressive aerated marine environment of the aquarium.

"The highly complex refurbishment programme of the older tanks minimises the need for major demolition. It involves remedial work to the existing concrete, the rebuilding of the concrete rebates for the acrylic viewing panels, the installation of a galvanic protection system and, finally, a full concrete re-lining of the inside of the tanks. This programme will commence in 2015," comments Herring.

Exciting extension project called for

In order to house many of the animals in the current two main exhibits, an extension project in the form of a new large-scale exhibit is underway. "The exhibit will have a capacity of 1.2 million litres and will feature a 9 m x 4.5 m viewing panel, and an acrylic walk-through tunnel," says Herring.

It will house large ocean predators and will aid in drawing crowds while the existing tanks undergo refurbishment.

Construction of the new exhibit officially commenced in January 2014 and is slated for completion by December 2014.

"Aurecon is proud to be working on a project that showcases the best of the continent's sea life. The Two Oceans Aquarium is a key tourist attraction in Cape Town and we look forward to helping ensure it continues to operate as a beacon of excellence," concludes Herring.■

Photograph courtesy of mlh architects & planners

More information from Jody Boshoff,
Tel: +27(0)12 427 2066 / www.aurecongroup.com

A tank housing some of the 3 000 sea animals in the Two Oceans Aquarium forms a striking background for a chamber music performance.

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Lesotho's Metolong Dam close to completion

The massive wall of the Metolong Dam dwarfs construction vehicles.

Shutters on the up-stream face of the Metolong Dam.

Ash Resources, South Africa's leading manufacturer and supplier of fly ash products, is adding the Metolong Dam Water Supply Programme (MDWSP) to their impressive list of water infrastructure projects in Lesotho. MDWSP is designed to cater for the long-term needs of the lowland areas of Lesotho. In particular, it will provide a new raw water supply for the capital, Maseru, and the surrounding area, which has historically suffered from water shortages.

Ash Resources has supplied approximately 22,000 tons to date of its classified siliceous fly ash DuraPozz® to Sinohydro, the Chinese contractor for the key component of the MDWSP, the Metolong Dam, which impounded on 17 February 2014, together with its inlet tower and associated pumping station. A further estimated 11,000 tons is required to complete the dam contract, which is scheduled for September 2014. Ash Resources has also delivered approximately 4,000 tons of fly ash to other contractors and readymix producers for the construction of the MDWSP's water purification works, a raw water reservoir and portions of the pipelines.

Metolong Dam is a 83-m high roller-compacted concrete (RCC) dam with a design crest length of 280 m, constructed on the Phuthiatsana River, 35 km from Maseru. Contractor, Sinohydro, established an on-site batch facility to provide the estimated requirement of 280,000 m³ of RCC and 40,000 m³ of conventional vibrated concrete (CVC). The Beijing-based contractor is a top-ranking global construction and hydropower group that is involved in a range of projects on the African continent and has worked on projects such as China's Three Gorges Dam, the world's largest water scheme.

"Our association with Sinohydro began over three years ago with the construction of the Kariba North Bank project in Zambia," said David Kanguwe, Ash Resources' commercial manager. "For Metolong Dam, they required a consistent quality classified fly ash and wanted to deal with a company that had a record of reliable supply of large quantities of fly ash to major dam construction sites."

A high fly ash content in the RCC for dam construction helps control heat of hydration during mass concrete pours. Arising from discussions in Maseru with consultants, Arcus GIBB, and Sinohydro, Lafarge's Quality Department Southern Africa (QDSA) advised on the mix designs for RCC and CVC and conducted laboratory evaluations. Sinohydro accepted QDSA's mix design recommendations for the RCC mix to contain 66% and the CVC mix (grade 25/38) 52% of Ash Resources' DuraPozz® classified siliceous fly ash.

The recent abnormal rainy season has had a significant

impact on the Metolong Dam construction programme, which has contributed to pushing back the anticipated completion time of April by five months. Delivering to the Metolong project site had its own challenges: in addition to coping with border crossing delays, the final 18 km of dirt road were frequently flooded and damaged by the rains. Apart from this, the very nature of dam construction leads to considerable variance in the fly ash usage – when the conditions were right, the contractor did major non-stop pours, and the consumption of cementitious materials increased dramatically. However, Ash Resources has extensive experience to call on from supplying the Lesotho Highlands Water Scheme and, in particular, supplying almost a quarter of a million tons of fly ash for the construction of Katse Dam.

"While being able to guarantee supply of large quantities of consistent high quality fly ash from our SANS 50450 certified plants is a major competitive advantage for us, our aim is to satisfy a construction contractor's needs in all respects," adds Kanguwe. "This is where our logistics team plays a major role in ensuring fly ash is always available on site no matter what delivery challenges are encountered."

"We are very pleased that we chose the right fly ash supplier in Ash Resources," comments Mr Xie Yunhua, deputy project manager of Sinohydro. "They not only lived up to their guarantees but they lived up to their reputation for acting as committed supply partners in a project. The company gave us outstanding support so that we never ran out of fly ash. If we build other projects in Lesotho or South Africa, we will select Ash Resources as the fly ash supplier too."

"Water is such a vital commodity in Southern Africa: it can completely transform the economies and quality of life in disadvantaged communities. This makes water infrastructure projects especially important to all of us at Ash Resources," says Kanguwe. "We are proud to maintain our status as the preferred supplier of fly ash for water schemes in Lesotho and look forward to building on our good relationship with Sinohydro." ■

More information on the website at: www.ashresources.co.za

Metolong Dam outlet works.

Africa's first multi-span prestressed concrete ribbon bridge

By C.J. Meintjes

The new pedestrian bridge over the Metolong Dam in Lesotho spans a section of the dam where the tail-water on the Phuthiatsana River will be approximately 215 m wide by 45 m deep. The design challenge was to find a cost-effective solution for a fairly long bridge, with a relatively lightweight deck, to span a deep and steep-sided gorge. Of the alternatives considered, a prestressed concrete ribbon bridge seemed best suited for the task, particularly in an area where hard, massive sandstone is available for anchoring the bridge abutments.

The completed Metolong Dam Pedestrian Bridge.

The bridge deck is continuous over two spans 102-m and 127,5-m long respectively. The total walkway length, including the approaches over the abutments is 249 m. The central support of the bridge consists of a 35-m-tall reinforced concrete pier, seated on top of a sandstone cliff 15 m above the river bed.

Jeffares & Green, part of the Lowlands Waterworks Joint Venture, designed the bridge for the Metolong Authority, at a location where local communities on either side of the Phuthiatsana River need easy access to each other. Social consultants, in discussion with local communities, identified this location as being a regular crossing point for trade, social interaction and access to Sefikeng and Thaba Bosiu.

The bridge was built by civil engineering contractors, EXR Construction, at a total cost of R9,5 million.

Conceptual design

The walkway of the prestressed concrete ribbon bridge forms a catenary that spans continuously from one abutment over a pier towards the second abutment.

A catenary bridge consists of a walkway suspended on, or from, tension members anchored to abutments at their respective ends. These tension members transmit the total

Launching of deck elements.

load of the bridge and its imposed loads to the abutments, while walkway elements transmit local loads to the tension members only. The main tension members are represented by two longitudinal members at the bottom of the deck. The planks spanning transversely between these tension members represent the walkway, and the handrails have no structural value apart from providing safety for the users.

Post-tensioning the catenary is required to counteract tensile stresses that will later be introduced to the ribbon by its required live loads. Such post-tensioning cables will be additional to the main bearer cables, will run inside ducts placed inside the concrete deck along the length of the bridge and are tensioned from the abutments. It will impose an

Drilling for rock anchors.

Stringing the main cables between abutments.

upward lift on the bridge deck and in doing so place the ribbon under compression in its longitudinal direction. The abutments may also need to be anchored back to accommodate very large horizontal forces imposed on it by the catenary.

Jeffares & Green's previous prestressed bridge

Prestressed ribbon bridges are user friendly as there are no bearings or expansion joints needing maintenance. A frequent question is whether these bridges can withstand high wind loads.

In 2007 the first prestressed concrete ribbon bridge, the pedestrian bridge over the Mkomaas River in KwaZulu-Natal, was built in Africa. It has a clear span of 150 m – equalling the world record for this type of bridge.

The bridge was also designed by Jeffares & Green and the designers were anxious to anticipate the worst possible conditions that could occur. Thus they had to investigate whether the bridge's behavior during strong winds would be acceptable to users, and also to investigate the structural integrity of the bridge during extreme wind conditions.

The report received was based on wind tunnel tests, computer simulations, an extensive literature review and contact with a researcher of similar projects. It concluded that wind was unlikely to play a significant role in the lifespan of the bridge and that for moderate to large wind speeds, the bridge could still be used by pedestrians. Under winds gusting up to 150 km/hr the report also showed that the bridge would remain intact.

Another question is whether the bridge resonates excessively

continued on page 36

Launching precast deck elements using the main cables.

while people are walking over it. Even though these bridges have low natural frequencies, experience and literature have shown that the oscillations created by walking over these bridges remains within acceptable limits.

Construction

Construction of the Metolong Dam Pedestrian Bridge was completed in December 2013. It was only the second prestressed concrete ribbon bridge built in Africa and the first multi span bridge of this kind on the continent. Construction of the bridge progressed without major incident.

The precast concrete elements were launched on rollers, devised by the contractor. However, on-site adjustments to the applied cable forces were needed to level the bridge deck elements, transverse to the direction of the bridge. This can be attributed to the combined effect of a narrow deck and small differences in the large deflections between the sets of main bearer cables on either side of the walkway. Prospective designers of similar bridges should make allowances for a degree of on-site 'tweaking' of these cables. The total yield strength of all main bearing tendons used in the deck is 13,95 MN and the total yield strength of all post-tensioned tendons used in the bridge deck is 4,45 MN.

The maximum calculated horizontal force applied by the catenary to each of the abutments is about 1100 tons, which, pending the degree and extent of fractures in the rock mass, could slide a large block down the side of the valley, if not properly anchored. Therefore the design presumed the possible existence of near-surface, extensive, inclined fractures in the rock mass. Consequently, 6 No x 3,10 MN cable ground anchors were installed through each abutment, inclined 55° above horizontal.

The drilled holes for the anchors were water-pressure tested to confirm that grouting around the anchor strands would be effective, and 'reserve' ducts were cast into the abutments in case it was necessary to replace any anchor that did not perform satisfactorily. Fortunately, all anchors performed satisfactorily.

The steel strands of the cable ground anchors in the fixed anchor zones are all provided with 'double corrosion protection' of outer grout, corrugated PVC ducts and inner grout. In free-straining zones, grease filled HDPE sheaths were provided around each steel strand, in addition to the grout and PVC ducts provided in the anchor zones.

Conclusion

The Metolong Pedestrian Bridge, proves that prestressed ribbon bridges are ideally suited for cost-effective pedestrian access over deep valleys and relatively wide expanses of water.

The lightweight bridge is fairly easy to construct and fulfils the criteria for both form and function. Despite a relatively low natural frequency, the speed and magnitude of oscillations from live loads, are within acceptable limits.■

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The completed Metolong Pedestrian Bridge.

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PPC entrenched as a legacy builder: De Hoop Dam

South Africa is currently experiencing a surge in infrastructure development projects, which aim to better the lives of all South Africans. The latest, the De Hoop Dam project, which will see a significant rise in potable and irrigation water to people living in the Limpopo and Mpumalanga provinces, was opened on 24 March 2014.

South African President, Jacob Zuma, attended the opening ceremony which took place just after the country celebrated National Water Week (17 to 23 March).

"The dam will be used for two primary purposes. The first is to supply water to the towns, industries and poorly serviced rural communities in Sekhukhune, Waterberg, and Capricorn Districts of the Limpopo province. Secondly, the dam will supply water to the mines to help unlock vast mineral deposits, mainly the platinum group metals found in the region. The dam will therefore be a catalyst for both social and economic development for this region," said the President.

De Hoop Dam was opened on 24 March 2014.

At 347-million cubic metres, the De Hoop Dam commissioned in 2007 is one of the largest concrete dams in South Africa. It cost in the region of R3.5 billion to complete.

The Dam was built using cement supplied by PPC Ltd, a pioneer in the southern African cement industry. At its completion, construction of the Dam had consumed 94,963 tons of cement.

"We are thrilled that the Department of Water Affairs chose our products to construct this vital infrastructure project. We have been a part of South Africa's infrastructure development for over 120 years and we plan to continue to be for the foreseeable future," said Naseam Ismail, PPC's Mpumalanga area manager.

The De Hoop Dam is the first project that forms part of the Presidential Infrastructure Coordinating Commission, which seeks to boost infrastructure development in the country and stimulate economic growth and job creation.

The construction of the De Hoop Dam also signalled several firsts for PPC and the construction of concrete dams in the country. At the 2013 Fulton Awards, the project won 'Civil Engineering Structure' and 'Sustainable Concrete' awards.

Work done at the De Hoop Dam Project led to significant simplification of the construction process and achieved one of the highest construction rates attained in South Africa, with a peak of over 130 000 cubic metres of roller-compacted concrete placed in one month.

The De Hoop Dam Project is also a flagship project for the Department of Water Affairs and will address a significant portion of future water needs in Limpopo Province.

During the 2014 State of the Nation Address (SONA) President

The De Hoop Dam's Vibratable RCC was a world-first use of Immersion Vibrated RCC.

Celebrating the setting of a new RCC placement record.

Zuma reiterated the call for government, business and labour to work together and come up with collaborative solutions to enable South Africa's economy to grow.

"We have to work together as government, business and labour to grow our economy at rates that are above 5% to be able to create the jobs we need. Fortunately this collaboration is already taking place," said President Jacob Zuma.

The President went on to say that progress had been made during 2013 to engage with various businesses on specific steps that the government could take to "make doing business in South Africa easier."

"The willingness of the private sector to engage with government around speeding up infrastructure delivery is very clear; there are many initiatives. The Business Leadership of South Africa has created a working group that is interacting with government. Everybody is very excited. It is perfectly clear that everybody needs a new way to ensure infrastructure can be delivered," said Ketso Gordhan.

About PPC Ltd

As the leading supplier of cement and related products in southern Africa, PPC Ltd has nine manufacturing facilities and three milling depots in South Africa, Botswana and Zimbabwe. Related products include aggregates from quarries in Gauteng and Botswana. PPC Lime supplies metallurgical grade lime and burnt dolomite.■

More information from Nomzamo Khanyile, +27(0)11 386 9309 / www.ppc.co.za

A view across the Dam's rising waters.

Summer rains a challenge for Gauteng Piling at Pomona

Leading piling company, Gauteng Piling, has been awarded the contract for the piling for a new large-scaled warehouse for Value Logistics in Pomona, Kempton Park.

The main contractor for the 9,100-m^2 warehouse project in E.P. Malan Road is Bruce Kirchmann Construction.

Martin Eygelaar, contracts manager of Gauteng Piling, said the contract calls for 152 auger piles. Auger piles are deep foundation elements that are cast in place, using 450-mm, 500-mm or 600-mm-diameter flights. The process is carried out by auger drills that excavate the piling holes drilled into the soil to pre-designed depths, which for the Value Logistics project vary between 8 to 10 metres.

"After reaching the required depths, the auger hole is cleaned, and concrete is placed directly into the hole from the readymix truck. Reinforcing steel is then lowered into the wet concrete. The finished foundation element resists compressive loads. The technique is globally popular and is being used to support towering buildings, tanks, towers and bridges," Eygelaar explained.

Gauteng's heavy summer rains – coupled with underground moisture – posed an early unexpected challenge for Gauteng Piling at Pomona. "After extensive pre-piling geotechnical soil tests, we were prepared for a relatively high level of moisture in the soil but, of course, none of the preliminary soil tests could predict the heavy summer rains that followed and led to the underground water table rising much higher than expected.

"Eventually, we had to revert to the traditional 'drill and cast' piling method instead of auger piling because the pile bore could not be sealed against water ingress. 'Drill and cast' operations call for a concrete truck to be on standby right next to the drill rig. When the rig has reached the required depth, the operator immediately lifts the extracted soil to the surface, and concrete is then cast – within seconds – to prevent water ingress and the piles from collapsing," he stated.

Another major challenge on site was exceptionally stringent health and safety standards imposed by the contractors and designers. This involved certification of lifting equipment, provision of maintenance record of auger rigs, and regular inspection of the rigs and other similar health and safety standards. "Although far more stringent than the norm on most building projects, Gauteng Piling actually welcomed this exceptional emphasis on health and safety as it reinforces our own company's philosophy. As members of the Master Builders Association North, we value our staff's safety above financial profits," Eygelaar said. "In fact, we would like to help the contractors and professional teams lift this project to award-winning status in a future MBA North safety competition."

Gauteng Piling is using two auger rigs for the Value Logistics warehouse project: an MF and LDH machine – both chain-and-sprocket machines. The rigs provide exceptionally high drilling speed which allows sufficient time to place the concrete and also helps to remove the risk of collapse and ingress of water inside the bore.

Bruce Kirchmann, MD of Bruce Kirchmann Construction, commenting on the Pomona project, praised Gauteng Piling's 'professionalism'. "The company has always provided us with a cost-effective product, delivered professionally and within deadline," he stated.

Established in 1996, Gauteng Piling (led by MBA North immediate past president, Hennie Bester), has completed close to 1,500 major piling contracts. The company has attained 135% BBBEE recognition and is strongly committed to the future development of emerging contractors in all facets of the building industry. Simon Linakane, Gauteng Piling's quantity surveyor, was recently elected to serve on the executive committee of Master Builders Association North.

Gauteng Piling has a fleet of 23 straight-shafted augercast machines, three cranes, four bore rigs and six Grundo hammers (mainly used for residential foundations), as well as three machines for lateral support.

The company recently completed the contract for the piling for the construction of southern African's largest single-phase retail centre, Mall of Africa, which called for over 400 piles. Other recent contracts handled by Fourways-based Gauteng Piling include the piling for the Fire & Ice Hotel in Pretoria, The Grove Shopping Centre in Pretoria, and the Bon Accord Police Station, also in Pretoria. The company also handled the piling requirements for a new FAW auto dealership in Croydon in Ekurhuleni.■

More information from Hennie Bester,
Tel: +27(0)11 465 7751 / www.gautengpiling.co.za

Gauteng Piling is using two auger rigs for the Value Logistics warehouse project: an MF and LDH machine. The rigs provide exceptionally high drilling speed which allows sufficient time to place the concrete and also helps to remove the risk of collapse and ingress of water inside the bore.

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Ultimately, Grace feels, it is the long-term value the product or system has for their customers that is most important.■

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Geopolymer concrete: a practical approach

By Cyril Attwell, Concrete Centre of Excellence, Murray & Roberts (Pty) Ltd, South Africa

Alkali-activated material has a history stemming from 1939; the material is generally referred to as geopolymer after a classification by Davidovits in 1979. Significant strides have been recorded by several authors.[i]

In South Africa, CO_2 tax will be implemented from January 2015[ii] making alternatives to high-CO_2-emission portland cement concrete in construction critical.

Cement production is estimated to contribute 5-8% of total CO_2 emissions worldwide[iii]. Reducing the CO_2 footprint of concrete is a priority for the South African construction industry.

