

CONCRETE

Journal of the African Cement and Concrete Industry

trends

VOL 18 No 1 February 2015



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Cover:
 Story on Page 20
 A new technology introduced by CLF is the so-called 'tilt-up' construction method, which uses the floor of a building as a casting bed for the wall panels, which are then simply lifted into position with a crane.

CONCRETE trends

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Page 18 - Keo Lekutu, Gauteng Piling's contracts manager, feels MBA North's Youth Forum will be important.



Page 46 - Jacking pipes manufactured by Rocla have been chosen for the Palmiet to Signal Hill project.

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Editor's message February 2015

In this era of 24/7 newscasts, social media and the Internet, unsubstantiated claims are common, and rumours – supported by very little – are taken to be true. So it is hardly surprising to find that quantification is what makes us feel that there is veracity in what we hear, see or read.

Just recently there have been a number of reports that serve to confirm claims we have, perhaps, greeted with scepticism.

One of these must be that 'green building' and alternative energy sources are not more expensive than their traditional counterparts and that they bring benefits to those brave enough to take that step.

A recently-released report from the CSIR has succeeded in putting numbers, scientifically derived, to the financial benefits South Africa has gained from alternative energy sources over the past year. The independent study found that renewable energy from the country's first wind and solar (photovoltaic) projects created R800-million more financial benefits for the country than they cost during 2014.

The report says that the Department of Energy has already procured nearly 4000 MW of renewable capacity (mainly wind and solar) from independent power producers. In addition, R3.7 billion was derived from diesel and coal fuel cost savings, as 2.2 terawatt-hours of wind and solar energy replaced the electricity that would have otherwise been generated from

diesel and coal. With the parlous state of Eskom, this can only serve as the stimulus for which the alternative energy sector has long been waiting.

Another interesting set of numbers comes from the African Union headquarters in Addis Ababa where China, the continent's largest trading partner, and the AU have signed an MOU for an ambitious plan to develop road, rail and air transport routes to link capitals across the continent.

China has often been accused of 'concrete diplomacy' and of seeking only to exploit the continent's resources. Defending her country's aid to Africa, foreign ministry spokeswoman, Hua Chunying, said that China had completed 1,046 projects in Africa, building 2,233 km of railways, 3,530 km of roads and 132 schools and hospitals. Whatever you feel about Chinese aid, these are incontrovertible contributions to Africa's connectivity, trade and breaking down development bottlenecks.

Finally, the Cement Map accompanying this issue, and the editorial in the magazine provided by suppliers to the cement industry, offers proof of how vital and exciting are the cement and materials industries in their support of the continent's burgeoning middle class and their commitment to building a better life for all.

Gill Owens



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Duncan honoured for 'Extraordinary Contribution'

Neil Duncan, chief financial officer of Kevin Bates Albert Carpets, has received the special Master Builders Association North Presidential award for his 'Extraordinary Contribution' to the MBA.

The award honours the efforts of Duncan, who was president of the Gauteng Master Builders Association from 2006 to 2007 before the association changed its name to MBA North. He has for many years been Honorary Treasurer of the MBA North and serves on the association's Executive Committee, and is also extremely active in the MBA training initiatives.

The 'Extraordinary Contribution Award' praises Duncan's dedication to the building and construction industry and states that his contribution and perseverance helped the MBA maintain its exceptionally high standard of both quality and ethics in business.

The association's president Lea Smith stated: "The Boy Scout's motto is 'Be Prepared' and this is how I would describe Neil Duncan, who was involved with the movement for many years. Neil has been an active member of MBA North for more than two decades and throughout, when asked to contribute, Neil did not provide 100% assistance but 110%. Neil always brings his 'A-game' and all of us at MBA North believe he is a true, inspirational leader to look up to and respect."

Smith said the special MBA North Presidential Award was not an annual accolade but only presented when the association felt an individual deserved such an honour. "I can think of no



Neil Duncan (left) receives a MBA North special award for his 'Extraordinary Contribution' to the association from MBA North president, Lea Smith.

more worthy case than Neil Duncan who, in his low-key, self-effacing manner, has been such a tremendous ambassador for MBA North for so many years," he added. ■

**More information from Palesa Khambi,
Tel: +27(0)11 315 0300 / www.mbanorth.co.za**

SMEC South Africa appoints new CEO

Global engineering consultancy firm SMEC has appointed a new and highly experienced CEO to its South Africa operation.

Kostas Rontiris has been appointed as CEO effective from September 1, 2014. Rontiris has over 30 years of experience in the transport infrastructure sector and the management of business units in southern Africa and Europe.

"In my previous position as strategic business development executive for SMEC South Africa, I was responsible for the management of approximately 700 employees, which involved market development, commercial and human resources," he explains.

Rontiris holds an MSc degree in Highways and Traffic Engineering, as well as a BSc degree in Civil Engineering. Furthermore, he has worked on a variety of local and international projects, gaining extensive experience in business development, client relations, negotiations and contract management, financial



Kostas Rontiris.

management, and infrastructure project implementation.

About SMEC

SMEC is a professional services firm with Australian origins and a global footprint that provides high-quality consultancy services on major infrastructure projects. SMEC has over 5,100 employees and an established network of more than 70 offices in Australia, Asia, the Middle East, Africa and North and South America.

The SMEC South Africa operation provides professional engineering services throughout South Africa and the rest of Africa in the following sectors: hydropower, transport, water, natural resources and environment, geotechnical, mining, tunnelling, urban development, renewable energy, power, government and advisory services and social infrastructure development. ■

More information at www.smec.com

GIBB named Engineering Firm of the Year



GIBB Group CEO, Richard Vries and Adele Lombard, Structural Engineer at GIBB at the SAPSA awards

The South African Professional Services Awards (SAPSA) has named GIBB Engineering Firm of the Year in for 2014. GIBB was judged on business pedigree, transformation, empowerment among other rigorous criteria. Other finalists in the category of Engineering Firm of the Year included WSP, Worley Parsons, Fluor Africa and Arup.

Adele Lombard, a Structural Engineer at GIBB, also clinched the coveted title of Young Professional of the Year, competing against candidates from prominent legal, financial and engineering institutions.

The premier event is likely to remain a feature on the conference calendar given the exceptional turnout and the number of entries from A-List firms.

GIBB Group CEO, Richard Vries said: "GIBB prides itself on investing in future leaders and engineering excellence – and this was indicative of the awards received on the evening."

K.C.Rottok, the project manager of SAPSA made this observation: "The SAPSA

awards serve to recognise companies and individuals who have excelled within the professional services industry. GIBB has made a significant contribution to the consulting engineering profession and its professionalism is highly commendable."

GIBB is regarded as the largest South African black employee-owned consulting engineering firm and boasts more than 900 employees in South Africa and has several offices on the continent.

The multi-disciplinary firm has recently acquired a 70% stake in the leading architectural firm, SVA International to further diversify its offering to the market.

With major projects such as the Ingula Pumped Storage Scheme in Little Drakensberg and Port Harcourt in Nigeria in its stable, the firm is growing at an impressive rate, competing in a space largely dominated by multinational firms. ■

More information from Rowan Sewchurran, Tel: +27(0)11 519 4600 www.gibb.co.za

Anglo American leads South Africa in Corporate Social Investment

Anglo American has recently been ranked as South Africa's leading company in Corporate Social Investment (CSI) by Trialogue, for the tenth time since the inception of its Chairman's Fund.

Norman Mbazima, the Chairperson of Anglo American's Chairman's fund, said: "While the results attest to perceptions pertaining to our impact as a company, the results nonetheless show which companies are successfully communicating their programmes and are achieving reputational benefits," reads the report.

"In 2014, respondents agreed that Anglo American was achieving the greatest development impact, with 26 corporate mentions and 24 non-profit organisations (NPO) mentions. This is in line with results from 2013, in which Anglo American was voted the NPO favourite and it shared the distinction with Nedbank of being in the corporate top-ten list."

Anglo American's total CSI spend in South Africa for 2013/14 was R643 million including Group companies and the Chairman's fund. The primary focus of this expenditure was on education, health, community development, enterprise development, arts and culture as well as sports.

"Our top ranking in this survey can be attributed to the competency of management, thorough our respect

and engagement with beneficiaries, as well as innovative embracing of dynamism in these communities. It is a credit to the positive change our CSI activities has achieved in our local communities."

"We're committed to not only being a good corporate citizen but also to making a genuine difference in the communities surrounding our operations, and in South African society as a whole. In all our efforts as a company, we work towards delivering sustainable value that makes a real difference now and for the future. We currently have a broad range of initiatives under our CSI banner across the country that are helping thousands of people to take greater control of their lives."

Mbazima adds that in emerging economies like South Africa, Anglo American believes business has a responsibility to work in partnership with government to help to build the future of the country and its citizens.

"By working in creative partnerships with government and our host communities, we have successfully harnessed our various strengths and resources and created an enabling environment for sustainable benefits." ■

For further information, please contact: Hulisani Rasivhaga, Tel: +27(0)11 638 4401



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Chryso's new owners will help boost African growth

There are substantial benefits for the Chryso Southern Africa Group following the acquisition of Chryso from its French parent company, Materis, by a leading European equity firm, LBO France, which has €4 billion under management, says Norman Seymore, vice president of the Chryso Group globally.

In South Africa, the Chryso Southern Africa Group comprises admixture producer, Chryso SA, and construction chemicals manufacturer, a.b.e. Construction Chemicals. Seymore is CEO of both companies.

"For Chryso worldwide – and particularly in South Africa – the acquisition has strong benefits because Chryso will now be a stand-alone entity globally, and the cash injection from the



Norman Seymore, vice president of the Chryso Group globally, says the acquisition of Chryso by LBO France will benefit the Chryso Southern Africa Group.

acquisition will provide Chryso with a new credit line to finance future growth," Seymore stated.

He said the expanded credit reserves would enable Chryso to expedite the expansion and acquisition plans that were part of its future growth strategy.

"Chryso has just acquired operations in Sri Lanka, and the Chryso Southern Africa Group has plans to establish manufacturing facilities in East and West Africa. LBO's acquisition has provided funding that will enable Chryso Southern Africa to become the Chryso springboard to move into Africa," Seymore added.

LBO France's announcement regarding the acquisition of Chryso for €285 million, along with the incumbent management team, states:

"This transaction follows Chryso's successful refinancing completed in the (European) summer of 2014. Based on a moderate leverage, it gives the company the flexibility to step up its growth strategy.

"A world-leading speciality chemicals player at the service of the construction industry, Chryso specialises in admixtures and construction systems, and is renowned for its strong culture of innovation and capability.

"With sales of €239 million in 2013 and nearly 1,000 employees, Chryso is a global player, present in over 20 countries, including both developed and emerging markets – the latter accounting for over 50% of its business.

"Working with the experienced management team which has built Chryso's current strong market position, LBO France will support the company's ambitious business plan by reinforcing its technological leadership and continuing its geographic expansion at a global level." ■

**More information from Norman Seymore,
Tel: +27(0)11 306 9000 / www.chryso.com**

a.b.e. appoints national flooring sales manager

Peter Jones has been appointed national sales manager: flooring for a.b.e. Construction Chemicals, part of the Chryso Southern Africa Group.

Based in East London, Jones joined a.b.e. there in 1995.

During his 20-year career with the company, he has served as regional sales manager, assisting in the opening of a.b.e.'s new George branch; then East London branch manager; and later regional manager: construction for the Eastern and Southern Cape.

He subsequently joined the a.b.e. Export Team, with the West Coast of Africa as specific personal responsibility.



Peter Jones, a.b.e. Construction Chemicals' new national sales manager: flooring, pictured in the company's Durban laboratory, with Bongani Mangazi, laboratory assistant.

This involved visiting various countries to promote the company's products.

As product manager: flooring for a.b.e., he handled new product launches, staff and customer training, as well as the training of a.b.e.'s export contractors and customers.

In his latest position as the national sales manager: flooring, Jones will be coordinating and managing the operations of the regional branches' new Flooring Forums, recently established by a.b.e. Construction Chemicals. ■

**More information from Charné Batty,
Tel: +27(0)11 306 9000
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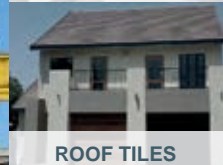
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New general manager for Lafarge Aggregates



Praveen Bechoo, General Manager – Lafarge Aggregates.

Lafarge recently welcomed Praveen Bechoo as its general manager for aggregates.

Praveen, whose appointment commenced on 1 October 2014, is based at the Lafarge head office in Longmeadow, Johannesburg and is also a member of the Lafarge Country Executive Committee.

A qualified engineer, Bechoo holds a degree in BSc Mechanical Engineering, a Bachelor of Commerce degree and a Master's in Business Administration.

Prior to joining Lafarge, he occupied various senior management positions with companies such as Eskom, Holcim and M-Web Commerce Zone. His recent position was Business Unit Chief Executive Officer at Macsteel Coil Processing and Macsteel Special Steels where he spent 13 years.

Bechoo replaces Jacques Schutte, who has been overseeing the Aggregates Product Line for the past nine months. Schutte will return to his position as strategy and business development manager. ■

Additional information is available on the website at www.lafarge.co.za

New financial manager at Ash Resources



Ash Resources' new Financial Manager, Mayibongwe Gegeza.

Ash Resources, South Africa's leading manufacturer and supplier of fly ash products, has appointed Mayibongwe Gegeza as its new Financial Manager and member of the company's Exco, with effect from 1 December 2014. He takes over from Debbie Fox who, after nine years with Ash Resources, has returned to Lafarge South Africa to work on a special IT project.

Gegeza has been with Lafarge Industries South Africa for over six years, starting as an Internal Auditor and, for the last three and a half years, as Financial Accountant. He is a Chartered Accountant, obtaining his B Com Honours, Commerce (Accounting) from the University of Natal. "I am excited at this opportunity to spread my wings in the Lafarge Group and take on more responsibility," Gegeza says. "In the same way that I encourage my staff, no matter how big the challenge, I aim to achieve the best in everything I do."

Married with three young sons, Gegeza is a lover of a wide range of sports: these days it is mainly as a supporter of Kaizer Chiefs, the Stormers, and the Warriors! ■

Additional information is available on the website at: www.ashresources.co.za

Advisory Note

Legal representatives acting for Mr. Paul Hartman have alleged that the cautionary notice published in our November 2015 edition for and on behalf of A. Shak (Pty) Ltd contained untrue allegations and statements defamatory of their client. We have no way of verifying the correctness of these allegations but to the extent that they are true, the magazine formally distances itself from the offending portions of the notice published on behalf of A. Shak (Pty) Ltd. ■

Chryso Group acquires Sri Lankan admixture producer

Global construction chemicals producer, the Chryso Group, has acquired the controlling shareholding of Sri Lanka's CST (Concrete Solutions Technology Lanka Pvt Ltd), a licensed producer and distributor of Chryso products in Sri Lanka since CST's inception in 2010.