South Africa's reliance on coal-fired power stations for most of its electricity and the availability of substantial metal resources, makes pulverised fuel ash, (PFA), and slag obtainable in large quantities. Efficient use of this by-product/waste can assist economic growth by decreasing the material costs of construction and increasing the durability of structures. This can be enhanced by better utilisation of non-virgin aggregates (slag and bottom ash) which are generally not used as concrete aggregates because of their density and vesicular nature.

Investigations into alkali-activation using excessive sodium silicate, (waterglass), and sodium hydroxide resulted in a material that set rapidly with significant shrinkage, making it economically and structurally unsuitable. By evaluating the crystallography of the PFA and slag monomers and polymers which trap water molecules in the polycondensation phase, another approach to the design process was adopted and implemented for laboratory testing. After successful laboratory trials, a site application was recommended for further data analysis into the potential of the material as an alternative to portland concrete. The plastic and hardened properties of the material required site verification.

The elements chosen were 450-mm-thick surface beds without reinforcement. These were chosen for ease of access when the container terminal was operational in case any of the alkali-activated material failed prematurely and needed replacement. The project specification required compressive strengths of 40 MPa and flexural strengths of 3.5 MPa.

Site testing was used to ensure the alkali-activated concrete achieved a workability enabling the material to be easily placed within 3 hours.

The concrete's plastic and drying shrinkage were evaluated by eliminating all protection and air-curing the concrete without moisture or curing membranes.

Further testing was conducted by a SANAS-accredited laboratory to evaluate shrinkage according to SANS 6085.

Durability testing was conducted on cores taken from the finished slab in areas with visible cracks or surface weakness.

Theory

Alkali-activation has been reviewed and utilised in the USSR[iv] in concrete since 1960 and in several other disciplines. Medical technology is currently using alkali-activation in research of IRR, (insulin receptor-related receptor)[v].

However, little work has been undertaken on the optimal balance of alkali-activator and by-products/wastes to form a thermally and volumetrically stable binder that is economically feasible and safe.

Because shrinkage values greater than the standard 0.06% of portland cement concretes are often attained, use of alkali-activated materials in structural and most non-structural applications has been discouraged. The effect of accelerating the natural carbonation that occurs on the surface of the material was also reviewed in an attempt to limit shrinkage to below 0.06%.

Experimental Methods

The following tests were conducted on the alkali-activated material on site at the City Deep Container Terminal:

- Initial drying shrinkage and wetting expansion of concrete – SANS 6085:2006
- Testing of Hardened Concrete - Compressive strength – SANS 5863
- Testing of Hardened Concrete - Flexural strength – SANS 5864
- Drilling, preparation and testing of cores – SANS 5865
- Concrete durability – SANS 3001-CO_3

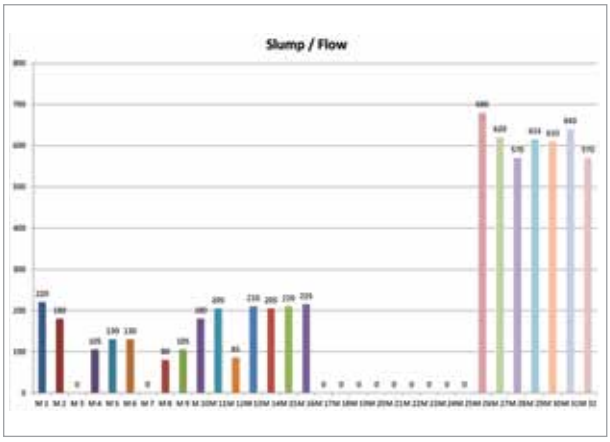
The following methods were adhered to:

- Sampling of freshly mixed concrete – SANS 5861-2
- Consistence of freshly mixed concrete, slump test – SANS 5862-1
- Consistence of freshly mixed concrete, flow test – SANS 5862-2
- Making and curing of test specimens – SANS 5861-3.

It must be noted that due to the experiment relating to the carbonation, additional test specimens were cured in ambient conditions of 22-25°C with humidity below 45%.

Results

A total of 32 laboratory trials using the aggregate available for site were compiled. Some of the results are summarised below;



A slump/flow graph of workability achieved in laboratory trials, SANS 5862-1 &-2.

The above graph indicates that several mixes achieved a flash set or no workability.

continued on page 44

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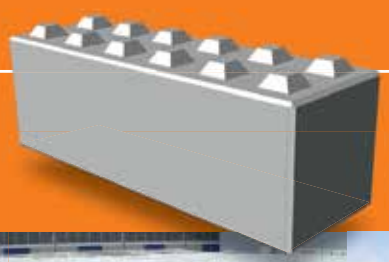

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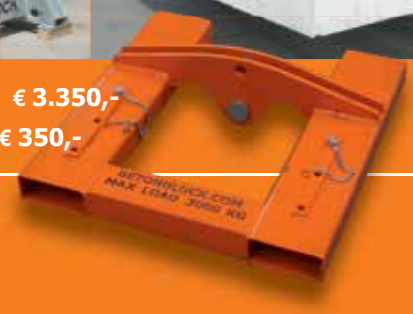

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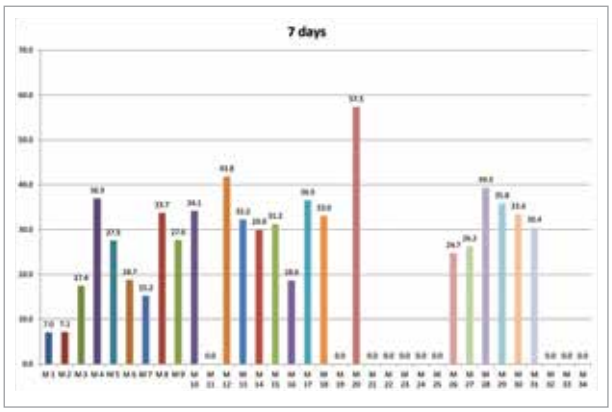
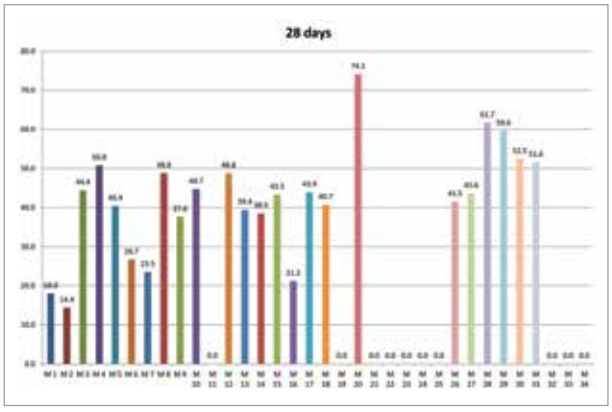


Compressive strength at 7 days in laboratory trials.



Compressive strength at 28 days in laboratory trials.

Several criteria governed the choice of which design to apply on site:

Compressive strength	40 MPa minimum at 28 days
Workability	150 mm slump minimum
Workability retention	2 hours in excess of 75 mm slump
Costs	Similar or reduced material costs

Seven of the concrete mix designs shown in the graphs above complied with these parameters, six of the mixes (M26-M31) were based on the most feasible original design, (M10).

Considering all the parameters, the six filtered concrete mix designs did not optimise the original M10 any further, so M10 was chosen as the concrete mix design to use on site.

Alkali-activated concrete on site at the City Deep Container Terminal.

Alkali-activated concrete, City Deep container Terminal after 3 days.

In addition to the usual criteria, initial temperature and time taken for the material to reach ambient temperature were measured to understand the consequences of batching varying volumes. The 1st, 2nd, and 3rd readymix trucks were batched with 2 m³, 4 m³ and 6 m³ respectively. The 4th batch was the required final quantity of 3 m³.

Truck No.	Volume of material (m³))	Workability (mm)	Initial Temperature (°C)	Time to Ambient (min)
1	2	165	31.4	38
2	4	180	32.6	43
3	6	190	33.7	46
4	3	185	32.3	42

Plastic properties on site, City Deep Container Terminal.

The hardened properties were tested by three different laboratories:

- The site laboratory – SANS 5863
- AfriSam laboratory – SANS 5865 & SANS 3001-CO_3
- SANAS-accredited independent laboratory – SANS 6085 & SANS 5864

Tests	Results	Parameters
Compressive Strength (MPa)	51.0	40 minimum
Flextural Strength (MPa)	4.2	3.5 minimum
Shrinkage (%) SANS 6085	0.028	0.045 maximum
Shrinkage (%) reduced humidity (45%) SANS 6085	0.022	0.045 maximum
Oxygen Permeability Index	9.7	9.4 minimum
Chloride conductivity	0.43	2.5 maximum
Water Absorption	9.5	12.0 maximum

Hardened properties, at the City Deep Container Terminal.

Additional test specimens were taken and cured at lower humidity, (below 45%) and tested further as per SANS 6085.

Analysis

The plastic and hardened properties of the alkali-activated material comply with project requirements and SANS

specifications and had conformed to all the SANS test methods listed in the experimental methods. Marginal increases in initial temperature were measured on site as expected; however, all batches of material achieved ambient temperature within an hour, confirming the minimal effect of mass on temperature.

The carbonation film-forming occurred between 15-20 minutes after casting and prevented plastic shrinkage cracks from occurring. In addition, this protective layer increased the estimated workability retention established in the laboratory. Due to the strength of the carbonation layer, the concrete placement team could move on top of the material within 15 minutes without penetrating the surface.

When reconsolidated with poker vibrators, the protective layer was broken and the fluid material beneath was easily reconstituted with the fresher material above without any layered differences, which was verified on the cores drilled for durability testing.

The shrinkage results are approximately 40 - 50% of the shrinkage generally achieved in good concrete. The low heat in mass indicates a benefit of the alkali-activated material compared with higher heat of hydration of portland cement concrete.

A ratio of flexural to compressive strength of 8.2% was achieved on site, comparable to portland concrete.

Seven-day compressive strengths were approximately 75% of 28-day strengths; similar to the ratio achieved in the laboratory.

Durability results show high resistance to chemical attack and service life design modelling in excess of over 50 years.

Conclusions

Some of the benefits of using alkali-activated by-products/wastes are;

- Lower heat of hydration
- Limited plastic shrinkage due to the protective carbonation layer
- Air-cured material
- Low potential drying shrinkage
- High chemical resistance
- Lower labour costs due to protective carbonation layer
- Low material costs
- Lower CO_2 footprint than portland concrete

The benefits of using alkali-activated by-products/wastes are numerous and the material is similar or superior to portland concrete in several technical aspects.

Suggestions for further research

Further research should be undertaken to understand the reaction kinetics of the protective carbonation layer and its limitations, i.e. underwater concreting. The creep of this material must be tested. It may be possible, by adjusting the chemistry, to enhance the flexural to compressive strength ratio by changing the resultant crystallography of the geopolymer. ■

i Alkali-activated Cements: Opportunities and Challenges, Chem. Concr.Res., pgs 249-254, (1999)

ii Carbon Tax Policy Paper, Reducing greenhouse gas emissions and facilitating the transition to a green economy, Department of National treasury, (May 2013)

iii The effect of activator concentration on the residual strength of alkali-activated fly ash pastes subjected to thermal load, Construction and Building Materials, (2011)

iv High Strength Slag Alkaline cements, 7th International Congress on the Chemistry of Cement, Glukhovsky (1980)

v Structural Determinants of the Insulin Receptor-related Receptor Activation by Alkali, Deyev, Mitrofanova, Zhevlenev, Radionov, Berchatova,Popova, Serova and Petrenko, (2013)

Pigmented roads for Sunward Lifestyle Centre

Concrete roads, coloured black with a Bayferrox inorganic pigment, were selected ahead of asphalt or other alternative road surfaces for the extensive road network in the new R220-million luxury Sunward Lifestyle Centre shopping complex in Boksburg.

Bayferrox pigments are imported by Chryso Southern Africa from Lanxess in Germany. Chryso is also the sole distributor for the southern African construction industry

Dumaine Els, Chryso SA's technical sales representative, says Netrac Investments, developers of the upmarket and strategically situated convenience and lifestyle shopping facility, had no hesitation in opting for concrete to handle the heavy vehicular traffic expected to visit the 27 stores spread over 17,000 m^2. Inside the shopping centre, the 1,000 parking bays are paved with unpigmented interlocking concrete blocks.

"The developers wanted the exceptional durability and long service life that concrete roads can provide for a shopping complex with over 340,000 people in its catchment area and likely to attract exceptionally high vehicular traffic. Bayferrox 330 black pigment was selected to make future tyre marks and oil spills less obvious."

Large quantities of Bayferrox 330 black pigmentation were also used recently to conceal spillage staining on the bunded concrete areas surrounding fuel storage tanks on Transnet's new Multi-Product Pipeline (NMPP) which runs between Durban and Heidelberg, Gauteng.

Bayferrox dosage of 16,6 kg/m^3 of concrete was used for the concrete roads at Sunward Lifestyle Centre. In total, 47 tons of pigments were utilised by main contractor, Mikon Construction of Boksburg. to achieve the required shade of black.

AfriSam's Technical Department designed the mix for the pigmented concrete used for the roads. Matthews Setlhodi, AfriSam team production leader responsible for the project's concrete requirements, says 80 to 100 m^3 of readymix was supplied from the company's Wadeville operation daily for eight months.

Lanxess' Bayferrox 330 pigment using the patented Laux Process, which produces high quality, colour intensity and colour consistency. "Bayferrox pigments are also weather-stable, lightfast, non-toxic and non-irritating," Els adds.

"In line with Chryso Southern Africa's move to dustless technology, the free-flowing iron oxide pigmentation is supplied in granular form."

Chryso SA's colour laboratory in Jet Park can measure the colour strengths of pigmentation, and help customers match colour to available concrete masonry ranges. A free leaflet *Pigmented Concrete*, is available from Els, email: dumaine@chrysosa.co.za.

Concrete roads authority, Bryan Perrie, MD of The Concrete Institute, says opting for pigmented concrete roads at Sunward Lifestyle Centre is a pioneering move for the South African commercial sector. "There certainly is potential for similar designs at shopping malls as concrete roads offer exceptionally long life in heavy-traffic situations. And using quality colour pigmentation would extend design possibilities even further.■

More information from Kirsten Kelly, Tel: +27(0)11 395 9700 / www.chryso.com

Matthews Setlhodi of AfriSam Wadeville and Dumaine Els of Chryso SA, inspecting a pigmented concrete road at Sunward Park Lifestyle Centre. Chryso SA supplied the Bayferrox pigments.

Master X-Seed awarded innovation prize

BASF was honoured in the concrete technology category at the Ulmer BetonTage 2014 trade fair in Germany, for the concrete hardener Master X-Seed® 120. "It is a great honour, and as this award demonstrates, we have developed an innovative product that will offer new business opportunities to our customers," said Herwig Heegewaldt, who is responsible for BASF's concrete additive business in Germany, Austria and Switzerland.

Prof. Dr.-Ing. Hans-Wolf Reinhardt, University of Stuttgart, Dr. Ulrich Lotz, FBF Betondienst GmbH, Christian Jahn, Editor-in-Chief BFT International, Herwig Heegewaldt, Market Manager BASF Admixture Systems Germany, Switzerland, Austria.

Master X-Seed allows very finely dispersed synthetically produced Crystal Speed Hardening crystals to be added to the concrete in a ready-made suspension as crystal seeds.

This process – known as "seeding" – speeds up the hardening process significantly, particularly during the early stage of cement hydration. Adding Master X-Seed means concrete hardens as rapidly at 20°C as concrete without hardener at 60°C. Conventional methods involve adding heat to accelerate the hardening process and thus ensure a high level of productivity.

"In developing the seeding technology, a close link between surface and polymer chemistry, as well as mineralogy and structural engineering know-how were essential. Master X-Seed is an excellent example of how our interdisciplinary approach to research allows for new applications in the construction industry and creates added value for our customers," said Dr. Michael Fischer, BASF regional market manager for concrete additives in Europe.

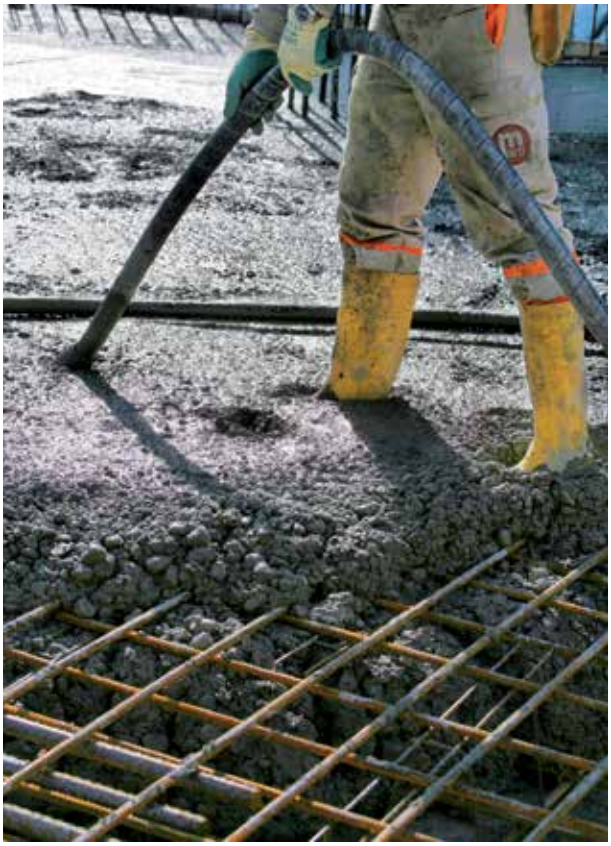
The precast concrete industry can use Master X-Seed to optimise production processes, improve concrete quality and energy efficiency, and reduce CO_2 emissions by eliminating the need for heat curing. Master X-Seed also offers new possibilities in ready-mix concrete. Reduced waiting times make placing concrete at low winter temperatures easier and concrete floors can be installed more quickly.

In contrast to conventional acceleration methods, Master X-Seed does not adversely affect the concrete's final hardness and service life. Master X-Seed is approved for use in concrete in accordance with DIN 1045-2. "As part of our extensive solutions portfolio bundled under the Master Builders Solutions® brand, Master X-Seed is setting new standards in the concrete industry. Process optimisation with lower energy input and consistent product quality is helping our customers achieve more sustainable construction," Fischer explains.

The innovation prize from the concrete component supplier industry is awarded annually by FBF Betondienst, host of the Ulmer BetonTage, and the BFT International *Betonwerk + Fertigteil-Technik* journal. Assessment criteria include the level of innovation and the originality of the nominees, relevance for the precast concrete industry, market and application potential, and compliance with technological standards.■

More information on BASF products at www.basf.com

Sika's solutions for sustainable concrete



Sika's admixtures enable production of high-quality, durable concrete.

Sika has long been considered a world leader in the innovation and production of concrete admixtures. Now Sika has identified environmental trends that are predicted will change the needs for concrete products in the future.

These challenges and the appropriate Sika solutions are:
Energy efficiency: Sika Concrete Admixtures and Systems contribute to reducing the energy demand of the concrete mix and its application.
Resource efficiency: Sika Concrete Admixtures and Systems contribute to reduce the resource demand of the concrete mix.
Climate protection: Sika Concrete Admixtures and Systems contribute to reducing the carbon emissions of concrete mixes.
Water efficiency: Sika Concrete Admixtures and Systems contribute to reducing the water demand required to achieve high-quality concrete and improve durability.