This follows the acquisition of Chryso itself by European equity firm, LBO France, in 2014. Norman Seymore, vice president of the Chryso Group globally and CEO of the Chryso Southern Africa Group, said the new ownership would facilitate Chryso's future growth strategy.

Seymore will form part of the team to drive the operations of Chryso/CST based in Seeduwa, close to Colombo International Airport in Sri Lanka.

"CST is extremely active in the concrete admixture and construction systems markets in Sri Lanka and is an appropriate platform to service fast-growing local demand: the admixture market in Sri Lanka has grown by ±30% in the past few years. The Sri Lankan market will benefit from the Chryso Group's expertise, technology and innovative solutions. Chryso is now the only admixture producer to have a fully installed manufacturing plant in the competitive Sri Lankan market. CST is also well equipped in technology and quality control and has its own laboratory on site," Seymore stated.

"a.b.e. Construction Chemicals, another member of the Chryso Southern Africa Group, has products already being distributed in Sri Lanka by CST."

Seymore said: "CST has shown impressive growth and would benefit from the foreign investments and opportunities offered



The staff of Chryso/CST with VIP guests and management at the opening of Chryso/CST in Sri Lanka. Seated from left: Jerome Besnoux, Chryso Gulf GM; Ebrahim Seedat, MD Chryso/CST; Thierry Bernard, Chryso Group CEO; Norman Seymore, Chryso Group vice-president; and Patricio Ayuban, Chryso Gulf Technical Services Manager.

by the GDP growth of 7 to 9% that has been predicted for Sri Lanka in the next five years.

Ebrahim Seedat, founder of CST, is now MD of Chryso/CST and serves on the new company's board of directors with Seymore and Chryso executives, Thierry Bernard, the Chryso Group's CEO and Jerome Besnoux, Chryso Gulf GM. ■

More information from Norman Seymore,
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Mtwara cement plant set to fuel Tanzania's growing economy

Tanzania's economy is booming, with the construction industry and demand for cement being key drivers in boosting the economy.

Commissioning the Dangote Group's new cement plant in the Mtwara region will help facilitate further growth and help Tanzania meet its local cement needs but will also provide supplies for export. The plant, set for completion in 2015, will produce three million tonnes of cement per year, approximately half of Tanzania's current production. It will be powered by a 75-MW coal-based power plant – one of only four facilities worldwide to use coal to fire its kiln.

Aurecon has been appointed as the local engineering consultant on this greenfields project and will be providing civil, structural, mechanical, electrical and plumbing (MEP) engineering design review as well as registration and construction supervision services.

Ensuring buildability

Craig Wood, Aurecon's country manager, Tanzania, says the project has been challenging: "Because the design of the plant originated in China with external design review from America, Aurecon had to ensure the final design was an applicable



and constructible solution for Tanzania. To do so, Aurecon utilised expertise from its local and global teams to ensure the buildability of the design to local standards," explains Wood.

"Processing and standardising the information originating from designers and reviewers spread across the globe was particularly challenging. Advising our client on adapting their standards to comply with Tanzanian standards has been a value-add to the facility," says Anna Munyagi, Aurecon's in-country coordination engineer.

Aurecon formed a consortium of architects and quantity surveyors in Tanzania to ensure that the design, material selection and standards were achievable within local conditions and taking into account local constraints.

"In addition, Aurecon is also managing critical Tanzanian registration and compliance matters, including obtaining approvals on local legislation for the plant. Mtwara is set to become a significant infrastructure hub to support the emerging large industries in Southern Tanzanian/Northern Mozambique. As Aurecon is also involved in the Mtwara Town Master plan we have a good platform to engage the local authorities," says Munyagi.

Critical project oversight

Harun Mopendela, a civil engineer with Aurecon in Tanzania says, "Aurecon is playing a critical oversight role throughout the project's final design and construction phases and is maximising involvement of its local staff to draw on their local knowledge and experience."

"Increased construction and a subsequent rise in cement demand in Tanzania places the Dangote Group in the ideal position to facilitate growth within the country, as well as in neighbouring African economies," concludes Wood. ■

**More information from Ermis Marques,
Email: Ermis.Marques@aurecongroup.com
www.aurecongroup.com**

Qatar unveils a third World Cup stadium

The body responsible for building stadiums and infrastructure for the 2022 FIFA World Cup in Qatar has unveiled the design for renovation of the Khalifa International Stadium, the third proposed host venue.

A joint venture between Midmac Contracting and a subsidiary of the Belgian Besix Group, Six Construct, is overseeing the main construction work on the stadium. Dar Al Handasah and Projacs are the design consultant and project manager respectively.

The design has been published by the Supreme Committee for Delivery & Legacy and the Aspire Zone Foundation. The redevelopment includes revamping the venue to include a seating capacity of 40,000 during the tournament to be compliant with FIFA's stadium requirements. Additionally, cooling technology will be incorporated to ensure an optimal



playing temperature of 26°C and provide a comfortable viewing environment. The new technology was tested at an open-air fan zone set up in Doha during the 2014 FIFA World Cup Brazil.

The fan zones brought the temperature down by 12°C and were tried by more than 15,000 people.

Khalifa International Stadium was built in 1976 and renovated for the Asian Games in 2006. It will undergo a comprehensive renovation, which will include adding a

new building to the east wing, and building a single roof to cover the whole seating area.

In addition, the stadium will include a museum to house historic sport collections and interactive exhibits. ■

<http://goo.gl/GVy7Ov>

Namibia: Hailulu explains why govt should not provide free housing

By Mathias Haufiku



National Housing
Enterprise Chief
Executive Officer
Vinson Hailulu.

National Housing Enterprise (NHE) Chief Executive Officer Vinson Hailulu says no free houses should be provided in the country because beneficiaries might not value and take ownership of the houses in the same manner they would care for properties they have to pay for.

Because of the abundance of untapped mineral resources in the country, Namibians have over the years called on government to consider providing free public housing to its citizens with the revenue generated from the country's abundant minerals.

"As a country we have made it a point to say no free housing. Yes government will subsidise some houses depending on the level of income that those qualifying are at, but no free housing. There will be a portion the household will be responsible to pay for in the form of credit facilities they will get either from NHE that also gives mortgages, or commercial banks," Hailulu said during a television interview conducted by the Concrete TV team at the African Union for Housing Finance annual conference, held in Cape Town in November 2014.

"This brings in the element of responsibility and ownership on the part of beneficiaries. If people get free housing they might not value or take ownership required - but when they are part and parcel of the arrangement they become quality assuring agents themselves," Hailulu said.

Government plans to build 185,000 low-cost houses by 2030 through the N\$45-billion mass housing development programme currently ongoing in 27 local authorities across the country. Hailulu said the project is going well.

"The timeline is tight but achievable because we have contractors who have capacity to deliver the project in the given timeframe. There are some South African companies supplementing the local ones, and with that capacity we should be able to attain the goals of building houses and servicing plots to go hand in hand with that," he said.

NHE awarded two-year tenders for the construction of 10,137 houses countrywide to 25 companies for N\$2.9-billion. ■

<http://allafrica.com/stories/201412051362.html>

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Investors keep an eye on the big picture in Africa

By Javier Blas and Andrew England

Concerns about the Ebola crisis and plunging commodity prices would have had investors fleeing Africa not that long ago. But dealmaking in the sub-Saharan region is buoyant as most investors have set aside short-term worries and are betting big on growth potential.

"Africa is on the radar," said Miguel Azevedo, head of sub-Saharan Africa investment banking at Citigroup in London. "Companies are developing strategies to go into the region, and mergers and acquisitions are naturally following up."

Recently, a host of multinationals announced almost \$8-billion (about R93-billion) in deals across several sectors, demonstrating the appetite that exists to tap the region's growing consumer markets.

Philip Lindop, head of investment banking for Africa at Barclays in Johannesburg, said: "In Lagos, you see 170 million people wanting a better life, and a Coca-Cola at the end of the day ... It's just fabulously exciting."

Until early December 2014 the sub-Saharan region had seen 631 mergers and acquisitions, the most for a comparable period since 1995 and up nearly 10% from 2013, according to Dealogic.

The International Monetary Fund has forecast that Africa will be the second fastest growing region next year, expanding 5.75%, behind the developing Asia region that includes India and China. And although a rout in oil and other commodity prices would dampen growth in 2015, optimism still prevails.

Joseph Rohm, of Investec in Johannesburg, said an important trend was the renewed interest of the Middle East. In 2014, the Investment Corporation of Dubai poured \$200-million into Dangote Cement and the Qatar National Bank paid \$500-million for a stake in pan-African lender Ecobank.



Johannesburg, South Africa.

Image by: ©AFP PHOTO / STEPHANE DE SAKUTIN

Another driver is the arrival of global private equity groups, joining smaller Africa-focused firms. "Private equity activity, both exits and entries, is driving M&A," said Rohm.

Bankers say the interest of South African companies, which are facing lacklustre domestic growth, is fuelling deals. The number of deals supports the 'Africa rising' narrative of a virtuous circle of growth in the continent's economies – supported by the high commodity prices and cheap Chinese loans – and improved governance.

Colin Coleman, head of investment banking at Goldman Sachs in Johannesburg, said: "There is a great enthusiasm about Africa – particularly as other emerging markets' economic growth disappoints."

Nonetheless, there are signs of caution. Although more deals have been done, they are worth less than in 2013. During 2014, mergers and acquisitions worth \$34-billion have been announced, down from \$35-billion in 2013, and almost \$49-billion for the whole of 2007.

This reflects two trends. First, investor focus is on deals outside South Africa, particularly Nigeria, where transactions are smaller. Second, valuations in the natural resources sector are down from the boom days of 2005-07.

In banking, retail and food sectors, valuations are higher than they were five years ago. Martin Kingston, chief executive of Rothschild South Africa, said: "The deal size is relatively small, but people are paying significant multiples to secure toeholds built on existing franchises."

Will it last? The industry consensus is a categorical yes. But with mounting economic headwinds – and presidential elections in Nigeria early in 2015 – some investors are bracing for a slowdown in mergers and acquisitions. ■

<http://goo.gl/9lgvQE>

Five quotes from Dangote on why he is successful

To become a successful entrepreneur is not a day's job. Successful businessmen all have a driving force and this motivation is what keeps them going in the face seemingly insurmountable challenges.

Africa's richest man, Alhaji Aliko Dangote, gave *Ventures Africa* five quotes that should serve to inspire businessmen as well as entrepreneurs.

1. "I enjoy myself a lot but I derive more joy in working. I believe in hard work and one of my business success secrets is hard work. It's hard to see a youth that will go to bed by 2 am and wake up by 5 am. I don't rest until I achieve something."
2. "I built a conglomerate and emerged the richest black man in the world in 2008 but it didn't hap-

pen overnight. It took me thirty years to get to where I am today. Youths of today aspire to be like me but they want to achieve it overnight. It's not going to work. To build a successful business, you must start small and dream big. In the journey of entrepreneurship, tenacity of purpose is supreme."

3. "After my death, I want to be remembered as Africa's greatest industrialist."
4. "If you don't have ambition, you shouldn't be alive".
5. "Every morning when I wake up, I make up my mind to solve as many problems as I can, before retiring home." ■

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“Renewable energy benefits SA” says CSIR



The Kalkbult solar power plant.

Renewable energy has already brought benefits to South Africa, a recent study by the Council for Scientific and Industrial Research (CSIR) has discovered. The independent study by the CSIR found that renewable energy from the country's first wind and solar (photovoltaic) projects created R800-million more financial benefits for the country than they cost during 2014.

The study was conducted against the backdrop of the Department of Energy running its procurement programme to expand the generation capacity in the country.

It has already procured close to 4000MW of renewable capacity (mainly wind and solar) from a number of independent power producers (IPPs).

According to the chief engineer at the Integrated Energy Research Centre at the CSIR, Dr Tobias Bischof-Niemz, the study was based on actual hourly production data for the different supply categories of the power system.

“The benefits earned were two-fold. The first benefit, derived from diesel and coal fuel cost savings, is pinned at R3.7-billion. This is because 2.2 terawatt-hours of wind and solar energy replaced the electricity that would have otherwise been generated from diesel and coal.”

The second benefit of R1.6-billion is a saving to the economy derived from almost 120 hours of so-called ‘unserved energy’ that were avoided thanks to the contribution of the wind and solar projects. During these hours the supply situation was so tight that some customers’ energy supply would have had to be curtailed (‘unserved’) if it had not been for the renewables.

“Therefore, renewables contributed benefits of R5.3-billion in total (or R2.42 per kWh of renewable energy), while the tariff payments to independent power producers of the first wind and photovoltaic (PV) projects were only R4.5 billion (or R2.08 per kWh of renewable energy), leaving a net benefit of R800-million,” said the CSIR.

“We’ve developed a methodology at the CSIR Energy Centre to determine whether at any given hour of the year renewables have replaced coal or diesel generators, or whether they have even prevented so-called ‘unserved energy’,” said Bischof-Niemz. This CSIR methodology was fed with cost assumptions from publicly available sources, such as power utility Eskom’s interim financial results 2014 for coal and diesel costs, or the Department of Energy’s publications on the average tariffs of the first renewables projects, or the Integrated Resource Plan on the cost of unserved energy.

“Our study shows that in 2014, renewable energy provided a net financial benefit to the country. Without the first solar and wind projects, we would have spent significant additional amounts on diesel, and energy would have had to be ‘unserved’ during approximately 120 additional hours in 2014,” said Bischof-Niemz.

“What is more, the cost per kWh of renewable energy for new projects is now well below R1 for solar PV and between 60c and 80c for wind projects. That will keep the net financial benefits of renewables positive, even in a future with a less constrained power system,” he added. The CSIR is one of the leading scientific and technology research, development and implementation organisations in Africa. ■

<http://business.iafrica.com/news/979489.html>

Concrete, not cement, responsible for most collapsed buildings

The cause of the collapse of many buildings in Nigeria is due to the quality of the concrete used in construction, rather than the brand of cement used,” Femi Yusuf, project manager of Lafarge Africa, told journalists attending a recent training course in Lagos sponsored by the company.

He stated that the quality of concrete used in the construction of most buildings is the major cause of building collapse in the country.

“Water has a lot of impact on concrete mixes, especially in a place like Lagos, where it rains often. Concrete quality is important, as is the quality of the steel, sand, aggregate and water,” he explained to the journalists.