How Sika Concrete Concepts contribute to sustainable construction

Admixtures can improve the sustainability of concrete in many ways: Firstly, by significantly improving quality and performance of concrete, extending its service life. Thanks to admixtures, concrete can be used instead of other materials to extend the life of infrastructure; e.g. concrete roads greatly improve the quality and durability of highways compared with conventional road surfacings.

Further, the addition of special admixtures, such as stabilisers or water-reducers, enables use of alternative and recycled materials, such as recycled aggregates, to produce good quality concrete. Finally, the energy required to produce certain cement or concrete mixes will often be positively impacted

A leader in innovative admixtures, Sika Concrete Concepts contribute to sustainable construction.

by the use of admixtures. One example is adding water-reducing and accelerating admixtures to obtain high early strength in precast concrete, greatly reducing or even completely replacing external heating of elements.

Sika's Sustainable Concrete System components

1. **Durability:** Several admixtures enable the production of concrete with extended durability, even in aggressive environments. For example, Sika® ViscoCrete® minimises porosity in the cement matrix significantly and SikaAer® improves concrete's freeze/thaw resistance.
2. **Solution:** Using the right admixtures allows for the production of specialty concretes, offering environmentally friendly applications or can be used instead of other building materials (pervious concrete, insulating concrete). Sika® ViscoCrete® - Self Compacting Concrete (SCC) enables the reduction of a structure's dimensions (wall thickness); Sika® Stabilizer - generates a stable paste layer around the aggregates; and SikaPlast® - ensures a high-quality paste.
3. **Source:** Using alternatives of recycled materials in a concrete mix often has a negative impact on the concrete's fresh or hardened properties. Admixtures can be used efficiently to counter such effects. SikaPlast® and Sika® ViscoCrete® ensure the quality of concrete produced with recycled aggregates, and SikaRapid® compensates for early strength loss by using SCM.
4. **Energy:** A lot of energy is used in producing, placing and/or curing cement and concrete. Several admixture and additive solutions enable a reduction of this process energy. Sika® ViscoCrete® or SikaPlast® offset the negative influence of cement reduction on final strength through water reduction; SikaGrind® reduces the time to grind cement of a specified fineness; and SikaRapid® supports a reduction of steam curing in precast element production.

Case study: paste volume optimised concrete with Sika® ViscoCrete®

Argos is the first cement and concrete producer in Colombia and the fourth largest concrete producer in the USA. Argos Quality Control and Concrete Technical Development collaborated with Sika's Technical Department in a challenge to further reduce water and cement (paste) content in high-volume concrete.

Their strategy focused on incorporating the latest aggregates compressible packing model, but to use a less viscous cement paste and to include SikaViscocrete. The Viscocrete technology facilitated a reduction of cement paste contents in the conventional concrete, thereby obtaining a better-quality concrete (in fresh and hardened states) and at a lower cost. The durability aspects of the cement paste reduction (for a constant w/c ratio) were studied in detail.

It was found that lower cement paste content was able to decrease four of the major challenges in concrete production: drying shrinkage, creep, abrasion erosion and liquid penetration (chloride and sulphate penetration).

Argos was able to take advantage of these new admixture technologies, thereby managing to produce better concrete, using less water and cement, while still maintaining or improving its properties. Apart from economic benefit, this company, whose manufacturing priority is sustainability, produces a smarter and more sustainable concrete.

This Sika paste volume optimisation programme has been introduced in all of Argos' main operation centres in Colombia, including Bogota, Medellin, Barranquilla, Cartagena and Cali. Following extensive laboratory trials, the field-testing phase was initiated and successfully completed.

Based on existing concrete recipes for all Argos concrete varieties the target was:

- To optimise costs of concrete mixes
- To ensure no negative influences on fresh concrete properties
- To improve the quality of hardened concrete
- To increase concrete design for sustainability

Sika Solutions

By using the Sika paste volume optimisation approach it is possible to improve hardened concrete properties while with reducing costs of the mix and improving life cycle aspects of the concept. Under this consideration, the customer achieves a significantly reduced cement content.

Fresh concrete properties: As soon as the paste volume with constant w/c ratio is reduced, the fines content of the mix is reduced. This is possible provided that the fresh concrete properties will not be negatively affected.

Hardened concrete properties: The reduction of cement content with constant w/c-ratio will result in improved concrete durability as long as the required workability is achieved.■

More information on Sika products and systems, at www.sika.co.za

Stoneflow ensures the highest quality finish to any concrete floor

4.5-mm marble aggregate and 4.5-mm red aggregate being introduced into Stoneflow black matrix.

Stoneflow was launched in the local market in 2014 as a joint initiative between three concrete flooring experts: Rock Solid Flooring — a specialist in polished concrete and Stoneflow applications, and TAL Xcalibur — an international construction systems company focusing exclusively on the manufacture and supply of specialist products for the construction industry.

The third partner in this initiative is HTC, a specialist in Superfloor polished concrete machinery for preparing, grinding, polishing and maintaining polished concrete floors. HTC is marketed locally through Superb Flooring Systems, part of the PMSA group of companies. HTC has helped to develop the grinding and polishing of the product.

Rock Solid Flooring founder Sydney Little notes that Stoneflow can be placed, polished and finished in record time. "A 100-m^2 job including floor preparation, finishing and handover, is achievable within five days when using the correct HTC equipment," he explains.

The Stoneflow flooring concept was born when the company first purchased HTC equipment for polishing concrete, states Little. "Having purchased the equipment to polish concrete floors, we realised that not all concrete floors can be polished. This is particularly prevalent in older buildings, where the concrete is not the correct MPa."

According to Little, the company undertook research and development to determine the viability of a decorative industrial screeding compound that could be placed over concrete, and then polished for a decorative finish in custom colours. "Rock Solid Flooring, together with TAL Xcalibur, finalised the development of Stoneflow flooring, which can

Mixed Stoneflow with marble aggregate being placed.

Priming coat being applied by roller with scatter sand aggregate

The remote controlled HTC 800 RX grinder with its operator. Polishing process stage 1 started.

be polished using HTC's comprehensive range of machinery."

Screed technology is available from Rock Solid Flooring that only requires a curing time of five days compared to the standard 28 days. This can be used if the project schedule demands it and if the budgets allow for this technology. The Stoneflow concept made a measurable impact on the local market when it was adopted by the Tsogo Sun hotel chain. Stoneflow has since been used in several Tsogo Sun hotels nationwide, including the Maharani Hotel in Durban in 2013.

Little says a major challenge for this project was floor preparation. "We had to remove existing concrete and place a new 30-MPa screed, which had to be left for 28 days before we could begin the grinding process. In addition, we developed custom colours to the client's specification."

Superb Flooring Systems manager for Southern Africa, Andreas Hasselmose, explains that a wide selection of HTC machinery was used for the Maharani project. "The HTC 650 RX model four-head grinder, the HTC 800 RX grinder and the HTC 270EG edge grinder were used to ensure a precisely accurate floor level. Afterwards, HTC Twister pads were used, producing the highest standard of shine and finish."

Following the project's success, the Stoneflow flooring concept has been adopted by a number of other hotels nationwide. "Following its proven performance in creating seamless flooring, the increase in demand for Stoneflow has been exceptional, and the future outlook is overwhelmingly positive, with a number of high-profile contracts lined up across South Africa," Little concludes.■

More information from Quintin Booysen, Tel: +27(0) 578 8700 www.pmsa.com

Priming completed.

Demand grows for Flowcrete floors

The car park at the Dubai Mall is the largest in the Middle East.

The hygienic floor at Fu Wai Hospital, China.

Flowcrete South Africa has seen demand for its products increase significantly across the continent, with new projects and new markets opening up for the resin flooring specialist.

This includes large-scale constructions increasingly turning to its durable and hard-wearing floors to provide robust platforms for heavy industrial activity. This is particularly evident in Zambia where the First Quantum Minerals developments, the Sentinel Expansion Project and the New Kansanshi Heavy Mining Equipment Workshops, have specified Flowcrete South Africa's resin flooring solutions.

There are many sectors that are realising the possibilities of Flowcrete South Africa's floors, from mining and manufacturing to food and beverage processing and healthcare. The Kalumbila Clinic in Zambia for example installed the seamless and smooth epoxy solution Flowshield SL and Flowshield SL ESD, which has been specially formulated to disperse static charge build-up in the floor.

Outside Zambia, Flowcrete South Africa has identified several other key growth areas. Professionals' workshops have been held in countries such as Zimbabwe to inform architects and engineers of the product range and, in February this year, Flowcrete South Africa officially opened a brand new Cape Town warehouse and sales office, built to service increasing calls for its systems in the developing Western Cape market.

The new facility provides a logistical advantage to the operation of the warehouse and sales office as it is located at the Airport Industrial hub close to the Cape Town International Airport. It will be a huge benefit to clients who will see the lead times of product supply and delivery fall due to the facility's ability to stock 88 tons of product much closer to the end user than was previously possible.

Flowcrete South Africa also has a head office and manufacturing centre in Durban with another office and manufacturing centre in Johannesburg. The combined South Africa operations are thus capable of providing high-quality flooring solutions to the whole of Africa.

Flowcrete products have been utilised in high-profile industrial and commercial projects around the world. This has included specialist flooring for one of the world's leading cardiovascular treatment hospitals, a highly durable system for the largest car park in the Middle East at the Dubai Mall and a visually stunning, bespoke solution for the National Aquarium Denmark.■

For the Flowcrete South Africa contact in your area visit www.flowcretesa.co.za/contact-us or contact Daniel Ash, email: dan.ash@flowcrete.com

Flowcrete provided a visually stunning solution for the Danish National Aquarium.

One-stop post-tensioned pavement shop launched

PT-Pave is a dynamic new venture between Amsteele Systems and Chris Howes Construction, aimed at providing a complete package or one-stop-shop for post-tensioned concrete pavements.

Amsteele Systems' beginnings date back to the late 1960's, with CCL (SA), the forerunner of Amalgamated Prestressing, which merged with Steeledale Systems in 2000 to form the present company, Amsteele Systems.

Founded in 1993, Chris Howes Construction (CHC) is known for delivering products of an international standard and services of the highest quality. CHC-SA has evolved into national leaders in this field.

The system

Post-tensioning in concrete pavements serves two functions; firstly to counteract short-term shrinkage cracking from about 18 – 24 hours, then to pre-compress the concrete to counteract cracking due to ongoing long-term shrinkage, flexural tensile stresses from service loads and temperature gradients in the concrete.

The post-tensioning can be a bonded or un-bonded flat slab system with the following basic methodology:

- Slabs are cast with high-tensile prestressing strands running through the slab from edge to edge, at regular spacings,
- Tendons are unprofiled (flat) in one layer, with equal or nearly equal quantities in orthogonal directions.
- Tendons are anchored at slab edges and stressed after concrete placement, exerting a permanent two-way compression force on the slab,
- If a bonded system is used, this force is locked in by grouting the ducts with a high-strength grout, which also acts as corrosion protection.
- Tendons can be stressed continuously between slab panels by using coupling or intermediate stressing anchors, enabling total elimination of movement joints between panels as adjacent panels are 'pulled' together through the post-tensioning process.
- This can produce 1000's of square metres of floor slabs without movement joints. Careful planning of floor construction methodology is needed, with the final slab edges requiring special consideration.

Eliminate joints

Post-tensioned concrete pavements are used in facilities where the main objective is to eliminate joints that are the major weakness in any concrete pavement. The post-tensioning system allows a significant reduction in the number of joints while keeping the structure within allowable tensile stresses, which leads to lower maintenance costs over the design life of the slab.

The best solution

Concrete has limited capacity to resist tensile stresses. Post-tensioning allows balancing of the tensile stresses in the concrete, leading to thinner slabs without the need to significantly increase the amount of reinforcement. The major advantages of using a post-tensioned slab on grade solution compared to other ground-slab systems is as follows:

Effective load support – It is a properly engineered floor designed for any load system

Active crack control – Post-tensioned slabs reduce the risk of cracking far more effectively than any other method due to the active compression force exerted on the slab

Fewer or no joints – Using post-tensioned slabs on grade greatly reduces the joints required in a floor, resulting in reduced maintenance

Curling – The risk of slab curling is reduced with fewer joints and greater joint spacing. This produces a smoother ride and less maintenance for forklifts

Poor ground – Greatly increased resistance to problematic soils. Reduced sub-grade preparation, thinner slabs, and fewer or no joints, save construction time and costs.■

More information from Paul Heymans,
Tel: +27(0)11 827 6721 / www.amsteele.com

The role of synthetic fibres in concrete

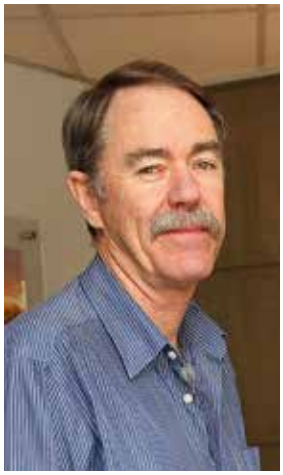
By Bryan Perrie, Managing Director of The Concrete Institute

Deficiency in tension in both plastic and hardened concrete made with portland cement can be overcome by the use of conventional rod reinforcement and the inclusion of a sufficient volume of certain fibres.

Synthetic fibres are, however, primarily used for crack control in plastic and semi-hardened concrete. This is especially so in the case of industrial floors which have a large surface area to volume ratio and are thus prone to plastic shrinkage cracking.

They are so successful in this role that some readymix producers routinely add fibres to their mixes for concrete floors.

Synthetic fibres are man-made fibres resulting from R&D in the petrochemical and textile industries. There are two physical fibre forms: monofilament fibres and fibres produced from fibrillated tape.



Bryan Perrie, MD of The Concrete Institute.

There are two different synthetic fibre volumes commonly used – low-volume percentage (0.1 to 0.3% by volume) and high-volume percentage (0.4 to 0.8% by volume). Most synthetic fibre applications are at the 0.1% level at which the strength of hardened concrete is unaffected and their use is restricted to crack control.

Synthetic fibre types that have been tried in cement concrete matrices include: acrylic, aramid, carbon, nylon, polyester, polyethylene and polypropylene.

Acrylic: These fibres have been used to replace asbestos fibre in many fibre-reinforced concrete products. In this process, fibres are initially dispersed in a diluted water and cement mixture.

Aramid: Aramid fibres are 2,5 times stronger than glass fibres and five times stronger than steel fibres, per unit mass. Due to their relatively high cost, aramid-fibre-reinforced concrete has been primarily used as an asbestos cement replacement in certain high-strength applications.

Carbon: While carbon fibre is very strong, it is substantially more expensive than other types. Its commercial use has thus been limited.

Nylon: Currently only two types of nylon fibre are marketed for concrete. Nylon is heat stable, hydrophilic, relatively inert and resistant to a wide variety of materials. It is particularly effective in imparting impact resistance, flexural toughness and sustaining and increasing the load-carrying capacity of concrete following first crack.

Polyester: These fibres are available in monofilament form and belong to the thermoplastic polyester group. They are temperature sensitive and above normal service temperatures their properties may be altered.

Polyethylene: Concrete reinforced with polyethylene fibres at contents between 2% and 4% by volume exhibits a linear flexural load deflection behaviour up to first crack, followed by an apparent transfer of load to the fibres permitting an increase in load until the fibres break.

Polypropylene: Polypropylene fibres are hydrophobic and therefore have the disadvantages of poor bond characteristics with cement matrix, a low melting point, high combustibility and a relatively low modulus of elasticity.

Polypropylene fibres are tough but have low tensile strength and modulus of elasticity; they have a plastic stress-strain characteristic.

Fabric and composite fibre reinforcement: South African manufacturers have been innovative in developing versions of fibre for use with concrete.

To overcome the bond and elastic modulus problem of polypropylene fibres, one development has been using a composite of a core fibre (which can be polypropylene or a stiffer material such as acrylic, Kevlar, glass or carbon fibres) around which a fluffy coating of polypropylene or cellulose is spun.

The coating can be bonded to the core at intervals to enhance the composite behaviour. These composite strands can be woven into a textile, or cut into appropriate lengths for a range of applications.■

Concrete, whether used on the ground or raised by charging hopper for loftier applications, can be improved by the use of fibres, says The Concrete Institute.

More information from The Concrete Institute, Tel:+27(0)11 315 0300 or download Fibre-reinforced Concrete from www.theconcreteinstitute.org.za

Get the job done. Get a pro.

When people and machines need to deliver peak performance, only one thing counts: uncompromising quality. This requires true professionals who are tough enough for every job and equal to any task - like STIHL construction tools. These powerful tools feature innovative, high-performance, reliable technology and are particularly efficient in day-to-day handling. For cutting, boring or cleaning - STIHL has the appropriate tools and proper safety equipment for almost any construction job.
Think Performance. Think STIHL.

Elematic slabs offer versatility and speed for designer elements

Hollow-core precast concrete slabs from Elematic SA (ESA) are proving their worth in the construction of a new multi-storey townhouse development on a prime site in Sandton. The slabs are being used for all the suspended flooring on four floors, as well as for construction of distinctive cantilevered boxes which wrap around the balconies and give the façade architectural interest.

Projecting, cantilevered boxes formed with ESA slabs add interest to The Epic apartments.

Seen from below, the projecting boxes designed to add character to The Epic apartment building.

ESA hollow-core slabs forming the first floor of The Epic development.

The Epic is a new upmarket development on Patricia Road in Sandown. It currently consists of 96 units built in three phases, with another two phases expected to commence soon.

Offering two-bedroom, two-bathroom units with a central kitchen and lounge and a balcony, selling for just over R2 million each, The Epic is both upmarket and central – and all units in the first three phases have already sold out. Construction commenced in October 2013 and is scheduled for completion in November this year.

The sophisticated nature of the development called for an architectural design with character. For the architects, Messaris Wapenaar Partnership, the protruding cantilevered boxes provided a way to achieve this while still being functional. Gustav Appelgryn of Dalmar Construction, the main contractor on the project, says that while constructing them has been a little more complicated than usual, it has also constituted an exciting challenge for him and his team.

The box structures would normally have been constructed using cast-in-situ concrete, but Dalmar decided to use ESA's precast slabs instead. "Using precast slabs speeds up construction as they are pre-designed and manufactured off site, and erected on site quickly and with the minimum of fuss. This eliminates the need for formwork on site and also a number of the other trades that would typically have to be involved," Appelgryn says.

Once the slabs are installed, they are ready to be built on immediately. The quality of their surface finish is such that they can be painted immediately.

The design required extra thought to ensure structural stability on the cantilevers. ESA's engineer, Charles van Wyk, explains that rather than using reinforced concrete beams for the cantilevers, steel beams have been used as they were easier to install and could be matched to the depth of the slabs. The hollow-core slabs have been laid on these steel beams and brick infill has been used for the sides. An extra structural beam has been required on either side of the bottom of each box in order to provide an adequate counterbalance to the structural weight of the 'roof' portion of the box.

Dalmar Construction is pleased with the quality of the final product and the speed with which construction has progressed. The company, which has been in business for 40 years and which provides a range of construction services including land procurement, project planning and cost analysis, project management, property development and turnkey construction, was ESA's first client and has given ESA repeat business based on its fair prices, good service and high-quality products. ESA's director, Craig Webber, says ESA has already done 25 projects with Dalmar Construction and looks forward to doing many more in future.

The achievements on The Epic are testimony to the way creative thinking and close co-operation between all parties can result in an established product being used in new and innovative ways. ■

More information from Craig Webber,
Tel: +27(0)11 423 2700 / www.elematic.co.za

Technicrete donates stock bricks and roof tiles to Bushbuckridge housing project

Beneficiaries in 10 Wards in the Bushbuckridge Municipality benefited from the collaboration between Buscor, a leading passenger bus company serving Mpumalanga and Technicrete, a manufacturer of concrete products, to assist in the construction of ten houses for the local community.

Technicrete donated 10,000 Double Roman high-quality roof tiles as well as 160,000 discounted Technicrete stock bricks. Buscor, under Chairman Nora Fakude gave R2 million and garnered contributions from local builders and suppliers.

The project, which fell within the Special Project Portfolio of David Mabuza, Premier of Mpumulanga, was designed to assist some of those living in this region where poverty is prevalent and the supply of housing is desperately needed. In some cases, beneficiaries of new houses, most of whom were elderly, had been living in an environment of squalor.

Access to the construction site proved difficult due to lack of infrastructure, but local hardware store Laduma assisted in collecting and delivering bulk stock from the Technicrete factory. Technicrete supplied discounted materials with a certain amount of stock supplied for free, reducing the price per house substantially.

Technicrete chose the Double Roman roof tiles as they are cost effective and aesthetically pleasing. The stock bricks guarantee good durability, strength, thermal insulation and longevity, as well as being fire resistant.

Municipal officials examine photographs of the houses donated to Bushbuckridge residents.

Technicrete has an active social responsibility programme that assists with projects that can utilise their concrete products and technologies.■

More information from:
Malebusa Sebatane
Tel: +27(0)11 674 6957 / www.murrob.com

Local building practice antiquated and expensive

South Africa is 30 to 40 years behind much of the developed and developing world in construction of multi-storey buildings. The substantial economic advantages European, American and Asian construction companies are realising by extensive use of precast concrete elements and hollow-core concrete slabs, have largely been unexploited by local property developers.

Precast concrete is the preferred building medium for multi-storey buildings in much of the world. In Europe, 90% of building superstructures comprise precast concrete with only 10% being cast in-situ.

In South Africa the reverse applies. Precast concrete is regarded as an alternative system while 90% is still cast in situ. This produces buildings that are more costly and time consuming to construct.

In Europe precast elements are incorporated into the design at the outset. Locally, when precast elements are actually used, they are specified by the construction engineer after plans have been drawn (rarely incorporating precast). Thus, when the engineer specifies hollow-core slabs, the plans must be returned to the architect and amended, adding to the cost.

This situation looks set to change. Not because of substantial cost/time and other advantages of precast technology, but because skills in in-situ building have declined in recent years. Smaller companies have lost much of their in-situ expertise during the downturn and now only major construction companies retain sufficient skills to pursue in-situ construction.

Fortunately South Africa's precast industry is healthy and companies such as the Echo Group, Africa's largest hollow-core slab supplier, are geared to assist building companies to make the switch. Once major architectural practices start designing with precast, the rest will follow.

In 2009 Echo Prestress commissioned the Concrete Manufactures Association (CMA) to manage cost case studies on medium-rise buildings, Bridgeview, a five-storey load-bearing masonry residential structure in Johannesburg and Capital Park, a seven-storey residential building in Pretoria. Built with hollow-core slabs, both served to highlight hollow-core's superior cost attributes.

The multi-storey car park in Glasgow built extensively with precast concrete elements. (Photograph SCC Ltd).

The projects realised substantial savings in construction costs, 30.76% for Capital Park and 23.79% for Bridgeview. Results were authenticated by quantity surveyors, Bathuleng, Wallace and Raubenheimer and designs verified by DG Consulting Engineers (Capital Park) and Knutton Consulting (Bridgeview).

Hollow-core slabs were introduced in the 1950s to fast-track flooring in multi-storey apartments during the post-World War II reconstruction of Europe. Over time, other precast elements – beams, columns, cladding, walling, double T slabs and staircases – were adopted.

Hollow-core slabs can be used for most applications requiring floor and roofing systems, i.e. flats, office buildings, schools, and hotels. Produced in well-equipped, up-to-date plants using advanced technologies, it is easier to ensure consistently high quality than in an in-situ building environment.

Slabs are manufactured on steel casting beds, and in the Echo Group, using slipform technology. Echo manufactures both reinforced and prestressed hollow-core slabs of varying lengths. Longer spans and the capacity to carry heavy loads enable better space utilisation, lower floor/floor heights and more profitable buildings.

Hollow-core slabs are cast with continuous voids, reducing weight and cost and offer excellent sound insulation. They can also be used for security walls, retaining walls and cladding. Overseas use indicates that the potential uses of hollow-core slabs have not been fully exploited locally.

Precast in Europe

Four recently completed structures, three in Glasgow, Scotland, and one in Manchester, UK, contain high percentages of precast concrete and typify precast concrete construction dominating the European building landscape.

The Scottish buildings include the Emirates Arena and the Sir Chris Hoy Velodrome, (both situated on a 10.5-hectare site in Glasgow's East End), and a multi-storey car park adjacent to the City's exhibition and conference site.

The Manchester project is a £60-million 24,000-m^2 health, psychology and social-care building on the Metropolitan University's new campus. The scheme has utilised precast concrete extensively and will be the greenest university campus in the UK, with environmental sustainability integral to all aspects of the design.

The overall on-site duration was only 21 weeks with lower-level floors handed over five weeks early due to the back-propping design and integration of J&P Building Systems' BSF Connectors.

European standards adopted locally

To accommodate South Africa's switch to precast construction, local precast companies such as Echo, are adopting European standards, as are several construction-related engineering practices.

Euro codes for precast concrete are far more detailed than local codes and provide extensive and very detailed guidance, especially on hollow-core slabs. Local construction professionals are thus turning to European standards to ensure constructing better buildings more efficiently.■

More information from Melinda Esterhuizen, Tel:+27(0)11 589 8800 / www.echo.co.za

Rocla's Alfabloc retaining walling system

The need to store or partition fertiliser, coal, sand, stone and/or other granular or loose particles separately at site or in a warehouse environment is critical for many sectors of industry. These requirements are easily facilitated by installing Rocla's Alfabloc concrete retaining walling system.

Manufactured under licence from Poundfield Products Ltd of the UK, the Alfabloc with its A-frame design is a naturally stable and robust retaining wall block requiring little or no ground fixing while offering many configurations and a quick installation period.

"The Alfabloc is a versatile product that can be utilised across many applications. The traditional retaining wall concept is ideally suited for the separation and storage of granular materials. With a new or existing surface bed forming the foundation upon which the blocks are placed, quick and easy alignment of the Alfabloc is what makes it an efficient option." said Justin Kretzmar, sales engineer at Rocla.

"The design of the Alfabloc is what makes it the best precast concrete retaining wall option due to the weight being minimised and evenly distributed, sturdiness and durability. The inner cavity resulting from the A-frame design can be used for placement of electrical cabling for lighting, CCTV alarms or any other wiring requirements. The application and/or specification of stored material determines whether the blocks are free-standing or bolted into place" said Kretzmar.

Rocla's Alfabloc is available in three heights: 1.2 m, 2.4 m and 3 m to offer the market a wide range of storage capacities. The 1.2-m-high mini-Alfabloc has been very successful at offering a very quick, flexible option for storage requirements as well as a new alternative to the New Jersey Barrier for many non-road-related applications. Compared to the larger blocks, it is narrower and longer allowing for faster installation.

"The design of the Alfabloc is what makes it the best precast concrete retaining wall option due to the weight being minimised and evenly distributed, sturdiness and durability."

The Port of Durban erected 22 mini-Alfablocs as a temporary security measure for crowd control, while a Durban-based logistics company utilised the large 2.4-m Alfablocs for their manganese stock pile facility.

Rocla themselves have used the 3-m Alfabloc for a retaining wall required for their river sand bunker at their Polokwane manufacturing plant. Time was a critical factor in the installation due to the need to reduce the cost of operational downtime. It only required two weeks to install and secure the 10 Alfabloc units from start to finish.

The Alfabloc has also been utilised at chemical factories, farms and mines as well as at airports, railways and other transport-related locations when infrastructure needs to be built, upgraded or replaced. The mini Alfabloc has found a home along railway lines keeping people, wildlife and farm animals safe from moving trains.

All blocks interlock with a cast-in concrete tongue-and-groove joint as standard. Each block has two sockets cast into the top surface, which can be used, with eye-bolts, to easily lift and move the blocks on site or to attach additional items such as roofing structures and razor wire or electric fencing to increase overall height and security.

More information from Malebusa Sebatane
Tel: +27(0)11 674 6957 / www.rocla.co.za

Rocla's new Alfabloc units are ideal for separating stored granular materials.

Sustainable infrastructure: retaining walls in the urban environment

The concept of fibre-reinforced soil and stackable blocks is not a new one, and can be traced back to the ancient Megalitian cultures that lived in Europe, the Middle East, Central America and Asia. Yet, for decades, engineers relegated gravity block walls to residential backyard landscaping.

This knowledge was re-discovered in 1969 by Henri Vidal while building sandcastles. Having interlaced dry sand with pine needles to build small, vertical sand walls, not only was he surprised that the castle kept its shape under loading, its high strength captured his imagination. This ignited a renewed interest in the composite earth retaining wall industry. Despite the few early supporters, the technology eventually caught on, ushering in a new age of geosynthetic-stabilised slopes faced with segmental retaining walls (SRWs).

Regulated environments, particularly transportation and other governmental agencies, were slow to incorporate SRWs into their specifications. Nevertheless, SRW systems continued to grow both in volume and scope of application and are now the leading earth retention system in urban infrastructure worldwide.

Terraforce, an early adopter of SRWs in South Africa, has been involved in the industry for over 30 years, and now has suppliers all over the world. The blocks have become very popular for sustainable development of urban infrastructure, where the goal is to protect undeveloped land and preserve habitats by channeling development to urban areas with existing infrastructure.

Use of SRW units facilitates this, as they are modular and relatively small, so are well-suited for use on small and irregularly shaped lots. This reduces material staging areas and fewer large pieces of equipment are needed for cut and fill operations in urban areas.

SRWs can also be used to conserve natural areas on the project site by maximising the amount of open space relative to the development footprint. They also maximise site usage, reducing the total percentage of land area needed for development. Lastly, SRWs support vegetative growth, which provides improved storm water and erosion control.

Terraforce also developed an interlocking, permeable hard lawn paver that limits storm water runoff by minimising impervious surfaces. The stone-filled gaps provide surface permeability, allowing storm water to be absorbed into the base materials gradually recharging the underlying groundwater.

When the City of Cape Town planned a new head office for the Western Cape Electricity Department, the plans included an underground and large above-ground parking lot, necessitating cut-and-fill slopes that needed stabilisation. To conserve space, as well as to provide a green and aesthetically pleasing solution, Terraforce blocks were specified by NWE Consulting Engineers. Haw & Inglis Civil Engineering were awarded the tender, and Greymo Construction installed the wall, which was completed in November 2013.

In Mountain Mill Drive, Worcester, a Nissan dealership's planned extensions created a steep, exposed fill. Pieter Swart form Osiris Civils offered various earth retaining options and the client chose the Terraforce L13 Standard block. Terracrete pavers were also installed in the customer parking area as an alternative to impervious surfacing.

Said Swart: "The client needed more space for a service road and a second car park, so our wall had to go up pretty straight. The Terraforce system provided this in a cost-effective manner, and is plantable and flexible enough to deal with any other existing site requirements."

Terraforce-approved installers, Dassenberg Retaining, installed the wall in November 2013, with 15 MPa concrete as anchors to every second block and 20/19-MPa concrete foundations.■

More information from Terraforce,
Tel: +27(0)21 465 1907 / www.terraforce.com

The Western Cape Electricity Department's new premises used Terraforce products extensively.

Popular a.b.e. system for new Land Rover flooring

a.b.e. Construction Chemicals' abeflo epoxy self-levelling flooring system was selected for new flooring at the Land Rover dealership workshop in Hillcrest, Durban.

a.b.e. is part of the Chryso Southern Africa Group.

Brad Hunt, a.b.e. Technical Sales Consultant based in Durban, says abeflo was applied in 2-mm thickness over a floor area of about 800 m^2 at the Land Rover premises by a.b.e.-approved applicator, Duraco. The selected colours were Medium Sea Grey and Div Grey.

abeflo, which has been widely used throughout Southern Africa, is a four-component solvent-free self-levelling flooring surface system. It comprises a clear resin and hardener, pre-packed blended aggregate and a ready-for-use pigment paste.

Hunt says seamless abeflo complies with high hygiene standards as it does not produce crevices to accommodate bacteria. "abeflo produces a medium-gloss finish with strong colour retention. It is particularly suitable for areas such as showrooms, hospitals, schools, kitchens, factories, laboratories, canteens, supermarkets and garages."

abeflo surfaces, furthermore, in addition to offering exceptional protective qualities are resistant to chemicals, water, oils, fats, greases, diesel, mineral acids and alkalis. Shrinkage after curing is negligible. abeflo has been the selected flooring product in several other motor showrooms and workshops including Toyota and BMW dealerships in Durban as well as MF Autobody Panelbeaters in Boksburg.

a.b.e. Construction Chemicals' abeflo system was used for new flooring at the Land Rover premises in Hillcrest, Durban.

Leading supplier, a.b.e. Construction Chemicals has a range of flooring products that includes over 30 lines, covering various flooring requirements such as coatings, screeds, case hardeners, tile pointing, adhesives and dry shakes.■

More information from Kirsten Kelly
Tel: +27(0)11 395 9700 / www.abe.co.za

Blastcrete upgrades MX-10 mixer/pump

The upgraded MX-10 Mixer/Pump from Blastcrete Equipment Company has the fastest, most efficient mixing capabilities in the industry. Its new, closed-loop hydraulic circuit delivers greater speed and torque to quickly and effectively mix dense refractory materials in less than two minutes.

The new system provides greater efficiency that leads to faster and greater ROI on demanding refractory wet shotcrete and pump cast applications in foundries, power generation, petrochemical, steel mills and cement manufacturing facilities.

The MX-10's hopper handles up to 1,134 kg of material, and its high-speed hydraulic agitator keeps materials blended and in suspension as the material flows to the pump. The unit's 76-mm swing tube piston pump operates with up to 2,200 psi for consistent installation of as much as 12 tons of material per hour. The high-pressure pump also allows customers to achieve up to 450 vertical pumping distances when installing refractory materials.

The MX-10's 2.2-m^2 platform provides 50% more space than competitive equipment to give operators ample room to maneuver easily. The electrical controls are mounted on the platform and positioned away from the mixer to remain free from debris and water.

The unit is mounted on dual 3.5 ton-capacity axles with electric braking and lights for enhanced safety when travelling.

Lifting eyes on the platform allow operators to use a crane to lift the machine and place it on a flatbed for travelling longer distances. It also allows users to place the unit on work platforms in larger factories. Blastcrete offers the MX-10 with an optional skid-mounted framework that reduces the overall length, width and height of the machine.

Blastcrete's MX-10 Mixer/Pump's hopper handles 1,134 kg of material and its 76-mm swing tube piston pump operates at 2,200 psi for consistent installation up to 12 tons of material per hour.

Blastcrete's upgraded MX-10 Mixer/Pump features a closed-loop hydraulic circuit that can effectively mix dense refractory materials in under two minutes.

The new MX-10 can be equipped with a John Deere 4045T 99-horsepower or Deutz BF4M 2012 102-horsepower water-cooled diesel engine. Blastcrete also offers the unit with electric motors. The engine on the MX-10 is placed away from the mixer and receiving hopper to prevent thermal transfer that causes refractory materials to set prematurely.

"The new system provides greater efficiency that leads to faster and greater ROI on demanding refractory wet shotcrete and pump cast applications in foundries, power generation, petrochemical, steel mills and cement manufacturing facilities."

The MX-10 is faster and easier to clean than traditional swing-tube piston pump units. The swing-out receiving hopper provides easy access to the lower hopper and swing tube section for cleaning and maintenance. Blastcrete offers an optional 2,000-psi hydraulic pressure washer for easier cleanup and an automatic lubrication system to ensure proper greasing of the swing tube pump.

The MX-10 is CE-certified to meet European Union safety standards for equipment operation.

Blastcrete has been manufacturing safe, reliable and user-friendly solutions for the refractory and shotcrete industries for more than 60 years. With a complete product line consisting of concrete mixers, pumps and related products, the company serves the commercial and residential construction, ICF and SCIP building systems, refractory and underground markets.■

More information from Tripp Farrell
email: tripp@blastcrete.com
www.blastcrete.com

Doka shoring systems gain ground

Staxo 40, the lightweight shoring system for the building industry, is gaining ground at a rapid pace.

Safe, fast and efficient is a Doka maxim and Staxo 40 certainly lives up to this.

Ergonomically engineered to ensure ease of transport and erection, the H-frame is designed so that the heaviest frame, a mere 24 kg, can be carried by one man only. This feature, coupled with the minimal number of components in the whole system, guarantees an increase in production.

Shoring towers with a leg load capacity of 40Kn can be erected up to 10 m in height and can be completely erected horizontally at ground level, and then crane-lifted into position, ensuring both safety and efficiency.

Currently in use on the 2 Military Hospital in Cape Town, Staxo 40 has become a firm favourite with Local formwork company, Mandukas Formwork.

"What really impressed us in the pre-construction stage was the design of the support structure which showed a saving of 70 tons of equipment against conventional systems generally in use," said Greg Geduld, site supervisor.

"It was obvious even then that there would be labour savings. Once we started on site the savings became even more apparent," he explained.

"Doka provided on-site training which soon ensured that our workforce was completely familiar with all the components and erection procedures.

"The system is extremely safe, the regular footholds, which can also be used to connect safety harnesses, make climbing up and down the towers safer and easier. Consequently the erection of the towers is extremely fast. Our workforce is sold on the system and their increased productivity is proof of that," concludes Geduld.

Big brother, Staxo 100, Doka's heavy duty shoring system has made similar in-roads into the civil engineering sector. With a leg-load capacity of 100 Kn. Staxo 100 is ideal for supporting structures such as bridges, culverts, deep beams and heavy slabs

Staxo 100 frames have a fully integrated ladder for easy and safe access and Staxo 100 towers can also be erected horizontally and crane-lifted into the vertical position.

Staxo 100 combines perfectly with the Dokaflex slab systems and the Top 50 large-area formwork systems and has been used on a number of bridge projects in and around South Africa.

Projects include the N2 - Coega River bridges in the Eastern Cape, Colesburg interchange in the Orange Free State, Warwick Street bridge and Umgeni Interchange in KZN and the Tanganani Bridges in Gauteng.

Recently the Lanseria Water Tower, an 18-m-high structure was constructed using Staxo and Dokaflex.

Over the border, Doka Mozambique is supplying the Staxo System for the construction of nine bridges in Nacala Province.

CEO of Doka South Africa, Ganpersad Luckun says, "We are extremely pleased with the success of the Staxo Systems in Africa and are confident they will become the systems of choice with most building and civil engineering contractors all over Africa." ■

More information, National Contact no: 0860 365272
www.doka.co.za

Staxo 40 and Dokaflex: a proven combination for high slabs.

Builders Warehouse now bigger and better!

Builders Warehouse Rivonia opened its doors at the new store location (Cnr Leeuwkop and Rivonia Road, Sunninghill) to offer customers a bigger and better shopping experience.

Builders Warehouse Rivonia provides customers with the largest selection of quality mainstream, innovative and complementary merchandise at competitive prices, 300 knowledgeable and friendly team members for advice and information, convenient hours, free parking in over 600 parking bays and an in-store coffee shop.