Yusuf, an expert in structural engineering, said the type of weather, as well as the topography of the locality, should be considered when constructing a building. He said: “In Nigeria, we have at least two extreme types of weather. The type of concrete that would be used for constructing a house in the

south cannot be the same as the type used in the north. When you are building a tall building, wind becomes a major factor necessitating improved concrete quality.”

Yusuf also stated that few people employed the services of professionals but when they did, they would ignore their advice. “Research has shown that most of the collapsed buildings were not supervised by professionals,” he said.

He, however, noted that the recent debate over the 32.5 and 42.5 strength grades of cement is not the reason behind most collapsed buildings; adding that collapsed buildings are not peculiar to Nigeria.

Yusuf also said that there is a dearth of experienced professionals in the field of structural engineering and that there was a wide gap between the fresh graduate engineers and those with extensive experience. ■

<http://goo.gl/f9r4E7>

Engineers to assist government deliver NDP

Keynote speaker at the Consulting Engineers South Africa (CESA) conference in Limpopo during November 2014, Minister Thulas Nxesi of the Department of Public Works, said he believes that "Government cannot deliver the National Development Plan (NDP) alone. It is incumbent on the engineering fraternity to assist Government in delivering the priorities of the NDP and it is clear that engineering underpins these priorities."

He stated that the CESA conference came at a time when the sector is grappling with the challenges of infrastructure delivery and that efficient and effective procurement is central to government priorities. He felt that sustainable engineering should lead to sustainable development which would, in turn, result in a green economy.

The CESA conference theme was 'Together Sustaining Engineering – Delivering NDP Priorities'. Representation from the Department of Public Works, Transnet, Eskom, SANRAL, DBSA, cidb, the Department of Higher Education, ECSA, IMESA and Corruption Watch as well as CESA member firms, ensured lively panel discussions and plenty of opportunity to debate the key issues driving the NDP.

Government through the NDP has identified infrastructure development as key to the socio-economic development of the country. The Consulting Engineering Industry has a large multiplier effect on the development of the infrastructure as consulting engineers are the designers who create the large-scale infrastructure projects that provide employment to substantial numbers of people during the construction, operation and maintenance phases.

CESA believes that discussions and resolutions taken at this important conference are imperative in unlocking the mechanisms to help the various disciplines meet the challenges of ensuring quality outcomes, building the economy and creating and sustaining a better South Africa.

The principle of the Government achieving its developmental objectives through the private sector was emphasised by CESA's CEO who also made a clarion call for private sector companies to endeavour to include the Government and the NDP goals in setting their corporate strategies. This would ensure that there is a meeting of minds between Government and Business. ■

Copies of the presentations delivered at the conference are available at <http://www.cesa.co.za/node/474>

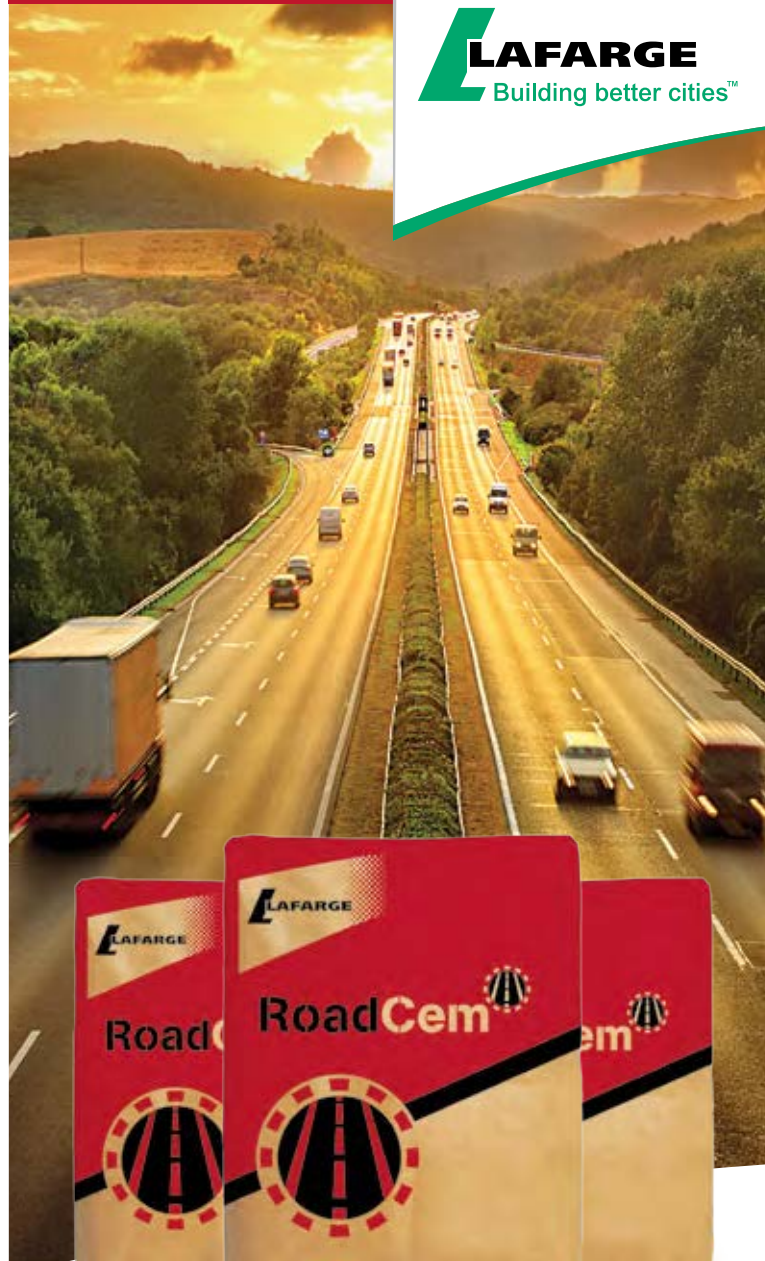


Lynne Pretorius, CESA Vice President, Thulas Nxesi, Minister of Public Works and Lefadi Makibinyane, then CESA CEO.

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The concrete industry gets tough

Tightening specifications for readymix concrete has led to substantial growth in the membership of the Southern Africa Readymix Association (SARMA) from companies seeking formal accreditation of their plants and processes.

The Association advocates using quality concrete only from suppliers that have been audited and accredited to have adequate safety, health, responsible road usage, environmental protection and quality systems in place. This would ensure that concrete delivered on site meets requirements and in so doing minimises the risk of failures.

Recent high-profile building collapses and the dismal state of certain low-cost housing developments have improved the construction industry's awareness of the importance of using accountable suppliers and of procuring concrete only from accredited companies.

General manager Johan van Wyk said that the association is engaging with all relevant role players to make specifying SARMA-accredited readymix concrete mandatory.

"Already several organisations, municipalities and mines have started stipulating use of SARMA-approved readymix on their sites. As a result, more companies are joining SARMA and undergoing our annual audits.

"Based on internationally recognised ISO standards, our systems establish minimum standards for our industry. SARMA



Johan van Wyk, general manager of SARMA.

also has its own requirements and all members are bound to uphold our codes of conduct and abide by all relevant legislation governing the industry.

"As a result, readymix concrete quality in South Africa is higher than ever before and, provided SARMA-accredited members are used, customers are assured of receiving concrete complying with our very high minimum standards. Unregistered readymix companies do not comply with these standards and concrete quality can thus be hit-and-miss," said Van Wyk.

Unannounced audits on members' sites will be instituted in 2015 to ensure plants comply with requirements at all times, preventing any 'window-dressing' around

audit times. Training workshops for members will be increased and skills development within the industry remains a top priority.

"We are planning to join readymix bodies in the USA and Europe, to introduce fast-response teams to clean up concrete spillages and to become the registering authority for concrete technologists in South Africa.

"We will continue working to ensure that the quality of readymix is able to compete with the very best in the world," concludes Van Wyk. ■

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

Associations pledge to support housing initiatives, eliminate corruption

Associations representing the main materials used in the construction of houses have thrown their weight behind Minister Lindiwe Sisulu's call for cooperation within the construction sector by signing a number of pledges on behalf of their members.

The Minister of Human Settlements called on all to work together to build 1.5 million houses within the next 5 years. To do this the Department undertook to address key issues standing in the way of closer cooperation and has taken various steps to unite the industry.

These included working with financial institutions to obtain loans for home owners to procure land; establish a dedicated unit to ensure payments are made timeously; establish an Ombudsman to deal with disputes; create forums to deal with bottlenecks; to use the Cuban model of youth brigades to train young people to build houses and enter the economy, as well as hastening the granting of title deeds.

In response, the Aggregate and Sand Producers Association of Southern Africa (ASPASA) and the Southern Africa Readymix Association (SARMA), representing companies that supply sand, stone and readymixed concrete, produced a



Nico Pienaar, a director on the Boards of SARMA and ASPASA.

combined list of pledges on behalf of all their members. These wide-ranging pledges include a commitment to help eradicate the scourge of corruption at every level within the quarrying and construction industries.

"Whether corruption is experienced at the point of mining minerals, or to procure business for the building of infrastructure or other large-scale projects, these dishonest business dealings put a strain on the country's economy. Corruption also has the potential to derail meaningful efforts to build sustainable

and competitive industries in future," said Nico Pienaar, a director on the boards of both associations.

"We are committed to ending corruption affecting our industry and appeal to any of our members who suspect dishonest dealings to take decisive action. We also support, most strongly, the initiative of the Minister of Human Settlements to enable all South Africans to have a home of their own and uplift the dignity of the entire population," Pienaar stated. ■

**More information from Nico Pienaar,
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Attention SA members of ICT

The Institute of Concrete Technology has just issued its Yearbook 2014/2015, publishing papers presented at ICT technical events over the past year – including the Annual Convention and the Young Researchers’ Forum – by distinguished speakers who are at the cutting-edge of their subject.

It opens with an interview with Bill Mitchell, the award-winning sculptor, and continues with ‘Some glimpses into the history of Scandinavian cement and concrete’ prepared by the Norwegian commentator Per Jahren.

In the Yearbook’s central section convention papers cover the topical theme of ‘The Changing Future of Cement and Concrete: Threat or Opportunity?’ with thought-provoking pieces on carbon-pricing as a driver for mix design and for the development of non-Portland cement based concretes, an update on the major Crossrail project and a keynote address on the development of 3D

printing. Reports of technical seminars held in the months since conclude with a selection of prize-winning papers presented at the Young Researchers’ Forum by PhD students.

Turning to the current course in Advanced Concrete Technology, which is the principal qualification for membership of the Institute, the Yearbook reviews the progress of the latest cohort, currently at Queen’s University Belfast, and ends with summaries of the research projects prepared by these candidates for their qualification.

Packed with technical content, this latest Yearbook is a statement of the Institute’s role in promoting Concrete Technology as a recognised engineering discipline.

The price of the Yearbook is £50 (or £25 for a PDF version). ■



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MBA North Youth Forum enthusiastically welcomed

Members of the Master Builders Association (MBA) North's new Youth Forum have welcomed the opportunity to contribute to the future growth of the building industry in South Africa.

The MBA Youth Forum (MBA YF) consists of young professionals who are passionate about the construction industry and want to

ensure sustainability and promote career opportunities for many more young people in the industry.

The inaugural Forum consists of 25 qualified young professionals under the age of 35, who are employed by MBA North member companies or are from construction-related faculties of tertiary institutions within the MBA North region.

Forum member, Keoatlaretse Lekutu, contracts manager at MBA North member, Gauteng Piling, says: "It will give young members of the industry a sense of direction and motivation. I was most inspired after meeting other Forum members from different institutions and seeing their passion, motivation and excitement about the new body. Interacting with the MBA executive members in a relaxed environment was also refreshing.

Johann Walters, contracts manager at JC van der Linde & Venter Projects (also an MBA North member), believes the Forum will serve as a vital 'information hub', keeping its members abreast of new developments within the industry via personal meetings, social media connections, or presentations at universities and other applicable institutions.

Dr Deon Landmann, MBA North Education, Training and Transformation manager, says the Youth Forum was formed to uplift the industry and built environment professions by generating fresh, new ideas to assist and promote the industry, and also to identify potential problems facing the industry. "The Forum will also involve training and developing young professionals and provide an invaluable platform for networking."

The Forum's objectives include:

- Assisting MBA North to achieve its objectives through the election of sub-committees to assist main MBA North structures.
- Promoting and creating awareness of the important role and benefits of being part of the construction Industry.
- Ensuring the retention of young professionals within the industry.
- Sharing information and networking.
- Creating opportunities for graduates and students to gain workplace experience.
- Providing a platform to support each other with registration, training, mentoring and continuing professional development (CPD);
- Visiting schools and universities to promote construction-related occupations as a career. ■



Gauteng Piling's contracts manager, Keo Lekutu, believes the MBA North Youth Forum will play a vital role in bridging the gap between tertiary education and the working environment.

**More information from Deon Landmann,
Tel: +27(0)11 805 6611 / www.mbanorth.co.za**

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AfriSam makes the latest innovations in concrete products and solutions available to its customers

AfriSam's customers will have access to the latest innovations in concrete products and solutions, thanks to its partnership with specialist flooring and concrete solutions provider Concrete Laser Flooring (CLF). AfriSam recently announced it had acquired an equity stake in CLF, with an option to increase its shareholding over the course of the next two years.

"The acquisition will extend AfriSam's current product and service offering beyond the current supply of construction materials, and affording it a unique advantage to build closer relationships with its customers," says Amit Dawneerangen, National Multi-Product solutions sales manager at AfriSam.

Established in 1998, CLF has introduced a number of firsts into the South African construction industry, from laser screed technology to steel-fibre-reinforced concrete and polished concrete. "Innovation is part of our make-up and is also one of the reasons we partnered with AfriSam. We felt that by linking up with a strong brand like AfriSam, we could extrapolate a lot more value," Peter Norton, managing director, CLF, says.