The store stocks hundreds of new products and existing departments have been enlarged and enhanced, namely large appliances, the garden centre, a paint centre, power and hand tools, flooring, bathroom inspirations, kitchen design and lighting and décor sections.

Trade customers now have a dedicated trade entrance and exit, as well as a dedicated department and service counter that can assist them with their bill of quantities for projects. An experienced Key Account Manager will attend to the trade customers' specific needs pertaining to tender pricing, specifications and building supplies.

Builders also offers building cost estimation, design and manufacture of roof trusses, on-site measurements for additions and roofs, wooden doors and installation of kitchen cupboards, cornices specifically designed in width and cut to size, quotations and estimations, delivery as well as the option to open a 30-day account, cash or deposit account.

Ordering bulk aggregates is made easy with the new self-service cards in store: Select the product card of the item you want to purchase, take the card to the cashier to pay and choose whether you want to collect or have it delivered.

The Builders Money Centre offers financial services to customers to help them achieve their dreams. This includes: The Builders Card, the Trade Card as well as Home Improvement Loans.

Customers can enjoy the following free services when items are purchased at Builders:

- Remote control programming
- Glass cutting
- Key cutting
- Pool water testing and advice
- Paint mixing and colour consulting at the new Paint Centre
- Precision timber and board cutting

Other service offerings include easy gas exchange, refill or purchase; board edging; custom-made curtains and blinds; wall-to-wall carpet installation; kitchen design and installation; as well as shower door and air-conditioning unit installation.

The new Builders Warehouse Rivonia store is environmentally conscious and was built to comply with the latest energy efficiency regulations. LED lights reduce electricity consumption as do daylight harvesting domes.

A state-of-the-art Building Management System will regulate lights being switched when harvested daylight levels are low.

The system will also control air conditioning and regulate temperature.

A total of 300 positions were filled when the new store opened, contributing positively to the economy.

Builders' Corporate Social Responsibility initiatives encourage continuous engagement with local communities in which their stores operate and support early childhood development. Builders donated R5000, towards school renovations, to Sefikeng Primary School.

Trading hours:

Monday to Friday	: 07:00 to 19:00
Saturday	: 07:00 to 17:00
Sunday	: 08:00 to 16:00
Public Holidays	: 08:00 to 16:00 ■

Contact number: 086 000 8913

The opening of the new Builders Warehouse Rivonia was a very festive event.

Innovative Giatec CellTM from Protsurv

The Humboldt Giatec Cell™, available through Protsurv Geo Centre, is a tablet/smartphone-based NDT probe for fast, accurate and efficient detection and in-situ analysis of corrosion in reinforced concrete structures based on ASTM C876. Giatec Cell™ benefits from an advanced Bluetooth-enabled maintenance-free sensor that measures the corrosion potential and sends it wirelessly to a tablet for generating half-cell contour plots (corrosion maps) in real time. The results can be shared easily with the engineering office. Giatec Cell™ significantly reduces the labour cost associated with data collection and the subsequent contour plot generation and reporting.

Giatec Cell™ can be used for efficient and accurate corrosion mapping. Results are analysed using the Android-based application on site to identify locations of high corrosion probability. The output includes an equipotential contour map for the area examined. The contour plots are colour coded for greater clarity.

Three models of Giatec Cell™ are available. The HG-9049, for which the user downloads and installs a free App from the Google Play Store on their Android smartphone. This mobile App records measurements sequentially, but does not generate contour plots. The HG-9050 adds to this: a tablet and tablet App contour plot generation, carrying support, and basic extension arm. The HG-9051 adds an advanced extension arm instead of the basic model, a verification kit (an accurate reference electrode and filling solution), and an extension reel, all in a larger carrying case.■

The Humboldt Giatec Cell is a tablet/ smartphone-based NDT probe.

More information from Tel: +27(0)976 2070
www.protsurv.co.za

SAPY's Corehfil™ Fibres for readymix

SAPY (Pty) Ltd was incorporated in 1994 through a Joint Venture between Ninian and Lester and PFE International to capture the multi-filament polypropylene yarn market in South Africa and surrounding regions. Supported by strong technical expertise, manufacturing and distribution divisions, SAPY has established a sound market foothold in South Africa its neighbouring countries. Over 70,000 m² of factory space is home to three manufacturing and distribution divisions within SAPY – namely Yarn, Masterbatch and Fibre.

SAPY's Corehfil™ Fibres are made of virgin polypropylene, a fully recyclable and non-toxic Homopolymer. Corehfil™ Fibres improve the resistance to early-age cracking caused mainly by stresses that develop before the concrete has developed sufficient strength. This normally occurs during the first 24 hours after placement, when the concrete is most vulnerable to dimensional change.

When added to concrete, Corehfil™ Fibres limit the potential for plastic shrinkage cracking and plastic settlement cracking. The high surface area of the millions of dispersed microfibres improves the durability of concrete by increasing cohesion, reducing bleeding and lowering permeability.

Supplied in convenient, soluble paper packaging, SAPY's Corehfil™ Fibre can be added directly to the concrete mixer during the batching process. The fibre dosage is dependent on the project requirements and specifications and could typically range from 600 g to 900 g/m^3 of concrete.

Sufficient mixing time must be allowed (normally at high speed for 5 - 6 minutes, or approximately 80 revolutions for a drum mixer) to ensure adequate distribution of the Corehfil™ Fibres throughout the concrete. Concrete trial mixes must be made and tested to determine the optimum performance, mixing time and dosage of the Corehfil™ Fibre to meet the end-use requirements.

Typical applications for Corehfil™ Fibre-modified concrete include; driveways, pathways, precast elements, plasters, commercial and industrial floors as well as a number of other specialist applications such as repairs.

SAPY is supplying the Corehfil™ Fibres extensively to various local customers including Lafarge. Corehfil™ Fibres are also exported throughout Africa and the Middle East, as well as to countries including Australia, China and the United Arab Emirates.

Substantial volumes were used in the construction of the new Dubai International Airport.■

More information from Tracy Sinclair,
Tel: +27(0)31 736 8700 / www.sapy.com
www.corehfil.com

Tests prove Atlas Copco LP6500 Duplex Roller offers top operator comfort

The high level of operator comfort offered by the LP6500 Duplex Roller is a direct result of Atlas Copco's continuous focus on ergonomic design. Recently, in a test* performed by the independent technical inspection organisation TÜV Nord, the LP6500 was compared with two similar duplex roller models from other manufacturers. The test provided confirmation that the LP6500 has lower vibrations in the handle and lower machine noise than the other machines tested.

Test results conclusive

In the vibration test the LP6500 showed a hand-arm vibration level of only 4.14 m/s^2 in the top handle, while one competing roller was measured at 7.01 m/s^2 in the direction handle.

Thus the hand-arm vibration level in the handle of the LP6500 is 2.87 m/s^2 lower, which means considerably less strain on the operator during a working day. In the noise emission test, the LP6500 showed a sound pressure level of only 89 dB(A), which is 3 dB(A) lower than one of the competing machines, and 6 dB(A) lower than the other.

Effective on virtually any surface

The LP6500 provides a high compaction efficiency on thin granular soil layers, such as sand and gravel.

When compacting silt, the compaction effect depends largely on water content and here the LP6500 is most effective on thin layers.

On asphalt the end results are excellent and the LP6500 is well suited for smaller jobs in areas such as pavement construction or repair, narrow roads, playgrounds or parking lots.■

**Atlas Copco Construction Tools AB in Kalmar, Sweden, initiated and performed the comparative test under the supervision of TÜV Nord. All steps of the process, from preparation to tests and measurements were conducted in accordance with TÜV Nord requests. For further information please see the TÜV Nord Test reports and its appendix. Feel free to download the TÜV test results after simple request at construction.tools@atlascopco.com*

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Atlas Copco gives top operator comfort with the LP6500 Duplex Roller.

New 'application-driven' range of release agents

Chryso South Africa, part of the Chryso Southern Africa Group, has launched a new, widely welcomed range of 'application-driven' mould release agents.

Hannes Engelbrecht, Chryso S.A. GM: Marketing, says the unusual and innovative aspect of the new ChrysoDem release agents is that they have been designed to meet the needs of specific industries and applications.

"Choosing the appropriate release agent may be critical to the success of a project, affecting the quality and colour of the surface finish. The release agent's cost is low in proportion to the formwork or mould itself, so choosing the cheapest release agent available, is false economy."

"The top-quality release agents in the ChrysoDem range may cost a little more but provide greater coverage, are easier to use, and add consistent quality to production lines. This is particularly important in the precast industry, where high-temperature steam curing is a challenge in the production process," he states

"The new range is a revolutionary development for South Africa, long-awaited by industries which have had to use 'one-size-fits-all' mould release agents. The ChrysoDem range, locally manufactured by Chryso S.A. in Gauteng, KZN and the Western Cape, includes a vegetable-based, environmentally-friendly release agent," he explains.

Mould release agents assist in the clean, easy release of concrete from moulds or formwork, without damaging the concrete, the moulds or the formwork. "For satisfactory results, it is imperative to choose the correct release agent for specific applications. The new ChrysoDem range features different types of release agents for metal moulds (steel and aluminium); wood such as timber, plywood, resin ply, and shutter board; and for moulds made from plastic, polystyrene, rubber, latex, and fibreglass."

Other advantages of the ChrysoDem range include:

- Protecting and extending the life of formwork/ moulds;
- Reducing the likelihood of imperfections and surface damage (particularly blow holes) to the concrete, creating more durable and attractive concrete surfaces;

ChrysoDem for precast concrete.

A ChrysoDem release agent being used on site.

- Eliminating staining and colour changes;
- Plaster, paint and other coatings may be applied after mould removal as ChrysoDem release agents do not adversely affect adhesion of finishes and coatings;
- Water repellent and not affected by rain;
- No effect on hydration;
- Ready-to-use release agents which reduce the possibility of errors during mixing;
- Two-year storage life for virtually all the new release agents.

"The ChrysoDem range includes ChrysoDem Bio 10, a vegetable-based, bio-degradable and non-toxic release agent which will not pollute the environment and has a low odour making it safe for use in confined spaces such as mining, tunnelling, and poorly ventilated areas. Most other products in the ChrysoDem range are low-odour, safe to use, and comply with regulations for transporting and disposing of hazardous materials," Engelbrecht added.

The range includes ChrysoDemElio LSM which significantly reduces blow holes because its low-viscosity (thin) oil creates less surface tension against the sides of the mould – allowing air bubbles to escape. ChrysoDemElio SP can handle the high temperatures of steam curing and provides rust prevention. ChrysoDem Oleo FW is a mineral-based release agent suitable for all types of formwork and ideal for formwork suppliers. Other products cater for the heavy precast sector (pipe manufacturing); light wet and dry precast operations; and decorative concretes. Wax-based ChrysoDem WB is ideal for wooden moulds and prevents the veneer on shutter boards from delaminating.

"Chryso S.A. is planning to export this new range to the rest of Africa," Engelbrecht concludes.■

More information from Hannes Engelbrecht, Tel:+27(0)11 395 9700 / www.chryso.com

Sanika's concrete waterproofing is Krystol-clear

Sanika has been firmly entrenched in South Africa's waterproofing industry for 25 years. Their stringent quality standards, workmanship and superb customer service ensure that they retain their impressive client base, through which they often receive highly recommended referrals to new companies. Sanika has grown from strength to strength over the years by launching alternative and innovative waterproofing methods that respond to their customers' needs. This includes the patented Sanika lightweight boarded waterproofing system and the Kryton Crystalline Concrete Waterproofing product range to their portfolio.

Kryton are the original inventors of crystalline technology and and have been manufacturing concrete waterproofing solutions since 1973. Each distributor and applicator undergoes extensive and stringent training to ensure that they are taught the skills to apply the products correctly.

Only Kryton ensures 100% waterproof crack repair, self seals hairline cracks and keeps concrete watertight for the lifetime of the concrete. (View the Sanika/Kryton advert on page 61 to learn more about this Krystol technology.)

Sanika are the exclusive distributors and applicators of Kryton in South Africa. Since being awarded the exclusive distribution and application rights, Sanika have completed the world's largest crack repair using the Kryton Crack Repair System at Impala Platinum Slag Granulation Cooling Tower in Rustenburg.

Sanika's crack repair at Impala Platinum slag granulation cooling tower in Rustenburg.

They have also completed the concrete waterproofing for SAB Miller and Liberty Properties' subterranean basement car park in Braamfontein, Johannesburg.

Sanika's innovative approach has secured them several large projects nationwide and they are confident that these projects will put South Africa on the map of Kryton's Global footprint. ■

More information from Sandor Dowling, cell: +27(0)82 922 5586 / www.sanika.co.za

World-class waterproofing solutions from Mapei

With its comprehensive range of waterproofing products, Mapei South Africa offers well-proven solutions for all waterproofing challenges. For the past five years, the company's technical service team has been introducing the local construction industry and DIY homeowners to the benefits of the advanced building technology additives, sealants, adhesives and concrete performance chemicals available from the international Mapei Group. Offering market-leading performance and handling advantages, Mapei's 1400 products are recognised throughout Europe, America and the Far East.

For waterproofing a typical flat roof, balcony or terrace, curved roof, guttering and downpipes, Mapei offers convenience in a 20-kg drum in the form of Aquaflex Roof, a ready-to-use flexible liquid membrane containing fibres, for continuous waterproofing layers on exposed external surfaces. The versatile, easy-to-use product may be applied to concrete, ceramic and stone coatings, cementitious screeds, asbestos cement, bitumen sheaths, wood, and even galvanised sheet, copper, aluminium and iron after applying Mapei Eco Prim T primer.

Once dry, Aquaflex Roof is tough enough to withstand occasional light foot traffic, and flexible enough to cope with normal temperature variation expansion and contraction stresses. The product is resistant to all atmospheric conditions and UV radiation, and provides long-lasting protection for the substrate.

Mapeband SA has excellent adhesion to most substrates and gives immediate protection against heavy rain.

Aquaflex Roof HR is a ready-to-use waterproofing product with high solar reflectance.

Where there is a focus on the sustainable thermal efficiency of a building, the solution is Aquaflex Roof HR, a ready-to-use, fibre-filled liquid membrane with a high solar reflectance index (SRI) of 105. The white-coloured product lowers the surface temperature of the roof by more than 50% compared with a dark coloured covering. This contributes to a building's Green Star SA rating by reducing the heat island effect of roofs.

For any successful waterproofing job, 90% of the attention needs to be paid to 10% of the area: the corners, the joints, the cracks and the fillets between horizontal and vertical surfaces. Mapei's research and development into elastic waterproofing systems has produced Mapeband SA, a user-friendly, long-lasting solution for these awkward-to-seal areas. Mapeband SA is a self-adhesive butyl rubber tape with alkali-resistant non-woven fabric bonded on the outer surface to provide excellent adhesion for the waterproofing membrane that will be applied over it.

Mapeband SA has excellent adhesion to virtually any type of absorbent and non-absorbent substrate and gives immediate protection against heavy rain. Typical applications include waterproofing corners and fillets between walls and floors on terraces, balconies and in bathrooms and showers; sealing the joins between different types of material such as bitumen membranes, metal, ceramic and cementitious screeds; and those hard-to-reach fillets between windows and door fittings, ledges and substrates.

The ideal solution for flexibly sealing and waterproofing expansion joints and any cracks that are subject to movement is Mapeband TPE.

"Mapei's unrivalled research and development produces user- and eco-friendly products that enable us to offer our South African customers world-class solutions for any waterproofing needs," says Paul Nieuwoudt, Mapei South Africa's product manager for Building Systems. "We can provide an optimum solution for a wide range of structural and environmental conditions and ensure a long service life result."■

More information from Candice Santana,
Tel: +27 (0)11 552 8476 / www.mapei.co.za

Scaw participates in international trade fairs

South African steel and steel products manufacturer, Scaw Metals Group, took part in *wire 2014* in Düsseldorf, Germany during April 2014. One of the biggest trade fairs in the global wire and cable industry, *wire 2014* showcased all the latest technologies and products available in the industry.

More than 2,500 exhibitors participated and about 38,000 trade visitors and decision makers from around the world attended the fair at Düsseldorf's Exhibition Centre.

"This is one of the most important events on the calendars of all major manufacturers in the global wire and cable industry," said George Katergarakis, executive head of sales and marketing, Scaw Metals Group. "This year's expo was the biggest and most impressive one in its long and illustrious history. We simply had to be a part of it. I believe that it was the perfect platform to showcase our wire and strand products to the international market."

Scaw's Wire Rod Products Division is a leading manufacturer and distributor of specialised steel ropes, wire, strand and chains used in both the local and international mining industry.

The range of offerings at *wire 2014* covered a wide spectrum, from wire manufacturing and finishing equipment, mesh welding machinery, process engineering tools and auxiliary components, to input materials and speciality wires. Innovative solutions from the cable, measurement, control and test engineering sectors completed the portfolio, and specialised sectors such as logistics, conveying systems and packaging were also represented.

Scaw's participation in *wire 2014* was in conjunction with the Department of Trade and Industry (DTI), giving the global exhibition a true South African presence. "We have a great relationship with the DTI; they are showing great support to South African manufacturers and we believe that if manufacturers can work with the DTI, it will stimulate the South African economy and ensure that the local steel industry will become a global influencer," said Markus Hannemann.

In February 2014, Scaw took part in the Mining Indaba to bolster its African footprint. "We had great feedback from visitors. We will be participating in many shows and indabas in future," added Hannemann.

Scaw is a leading South Africa-based integrated steel maker producing highly specialised and critical consumable components for the mining, rail, power, offshore oil and gas, construction, commercial and other industrial sectors. It operates through four product-focused business units: Grinding Media, Wire Rod Products, Cast Products and Rolled Products. ■

More information from Dudu Ndlovu
Tel: +27(0)11 621 1524 / www.scaw.co.za

Polyurea comes to the fore in SA construction industry

Reflecting an international trend, polyurea is coming to the fore in South Africa as an innovative solution for repairing concrete buildings and structures — and Concor Civils' recently established concrete repair division is using this high-performance plural component elastomer in an increasing number of applications with beyond-expectation success.

"Polyurea has an extremely long service life, with high puncture and impact resistance and a completely seamless waterproofing barrier," Hein Pretorius, contracts manager at Murray & Roberts Concrete Repair, says. "Originally designed as a waterproofing product, it can also withstand harsh industrial chemicals including acids, is fully UV-resistant and is available in a large range of different colours, opening up a spectrum of potential applications.

"Although its use is relatively new to South Africa, it has been tried and tested in USA for over a decade. Its heat and impact resistant properties add up to a long lifespan and, depending on the application, the product can be guaranteed for up to 15 years.

"Polyurea can be applied to any type of substrate and it's also extremely flexible — up to 400 times its nominal thickness. This characteristic lends itself to the sealing of construction joints as an alternative to the traditionally used hypalon bandages."

Polyurea can be applied over torched-on waterproofing products, eliminating the costly exercise of removing a previous product before the treatment can be applied. As an industrial coating, it demonstrates excellent chemical resistance to hydrocarbons and hydrogen sulphide gas, as well as properties that enable its use in submerged sewage applications. It is also ideal for sealing potable water retaining structures, waterproofing applications, restraints, as steel corrosion protection and the internal lining of steel chutes.

"Since polyurea is a spray-on application, it's possible to cover up to 800 m^2 of surface area in one day," Pretorius says. "Only two people are needed to operate the application equipment, so it's also not a labour intensive process, and the area becomes fully trafficable only two minutes after application."

ABSA Towers during application of polyurea and drilling for anchoring new façades.

Marble arches at Standard Bank sprayed with polyurea on inside.

Murray & Roberts Concrete Repair team used polyurea on the ABSA Towers in central Pretoria, where the scope of work called for the application of 32 000 m^2 of 1.5-mm-thick polyurea to the external facade of the 34-storey building. Existing mosaic tiles had begun peeling and would have impacted the aesthetics of the building and possibly the safety of pedestrians in the area. Applying the polyurea to the outside face of the existing cladding restrained the mosaics and enabled the installation of a new façade, knowing that the substrate would not peel or come away over time.

"This is an historic building and it was important that the repair didn't damage the façade," Pretorius explains. "Using polyurea, we were able to give a guarantee in this regard. It was also highly cost-effective, because the mosaic tiling did not have to be removed to allow for repairs."

Polyurea was also used at Standard Bank's Johannesburg headquarters to restrain marble tiles applied to marble-clad arches. The marble slabs were pulling away from the structure and needed to be reattached, as this also had safety implications. Here, the cladding comprised large marble slabs 1.6 x 0.9 m and 50 mm thick and, by project end a total area of 1, 800 m^2 had been restrained.

"This project was unique because the polyurea was applied to the internal face, between the tile back and the structure," he adds. "This presented challenges, as access to the back of the façades was very limited. Where access was severely limited, we re-engineered the stringer attachment system to ensure the façade's structural integrity."

Murray & Roberts Concrete Repair's standalone concrete repair division was established earlier this year and is equipped to carry out the repair and rehabilitation of concrete chimney stacks, bridges and cooling towers, and to provide fast track floor coatings. The new division offers a high level of skills, complemented by a depth of technical and application knowledge and is underpinned by access to the Murray & Roberts Concrete Centre of Excellence.■

More information from Stephanie Swanepoel, Tel: +27(0)11 590 5833 / www.murrob.com

Rope access inspection and repair

Thanks to its unrivalled track record in Africa, rope access specialist Skyriders has developed a reputation for being an industry leader in concrete inspection, repair and maintenance for a variety of industrial applications.

Access to tall structures such as cooling towers and silos is often limited and dangerous. To gain access to these structures, Skyriders uses various industrial rope access techniques, which enable its rope-access technicians to work safely.

Skyriders marketing manager Mike Zinn notes that once access has been established, temporary or permanent platforms can be set up allowing Skyriders to carry out a wide range of concrete testing services. "This testing provides industries ranging from power generation to sugar processing with significant savings in terms of cost and time, as scaffolding can be costly and time consuming, and the cost can be disproportionate to the work that needs to be carried out."

Skyriders offers three primary concrete-related rope access services, including inspections, maintenance and repairs. Zinn reveals that concrete inspection comprises internal and external visual inspection, cover metal surveys, carbonation testing, core drilling, structural integrity surveys and protective coating surveys.

"Working closely with engineers, Skyriders rope-access technicians conduct structural integrity and protective coating surveys. These determine the extent of any damage to the concrete, reinforced steel, paint or any other coatings that cover the structure. Once a problem has been identified, Skyriders will carry out the required repairs in order to prevent further deterioration," he says.

In addition to inspecting and repairing concrete structures, Skyriders provides a strengthening and maintenance service.■

More information from Mike Zinn
Tel: +27(0)11 312 1418 www.skysolutions.co.za

Skyriders team carrying out maintenance work on concrete.

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Look sharp with Stihl

STIHL has a well-established worldwide reputation for producing top-quality equipment and tools that are durable, fast and cleverly designed for maximum performance with easy-to-use features. The revolutionary GS 461 concrete cutter is a perfect example. While it handles easily like a chainsaw, the GS 461 is robust and tough enough to make light work of cutting concrete and masonry, getting through concrete pipes and cast iron pipes like the proverbial hot knife through butter. Its maneuverability and smooth handling have made it the must-have piece of equipment for construction and hire companies, contractors, plumbers and electricians. The stalwart of fire and rescue professionals, it helps save lives whenever a tough yet supple cutting solution is needed.

The main advantage of using the wide, varied range of STIHL products is the attention to detail that the company's intensive R&D process dedicates to improving handling and longevity, along with prioritising consistently excellent operation and environmentally-friendly benefits. With STIHL it is about much more than getting a job done. The GS 461 boasts a typically diverse and clever repertoire of value-plus features, including:

- The 36 GBM diamond concrete cutter chain for wet-cutting stone. It has pre-sharpened diamond segments for brilliant cutting power, with a diamond segment on every chain link for extra-fast cutting.
- Humped drive links in the chain provide smooth, low vibration action.
- The guide bar is fitted with water channels to wash, cool and lubricate the chain, chain track and sprocket nose, extending their lifespan and significantly reducing dust production.
- The guide bar also has a hardened chain track and additional holes for attaching the saw chain, which extend the tensioning range.
- A long-life, easily cleaned air filter system with HD2 filter and an additional filter to protect the carburetor from dust, protecting the engine and extending service intervals.
- STIHL's anti-vibration system ensures comfortable use even over long periods.
- Great power-to-weight ratio for additional comfort.
- The modern, low-emission STIHL 2-MIX engine with 1-in-4 channel technology reduces toxic emissions and, with proper handling, ensures significantly improved fuel consumption.
- The 2-MIX engine also features high torque over a wide rpm range.

So if there's stone, masonry or concrete on a construction project, look no further than the blue-chip STIHL GS 461 concrete cutter. It's ideal for freehand work such as cutting out corners in wall openings, working at tight angles, and wet cutting easily and comfortably. A pleasure to work with, kind on the environment and its handler's fuel budget, and able handle any cutting task large or small, the GS 461 has what it takes. It's the perfect partner for a hard job, providing the best of cutting-edge technology when you need it most.■

More information from Anil Hoolasi,
Tel: +27(0)33 846 3800, www.stihl.co.za

STIHL's GS 461 concrete cutter makes short work of concrete pipes.

Rapid: home of the concrete mixer

Following a successful involvement at Bauma Africa 2013, concrete machinery specialists Rapid International are pleased to announce their participation at the Totally Concrete Expo 2014 at the Sandton Convention Centre.

For over 45 years Northern Ireland-based Rapid International has delivered high quality, reliable equipment to the concrete, construction and environmental industries. Today, with a presence in more than twenty countries, Rapid is a trusted partner to a wide variety of customers ranging from multinational construction groups to small concrete producers.

Rapid are aware of the exciting growth across Africa and will be keen to use the 2014 Expo as an opportunity to further present itself to potential local partners and customers alike.

Rapid is a global leader in the manufacture of:

- Pan, planetary and twin-shaft concrete mixers
- Mobile continuous-mixing plant/pugmills
- Specialised mobile continuous-mixing plant
- Mobile batching plants
- High-pressure mixer washout systems
- Silos

Rapid's vast experience over the last four decades ensures the highest quality design and manufacture of all equipment. Quality, reliability, efficiency and technological advancement are the greatest aims of Rapid's workforce, based at its impressive 50,000-ft² (4,645-m²) production facility headquarters in County Armagh, Northern Ireland. Always innovating, Rapid's emphasis on product development is driven by the needs of its wide-reaching customer base, and the company's in-house technical team consistently strive to meet the demands of total quality while exceeding customers' expectations.

Rapid's machines meet and exceed their customers' expectations.

Experience counts. Four decades in the industry guarantees the highest quality design and manufacture of all Rapid's equipment.■

More information from Rapid International, Tel: +44(0 28 3884 0671 / www.rapidinternational.com

Brokk 400 demolition machine now more stable and efficient

The electric Brokk 400 remote-controlled demolition machine has been redesigned to include a larger undercarriage for heavy-tracking applications like tunneling and mining and for enhanced stability when operating with heavier attachments like metal shears and scabblers. Brokk has also improved the hydraulic system; it now provides more efficient fluid flow when the machine is operating a drill attachment so there is more consistent power. With its new upgrades the Brokk 400 now delivers exceptional performance on a variety of construction, demolition and specialty applications.

The new 400 model machine features a bigger drive axis, rollers and sidetracks. It also has a larger undercarriage with new tracks that are 10% longer than its predecessor. This improves wear life for machines used in applications requiring a lot of tracking and provides up to 60% greater stability when operating with heavier attachments. In addition, the machine's outriggers provide a wide base that evenly distributes weight, ensuring even more stability. Its high chassis setup and heavy-duty rubber tracks make it easy to maneuver over rubble piles and obstacles.

The new Brokk 400 can handle attachments up to 644 kg, and its hydraulic quick-hitch system eliminates the need for hard pinning, so operators can change attachments more quickly and easily.

When paired with Atlas Copco's SB 552 hammer, the Brokk 400 has a hitting power of 773 foot-pounds at the tip of the tool, which makes it ideal for rock excavation in small tunnels, scaling or secondary breaking.

The new Brokk 400 weighs 5,098 kg and is 160 cm wide and nearly 205 cm tall. While it's slightly larger than its predecessor it's still compact enough for work in small spaces. It is powered by a 30-kW electric motor for emissions-free operation in confined areas.

The machine features a robust, three-part boom that can operate at angles of up to 30° and reach 6,7 m horizontally and 7.3 m vertically. The remote-controlled boom allows operators standing a safe distance away to reach into areas that traditional machines or users with handheld equipment cannot. The boom also features a box-weld design that provides additional protection for cylinders and hoses.

Brokk offers seven other models in various sizes and with a range of capacities. The smallest, the Brokk 60, weighs 500 kg, and the largest, the Brokk 800, weighs 11,045 kg. The company also engineers and builds custom machines with special equipment such as cameras, extended arms, side-angling devices and cable drums.

Brokk has been the world's leading manufacturer of remote-controlled demolition machines and attachments for more than 30 years. Through continuous innovation in engineering and design, Brokk is able to offer unique solutions to multiple industries worldwide, including construction, demolition, mining and tunneling, cement and process, nuclear and other specialty applications.■

More information from
Robin Jackson, Tel: +27(0) 82 413 1991
www.ddequip.co.za / www.brokk.com

The Brokk 400 remote-controlled demolition machine features a robust, three-part boom that can operate at angles of up to 30° and reach 6,7 m horizontally and 7.3 m vertically.

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Eirich's revolutionised mixing principles: 5 new mixers in the last 5 years

A Birkenmayer Eirich mixer.

Eirich has developed five new mixers in the last five years, drastically reshaping the mixer industry with sleek designs and the latest electronics, while maintaining the famous Eirich mixing principle.

Eirich mixers, German-engineered and locally manufactured by Birkenmayer, have revolutionised industrial processes for over 150 years. Constant product refinement to meet industry demands and robust, easily maintained machines result in Eirich's effective mixing principles being employed in 300 branches of industry.

The R12 basic version has a usable volume of 250 litres, or 400 litres in the more powerful RV12. Tool accessibility in the inclined mixing pan has been improved, the drives for the mixing tool and mixing pan have been side mounted and covered by a protective hood. Thus motors, electrical terminal boxes and central lubrication unit are now protected against dust. In the R12W, mixing tools can be driven upwards with the mixing pan lid, making the whole mixing area particularly accessible – an advantage for manufacturers of polymer concretes.

The second new mixer is the R16, big brother to the R12. Its usable volume is 600 litres and 900 litres in the RV16 version.

The third development is the EL1, a 1-litre laboratory mixer for high-tech ceramics applications where very expensive raw materials are used to develop specialised materials. The EL1 is attracting concrete customers as it is suited to preparing mortars.

"There are very good reasons why this mixer has a universal design. It has everything a large Eirich mixer has, but it also has a lot more: the mixing pan's inclination can easily be adjusted to 30°, 20°, 10° or 0°; the agitator rotates in both directions and runs with adjustable tool speeds of between 2 m/s and 30 m/s. Data from the mixing sequence can be acquired and read via a USB stick. Additionally, the weight of the mixer, designed for an input voltage of 100 to 240 V to enable global use, is only 46 kg," says Louis Eksteen.

Eirich's fourth and fifth developments are larger: the R28's usable volume is 4,000 to 5,000 litres and the R33 handles volumes of 5,000 to 7,500 litres. Both machines can be adjusted, with the inclination of the mixing pan varying between 20°, 10° and 0° and using one or two agitators. These two new machines exhibit Eirich's proven characteristics.

On-going efficiency and quality improvements for Eirich's unique mixing technology, as well as its commitment to working closely with clients, will enable the company to provide superior mixers for the next 150 years.■

More information from Louis Eksteen,
Tel: +27(0)11 970 3880 / www.birkenmayer.co.za.

Moulding an outstanding reputation in Africa

Pan Mixers South Africa (PMSA), the largest supplier of machinery and technology for precast units in Africa, carries a comprehensive range of precision block, brick and paving moulds from German-based RAMPF.

PMSA marketing and sales manager Quintin Booysen says RAMPF's wide range of products is ideally suited to PMSA's client base. "RAMPF manufactures internationally recognised concrete moulds for paving and building bricks, kerbstones, concrete planters, and dry-wall systems."

Booysen explains that RAMPF's products available through PMSA, also include CSI diamond exchange hollow-block moulds and vibration table controllers. "The technology enables these moulds to offer numerous advantages for clients, particularly longer wear life, which is important in the precast market."

CSI diamond exchange hollow-block mould.

RAMPF's proprietary CSI diamond hardening technology produces a hardness of up to 68 HRC, prolonging the lifespan of the mould, even in highly abrasive gravels, crushed stone and aggregates. With the rising cost of steel, this offers the client a clear cost advantage.

Booysen continues: "The components of the hollow-block moulds are bolted and not welded together, which means that there is quick and easy replacement of damaged or worn parts. What's more, individual components are easily replaced, improving turnaround times and savings on maintenance and service. RAMPF also boasts a mould slip system that protects tamper shoes of all models and moulds more effectively against wear. The mould slip system increases the number of cycles and reduces the reject rate of the mould. It also allows for quick change from mould to mould," states Booysen.

"The vibration table controller guarantees perfect utilisation of vibration energy and offers the user both mould and machine protection. It also ensures uniformity in height and density of the concrete elements being manufactured. Production levels are increased and mould wear and cracking reduced."

Booysen believes that RAMPF products will withstand the tough African terrain, making them ideal for any local concrete moulding application. "The advantages of the RAMPF range of products are boundless and ideal for our clients," he concludes.

PMSA's client CEL Paving – a CMA award winning company producing top-quality paving – recently purchased two RAMPF moulds, one for its new RE1400 block machine currently being manufactured by PMSA and a second RAMPF mould for its existing VB4X block-making machine.■

More information from Quintin Booysen, Tel:+27(0)11 578 8700 / www.pmsa.com

A new grinding mill for a new market

Plug&Grind® is the new containerised alternative for cement grinding and packing in Sub-Saharan Africa," explained Moises Rodríguez Nunez, sales manager at Spanish company Cemengal.

"In the recent global recession, the market in Sub-Saharan Africa did not suffer the same way as Europe and North America. This general downturn forced all major cement producers in Europe and North America to slow down or even stop investments worldwide; ongoing projects have been frozen and new plants postponed," he said.

But the world keeps spinning and such challenging conditions needed a positive, sustainable response: a simple, yet innovative, solution to move ahead in this ever-changing environment.

Adaptation is survival

"Cemengal, trying to adapt to this new situation, came up with, what we believe is an alternative for our clients to survive or even to profit from this market trends. Our Department of R&D worked nearly two years in the conceptualisation, design and optimisation of Plug&Grind®, a complete cement grinding and packing station, assembled in Spain with European components, shrunk to fit eight 40-ft. containers and able to produce up to 100,000 tpa of standard OPC cement or 60 000 tpa of slag. It can be delivered FOB seven months after purchase – and it can be moved," continued Nunez.

Plug&Grind®, with very low investment costs, offers a solution for cement producers to test new markets or fill niches

The first Plug&Grind units are operational in Africa and the Middle East.

The containerised units turn constraints into opportunities.

and for readymix producers and cement traders to vertically integrate their businesses. The system represents an interesting investment option thanks to its small footprint, simplicity of use and maintenance, and portability. The majority of spare parts will be available off the shelf around the globe. Finally, being designed to be 'self-sufficient' and containerised, as an exit strategy, the plant can simply be sold.

"Suitable markets for such an installation include Sub-Saharan Africa, Latin America and the Caribbean, Southeast Asia, Australia, Indonesia or the Indian Ocean Islands."

Plug&Grind® leverages the common market constraints and turns them into opportunities. Local scarcity on the offer side, micro-distribution complexity, fiscal issues, or limited yet persistent demand, all become competitive advantages for the owner of a Plug&Grind®. These conditions, which normally represent issues for business models based on large-scale plants are addressed and solved by this system. They are no longer issues; they are key elements for a successful alternative approach to cement production.

Suitable markets for such an installation include Sub-Saharan Africa, Latin America and the Caribbean, Southeast Asia, Australia, Indonesia or the Indian Ocean Islands.

Moreover, the possibility of moving the installation opens the door to investments in 'crowded', unpredictable or risky markets. In case the targeted area is not responding as expected, or the political conditions are not stable, the system can be moved elsewhere, to pursue new opportunities or protect the value of the asset itself. The system has broken the rules in terms of CAPEX reduction, portability and quick time to market.

"For all the above reasons, Plug&Grind® has been attracting the attention of clients worldwide since its launch two years ago. The first units are already working in Africa and the Middle East, and our first client in Saudi Arabia has already bought a second unit," Nunez said.

"Cemengal have been listening to the market, and next June, we will be presenting something big.

Pay attention to the news!"■

More information from Moises Nunez, Tel: +34 9139 21055 / www.cemengal.com

Conveyor belt cleaner designed for aggregates handling

Martin Engineering has announced a conveyor belt cleaner engineered specifically for the aggregate industry. The Martin® PV™ Cleaner is a durable, one-piece blade that contains approximately 20% more urethane than comparable primary cleaners, yielding a longer life in challenging service conditions. This aggressive design for gravel applications is able to remove even wet, sticky sand from belts 18-72 450-1800 mm wide.

Engineered to simplify maintenance and reduce costs, the mounting system delivers 'no-tool' replacement, as it's simply dropped into place and secured with a wire lock pin. "This cleaner uses an aggressive angle of attack to the belt for improved cleaning efficiency," explained Martin Engineering senior product specialist Dave Mueller. "And the quick-replacement feature means never having to deal with corroded bolts or other fasteners during blade changes."

The belt cleaner from Martin Engineering features the company's patented Constant Angle Radial Pressure (CARP) design for consistent cleaning throughout all stages of blade life. The specially-engineered curved blade maintains the same contact angle, even as the belt wears, helping to retain maximum cleaning efficiency.

The Martin PV Cleaner fits head pulleys up to 406 mm in diameter and belt widths from 300 to 1800 mm. Cleaning width is matched to the conveyor load profile. Typically supplied as a complete assembly, it can accommodate a standard cable tensioner, spring tensioner or the Martin® Twist™ Tensioner. The durable frame can be fitted with solid or segmented blades. Maximum recommended belt speed is 500 FPM (2.54 m/s).