"For AfriSam, it offered an opportunity for vertical integration and brand extension. It positions AfriSam as a proactive player in the marketplace. We do not only supply cement and concrete, but offer a total solutions approach to our customers' varied needs. We are always on the lookout for new solutions, innovations and opportunities to bring to the attention of our customers, as well as advancing the knowledge and skills base

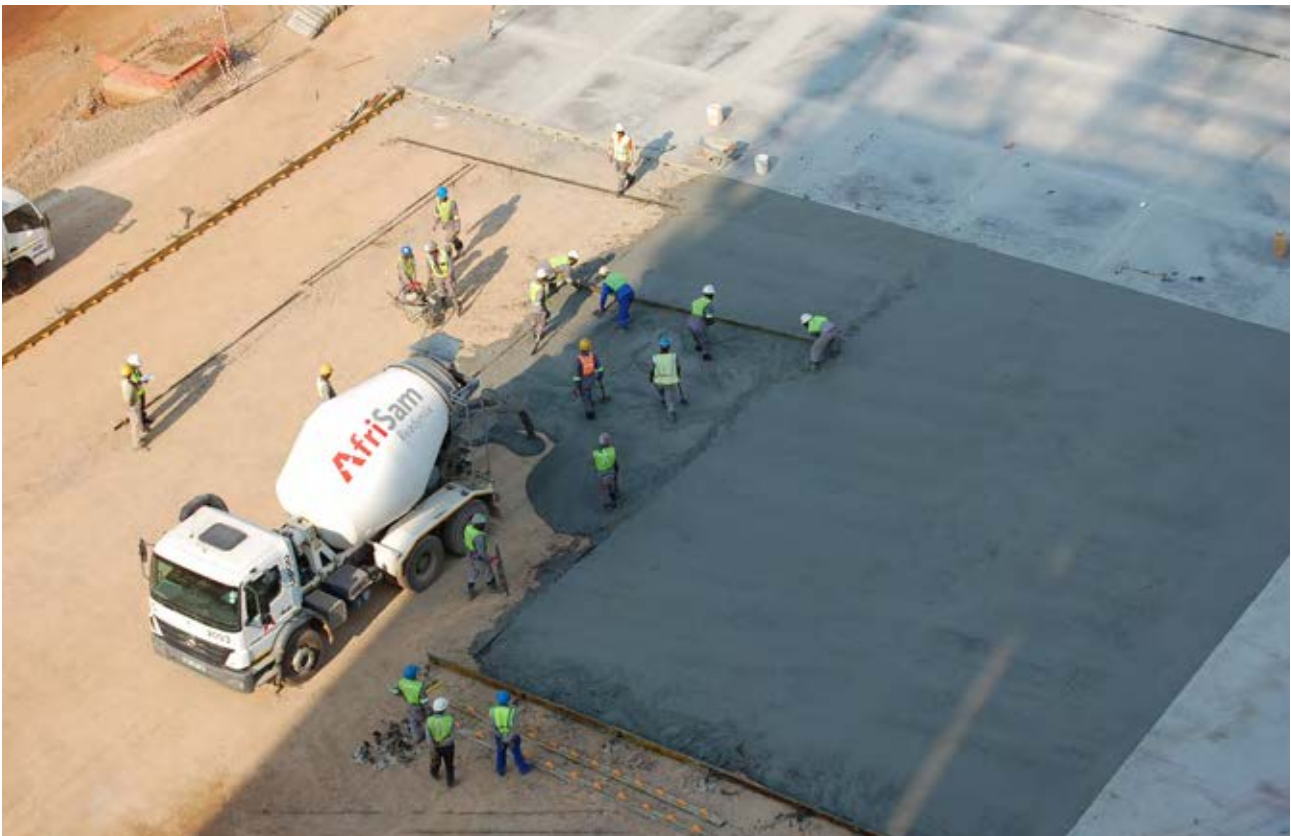
of the industry itself. Therefore the partnership with CLF was a natural fit for AfriSam," Dawneerangen comments.

With its main focus on the industrial and commercial market, CLF has introduced new technology such as a patented seamless concrete flooring system. "The trend in transportation and logistics is for large warehouses that form distribution hubs. Joints in warehouse floors are points of weakness that can fail. Every time a forklift wheel goes over a joint, it can result in incremental damage. The advent of seamless technology has resulted in flooring with high strength and low maintenance," Norton explains.

This technology can even be applied to concrete roadworks. "The shrinkage-compensating admixture we use in the concrete for these large seamless floors reduces both the shrinkage and the curling, which makes it ideal for the road sector. We would like to engage with the South African National Roads Authority (SANRAL) to conduct tests in this regard, as its massive backlog of road infrastructure work represents a major growth opportunity for us," Norton notes.

Another new technology introduced by CLF is the so-called 'tilt-up' construction method, which uses the floor of a building as a casting bed for the wall panels, which are then lifted into position by a crane.

Another option is for the wall panels to be cast at a precast yard and then transported to site. "That is trickier due to transportation and weight limitations, but the advantage is



AfriSam and CLF have collaborated successfully on tilt-up construction projects, such as a 10,000-m² building in Pomona. After casting the floor, the walls were cast as well.

that pours are done in a controlled environment and are not affected by inclement weather." Norton says that quality is improved significantly, which is currently an issue in the South African construction industry due to the shortage of skilled tradesmen such as bricklayers and plasterers.

Norton explains that CLF has used the tilt-up method on 42-t columns, a record in South Africa, while wall panels can even be as large as 50 m². "The entire sides of buildings can be cast and lifted in this manner," he says. "It is only reliant on having sufficient cranes and good spatial planning." Tilt-up construction represents 'a major growth curve' for CLF going forward, as clients are so impressed by the results that this often leads to additional and/or repeat business for the company.

"The advantage for AfriSam is that tilt-up construction represents a very significant increase in the demand for concrete," Norton says. He adds that CLF has been working closely with AfriSam to perfect the mix designs necessary for advanced construction methods such as seamless flooring. "It is not difficult to make good concrete; rather it is difficult to make good concrete consistently. There is a lot of variability in the industry, often even from one readymix truck to another the mix differs."

CLF and AfriSam have already collaborated successfully on tilt-up construction projects, such as a 10,000-m² building in Pomona. "After we cast the floor, we were requested to also cast the walls. This very successful project would traditionally use only 2,000 m³ of concrete, but in this instance that figure doubled to 4,000 m³."

Norton says that CLF conducts laboratory tests on all mix designs before undertaking the site trials. "By the implementation of the construction phase, there has been a lot of behind-the-scenes work on the concrete." Another example of CLF's research and development initiatives is its work on fibre-reinforced concrete, utilising both steel and synthetic fibres.

"Traditionally contractors had to order the reinforcing and the readymix from separate suppliers; by adding steel fibres to the readymix, it can now be delivered together. This is a growing trend and offers a number of benefits, such as increased strength and versatility." Another trend is 'thermal concrete', which comprises cement infused with expanded polystyrene (EPS) balls. "Thermal concrete is lightweight with a high insulating factor and is ideal for roofs. This represents a major benefit in terms of the 'green building'

trend," Norton explains. CLF also supplies a range of products in support of the tilt-up construction method, ranging from panel design, lifting insets to bond-breaking and curing compounds. "An example of the synergies that we hope to explore with AfriSam in this regard is to train contractors

on tilt-up construction, thereby equipping them with the necessary skills to start up small businesses."

Norton forecasts that tilt-up construction will eventually find its way into the residential sector. "This has been a major trend in North America, Australia, New Zealand and the Middle East. The application here is not so much for once-off, large-sized homes, but rather for townhouse complexes and for multi-storey buildings as tilt-up construction is based on panel repetition. It can therefore definitely be applied to low-cost housing as well."

Norton comments: "I am a firm believer in innovation, and am excited at the potential initiatives we want to engage in with AfriSam. From a practical viewpoint, we have our own yard in which we can experiment with different mix designs and provide technical feedback."

He adds that the work being undertaken by both CLF and AfriSam stands to improve the sustainability of concrete.

"A larger trend within the industry is the move towards using 'greener' concrete, which is based on the understanding that cement is a finite resource and that we need to make concrete that uses less cement. There is a growing demand from environmentally aware property developers that is driving the trend for 'green' buildings. Some of our work with AfriSam in this regard relates to activated slag mixes, and how we can extrapolate more value out of concrete while we utilise less finite resources.

"The results to date have been very good, which is why I believe the partnership works so well. AfriSam has the cement technology and concrete production, while we have a lot of practical construction experience," Norton concludes. Dawneerangen adds: "AfriSam is positioning itself as a total

solutions provider for its customers. The partnership with CLF is a perfect example, driving both the demand for and application of concrete and promoting the latest advances and technologies." ■

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



AfriSam has acquired an equity stake in Concrete Laser Flooring (CLF). Signing the agreement are Stephan Olivier, CEO of AfriSam (left) and Peter Norton, MD of CLF.



With its main focus on the industrial and commercial market, CLF has introduced a patented seamless concrete flooring system.



Another concrete trend is thermal concrete, which comprises cement infused with expanded polystyrene (EPS) balls. Thermal concrete is lightweight, with a high insulating factor and is ideal for roofs.

Coatings for Africa sets out to advance the production and use of coatings

In line with the changing face of Africa's growing paint and coatings industries, Coatings for Africa 2015 symposium and expo, taking place 11-13 May 2015 at the Sandton Convention Centre in Johannesburg, sets out to drive innovation and education in the paint and coatings industry across the continent.

The African coatings industry remains key to supporting the continent's ever-growing development requirements. The future for the paint and coatings sector looks particularly promising, given the strong economic outlook, long-term demographic growth and rising urbanisation across Sub-Saharan Africa.

Recognising opportunities in South Africa and beyond, Coatings for Africa is creating a completely new experience in 2015. With a distinctly pan-African focus and a minimum of ten African countries represented, the event connects buyers and sellers from across Sub-Saharan Africa as well as globally.

To generate additional synergies, Coatings for Africa is hosted alongside the African Construction and Totally Concrete Expos, Africa's biggest gathering of the concrete and construction industry. Africa's only three-storey expo is opening even more doors for business development.

A comprehensive three-day conference programme caters for all needs across the value chain. A technical symposium presents the latest innovation and developments the global paint and coatings industry has to offer the African marketplace and how these advancements help servicing their clients. Industry leaders such as BASF, BYK, Wacker, Nubiola and University of Stellenbosch will share their findings.

The programme includes topics around high performance additives, latest generation non-ionic synthetic associative thickeners, methods to improve substrate wetting of aqueous coatings and developing new coating systems. Technical professionals from the paint and coatings industry are invited to attend this unique Africa-centric opportunity to learn and network with others in the same sector.

The Coatings for Construction Seminar offers a one-stop solution for users of paints and coatings from the construction

industry. It will discuss novelties in decorative coatings for the construction industry and will start with an interactive panel discussion on urbanisation in an African context, leading experts will discuss parameters of urbanisation from various angles: architecture, technology, business and socio-economic. The keynote session will be followed by contributions around innovation in wall coatings, restoration and maintenance, cool roofing technology and quality control. Members of the construction industry such as architects, quantity surveyors, engineers and specifiers are invited to attend this seminar.

The Protective Coatings Seminar focuses on challenges around corrosion for users from the industrial and automotive sectors. It will highlight novelties in the industrial protection and maintenance space. The seminar is preceded by an opening session highlighting business innovation in Africa's construction and infrastructure sectors. The Protective Coatings seminar includes investigation into new developments and testing methods in protective, especially anti-corrosive coatings in an infrastructure context, from mining, automotive to industrial developments. Infrastructure experts such as engineers (civil, structure, consulting), design consultants, specifiers and quantity surveyors are invited to attend this seminar.

The programme is completed by a series of free workshops for users of paints and coatings products on the exhibition floor as well as a number of site visits which can be attended.

Coatings for Africa is hosted by the Oil & Colour Chemists' Association (OCCA) and the South African Paint Manufacturers Association (SAPMA) in conjunction with Hypenica and is the biggest showcase of coatings technologies, paint and related products on the continent. Coatings for Africa connects the entire value chain, from raw material suppliers to end users of the finished paint or coatings products.

Attendees can expect 120+ exhibitors, 2000 attendees, 10+ African countries represented and 30+ expert speakers. ■

For additional information, visit www.coatingsforafrica.org.za or email Sean Manson at sean.manson@hypenica.com



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PPC Imaginarium: creativity in concrete

By Daniel van der Merwe, Architect, PPC Ltd

PPC Ltd launched the Imaginarium in April 2014. The programme demonstrates PPC Ltd's role as one of the biggest supporters of the Arts in South Africa. The Imaginarium highlights PPC's recognition that art and design are major contributors to innovation. And innovation it is that provides solutions to the key issues facing people, communities, countries in their endeavours to create a better and more sustainable future – a 'better life for all its citizens.'

The primary aim of the PPC Imaginarium Awards is to recognise innovation and design using portland cement-based concrete as a primary inspiration and/or primary material. The programme incentivised, nurtured, identified, assisted and finally rewarded, emerging South African artists and designers, who included permanent residents, students and foreign students with study permits.

The Award is unique – combining as it does financial benefits, mentoring, workshops, exhibition opportunities, promotion in the media while also allowing for online exposure and sales.

The semi-finalists' work was curated and exhibited at the UJ Art Gallery, Johannesburg. The finalists' exhibition will be showcased at the Design Indaba in Cape Town, where the overall winner will be announced. The 2015 campaign will be launched with a street activation and exhibition at Young Blood gallery, 4 May 2015 and the First Thursday's event thereafter on the 5th of May. A curated travelling exhibition will raise awareness in Pretoria and Durban.

PPC Cement Ltd: a legacy of supporting the arts

PPC's contribution to the Arts was recognised when it received the 2013 Innovation Award at the 16th annual Business Day BASA Awards, for its partnership with fashion designer, Suzaan Heyns. Together they pushed out the boundaries of ready-to-wear fashion by a unique incorporation of cement into the construction of the garments that formed part of the Suzaan Heyns collection for the 2012 SA Fashion Week.

PPC was also nominated as a finalist for the Long Term Sponsorship and the Youth Development awards in 2013 for the Young Concrete Sculptor Awards.



Winner - Jewellery: Chris van Rensburg.



Winner - Sculpture: Mhlonishwa Chiliza.



Winner - Industrial design: Martin Bolton and Craig Tyndall.



Winner - Fashion: Bokang Lehobe.

The BASA award recognised a company which has very significantly developed as well as expanded its commitment to an arts project, while the latter award was for the development of young artists. The PPC YCSA competition was initiated in 1992, as one of the cement company's centenary celebrations. It is the only major competition exclusively devoted entirely to the art of sculpture using the medium of concrete.

In the launching of the Imaginarium Awards, PPC extended its sponsorship and support of the Arts to embrace other creative disciplines. This is fitting for a company that has contributed to the growth and development of South Africa for more than a century.

The Minister of Arts and Culture, the Honourable Paul Mashatile, has said: "Arts and culture is no longer a nice to have, but is firmly at the core of the work we do. At a recent United Nations debate, South Africa was mentioned as one of the countries that placed human development at the centre of progress. To succeed, we must strengthen the partnerships between the government, business and the arts."

Award categories

The new PPC Imaginarium Awards is organised under six different categories. Each category has a specific brief, a dedicated jury and distinct evaluation criteria to ensure submissions will be fairly judged. The PPC Imaginarium Awards categories are as follows: Fine Art: Sculpture; Fine Art: Jewellery; Industrial design; Architecture; Fashion and accessories; Short film.

The Imaginarium vision

The PPC Imaginarium Awards is a primary platform to support and promote innovative thinking in art and design in South Africa, and to provide assistance to young emerging artists and designers to establish themselves as leaders in their respective industries. PPC Ltd. believes that innovation in art and design is valuable.

It creates jobs, it makes for more sustainable communities, for better businesses, more exports and also adds stimulus ultimately towards growing our economy in a highly competitive global world.



Runner-up - Jewellery: Denise Andrews.

Portland cement is an incredible material. Not only is it used to make concrete with which to construct bridges, dams, roads and buildings – but it forms a vital component in many other everyday products. Without Portland cement civilisation as we know it would not have been possible. Concrete has become the most extensively used commodity after water in the world. It has become truly the ‘liquid stone of the 21st century.

Benefits for winners

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2. Media exposure and profiling in magazines, blogs, Facebook, YouTube, Twitter and other social platforms
3. Exhibitions, events and digital exposure

At a glittering awards function at UJ Art gallery, Johannesburg winners in each category were announced. More than 450 invited guests enjoyed the carefully curated exhibition of the 96 finalists’ work, selected from 477 entries countrywide in all categories.

Imaginarium Winners

Jewellery

Winner: Chris van Rensburg

Judges’ comments: Delicate, but bold; Considered; Technically sound; Wearable

Runner-up: Denise Andrews

Judges’ comments: Great conceptuality; Funky, fun and wonderfully experimental; Loved the use of different materials (Vinyl + pigments)

Merit Award: Sunet Ferreira

Judges’ comments: Beautifully delicate; Loved the marriage of white cement and gold; Intricate; Ornate and classical



Winner - Architecture: Ayanda Ntsingana.



Runner-up - Sculpture: Lee Burger.

Sculpture

Winner: Mhlonishwa Chiliza

Judges’ comments: Winning work – a well-considered work that explores the minimal realities of hostel life rendered here objects of personal and intimate function into the impersonal medium of concrete echoing the harsh realities of those environments.

A well-crafted piece that allows the medium the chance to shift in character and surface between the different objects through its treatment.

Runner-up: Lee Burger

Judges’ comments: a nice honesty and directness in the artist’s use of concrete that results in an interesting combination of textures and structural form. The lack of practical functionality of this hour glass lends a sense of futility to what could be seen as a relatively traditional monumental structure.

Merit Award: Karma Bosman

Judges’ comments: beautifully considered work combining a range of media and subtle humor to explore current national issues around the lack of housing and land ownership.

Film

Winner: Anri and Andre Coetzee

Judges’ comments: Most compelling; Making a film for cement and concrete can be difficult but the original interpretation conceptually challenges traditional creation myth; The slant towards females as the original creator.

Runner-up: Roland Reed & Rowen Smith, Juri Badenhorst & Johan de Klerk

Judges’ comments: Beautiful confluence and conflict of urban environment; Young people interacting with the urban environment; Excellent display of Skateboarding subculture and its inter-action with city of Cape Town.



Winner - Film: Anri and Andre Coetzee.

Continued on page 26

Merit Award cinematography:

Sumaiya Bhayat

Judges' comments: Fresh perspective; Textured treatment was able to capture the complexity of the buildings as characters

Industrial Design

Winner: Martin Bolton and Craig Tyndall

Judges' comments: Integrated use of material with huge potential; Material properties – functional

Runner-up: Riaan Coetzee and Bronwyn Furno

Architecture

Winner: Ayanda Ntsingana

Judges' comments: Nice urbanisation; Intuitive free flowing design; Public building; Subtle but bold and fun; Good and Innovative use of concrete and well suited to the desert like terrain; Project brief will definitely add positivity to Lainsburg as a swimming pool.

Runner-up: Phelelani Joyful Mthembu

Judges' comments: Inventive with concrete; Daring; Competitive challenge to the city; Great placemaking; Structurally



Merit Award - Fashion: Loxolo.

novel; Innovative structure and well suited to Durban promenade; Playful and witty.

Merit Award: Taswald Pillay

Judges' comments: Thorough presentation; Clear rationale; Mature texting language; Respectful to context; A very good contextual response convincingly realised.

Fashion

Winner: Bokang Lehobe

Judges' comments: Original use of cement with fabric; Unpretentious design

Runner-up: Mishka Lombardi

Judges' comments: Original use of concrete pieces stitched together to create a bodice

Merit Award: Loxolo

Judges' comments: This work pushes the boundaries of originality and fashion as art. ■

Photographs courtesy of Daniel van der Merwe.

More information from the author on email: Daniel.vandermerwe@ppc.co.za



Merit Award - Jewellery: Sunet Ferreira.



Merit Award - Sculpture: Karma Bosman.

PPC sets a new creative 'bench' mark on the streets of Tshwane



Benches designed by (left) Mavhungu Robert Ramavhale and (right) Izanne Wiid.

PPC has partnered with Cool Capital and Business and Arts South Africa (BASA) by funding 10 concrete benches to be designed and placed in public locations in and around Tshwane. This will serve as a reflection of the city's diversity in creative heritage.

The benches were commissioned by ten artists to be strategically placed in public spaces around the capital city where they will create a sense of community and belonging to all who make use of these functional art pieces.

Sculptor and programme director from Dionysus Sculpture Works, and the 2003 winner of Technical Excellence at the PPC Cement Young Sculptor Awards, Francois Visser said, "Through the placement of benches, we would like to create spaces where people from different cultures and backgrounds can enter into conversation with each other, becoming spaces of cultural exchange and integration."

Visser oversaw the manufacture and placing of the benches. He added that the designs vary from simple and modern to more intricate. "Other designs celebrate the 'snor city' legacy and the impact that Cool Capital has had in increasing public awareness of their environment," said Visser of the initiative.

Ten artists contributed to this project: Mathews & Associates Architects, Reply Mahlangu, Sybrand Wiechers, Izanne Wiid, Pieter Mathews, Mavhungu Robert Ramavhale, Tsebe George Magampa, Francois Visser, Alexander von Klitzing and Tabi Tabe Takeng.

Izanne Wiid said, "I designed a PPC bench for Jan Cilliers Park, also known as Protea Park, Groenkloof. I wanted the

sculpture to 'grow' out of the concrete, some areas still partly covered, others already exposed. The bench, although artificial, becomes another Protea bush, blending into its natural surroundings."

Artist Mavhungu Robert Ramavhale explained: "The story of recycling is a big part of our lives and became a major consideration when designing my bench. We all know that things like tin can be used as containers to hold something, while corrugated iron can be used to build a shelter. I recycled this idea to serve my purpose, by using two tins to make the feet of the bench, and corrugated iron as the seat."

Architect at PPC, Daniel van der Merwe said, "PPC Ltd is proud to sponsor the Cool Capital Bench initiative. Designers created several uniquely expressive benches as public art. Casting them in concrete using high-performance PPC cement will ensure an enduring legacy, sprucing up public spaces for the citizens of Tshwane, and its visitors.

"Benches in public spaces allow people to sit, eat, speak, listen, watch, read, love, think or just daydream. These benches are thus the ideal way to activate the power of public spaces," he concluded.

The benches can be found at the Pretoria Arts Association, the Pretoria Art Museum, Café Riche on Church Plain, the Gautrain Station in Hatfield, Viva Village in Mamelodi East and the Protea Gardens, Groenkloof. ■

More information from Andrea Meyer, cell: +27(0)72 261 7588
www.ppc.co.za



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Noblesfontein Wind Farm: helping to keep the lights burning



Noblesfontein Wind Farm's wind turbine generators stand 80 m tall.



The foundation with its densely packed reinforcing.



Foundation with electrical and communication cables in place.

When the Integrated Resource Plan (IRP) for Electricity 2010-2030 was promulgated in mid-2011, there was scepticism about South Africa's ability to become a global player, but by 2014 approximately 1,500 MW of renewable energy had been fed into the national power grid, representing the development of a R30-billion industry in just three years.

In the first round of the IRP competitive bidding process which concluded late in 2011, 28 alternate energy projects were given preferred bidder status. Jeffares & Green (J&G) has had input into some of these projects, which will generate approximately 570 MW of power. One such successful project is the Noblesfontein Wind Farm.

Early in 2012, Michael Manson-Kullin from J&G's Cape Town branch met with a wind farm developer who wanted to appoint a professional team to design a wind farm. The location was the farm Noblesfontein, belonging to the former Springbok rugby player Marnetjies Roux and is situated just south of the border between the Western Cape and the Northern Cape. Forty-one turbines were to be installed to produce 73.8 MW.

The project was driven by a consortium called Coria (PFK) Investments 28, comprising the Spanish group Gestamp Wind (60%), Shanduka (25%) and South African Renewable Green Energy or SARGE (12.5%). Another 2.5% was allocated to a community trust, with R2.5 million, or 1% of annual revenue, earmarked for the Noblesfontein Educational Trust.

J&G was appointed in JV with CA du Toit to undertake the design of the Balance of Plant (which amounted to designing more or less everything with the exclusion of the wind turbine generators), undertake a detailed geotechnical investigation and procure an aerial Lidar survey of a 20-Ha area.

Road designs for the 38 km of gravel roads were based on the aerial Lidar survey and aerial photographs. The challenge was to get transportation vehicles, which were up to 55 m long, carrying turbine blades and other components, over an existing railway line, underneath high-voltage Eskom electrical distribution lines, to the top of Karoo koppies. The requirements were that the roads should have a gradient of no more than 14%, with a minimum turning radius of 50 m.

Detailed investigations of the founding conditions for the turbine sites were needed and J&G's Pietermaritzburg team undertook the core drilling of 22 boreholes at selected turbine positions to depths of 15-20 m. After trial pit tests, rock strength testing, slope stability analysis, electrical resistivity testing and material characterisation tests, the founding conditions for the turbines and suitability of road building materials were both found to be acceptable. The bad news was that extensive rock blasting would be required.

Civil works included the roads, concrete works for the tower bases, a platform for the high-voltage substation and crane hardstand areas the size of rugby fields at each of the wind turbine positions.

The hardstand areas were used for storage and erection of the 80-m hub-height wind turbine generators. The WTG reinforced concrete foundations each consisted of 314 m³ of concrete and 40 tons of reinforcing steel. The roadworks generated about 400,000 m³ of earthworks consisting primarily of rock which was crushed and used for road pavement materials and bedding and as blanket material for the MV reticulation and stormwater pipes.

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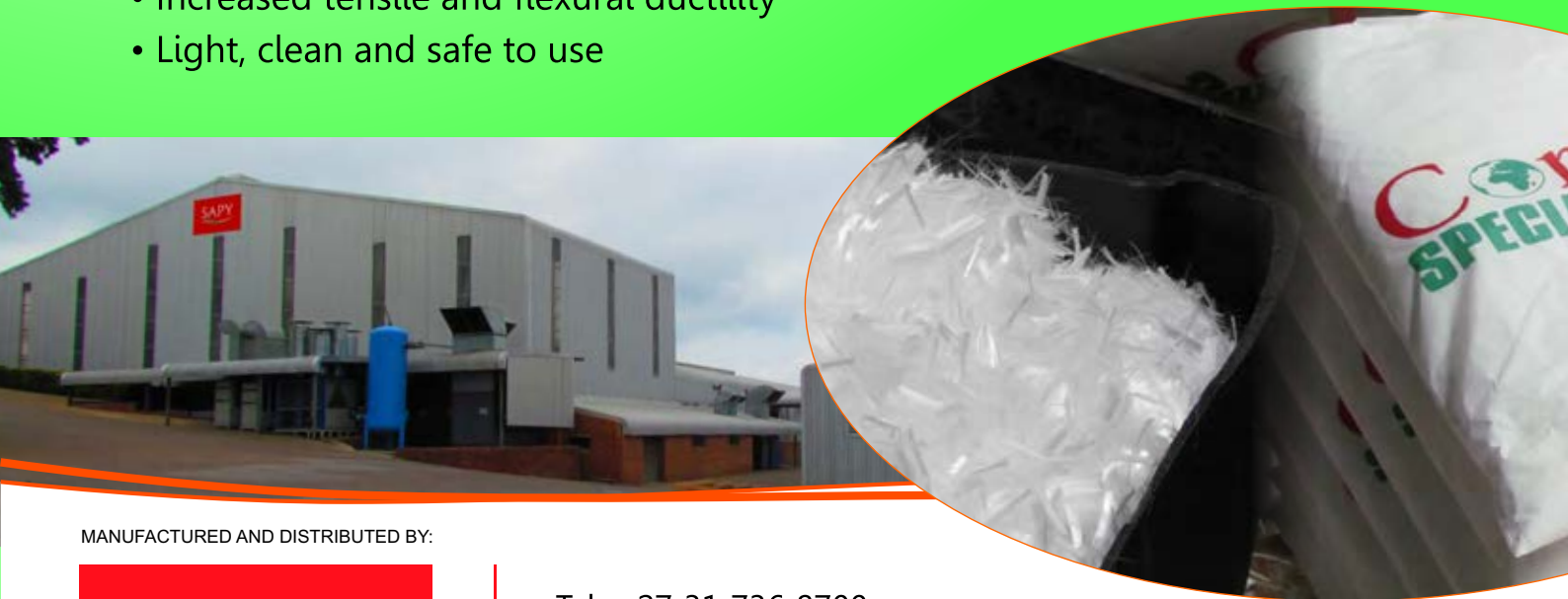
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The vehicles on the right show the massive size of the turbine blades which had to be transported by road on vehicles up to 55 m long.

The concrete was mixed on site; Scribante Concrete were appointed to establish and operate an on-site concrete batching plant. Cement was imported to site in trucks, sand was imported from Port Elizabeth and aggregate was obtained through on-site crushing of rock obtained from the road works cut operations. Water from a spring on an adjacent farm was tested and found to be suitable for the concrete works.

Scribante provided several concrete trucks to transport concrete from the on-site batching plant to the point of casting. The contractor, an Iberdrola/Group Five JV, provided concrete pump trucks to be used for placing the concrete into the wind turbine generator formwork.

This high-slump concrete was placed into the foundations in one continuous pour. The base portion of the foundation being 40 MPa, and the plinth portion being 50 MPa, it was necessary for the concrete works supervisor to ensure that the batching plant was instructed at the correct time to adjust the mix to the higher-strength concrete so that the pour could be continuous. The concrete required careful placement and vibration to ensure that no voids were formed between the over-crowded rebar. Temperature probes were used to monitor the temperature gain. The placed concrete was floated on an inclined surface, sprinkled with curing compound and covered with geotextile to aid curing.