Founded in 1944, Martin Engineering is the world leader in making bulk materials handling cleaner, safer and more productive. The company supplies conveyor products and flow aids around the world for a wide variety of bulk material applications, including coal, cement / clinker, rock / aggregate, biomass, grain, pharmaceuticals, food and other materials. The firm is headquartered in Neponset, IL, offering manufacturing, sales and service from factory-owned business units in many countries, including South Africa.■

More information from www.martin-eng.com or Tel: (309) 852-2384. Global representatives for Martin Engineering can be found at www.martin-eng.com/rep-finder.

Martin Engineering's new conveyor belt cleaner specifically for aggregates is an aggressive design able to remove even wet, sticky sand.

Consistency in cement manufacture

In any manufacturing process, product consistency is essential.

To the customer of a cement plant, consistency of product is critical in achieving the required concrete strength. In addition, there are other important parameters – colour being one.

Cement is produced from naturally occurring raw materials and using fuels that are inherently variable in quality. It is therefore essential for manufacturers to control the process streams of the cement production process and to do this it is essential that the right parameters be measured.

JAMCEM Consulting is a UK-based technical consultancy focusing on performance improvement in the cement industry. It has developed a process to assess the key elements of variability in the cement manufacturing process. This analysis of the process allows the cement manufacturer to identify the source of the variability as well as corrective actions to improve both final product quality and process efficiency. The process focuses on key chemical and physical parameters in the main material streams in the cement manufacturing process – these being raw meal, clinker and cement.

Mark Mutter, MD of JAMCEM Consulting.

Raw meal is the material produced by grinding the raw materials used to manufacture cement – limestone, shale or clay, iron oxide and alumina.

This material is fed into the pyro-processing stage of the cement manufacturing process and the chemical and physical composition of the raw meal will dictate the composition of the final cement as well as the fuel consumption and process stability.

When evaluating a cement plant, JAMCEM measures the target and standard deviation of the following parameters: Lime Saturation Factor, Silica Ratio, Alumina Ratio, 90-micron residue, MgO content, Na_2O_{eq}.

Evaluation at this stage of the process indicates how well the raw materials proportioning systems are working and also assesses the efficiency of the raw milling and blending systems.

The product of the pyro-processing system is clinker and again JAMCEM monitors the standard deviation of the following parameters: C_3S and C_3A content, Free Lime and $Na_2O_{eq.}$ In evaluating these parameters, the stability of the kiln system can be gauged and the potential strength of the final cement estimated.

The final stage of the cement manufacturing process is the cement milling, where clinker is ground with gypsum and, in some cases, limestone and other cementitious materials. JAMCEM evaluates the standard deviation of the following cement parameters: surface area, 45-micron residue, SO_3, C_3S, C_3A, Free Lime and loss-on-ignition.

JAMCEM Consulting has standard deviation targets for all of the parameters mentioned for raw meal, clinker and cement and the results of the evaluation will highlight:

- The stage at which the variability is introduced into the manufacturing process.
- The degree of variability and process instability within the manufacturing process.
- Which parameter should be targeted to reduce the variability of the final product's quality
- The potential gain that would be achieved by reducing the standard deviation of any of the parameters.

The evaluation of the process streams in this manner is a key part of any plant or process audit; the results of the evaluation will aid the cement manufacturer to improve their final product quality, leading to improved customer satisfaction and repeat sales.

In addition to this quality improvement, any reduction in the standard deviation of the chemical and physical parameters mentioned will lead to increases in throughput and reductions in fuel and power consumption.■

More information from Mark Mutter,
Tel: +44 203 405 1881
mark.mutter@jamcem.com

Something BIG will arrive soon...

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www.plugandgrind.com www.cemengal.com

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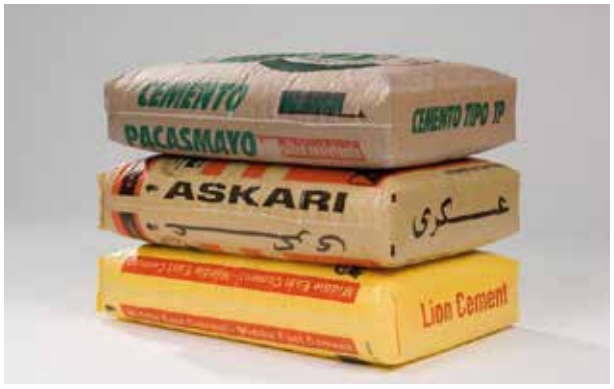


*AD*STAR sacks are used by cement companies all over the world.*

The AD*STAR block bottom valve sack concept, developed and patented by Starlinger & Co. GmbH of Austria and marketed since the mid-1990s, remains a major breakthrough in packaging and handling free-flowing materials. The brick-shaped sacks, made of polypropylene tape fabric, are ideal for the highly automated filling plants handling dry bulk goods such as cement, lime or plaster. Strong and tear-proof, they provide perfect product protection.

Combining the best of three worlds: A paper sack is brick shaped and ideal for automatic handling and storage; a PE film sack is tight and flexible; a woven polypropylene sack is very light with unmatched strength and resistance. The AD*STAR sack was developed by combining the best feature of each sack to create perfect packaging for dry bulk goods. The result: A one-layer block bottom valve sack made of stretched and woven polypropylene tapes, brick-shaped, flexible, lightweight and strong. AD*STAR sacks are manufactured without glue or sewing thread and are a mono-material solution. The coated surface enables all-over printing and gives the filled AD*STAR sack a crisp appearance.

Multi-functional use

AD*STAR sacks are used for packaging all kinds of free-flowing goods, including cement, building materials, fertiliser, chemicals, resin, as well as flour, sugar, or animal feed. AD*STAR sacks offer the following advantages:

- They are resistant to dropping, bending and squeezing, and strong enough to be stacked ceiling-high.

Perfect for the use on automatic filling machines.
(picture courtesy of PPC Cement)

*AD*STAR sacks palletised and stacked for storage outdoors.*
(picture courtesy of PPC Cement)

- They weigh much less than paper or polyethylene film sacks.
- They are air-permeable yet virtually dust-free due to optional microperforation.
- They are recyclable and reusable for various purposes.

For economy and ecology

An empty AD*STAR sack weighs half of other available sacks. The tape fabric ensures high strength and durability while using less raw material for production. The equation goes: The lighter the sack (while offering equal strength and protection), the less raw material input is required. This helps reduce production costs, but minimising raw material usage also contributes to preserving our environment.

The low breakage rate of AD*STAR sacks obviates soil and water contaminating sack contents. Potential savings for cement producers is high as breakage during filling, conveying, palletising, stacking, loading, transporting and unloading can be significantly reduced.

Finally, AD*STAR sacks are a resource even after emptying. Through waste-to-energy incineration, the high calorific value (almost as high as the energy value of fuel oil), can be recovered by burning the sacks.

Sack formats: AD*STAR sacks come in various sizes, from 25 to 50 kg, but new *mini AD*STAR sacks hold 10 - 15 kg.

AD*STAR production technology: Material characteristics are key factors in AD*STAR's strength and robustness as are the production processes. Polypropylene tapes are extruded, stretched and annealed. Tubular fabric is produced from the tapes and the outside covered with a polypropylene coating. On a special conversion line the polypropylene tape fabric is converted into block bottom sacks.

Technical support close by

Starlinger Southern Africa (Pty) Ltd has been operational in Johannesburg since October 2013. Headed by Stefan Ernst, it provides technical service, consulting, spare-part orders and sales support to customers in southern and eastern Africa. The branch office serves as a hub between customers and the company's head office in Austria, facilitating a fast, professional response to customer requests.

AD*STAR® is a registered trademark and produced exclusively on Starlinger machines.■

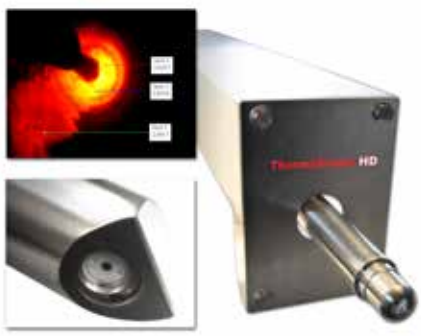
More information from Stefan Ernst,
Tel: +27(0)730 950 802 / www.starlinger.com

ThermaScope HD high-definition kiln and cooler cameras launched

Thermoteknix have recently launched an all-new version of their tried and tested range of ThermaScope kiln and cooler cameras.

The brand new, smaller ThermaScope HD is fully air-cooled, high-definition (1280p), full colour and has a display rate of 60 Hz. Two versions are available. The ThermaScope HD HTV is a high-temperature CCTV-type camera which displays high-resolution real-time imagery to a TV monitor in the control room. ThermaScope HD SLK is a very accurate high-definition radiometric (temperature measuring) camera enabling sophisticated monitoring of the pyroprocess and comes with completely redesigned software on Windows 7 and above.

Both systems can be supplied with either a straight or 90°-angled head for highly flexible mounting with fibre optic communication and a failsafe 'catflap' insert/retract camera mechanism. Thermoteknix' own state-of-the-art, proprietary, miniature, imaging and radiometric cameras have been designed and manufactured to fit inside the 38-mm stainless steel boroscope. The hi-tech design gives economy of operation and utilises less than 7cfm (200 l/min) for air purge and continuous cooling without the need for water. Built-in sensors monitor internal temperature, air flow and power for trouble-free operation.



The ThermaScope HD from Thermoteknix.

The new ThermaScope HD kiln and cooler cameras will improve operational efficiency and combustion control while enabling safe compliance with pollution-minimising protocols. ThermaScope HD aids in detecting snowmen, red rivers and other anomalies and make routine plant maintenance and shutdowns more predictable and less disruptive to the process. ThermaScope HD cameras are built to withstand the harsh environment of the cement kiln and provide high-quality, reliable and accurate data from inside the kiln.

Requiring minimal maintenance, they relay valuable information from the heart of the clinker-making process, allowing plant engineers to make informed decisions about their operation.■

More information from Jez Ford, Tel:+44(0)1223 204000 / www.thermoteknix.com

Energy-efficiencies achieved at Nuh Cimento Sanayi

Erwin Unger, a sales manager in the service department at TLT-Turbo GmbH in Oberhausen/Germany and an expert in refurbishing and implementing cost-saving measures, explains how a fan modification made at Nuh Çimento Sanayi A.S. in Turkey facilitated energy and cost savings by optimising an existing impeller.

TLT-Turbo GmbH is one of the world's leading manufacturers of technology-driven industrial fans and ventilation systems. The company develops innovative technical solutions to achieve the best possible economic efficiency; and offers competent help at any time. TLT-Turbo aims to assist clients to solve all their problems. From the most robust fans for industrial use to the light fans used in air-conditioning systems, the company can always offer the most suitable product.

Typical fields of application for TLT fans and systems include the following: cement plants, thermal power stations, mine ventilation, steelmaking and steel processing, chemical and petrochemical industry processes, waste incineration, tunnel ventilation, wind tunnels and test rigs, dryers, mechanical engineering, electronics, foodstuff processing, pharmaceuticals, precision mechanics, automotive industry, shipbuilding.

TLT provides services at four locations in Germany for axial and centrifugal fans supplied throughout Germany, within Europe and on all continents. TLT guarantees no-hassle repair of fans and delivery of replacement components and spares. TLT also offers customers expert advice, performance tests and analysis for optimising existing fan systems.

Description of the project at Nuh Cimento:

Client: Nuh Cimento Sanayi AS, in Hereke, one of the major cement producers in Turkey

Date: 2011-2012

Project

Very often with industrial fans, for example in the cement industry, the original design data and the data of the real operating point are not in accordance. The consequence is that the real operating point is often under aerodynamic part load of the performance graph of the fan. As efficiency and power consumption are suboptimal, we have to deal with high energy consumption.

Nuh Cimento planned to completely change the existing bearings, shafts and impellers at their factory and install equipment of a new design. They intended to keep the existing casing. The new-design fan was to have the same technical specifications. Additionally Nuh Cimento aimed at achieving energy savings.

In order to run the fan at the ideal operating level, it was necessary to regulate the volume flow and pressure of the fan. Thus, to find an energy-saving solution for the existing fan, a downgrade by minimising the impeller diameter, together with a slide modification of the fan housing was undertaken.

Technical Data

Rotor	Type 2116 BA/1584
Outlet-diameter:	2950 mm (Old: 3350 mm)
Inlet-diameter:	1584 mm (Old: 1584 mm)
Operating temperature:	100°C
Max. temperature:	200°C
Operating speed:	1000 rqm

This included the addition of one set of wear protection, flange shaft, bearings and couplings. In addition to the parts described above, TLT delivered a fan house nose including an additional wear scroll.

Result

The measures implemented resulted in costs that were 40% less expensive than they would have been had the company invested in new equipment. This demonstrates that, with relatively simple and convenient instruments, savings in operational costs can be achieved. In addition, by means of this solution, TLT-Turbo contributed to a reduction of CO_2 levels and also to decreasing energy consumption in general.

For 175 years the company has been decisively involved in the progress of ventilation technology with its range of high-quality products. TLT-Turbo continues to supply customers and users world-wide with future-oriented products.■

More information from Heike Schories,
Tel: +49 (0) 6233 77081-12 / www.tlt-turbo.com

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Perspectives on training for South Africa's construction sector

A budget of about R1tn has been allocated for the development of Strategic Infrastructure Projects (SIPs) in South Africa – which include building roads, schools, universities, harbours, power stations and other key infrastructure projects.

The lack of skills and adequate training in the building and construction industry, however, will hinder development of these ambitious infrastructure projects and increase implementation costs. South Africa has experienced a shortage of about 50,000 artisans in the past few years. At the same time, the construction of mega projects has made the challenges facing the industry even more demanding and complex. One of the building and construction industry's greatest battles is the production and development of professionals who have the necessary skills. So far, South Africa's construction sector has largely overcome the problem by importing skill.

Decade of the Artisan to promote the construction sector to South Africa's youth

Importing skills is not sustainable in the long term, and Government is therefore seeking an 'in house' solution to close the skills gap. Earlier this year, the Department of Higher Education and Training launched the 'Decade of the Artisan' programme, a campaign that promotes artisanship as career of choice to young South Africans.

The National Development Plan requires 30,000 new artisans per year to meet its objectives for the country's infrastructure development. The fact that South Africa currently produces fewer than half this number shows how ambitious this project is.

Continuous professional development is key

Building a solid foundation of young artisans is, without doubt, vital for South Africa's long-term success. However, equally crucial is the professional development of existing construction professionals. In the age of mega projects and a rapidly changing environment, ongoing skills development is more vital than ever.

Moreover, the maintenance of existing and future infrastructure must not be neglected. The renewable energy sector is especially vulnerable as there are hardly enough skills available locally to adequately maintain these facilities. With increasing regional and global integration, South Africa needs to focus urgently on providing its currently active professionals with a competitive edge.

Coming soon in Cape Town: Comprehensive training and skills development for (aspiring) construction professionals

With the Western Cape being a nation-wide leader in skills development for the construction industry, the market has demanded a platform that caters for both aspiring artisans and active professionals.

The Cape Construction Expo and Conference, taking place 13 – 14 August 2014 at the CTICC in Cape Town, offers such a platform to the industry. Over two days, the event brings together 2,500 construction experts from the Western Cape and other parts of South Africa – architects, contractors, designers, engineering firms, investors, property developers, project owners, quantity surveyors and specifiers – to facilitate an interactive exchange of knowledge and advance professional development.

The Cape Construction Expo covers issues around doing business in the Western Cape construction industry and looks at opportunities and challenges of current and up-coming major projects. An interactive exhibition floor with 30 free-to-attend training workshops over two days completes the educational programme.■

Please visit www.cape-construction.co.za for more information.

Kwikform College: an investment in growth and development

RMD Kwikform is committed to the investment and betterment of their people with a focus not only on stimulating and growing their employees, but also on improving the knowledge base within the organisation and the industry. Investing in the growth and development of human capital remains an imperative to ensure that the company's reputation for service excellence and technical expertise is maintained.

With this in mind, the Kwikform College, a secialised and purposeful educational institution within the company, was launched in 2013. The Kwikform College aims to create a unique opportunity for individuals working in the construction industry, or who would want to follow a career in the construction industry. Students will be equipped with important aspects of concrete construction, management development and technical marketing and sales skills within the context of Civil Engineering Construction.

The core focus areas will be technical training and development but will also include generic aspects of business such as managerial skills, conflict management and personal development. Experts from industry will be invited to share their knowledge and insights.

A structured syllabus is under construction and will be finalised with the input from nationally recognised education institutions. In time the Kwikform College will explore inviting students from outside the organisation to attend specific courses, contributing to uplifting the industry.

RMD Kwikform MD Johan Smit.

The Kwikform College will work with several interested and like-minded tertiary institutions to narrow the gap between the two worlds of academia and practice.■

More information from Julie Short,
Tel: +27(0)12 004 1045 / www.rmdkwikform.com/za

MBA North to run workshops on new Construction Regulations

The Government's new Health & Safety Construction Regulations 2014 were officially promulgated on February 10 along with the certification that SA Council for Project and Construction Management Professionals (SACPCMP) is the appointed registration body for Construction Health and Safety practitioners.

Master Builders Association North will later this year be running a series of workshops for contractors highlighting – and simplifying — what these regulations mean to the contractor. The Department of Labour (DoL) has offered its assistance so, where practical, the workshops will be run in collaboration with representatives from the DoL.

"Where the previous regulations failed in adequately identifying responsibilities from client through to contractor, the Construction Regulations 2014 endeavour to redress the situation which saw continued frustrations with generic health and safety specifications often issued after project start dates," says Doug Michell, MBA North Construction Health & Safety Manager

Doug Michell, MBA North Construction Health & Safety Manager, says the Association will be running a series of workshops for contractors.

Adds Mohau Mphomela, Executive Director of MBA North: "The workshops we are going to stage will simplify the Construction Regulations to assist our members to more fully understand the implications thereof — and how it is going to affect/impact them and their businesses.

"Our contractors/members are constantly busy on construction sites. Instead of them having the arduous task of studying and interpreting a myriad of pages explaining the complex legislation, MBA North intends to summarise and simplify it for them at the workshops," Mphomela added.

The dates of the MBA North workshops still have to be announced but will cover changes to the regulations (2003 vs. 2014) with particular focus on:

- Application for Construction permits – Clients' responsibility:
- Clients' duties and responsibilities;
- Designers' duties and responsibilities;
- Principal contractor and contractors' duties and responsibilities;
- Managers' duties and responsibilities;
- Registration of CHS practitioners; and
- Operational Regulations 2003 vs. 2014.

The workshops will be run in all four provinces of the MBA North: Gauteng, Limpopo, North West Province and Mpumalanga.

Phone Ashleigh Feeny, Tel: +27(0)11 805 6611 or email ashleigh@mbanorth.co.za for more details. The link below is to the Construction Regulations for downloading: http://mbanorth.co.za/index.php?option=com_content&view=article&id=337:construction-regulations-2014&catid=83:association-news&Itemid=570 ■

Issued for MBA North, Midrand / Further info: Mohau Mphomela, tel 011 805 6611 www.mbanorth.co.za

Busy training calendar for MBA North

Master Builders Association (MBA) North is planning several important training sessions for members and the public during the rest of the year.

MBA North's Construction Health & Safety department will present the following courses (all at the MBA North Offices in Midrand):

- Hazard Identification and Risk Assessment (HIRA) on Friday May 16; and then again on Friday 10 October and Friday October 17;
- First Aid Level 1 on June 25 and 26; and
- Health and Safety Representative on Friday August 15 and Friday August 22.