Regarding the challenges faced by the contractor, Michael Manson-Kullin explained: "Due to the distance between site and the cement supplier, there were times when concrete pours were delayed because the next delivery had not arrived on schedule. In addition, the breakdown of the concrete pump on several occasions caused delays. In fact, there was one instance where the primary and backup concrete pump trucks, as well as

the emergency (third) pump broke down! On a few occasions a skip was utilised to continue working because the concrete pump had broken down."

"The concrete works included the grouting which was placed after the first section of the tower (T1) was placed. This was a high-strength grout placed using a continuous-flow pump. The availability of the correct pumping plant for the grout work was a challenge because of the limited number of pumps available in the country, with several wind farms being constructed on similar timelines."

J&G's joint venture partner, CA du Toit, undertook the design of the electrical works, which included the internal reticulation of an underground 33-kV medium-voltage system, the 33/132-kV high-voltage substation and approximately 5 km of 132-kV high-voltage overhead lines. The overhead line was required to cross the Transnet railway line prior to connecting with the existing Eskom distribution network. The Lidar survey, geotechnical investigation, detailed design and tender documentation were completed in three months.

J&G was later invited to submit a quote for the construction phase of the Noblesfontein Wind Farm, and was subsequently appointed, as Owner's Engineer. The project was constructed over 16 months and Noblesfontein Wind Farm became commercially operational on 11 July 2014 – right on schedule. The total project costs were around R1.5 billion.

The project was run from Jeffares & Green's Cape Town office with branch manager Harold Tiganis as project director and Michael Manson-Kullin as project leader and Owner's Engineer. ■

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GIBB PRT at the forefront of providing low-cost housing solutions

In an effort to expedite and improve the delivery and quality of infrastructure in the province, the Gauteng Department of Human Settlements (GDHS) Gauteng Professional Resource Team (PRT) programme is at the forefront of providing much needed integrated human settlements solutions.

South African black-owned engineering consulting firm GIBB is the lead consultant in the most recent GDHS Gauteng PRT programme tender. Each PRT is a consortium of multi-disciplinary professionals whose mandate is to assess development feasibility, planning and design. The PRTs also manage the delivery of appropriate housing interventions through concentrated deployment of resources in identified precincts, providing housing solutions that are responsive to the real needs of the community and to ensure sustainability.

The GIBB PRT aims to contribute to the strengthening and enhancement of the process of creating sustainable human settlements, in line with the National Department of Human Settlements Breaking New Ground strategy.

Vusi Radebe, GIBB technical executive: integrated infrastructure said, "Breaking New Ground is an initiative for the roll-out of integrated and sustainable human settlements in South Africa. The emphasis of the initiative is to radically transform the apartheid spatial legacy by ensuring there is viable and real social and economic integration of the previously marginalised sectors of our society."

He added that integrated human settlements challenge all government departments and stakeholders to think and plan differently regarding the location and time of socio-economic amenities and services. The focus is on social and economic inclu-



The Danville Elandsport housing project is one of the projects in the GIBB PRT project portfolio.

sion as well as on securing affordable tenure options. The bulk of beneficiaries are the previously disadvantaged masses who, for the first time in their lives, find themselves on the property ladder.

"Innovation and state-of-the-art technology is always 'top-of-mind' in project design reviews," said Radebe. "For example, in the Mapetla Hostel Upgrading project, solar energy for water heating and the use of polymer plastics in place of copper (which attracts thieves selling to the scrap-metal market) is specified. These initiatives protect assets and lower heating and maintenance costs. This project post implementation will completely transform the Soweto Merafe Railway Station precinct by enabling the development of a high-density mixed-used node."

Programme appointments are renewed every three years in line with the GDHS's procurement regulations. The strategy behind the PRT framework agreements programme is recognition by the Department that PRT's are an important delivery mechanism to build and strengthen the technical capacity of the GDHS and ensure a steady stream of well-planned and designed projects.

The framework agreement approach is intended to make a significant contribution to the vision of economic, social and multi-cultural development of the province's urban landscape.

More than 6,600 housing units are included in the current GIBB PRT project portfolio and each project has its own time-frame which is local-area dependent.

"Planning parameters of new housing projects try to address the legacy of apartheid, where new housing developments are deliberately being brought closer to economic activity, reducing commuters' travel time and costs while promoting a more integrated society where infrastructure can benefit many people," said Radebe.

Radebe believes that involvement in the programme of delivery for the past six years has created a position of expertise for the GIBB-led PRT. "In addition to a satisfied client, team members receive great satisfaction to be part of this positive transformation of society," concluded Radebe. ■

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Binishells make affordable, energy-efficient homes

By Stephen Hanley

Looking for something like homes for modern day Hobbits, Binishells are ideal for meeting the world's need for affordable, energy-efficient homes. They can be built quickly using locally sourced green materials with little or no waste. These column-free organic spans can be designed in a variety of shapes and sizes to fit any need while reducing carbon footprints and construction schedules by more than 50%. Invented in the 1960s by Italian architect Dr Dante Bini, there are now 1,600 Binishells in 23 countries around the world.



Each Binishell starts as a two-dimensional shape on the ground, ringed by a wooden form into which an air bladder, reinforcing steel rebar and a load of concrete is placed. As the concrete sets, an air pump fills the bladder and a concrete dome begins to rise from the earth. Once the concrete has hardened, the bladder is deflated, removed for reuse, and the building's shell is ready for inspection and interior construction. Except for a few additives, these are constructed from the same concrete and rebars that are available off the shelves in local stores.

Modern construction techniques allow using the latest green building features such as green roofs and passive heating/cooling technologies. These simple structures are resistant to natural disasters like high winds and flooding, and have survived earthquake tremors in some locations for more than 50 years.

Compared to traditional construction, Binishells eliminate the need for skilled labor and expensive construction equipment on site. That means costs and the energy used in their construction is about half of what they would be for a conventional building. Once completed, they use 75% less energy for heating and cooling than a normal building. Binishells require minimal upkeep and can be easily re-purposed, making them ideal shelters for use in developing countries where housing is in critically short supply. ■

Source: *New Indian Express*

<http://goo.gl/IUyIV2>

New manual to help SMMEs

Following the increasing number of construction disasters, Master Builders South Africa (MBSA) has produced a new Small Builders Manual to help the thousands of small-, medium- and micro-sized building enterprises (SMMEs) operating in South Africa to comply with the latest legislation and registration requirements and generally to operate more efficiently.

Tumi Dlamini, executive director of MBSA, says the revised MBSA Small Builders Manual is another move to improve the dwindling skills in the building sector. "It is also aimed at promoting compliance with the relatively complex legislation and registration requirements for small players and home builders. With current disasters tainting the building industry's reputation, MBSA felt serious steps were needed to encourage legal and safe building practices in South Africa. The new manual will help smaller contractors to stay on the right side of the law, and preserve the safety of their staff.



Tumi Dlamini, executive director of MBSA, says the new MBSA Manual for Small Builders will help smaller contractors comply with legislation and site safety requirements.

"MBSA believes that successful implementation of the Government's Presidential Strategic Infrastructure Projects (SIPs) programme depends on developing and strengthening the capacity of SMMEs. Skills transfer to SMMEs is vital to ensure that houses built under such Government initiatives are safe and durable," Dlamini explained.

Although ±80% of MBSA members employ fewer than 20 people, this still represents a substantial workforce. "So, to facilitate as understanding of the principles and legalities of running a small building company, MBSA decided to update our Small Builders Manual."

"This will be used in conjunction with training courses aimed at small business enterprises, such as the course for small builders now being offered after-hours by MBA North." ■

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Critical factors affecting concrete quality for housing

The role that the various mix constituents play to produce quality concrete for housing is often not fully understood, Bryan Perrie, MD of The Concrete Institute, has cautioned. Perrie says using the correct mix proportions and ensuring good site practice affects the strength, durability and economy of the finished concrete. "Firstly, the quality of the cement is crucial. Contractors should note that all producers and importers of cement must have a Letter of Authority (LoA) from the National Regulator for Compulsory Standards (NRCS) for each cement type sold in South Africa. The LoA is only issued if the cement quality complies with either SANS 50197-1 or SANS 50413-1," he explains.

Perrie says five errors frequently occur when producing concrete for housing:

- The ratio between water and cement in a mix determines the concrete's strength. When site batching small quantities of concrete, contractors often use a builder's wheelbarrow for measurement. Unfortunately this can produce inconsistent concrete mix proportions. "The contractor should ensure that the wheelbarrow is always levelled off at the top when measuring materials for mixing, to ensure that the correct, consistent mix proportion is achieved throughout. Note that two 50-kg bags of cement is the equivalent to one builder's wheelbarrow," Perrie states.
- Another common mistake is the addition of extra water to improve the workability of the concrete after an extended period. This significantly reduces the concrete's ultimate strength.
- Incorrect curing and/or not cured long enough. "Newly cast concrete must be cured to ensure that hydration continues until the full potential strength is achieved and to minimise the tendency to crack. The concrete should be kept damp and not allowed to freeze during this time. The concrete should be cured for at least five days after placing and longer in cold weather," he advises.
- There is often confusion between client, specifier and contractor regarding finishing a concrete floor, specifically applying a cement screed to the finished concrete floor. Generally, a sand-cement screed should not be applied as



The role played by various mix constituents in producing quality concrete for housing is often not fully understood, says The Concrete Institute.

the final wearing surface. The appropriate application of sand-cement screeds and concrete toppings is described in detail in The Concrete Institute publication: *Sand-cement screeds and concrete toppings for floors*, which is available free of charge from the Institute.

- Cracks in plaster and floors are a common problem on most sites. This can be avoided or minimised by the correct use of expansion joints at appropriate intervals to allow for movement of the structure. It is important to allow for movement joints between different material types, such as clay bricks and concrete blocks.

Detailed information is available from The Concrete Institute's publication *Concrete basics for building*. This publication, as well as several other specialised information leaflets on these issues can also be obtained directly from the Institute. Courses on concrete suited to learners varying levels of experience are also presented by The Concrete Institute. ■

**More information from Bryan Perrie,
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www.theconcreteinstitute.org.za**

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Turnkey solutions showcased at Kumba's Sishen housing project



The houses comply with 'green' standards and feature solar water heating systems, to features such as carports and washing lines.

The Raubex Group has showcased its turnkey solutions capability at a 476-unit housing project for Kumba Iron Ore at its Sishen Mine at Kathu in the Northern Cape. "The success of the housing project undertaken for Anglo American at Kumba holds huge potential for Raubex in the mining services sector," Barend Badenhorst, MD of Raubex Housing, says.

The housing project formed part of Kumba Iron Ore's commitment to convert all mine hostels by the end of 2014 in line with the Mining Charter. It was undertaken by the Raubex Matlapeng Joint Venture.

Construction began in October 2013 and all four phases were handed over by December 2014. The project was complicated by a 6-km-long, 700-mm high-density polyethylene dewatering pipeline that bisected the site, a contract awarded in May 2013 to Raubex Infra and scheduled for completion in May 2015.

The latter contract includes a pump station and associated concrete works. Raubex Group companies Raubex Housing built the top structures, L&R Civil was responsible for the 13 km of water and sewer reticulation and Raubex KZN built the 8-km road network. Raubex Housing achieved a rate of 1.7 houses a day with six trucks delivering 60,000 bricks a day.



Anglo American contract specialist Renier Goosen and Raubex Housing MD Barend Badenhorst on site at the Raubex Matlapeng JV housing project at Kumba Iron Ore's Sishen mine near Kathu in the Northern Cape.



Raubex Housing built the top structures, L&R Civil was responsible for the 13-km of water and sewer reticulation and Raubex KZN built the 8-km road network.

The project required careful coordination and management as a result of the immense scale and scope. "Essentially this meant building the top structures while simultaneously putting in the electricity, water, stormwater and sewerage reticulation, as well as building the road network. All four of these disciplines were on site at the same time," explained Badenhorst.

The ground conditions were another challenge as the predominance of calcrete posed a major problem in terms of the installation of bulk services. A Vermeer milling machine was used to trench the calcrete to the required depth, with the minimum depth of the trenches being 1.6 m and going up to 4 m for the water and sewerage reticulation. This resulted in 80,000 m³ of waste material that L&R Civil screened and crushed on site for reuse as layer works in the road construction, and to sell into the open market.

The top structures were built on concrete rafts as opposed to foundations. About 1,500 workers were on site at the peak, with 12 excavators and ten TLBs in operation. The workforce was scaled back to about 200 as the project entered the finishing stretch, and a single plastering team remained on site to complete the final eight houses.

A key focus was investing in local skills development, with the Raubex Group establishing a contractors' camp on site to provide training in trades that included plastering, bricklaying and carpentry.

"Community development is an integral part of the Raubex Group's philosophy, as it strives constantly to add value wherever it operates. Our success is largely attributable to our employees, from management down to the workers on site. It is their passion and dedication that allows us to tackle projects of this scale, and to achieve such a consistently high level of quality and productivity."

Badenhorst concludes: "To have a complete project handed over from a developer like Raubex Housing, which took full responsibility and managed it from start to finish, is bringing a totally new perspective to bear on the market. This successful developer model is Raubex Housing's main success on this project, where it has proved particularly beneficial to Kumba Iron Ore." ■

**More information from Barend Badenhorst,
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Removing oil stains from concrete surfaces

Commercial property owners, facilities managers and homeowners often struggle to remove oil and grease stains from concrete areas such as parking areas and driveways.

Bryan Perrie, managing director of The Concrete Institute, says although most common, oil stains can indeed be extremely difficult to remove because of the stains' rapid ingress into the concrete. However, there is a solution and he provides some guidelines on how to deal with this problem:

First of all, before attempting to remove any stain from concrete, a small trial area in an inconspicuous place should be treated first to assess the effect the cleaning method will have on the concrete.

It is important to stop the stain from spreading so it should be encircled by a fine, dry material such as sand, cement, sawdust or even cat litter. Mop up as much of the stain as possible with paper towels or cloths by blotting rather than wiping, and sprinkle the entire stain generously with the fine material. This can then be broomed back and forth, and then swept up and disposed of.

The Concrete Institute has found the following cleaning materials to be effective for removing oil stains:

- Automotive engine degreasers
- High-foam washing powder
- Concentrated liquid detergent

These products are more effective when mixed and applied with boiling water. A stiff bristle brush, although useful for removing thick surface oil deposits, is inadequate for reaching deposits that have already penetrated into the pores of the concrete.

A high-pressure water jet cleaner (100 Bar) can be extremely effective in removing ingrained stains and will also remove chewing gum deposits. The high-pressure water jet cleaner should be applied some time after the cleaning agent was applied but before it has evaporated. Consequently, application of the cleaning agent in strong, direct sunlight is not recommended.

As soon as the oil or grease deposit has been dislodged, the entire area should be flushed with copious amounts of clean water to prevent soiled water re-depositing the oil on adjacent concrete. When using high-pressure water jets, protective clothing and goggles should be worn to protect against the rebounding of grit when the jet displaces material from the concrete or between block paving.

Once most of the surface stain has been removed as described above, cover the residue with a poultice made up of one part agricultural lime to two parts mineral turpentine. Spread a layer of about 5 mm of the paste over the stained area, ensuring that there is a margin of approximately 50 to 100 mm around the edges. Cover with plastic sheeting and leave for 24 hours. Builders' lime should not be used as it could cause skin burns. It may be necessary to repeat this process within a day or so to remove any deeply ingrained oil or grease that sometimes continues to rise to the surface. Finally, scrub the stained area with warm water and laundry detergent, then rinse well with clean water to end the treatment. ■

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Aurecon's second Century City building to seek Green Star rating

When Aurecon's Century City office building in Cape Town was built in 2011, it was the first building in South Africa to be awarded a 5-star Green Star SA Office Design v1 rating by the Green Building Council of South Africa (GBCSA). The company is rapidly outgrowing this space and will be developing a second building that will be adjoined to the first one via a sky-bridge. The existing building will be renamed Aurecon East and the new building will be called Aurecon West.

Rabie Property is to develop the second building and it will be owned by Ingenuity Properties. It will comprise 3,280 m² of premium office space on two levels, as well as three parking levels to accommodate 152 undercover parking bays. Construction of the R88-million green office building will start early in 2015, with completion scheduled for November 2015. The project team is also targeting a Green Star SA rating for this building.

As with the first building, Aurecon has been appointed for the engineering services and will also be responsible for the Green Star rating application for the new building. MaC Architects will be assisting with the design of the building, while Ludwig Design Consulting will assist with the Green Star rating process.



Aurecon's Cape Town Office Manager, Ferdi Nell, says a decision to pursue a Green Star SA rating was not only one that fulfils the group's aim to reduce its carbon footprint but also made business sense: "Profit aside, it's the right thing to do for our planet," he commented.

"The sustainable design practices that will be applied to Aurecon West align with our global strategy to continually improve the efficiency and effectiveness of our business operations. Green buildings give a positive return on investment and contribute to Aurecon's reputation as a leading, vibrant, global brand," added Nell.

The new building will incorporate the following environmentally conscious features:

A centralised water cooled chiller plant has been installed which uses treated effluent water in its cooling towers – this dramatically reduces overall energy consumption as well as potable water consumption.

The lighting system controls the lighting to ensure that energy is only consumed for lighting when and as required. When there is sufficient ambient light entering the building during the daylight hours, the lighting system automatically dims down to save energy while providing just the right amount of light for the building's occupants.

The BMS system controls the HVAC system to ensure that sufficient fresh air is circulated in the building and that the building is not over cooled or over heated.

All light fittings in the office areas are equipped with electronic control gear to ensure maximum energy efficiency and to remove any flicker from the fluorescent light fittings.

In certain areas, LED lighting is used to take advantage of their low energy requirements.

The standby generators are Tier 3 emissions standard engines which have the lowest emissions of all classes of back-up generators on the market.

An atrium as well as light well has been included in the design of the building. This will ensure that the core of the building is penetrated by natural daylight, reducing the energy required for illumination.

Facilities have been installed to encourage the use of energy-efficient transport systems such as bicycles, motorcycles and setting up car pools.

A metering and monitoring system has been installed to monitor all water and electricity meters. This information is used to identify areas of high consumption and thus potential energy / water saving.

Aurecon's investment in Century City has inspired a number of other large corporates to relocate to the area.

Aurecon has been verified as a Level 2 BBEE contributor. ■

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First green taxi rank benefits from innovative solutions



Lafarge Agilia™ concrete was used to construct South Africa's first green taxi rank in Cape Town.

South Africa's leading building materials company, Lafarge South Africa, worked closely with Cape Town architects Stauch Vorster right from the design phase of South Africa's first green taxi rank in Wallacedene, in the northern suburbs of Cape Town. For the construction of the building, Lafarge supplied its innovative, market-leading product, Agilia™ self-consolidating concrete.

The product met the requirement that all materials used in the taxi rank had to be environmentally friendly and contribute to a low carbon footprint for the facility. As well as producing high-strength, durable concrete, Agilia™ is popular with architects for enabling them to extend the boundaries of creative concrete expression.

Lafarge South Africa is the local presence of the international Lafarge Group, the world leader in building materials. The Group is committed to creating solutions that help to build better cities that are more durable and desirable environments to accommodate the global trend to urbanisation. With one of the largest building materials research and development centres in the world, innovation is a core strength of Lafarge.

The Lafarge Tygerberg Readymix plant supplied 133 tons of Agilia™ concrete to construct the columns and beams of the taxi rank structure. The product's exceptional fluidity enables it to fill all corners and areas in formwork or moulds without the need for vibration, while remaining homogeneous. It is also an ideal product for achieving smoother architectural concrete finishes with minimal need for remedial work. The Lafarge Readymix team from the company's Cape Town branch provided technical advice and on-site support for the project.

Durability is a key issue in this type of high-traffic public facility. Costing approximately R25 million, the taxi rank is expected to serve around 5,000 commuters daily, travelling in 50 minibuses. The challenge of running cost has been exceptionally well addressed with the structure's PV panels and battery backup almost eliminating use of Eskom power. Storm-water is captured and stored in underground tanks and recycled for washing vehicles.

"This has been a fascinating project," comments Herbert Groenewald, building marketing manager – Lafarge South Africa. "Lafarge is proud to have provided solutions for this taxi rank initiative and firmly believes it will be the model for future transport infrastructure development." ■

More information from Chantál Stewart,
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Students research green technology in artificial reefs

Biology and chemistry students at Valdosta State University, Georgia, are one step closer to commercialising a green-technology artificial reef used to stimulate marine growth. Students at VSU – under the direction of Dr. Tom Manning, professor of chemistry – filed for patents that support their marine project. The project includes the application of cellulose and cement to construct artificial mediums that encourage the growth of marine life.

The artificial reefs are prepared by drying different sources of cellulose, such as bamboo or pine – in an oven and then soaking it in nutrients before allowing it to dry at room temperature. Bioactive concrete, a mixture optimised by the students to promote marine life growth, is then used to hold the reefs in place in bodies of water. The entire system is biodegradable; designed to leave behind a functioning marine ecosystem after it decomposes. The value of their creation was proven after deploying reefs in the Florida Keys and monitoring the marine ecosystem for several months in 2013. Students found that the reefs contributed to growth of a host of marine organisms and that baby octopuses, crabs, Spanish lobsters, marine worms, and shrimp were feeding on them.

Along the Florida panhandle they demonstrated their material could be used to colonise oysters. Oysters have been singled out largely for their ability to control shoreline erosion and help with water quality issues, as one oyster can filter up to fifty gallons of water per day.

Large projects, such as oyster beds in the Chesapeake Bay and along the shoreline of Louisiana have drawn national attention, and may be a target for this new technology. “Since the project began, we have received a permit to do work in the state of Florida – testing the reefs in many different locations,” said Manning.

“Permits usually take as long as 18 months to obtain; however, the project has proven to be so promising that it only took the students three days to obtain it.” Manning and three students visited Washington, D.C. as part of the National Science Foundation’s merit review process, which allowed a range of professionals to evaluate projects and provide feedback on the potential commercialisation of the research. This process included recommendations on

applying for the Small Business Innovation Research (SBIR) grant that provides seed funding for projects to enter the market.

Recent biology graduate Brittany Butler presented the advantages of deploying green tech reefs compared to current practices, which include the use of steel and concrete reefs deployed by ships. “Our project was by far the most blue collar,” Butler said. “Coming into this, we were the underdogs. Nonetheless, our preliminary data, as well as the permit that we received to work in Florida, were very beneficial. Of the 24 teams that presented from across the nation, our team was one of six that was given a recommendation to pursue commercialisation.”

While Butler worked with Manning to gain approval for the SBIR grant application, Sydney Plummer, biology major, and Tess Baker, biology and chemistry major, met with legislative aides and members of the U.S. Environmental Protection Agency to lobby for safer practices for deploying reefs such as those used in the marine project. Now one step closer to commercialisation, the team is exploring the many ways the green tech reef can be used. “The reef is like Miragrow for the ocean,” said Butler. “We have explored how the reefs provide food for oysters and how more oyster beds help control water pollution. However, we are approaching the process of deploying these reefs to apply to anything that one wants to grow in the ocean – not just oysters.” Since the start of the project the team has developed partnerships with local companies including The Langdale Company and Scruggs Concrete.

The marine project is supported by a grant from the National Science Foundation I-Corps program, which fosters entrepreneurship that leads to commercialisation of technology. The group has filed three United States non-provisional utility patent applications on the different processes.

The students have presented their research at Valdosta State’s 2014 Undergraduate Research Symposium as well as the University System of Georgia Board of Regents October 2014 meeting. The project has also been featured in *Clean Technology Business Review* and *Sport Diver* magazine. ■

<http://goo.gl/RfPE13>

See also www.reefball.org for other projects undertaken worldwide.



New technology lays foundation for green building



There could be no stronger statement about Murray & Roberts Construction's innovative approach to sustainable building technologies than applying this to the world's largest inland port.

Transnet's City Deep Container Terminal in Johannesburg recently underwent a major revamp that required the 144,000-m² facility to be resurfaced and expanded by an additional 2,000 m².

A key stipulation in the contract was to recycle more than 10,000 m² of the original surface concrete in the new build to meet Transnet's sustainability objectives.

"We are very proud to say that, with the client's buy-in, we exceeded this requirement by processing more than 35,000 m² of the old concrete and almost 65,000 m² of layer works," says Jerome Govender, Operating Platform Executive of Murray and Roberts Infrastructure and Building. "The true innovation, however, was using a revolutionary new geopolymer concrete and High Volume Pulverised Flue Ash (HVPFAC) concrete to surface the terminal, thereby raising the sustainability bar to even higher levels."

This unique approach to sustainable building technologies was also given credence earlier this year when the City Deep Container Terminal project was named runner-up in the Nedbank Capital Sustainable Business Awards' Infrastructure and Renewable Energy category. Giving even greater substance to this recognition is that the category winner, the Tshedimosetso House in Pretoria owned by Growthpoint Properties, was developed by Murray & Roberts.

HVPFAC relies on a relatively new

technique that combines the flue ash recovered from the coal burnt in power-generation plants with mineral slag to produce a concrete that has clear environmental benefits.

"HVPFAC has, in the past, been considered to be inferior to conventional concrete. However, our processes and technological advancements have shown that this is no longer the case," explains Govender. "The compound significantly reduced water consumption, improved workability, minimised cracking and enhanced durability, demonstrating that new technologies can compete favourably with some materials that have become industry staples."

Geopolymer concrete, on the other hand, relies on using industrial by-products to form a solid binder that has similar characteristics to portland cement. Using this technique, CO₂ emissions are reduced by up to 90% while the concrete also has improved resistance to fire and aggressive chemicals.

"We firmly believe that the application of these technologies points to the future of construction methodologies. These are particularly relevant to South Africa given the focus on carbon emissions and the introduction of a carbon tax," says Jerome Govender.

"Of course, it also takes foresight from our clients to adopt these technologies, and Transnet needs to be commended for allowing us the leeway to show them how they could benefit." ■

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WinSun 3D Prints five-storey apartment building and impressive villa

By Brittney Severson



A five-storey building which has been 3D printed by WinSun.

The 3D printed home is an accomplishment which many architects and designers have at least been contemplating for some time. Numerous companies as well as individuals have moved into the space recently, with design concepts which take home building well into the 21st century.

Although China has lagged behind the U.S and Europe in terms of consumer and manufacturing-based 3D printing, one China-based company seems to be leading globally when it comes to the 3D printing of large-scale structures such as homes.



3D printed components for WinSun's structures are built off-site.



Inside the 3D printed apartment building.



A stand-alone villa, which has been 3D printed.

In April 2014, Shanghai, China-based WinSun Decoration Design Engineering Co. revealed what many initially believed was a hoax – 10 homes which were almost entirely 3D printed with a recycled concrete material. The company seemingly emerged from nowhere and surprised everyone.

It is now apparent that WinSun has made significant progress in their drive to 3D print livable homes and other structures. They have 3D printed an entire apartment building, consisting of five storeys, as well as an impressive home. These structures were unveiled at the Suzhou Industrial Park, in east China's Jiangsu Province, and the apartment building alone features a structure which is approximately 1,100 m² in area.

Using a machine which measures 6 m tall, 10 m wide and 150 m long, the team at WinSun started with a basic CAD drawing which they fed to the massive 3D printer that was able to fabricate the structure piece-by-piece using a specially formulated and patented 'ink'.

The ink, which includes construction waste such as concrete, fibreglass, sand, and a special hardening agent, is an incredible way to recycle general construction materials – not to mention that it is flexible, self-insulating, and resistant to strong earthquakes. The walls and other components of the structure were fabricated offsite with a diagonal reinforced print pattern and then shipped in and pieced together. The company then placed beam columns and steel rebar within the walls, along with insulation, reserving space for pipe lines, windows and doors.

The construction methods, according to the company, are able to save 60% of the materials typically needed to construct a home, and can be printed in a time span which equates to just 30% of that of traditional construction. In total, 80% less labour is needed, meaning more affordable construction, and less risk of injury to contractors.

This is probably one of the most exciting accomplishments within the 3D printing space. To be able to construct a five-storey building with 3D printed material is certainly a feat that's guaranteed to garner further attention.

WinSun is not done by any means. They will continue to further the technology behind this incredible 3D printer, and hope to eventually construct numerous homes at affordable prices within mainland China. ■

Source: <http://goo.gl/VWq7AA>

TailorCrete seeks to revolutionise concrete fabrication

By Connor Walker

Superpool's Full Scale Demonstrator is a sculptural form built from concrete plates folded via robotics before the concrete is fully hardened.

Concrete construction has been an important part of architectural practice since the Roman Empire. Extremely malleable, fluid concrete is capable of being poured into almost any conceivable form. In theory, this makes it an ideal building material. In practice, however, creating complex forms out of concrete is extremely inefficient. Pouring on site requires formwork that is painstakingly made by hand, and precast concrete is usually limited by orthogonal moulds. Concrete has become restricted to a few simple forms that are easy and cheap to produce when, in many cases, a building would benefit from concrete casting that is optimised for its structural and economical needs. How do we make such optimisation feasible? This is the question that the EU-sponsored TailorCrete has attempted to answer. A research consortium lasting for four years, TailorCrete explored new technologies that could make non-standard concrete structures commonplace in the future.