For more information on the courses, contact Ashleigh Feeny on email ashleigh@mbanorth.co.za or Tel: +27(0)11 805 6611.

The Education, Training and Transformation department of MBA North's training calendar for the rest of 2014 includes:

- Microsoft Word 2010 on June 4;
- Effective Business Writing Skills on June 23;
- Joint Building Contracts Committee (JBCC) on July 1, September 16 and November 10;
- BEE half-day seminar on August 5 and October 20;
- Project Management for Non-Project Managers on August 18;
- Microsoft Excel 2010 on September 2; and
- Microsoft Power Point on October 16.■

The venue for these courses is also the MBA North offices in Midrand. Full details are available from Sarah Mnyandu on email sarah@mbanorth.co.za or Tel: +27(0)11 805 6611.

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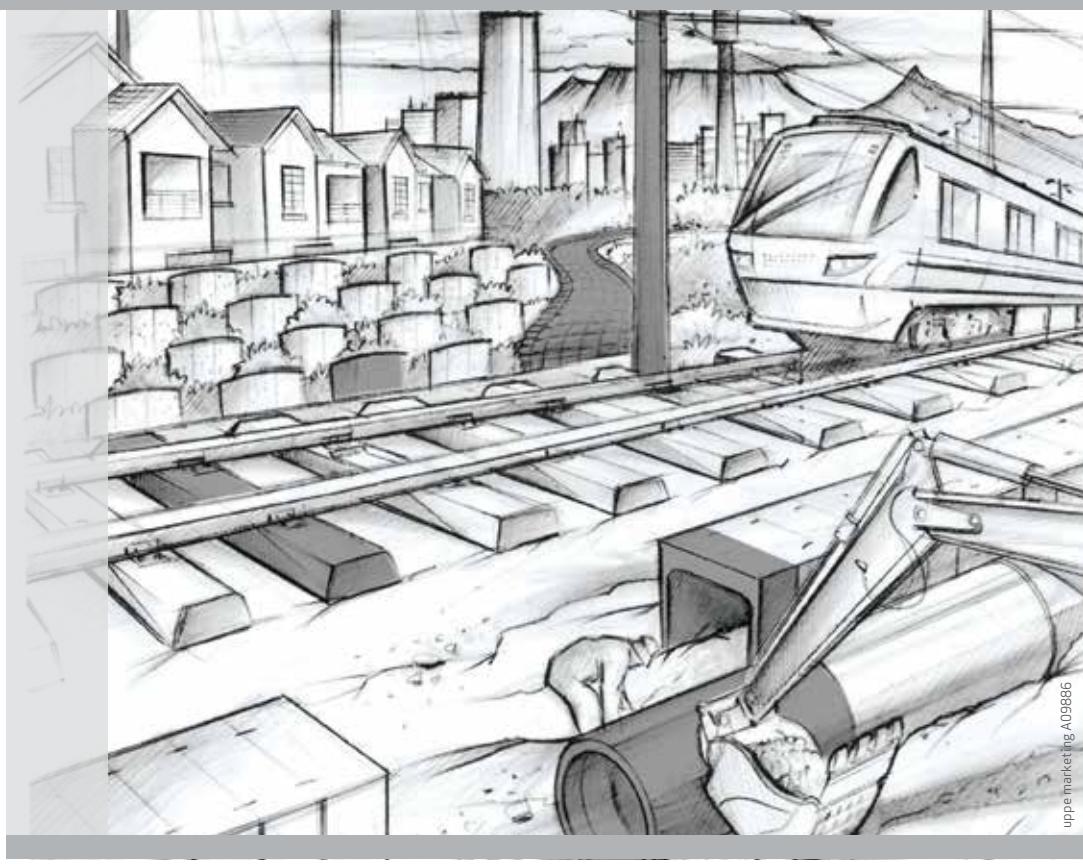

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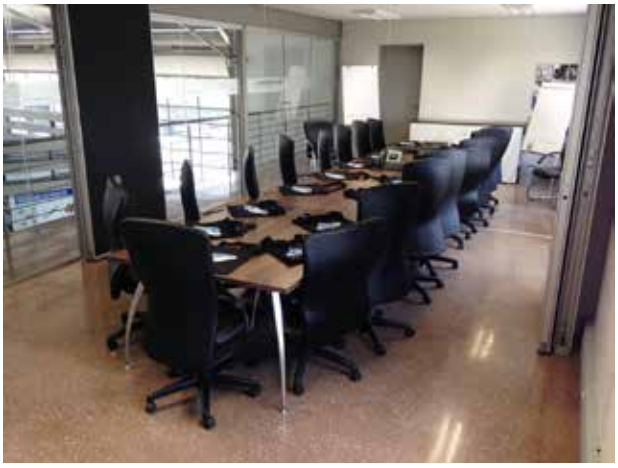
Industry-specific training and workshops add value to market

PMSA marketing and sales manager Quintin Booysen reveals that the workshops and training sessions will include input from concrete experts and industry leaders from Europe and South Africa. "The decision to host regular open training and workshop sessions is of particular importance to PMSA, especially as our product and service offering to the construction, mining and precast concrete sector continues to expand at a consistent rate across South and Southern Africa." Booysen notes that PMSA will be conducting monthly seminars, to which it will invite up to 17 industry professionals per session. "These seminars will be between half and one-day events where outside companies can come and learn more about what PMSA has to offer, and the latest developments in the concrete equipment sector."

The seminars will be presented by a variety of PMSA's European suppliers, with a different theme and presenter each month. Booysen explains: "The seminars will showcase the products and services we have to offer, as well as explaining developments in the technology. We want to drive the technology and the solutions that we provide through these workshops offered to the industry."

In addition to the seminars, PMSA will also be conducting in-house training sessions for its staff to ensure that they are up-to-date and skilled with the various technology updates from industry and the range of suppliers to PMSA.

PMSA marketing and sales manager Quintin Booysen.



The training room ready for the courses offered by PMSA at Jet Park.

Seminars planned for 2014 include:

- An HTC seminar on the preparation, polishing and maintenance of polished concrete floors
- Wil El Mil wet pressing technology for street kerbs and concrete products
- BFS seminar will focus on concrete pipe making systems
- RAMPF will look at mould technology for brick and block machines
- An IMER seminar focusing on batching and mixing plants and transit mixers
- A Finke workshop examining oxide dosing and metering systems
- FIORI will examine self-loading concrete mixers and certified concrete
- Pavatile's workshop will feature moulds for simulated stone
- A building and civil industry concrete pumps workshop conducted by Turbosol and Sermac
- Automation and product handling of brick and block making machinery, hosted by PMSA

All training will be conducted at the PMSA facility in the showroom boardroom section.Each seminar will cater for a maximum of 17 people. Booysen highlights that in 2015, the company will expand this into a full-time training centre established alongside the showroom.

All seminars will be advertised to industry and outlined on the PMSA website, www.pmsa.com. Interested parties can contact vannesa@panmixers.co.za for more information or to be invited to attend the seminars.

Booysen comments that in the future, PMSA is planning to host more in-depth, two-day courses for owners of equipment as well as prospective clients.

"These seminars keep us active in the South African market, and give us a competitive advantage. We are supplying valuable technology training and the latest information to the market," he concludes.■

More information from Quintin Booysen
Tel: 086 100 7672
Email: quintin@panmixers.co.za

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SAPMA's offer to redeployed Medupi workers

The new training facilities for aspiring paint contractors at the SA Paint Manufacturing Association (SAPMA) Centre of Excellence in Springs could provide essential training for the hundreds of workers who will be jobless after the completion of the Medupi Power Station.

Deryck Spence, executive director of SAPMA, says this is only one of many potential opportunities various departments of government could utilise to train the unemployed and reduce joblessness in South Africa.

"The course, although basic, will nevertheless be comprehensive enough to help successful students gain employment in the paint contracting sector after which they could strive to attain full qualification and expand experience and training to entrepreneur status and starting their own businesses."

SAPMA has suggested to the consultants entrusted with the redeployment of Medupi workers that SAPMA and its training arm, the SA Paint Industry Training Institute (SAPITI) could develop a special curriculum, covering one day of theoretical and four days of practical training, for ex-Medupi workers.

"The course, although basic, will nevertheless be comprehensive enough to help successful students gain employment in the paint contracting sector after which they could strive to attain full qualification and expand experience and training to entrepreneur status and starting their own businesses," Spence explained.

A CIDB delegation met the residents of an Ekurhuleni informal settlement, such as Ntebo Nqozwana (pictured), who attended a free course in basic paint application provided by SAPMA at the new Centre of Excellence in Springs.

A trainee applies paint to a roof using skills acquired at the free course.

SAPMA has offered to provide special cut-price training and accommodation for a 'trial team' of 10 Medupi candidates facing redeployment who would then afterwards become promoters of the training available at the Centre of Excellence to work colleagues and potential candidates.

A delegation of the Construction Industry Development Board (CIDB) also recently visited the Centre of Excellence training facility and was, according to Spence, exceptionally impressed and motivated to assist in the future growth of the Centre and its courses.

"The delegation met the residents of an Ekurhuleni informal settlement who attended a free course in basic paint application provided by SAPMA. The CIDB executives were touched by the passion and determination of these jobless disadvantaged people, of whom five were women, to learn new skills to earn a living.

"With SAPMA's help, the eight students have already found contractual employment and their success has inspired SAPMA to consider compiling a list of Centre of Excellence-trained paint contractors for use by the public and relevant organisations seeking qualified painters."

But Spence says the Centre of Excellence critically needs support from governmental bodies as well as the coatings sector to become viable this year. "Despite the fact that the Department of Trade & Industry has called for a strong working relationship between the private sector and the government in terms of its National Industrial Policy Framework and the five facets of the government's Industrial Policy Action plan, there has so far been no tangible support from state departments to the SAPMA training on offer.

SAPMA has, for example, invited the Department of Labour, the Department of Public Works, and the Department of Correctional Services to send students to the Centre of Excellence.■

More information from Deryck Spence, Tel:+27(0)11 455 2503 / www.sapma.org.za

Training to overcome floor problems

Vexing problems associated with concrete industrial floors on the ground remain the subject of most of the calls for assistance received by The Concrete Institute, says the Institute's MD, Bryan Perrie.

Perrie says the volume of calls for help is not surprising as it is not generally realised that design and detailing, as well as sound construction practice, are aspects of concrete flooring that require specific training.

"A thorough understanding of all the characteristics of concrete, the influence of material selection, environmental inconsistencies, as well as handling and finishing, are essential to produce a quality floor. A disregard for any of these factors can cause problems normally observed too late in the process for remedial action," he warns.

The Concrete Institute's School of Concrete Technology's training on concrete industrial floors aims to help consulting engineers and contractors overcome these problems. The syllabus is extensive and covers all aspects of design and construction.

Flooring training courses are regularly presented. The next 'Concrete Industrial Floors on the Ground' one-day course will be held on May 29 in Durban, July 1 in Cape Town and September 12 in Midrand. Arrangements for special flooring courses can also be discussed with the School. The course has CESA accreditation and earns 1 CPD point.

Publications on flooring available include *Repairing spalled joints in concrete floors* and *Sand-cement floor screeds and concrete toppings for floors*. These publications can be downloaded from www.theconcreteinstitute.org.za free of charge. *Concrete Industrial Floors on the Ground*, the book by Bryan Perrie and Louis Marais, can be purchased from the Institute.■

A concrete industrial floor under construction.

More information from Bryan Perrie,
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Murray & Roberts develops zero percent cement concrete

High production costs of concrete in combination with the high CO_2 footprint of cement has instigated the research, development and application of concrete utilising by-products and wastes as partial or entire binder replacements. Concrete.TV spent time with Murray & Roberts' to document the development of the geopolymer concept.
http://goo.gl/AiG9z2

Buildings that get better with time

Too many buildings look impressive when handed over to the client, but become a liability once they get older. With their nature-inspired approach, StudioMAS Architects want to challenge our notion of beauty by not covering up cracks and imperfections but rather integrated them into their design.
http://goo.gl/dciydb

Concrete Evolution: art installation by using cement

Johannesburg-based designer Suzaan Heyns' partnership with cement giant, PPC Cement, has resulted in an on-going art installation and transformation of her store in Melrose Arch. Born from their 2012 Reimagine Concrete collaboration, the stylish partnership between Heyns and PPC Cement has grown beyond expectation in creating a one-of-a-kind sensory space and experience.
http://goo.gl/hDYdJf

'The private sector should drive the housing delivery'

Concrete.TV interviewed Bonginkosi Madikizela, the Western Cape Minister of Human Settlements who acknowledges there have been a number of challenges for government to tackle the R26 billion infrastructure backlog in the Western Cape province.
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Soaring to the heavens on Rio's Christ the Redeemer

Repairing this iconic concrete statue calls for skills, bravery – and faith, writes Jan de Beer.

Nothing lasts forever they say. Even concrete, despite its renowned durability, occasionally needs fixing. Repairs are usually fairly routine operations – but there's one currently under way that's anything but. In fact, it's so challenging that the repair team even asked an Archbishop to bless them before starting work.

The daunting repair project is the iconic 38-m-tall statue of Christ the Redeemer which, from a 700-m granite peak, overlooks Rio de Janeiro, currently sprucing itself up for the 2014 Soccer World Cup in June, and the 2016 Olympic Games.

The 635-ton statue of Christ is considered the largest Art Deco figure in the world. Designed by local engineer, Heitor da Silva Costa – whose open-arms design, symbolising peace, was chosen after lengthy deliberations. Christ the Redeemer was created from reinforced concrete with soapstone outer layers to augment durability and facilitate maintenance. Construction took nine years and cost (in current terms) R33 million. It was officially opened on 12 October 1931.

The statue is often hit by lightning because of its lofty exposed position, but it has endured an exceptionally intense electrical barrage this year. Lightning damaged the 28-m wide statue's head, right finger and thumb in 2014. As part of the concrete repair being carried out by (very brave) abseiling engineers, additional lightning conductor rods will be placed on the statue to prevent future damage. Already a lightning conductor covers the head like a crown of thorns, and stretches down each arm to the hands. The work will now extend the lightning rods to the fingertips.

Christ the Redeemer towers over the city of Rio de Janeiro.

It takes scaffolding - and nerves of steel - to repair this iconic statue.

Improving the earthing of the rods is important. Effectively earthed, there would be less risk of damage in the immediate vicinity of the conductor. But earthing is tricky at the top of a big granite rock, as granite itself conducts electricity poorly.

The damage caused by 2014's spectacular lightning strikes was more serious than usual, says Pirelli South America, which is footing the R8-million repair bill. The statue will remain open to tourists while work is progressing. Expected to take about four months, it will be completed before the Soccer World Cup commences in June.

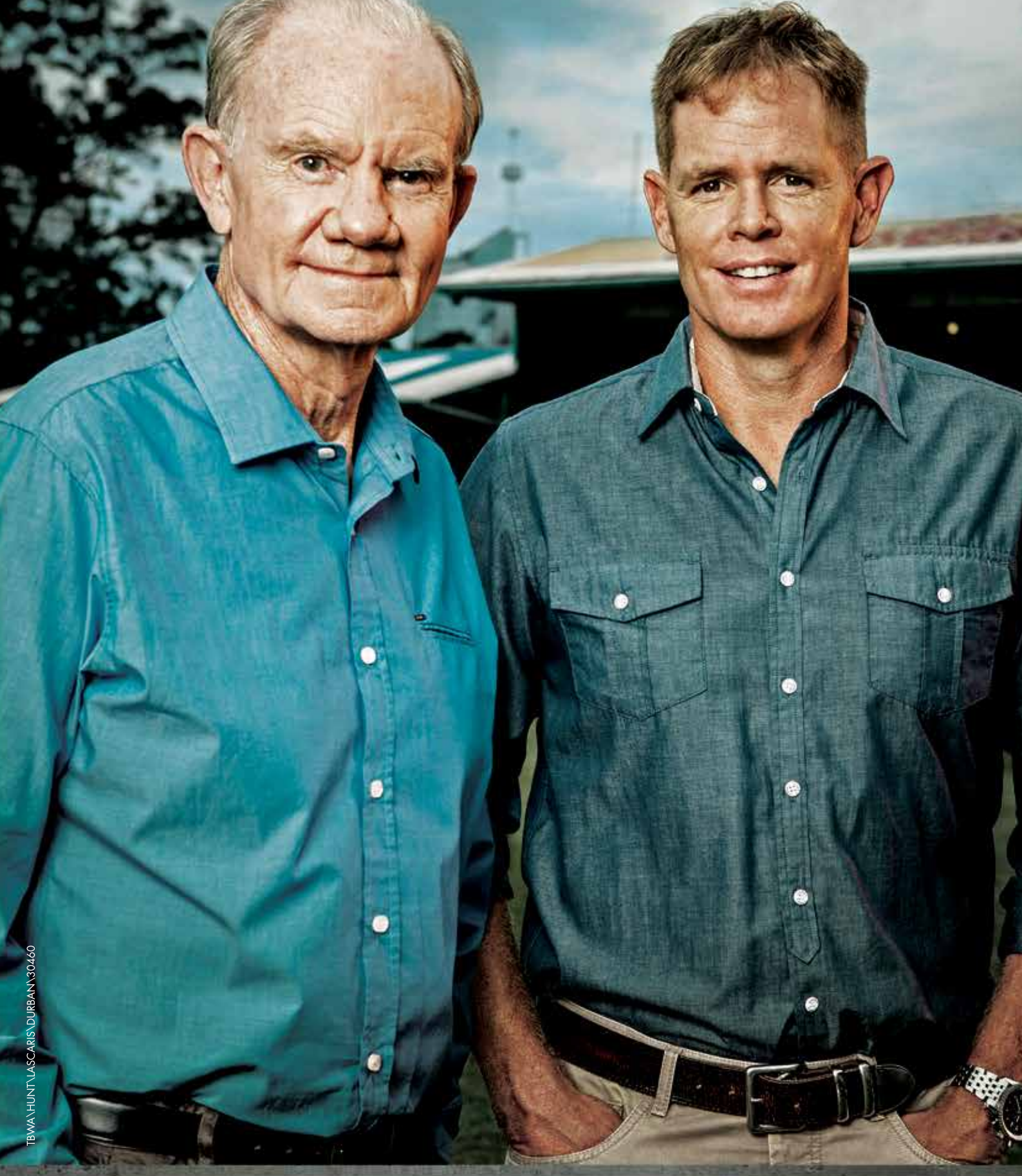
The statue underwent a R40-million renovation in 2010 to repair eroded parts of its face and hands; and was also damaged in April 2010 when arms, head and chest were covered in spray-painted graffiti. The perpetrators used the scaffolding for the renovation to scale the statue and vandalise it.

The current repair project is mind-boggling and has produced some astounding photographs. Readers (apart from those with no head for heights) should just Google the subject to understand why repairmen asked the Archbishop to pray for their safety while on the arms of the Lord…

* * * * *

Cement fans who never find homage to their favourite product on stage, should know that the great Liberace had, in his early days, a stirring sonata, *Cement Mixer*, in his repertoire. Jonathan Roxmouth performed the rare spoof in *Call me Lee*, his tribute to Mr Showmanship staged at Montecasino in April.

The lyrics are cryptic, adding only the words 'putty, putty' to the song's title, while the piano reaches dramatic and rousing levels of passion. Roxmouth's inspired, tongue-in-cheek interpretation nearly brought the house down. Figuratively, of course. We are, after all, speaking about our beloved building material.



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