TailorCrete was led by the Danish Technological Institute, and involves 14 partners: Bekaert, Chalmers University of Technology, Czech Technical University, DesignToProduction, Dragados, ETH Zürich, Gibotech, Grace, MT Højgaard, Paschal, Superpool, Unicon, Syddansk Universitet. The project explored a variety of construction technologies, such as alternative formwork, and robotics. The goal, according to the TailorCrete website, was to "replace the use of traditional formwork and thus enable greater flexibility in producing singular concrete structures with different geometric designs. Through the development and use of self-compacting concrete with robots, a link was created between digital design and the fabrication of materials and components and ultimately to the on-site construction processes."

Partner Superpool, an international architecture practice based in Istanbul, Turkey has already demonstrated the fruits of this research. Their Full Scale Demonstrator (FSD) is a sculptural form built from concrete plates that have been folded via robotics before fully setting. This optimised structure spans 23



metres in length and 6.5 metres in height while its thickness is, at most, only 25 centimetres.

The TailorCrete project concluded in 2014. For more information on its findings and research developments, visit their website <http://www.tailorcrete.com/> ■

Photographs by STAMER KONTOR.

Source: <http://goo.gl/cHVIBU>



UK partners aim to develop 3D concrete printing in construction

Skanska UK and Loughborough University have signed a collaboration agreement to develop the use of 3D printing in construction.

The aim of the agreement is to allow Skanska to use – under licence – 3D concrete printing technology developed through research at Loughborough University, applying it to on-site uses.

A team in the School of Civil and Building Engineering at Loughborough, led by Dr Richard Buswell and Professor Simon Austin, have worked on the development of 3D printing technology for the construction industry since 2007. The project was started under the Engineering and Physical Sciences Research Council's (EPSRC) Innovative Manufacturing and Construction Research Centre (IMCRC). The team have developed 3D concrete printers fitted to a gantry and a robotic arm, which is now in its second-generation form. The printer deposits a high-performance concrete precisely under computer



control. It works by laying down successive layers of concrete until the entire object is created. The printer can make things which cannot be manufactured by conventional processes such as complex structural components, curved cladding panels and architectural features.

The aim of the initial 18-month development programme is to develop the world's first commercial concrete printing robot. Working with Skanska are a number of influential collaborators including Foster + Partners, Buchan Concrete, ABB and Lafarge Tarmac. As a result of this programme, Skanska aims to explore opportunities opened up by the new technology and help develop a 3D printing supply chain.

The agreement puts Skanska in a good position to capitalise on an emerging technology with the potential to revolutionise the design and construction process.

Rob Francis, Skanska's director of innovation and business improvement said: "3D concrete printing, when combined with a type of mobile prefabrication centre, has the potential to reduce the time needed to create complex elements of buildings from weeks to hours. We expect to achieve a level of quality and efficiency which has never been seen before on construction sites around the world."

Dr Richard Buswell from the Building Energy Research Group at Loughborough University comments: "The modern construction industry is becoming more and more demanding in terms of design and construction. We have reached a point where new developments in construction manufacturing are required to meet the new challenges and our research has sought to respond to that challenge." ■

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DysCrete: concrete that delivers solar energy

A University of Kassel research team has developed a building material, 'Dyscrete' that simultaneously functions as a photovoltaic cell. Important components of this new material are electrographic concrete and liquids such as fruit juices. In future, DysCrete could be used for façades which transform solar energy into electric power.

DysCrete consists of a special, electrographic concrete coated with layers of titanium dioxide, organic liquid, an electrolyte, graphite, and a transparent surface. The result is a dye-sensitised solar cell with the concrete taking on the function of an electrode.

The transformation of solar energy into electric power follows the principles of photosynthesis and the material is especially ecofriendly. The development of DysCrete is a project of the interdisciplinary learning and researching platform 'Bau Kunst Erfinden' (Building Art Invention), led by Prof. Heike Klusmann, Head of Visual Art Studies at the University of Kassel, and Thorsten Klooster, project manager of the field. The project is funded by Germany's Federal Ministry for Housing and

Development and will continue into the middle of 2015.

"It is our goal to develop a material that can be employed in the construction industry in future – for prefabricated building components, façade elements, and innovative wall systems," explains Prof. Klusmann. "It will also contribute to a sustainable and decentralised energy supply through its function as a solar cell."

What makes this development so novel is the conflation of solar cell and construction material. The dye-sensitised solar cell or 'Grätzel Cell', developed by Swiss chemist Michael Grätzel, is an affordable alternative to conventional silicon solar cells.

To maximise efficiency when transforming solar energy using solar energy concrete, the research group is currently optimising the coatings. The components for dye-sensitised solar cells are readily available, eco-friendly and easily recycled. In addition, the manufacturing costs of dye-sensitised solar cells are significantly lower than those of silicon solar cells. ■

Source: <http://goo.gl/quEnaR>

Alfabloc offers a practical chemical powder barrier

Storing bulk supplies of inorganic chemicals in powder form can be problematic with the greatest risk being cross contamination of compounds that could lead to corrosion of substrates.

The CHC Group SA, a leading distributor in South Africa of chemicals, plastic, packaging materials as well as mining and construction products recently installed 50 Alfablocs, each 1.2 m long, 760 mm wide and 2.44 m high.

Amith Lalchund, GM at CHC Resources, said "As a chemical sales and distribution operation, we require bulk storage facilities for our inorganic chemical powders. Managing cross contamination in our storage facilities is always an issue, and we recently asked Rocla to propose a suitable solution. They suggested their Alfabloc system.

"What impressed us was the ease and speed of installation – the complete Alfabloc system was installed in about a week. It is an extremely durable system which offered us the solution to safe storage of our chemicals," said Lalchund.

The Alfabloc is a free-standing A-frame system with interlocking blocks and no protruding toe, which allows for easy loading, cleaning and unloading. The inner cavity formed by the A-frame can be used to place electrical cabling for

lighting, CCTV alarms or any other wiring requirements. The storage requirement determines whether the blocks should be placed onto natural ground, a concrete surface bed or bolted into a suitable foundation with chemical anchors.

Rocla's Alfabloc is available in three height options. The mini-Alfabloc, at 1.2 m high, has also been successful, providing a quick, flexible option for materials storage. Excluding projects where the blocks are anchored to a foundation, all other installations can be temporary, allowing the client to move premises and take their investment (in Alfablocs) with them to a new location.

Rocla have utilised the Alfabloc system in the river sand bunker at their Polokwane manufacturing plant. 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 Alfablocs to manage their manganese stock-pile facility more efficiently.

Rocla is part of the IS Group, which also comprises Technicrete and Oconbrick. ■

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Terraforce turned 35 in 2014, and Holger Rust, the founder and owner of the company wishes to thank clients, licensees and recommended installers for joining them on this journey of building outstanding retaining walls. Says Rust: "The future looks very encouraging and we are excited to continue to grow our product presence worldwide."

Rust designed the original interlocking and reversible hollow-core earth retaining blocks 35 years ago. They are amazingly versatile, but their most significant aspect is that, by being fully permeable, reversible and plantable, they offer a sustainable solution to anyone considering landscaping or erosion control on site as an alternative to impermeable solid concrete or brick methods.

Not only has this always been part of Terraforce's marketing approach, but it goes beyond strategy for the company. Karin Johns, marketing manager for Terraforce, explains: "Rust has always been passionate about green living and green products and it is this passion that steered him into creating a product that allows a concrete retaining wall to blend into its surroundings. This is an often ignored aspect of maintaining a balance in urban or rural environments, where profit commonly outweighs sustainable choices".

Holger Rust is satisfied with his decision to pursue a sustainable business model, through extensive product testing and research locally and overseas.

"I was warned that making too much information freely available on our website would encourage the 'reverse engineers' to copy our designs. This has happened to some extent, but on the whole, their activities have been unable to hamper our sustained growth, even in the current recession.

"For me that is confirmation, that a combination of innovation, quality and commitment, are the most powerful drivers of a long-lasting business. Our bottom line is to "go green and clean" wherever we can. In life and in business, it is the only truly sustainable option for the future."

In 2012, mobile operator Cell C started the construction of a new head office in Midrand, occupying an initial 46,000 m³, with 14,000 m³ held in reserve for future development.

The campus includes offices, a national network operations centre, data centre, customer walk-in centre, call centre, Cell C shop, and a distribution warehouse. The new campus will form part of the multibillion-rand Waterfall Business Estate.

The construction site is situated on a slope, which required the earthworks platforms to be terraced, creating cut-face and bulk embankments above and below parking areas that needed to be retained.

Says Silvio Ferraris, Terraforce licensee, Remacon: "The Terraforce retaining wall system was chosen by the architects Bentel Associates International for its closed-face configuration and plantability. The walls reach up to 6 m in height and are mostly reinforced with geo-fabric, while some are installed against natural, residual granite formations."

The installation of 4,680 m² standard, grey L11 blocks commenced in September 2012 and the last walls were constructed around the Cell C mast in July 2014. All the walls were planted with creeping, indigenous groundcovers for a softening and greening effect, and to add to the overall visually striking and functional landscape planned by Insite Landscape Architects. ■

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

Motor dealerships turn to Technicrete

Petrol stations and motor dealerships have very specific requirements for paving on their premises to meet differing operational requirements such as new, pre-owned and commercial vehicle sales; vehicle maintenance bays and also drive-through business. Key requirements are durability, good appearance and cost competitiveness. These factors led to Technicrete products being selected for the revamp of Lionel Motors in Rustenburg as well as for seven Westvaal Delta motor dealerships.

Lionel Motors required their entire site re-kerbed along with paving for heavy-duty truck display areas and under-roof outdoor pre-owned display sections. Brink Jordaan, MD of RTB Civil Tech said: "We sourced Technicrete DZZ grey 60s and 80s for the 1463-m² pre-owned and heavy-duty truck areas of the dealership. The DZZ interlocking pavers gave the dealership a hard wearing yet attractive finish. The 2,086 precast kerbs we used included barrier kerbs and semi mountables in two sizes."

"The area for the under-roof display of pre-owned vehicles was important as pre-owned vehicles can suffer oil and grease leakage, making Technicrete's charcoal cobble perfect for this application. The leaks are absorbed into the black colouring, enabling the display area to retain its clean, professional appearance," said Jordaan.

"We at RTB Civil Tech had excellent technical support from Technicrete and we like the longevity of their products," concluded Jordaan.

Seven branches of the Westvaal Delta car dealership group recently had complete facility upgrades; their petrol forecourts, showrooms and yards were revamped with Technicrete paving.

Mike Prinsloo, MD of Westvaal Delta said: "The quality of the Technicrete paving is good and it is durable. We used 3,594.5 m² of their Autumn BondBricks which, while known as a traditional and reliable option for commercial surfaces,



One of the seven Westvaal Delta car dealerships that had complete facility upgrades, including revamping petrol forecourts with Technicrete pavers.

specifically meets our needs as a vehicle sales and petrol service station operation subject to heavy trafficking.

"We also used 1,500 Technicrete grey 60s, 660 Earthform greys, and a mixture of mountable, semi mountable and garden kerbing on the seven dealerships," said Prinsloo.

The Earthform range was utilised to simplify the maintenance of steep areas by providing easy-to-maintain walls that can be stacked up to eight layers high and incorporate spaces for plants.

"The dealerships now look smart and professional. Technicrete's products are competitively priced, delivery is reliable and we will definitely use their paving again as we continue to refurbish branches throughout the region," said Prinsloo.

Technicrete is part of the IS Group of companies, comprising Technicrete, Oconbrick and Rocla. ■

**More information from Malebusa Sebatane,
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Rocla jacking pipes chosen for the Palmiet to Signal Hill project

No population can survive without potable water, making the management of water a crucial element of local municipality responsibility. The need to maintain and upgrade water related pipelines and related technical equipment, as has recently been highlighted, is of paramount importance to ensure that community health, hygiene and safety are not compromised.

Rocla, part of the IS Group, has been contracted to supply a part of the 1,100 metres of jacking pipe for two of the 19 sections (1 x 90-m and 1 x 288-m sections) for underground construction to the upgrades for the Palmiet Pumping Station to Signal Hill Reservoir project, which is currently being constructed for Rand Water.

Two contractors, Wepex and Esor, both sought product from Rocla because of their superior jacking pipe offering and availability. Contracts manager, Pipe Jacking Division for Wepex, Luke Woodhams, said: "The Palmiet/Signal Hill project is an 18-month contract with hard rock, alongside residential and national roads, needing to be blasted. The Rocla 100D jacking pipe has a nominal diameter of 2,500 mm and an outside diameter of 3,000 mm and a proof load of 250 kN/m. It is an ideal pipe for this application – to carry water supplies for human consumption as well as to withstand the immense pressure of vehicle weight," said Woodhams.

Steel pipes will be inserted into the jacking pipe for extra support and for their anti-corrosion properties.



The Rocla jacking pipes on site at their Roodepoort factory.

Self-Compacting Concrete

The Rocla 100D jacking pipe is made from self-compacting concrete and complies with SANS 677. Manufactured through a vertical-cast process, self-compacting concrete renders a better surface finish, while the benefit of the vertical-cast (VC) process instead of the traditional roller-suspended (RS) process is that a more consistent thickness throughout the product is achieved compared to the RS operator-related effort of compaction.

The VC process gives an improved compaction around the reinforcement, improving the bond to the reinforcement and offering greater ease in filling extremely thin-walled sections.

Self-compacting concrete can increase safety on the job by eliminating the need for consolidation; offers improved pumpability and labour efficiencies; shorter construction time making it a cost-effective option. It can be placed at a faster rate without automated vibration and therefore requires less screeding. A quicker concrete vehicle turn-around time is facilitated, assisting contractors in servicing a site more quickly.

"Pipe jacking is a technology where specifically made pipes are tunnelled through the ground by hydraulic jacks, eliminating the need to dig up the road infrastructure."

Woodhams added "Rocla had the right pipe with good availability. Their product is of an excellent quality and at a good price. We are very pleased with the service the company has given us and we would definitely use Rocla again whenever we can in the future."

Civil Engineering and Construction Group, Esor is involved in the Phase B section of the Palmiet/Signal Hill project. Anton Naude, director of Pipejacking commented: "The Rocla product is very competitive, the jacking pipes need to be able to last the lifespan of the project, which they will easily do due the quality of the pipes. These are huge jacking pipes that have an approximate mass of 5,680 kilograms per metre and a mass of 8,518 kilograms per pipe."

"Currently the upgrades are running under the road from Alberton to Germiston, and it was essential that we had the right product and the right technology in place to eliminate traffic disruption" said Naude.

"One of the challenges facing contractors on this Rand Water upgrade project is that the old pipes are running parallel to newly positioned jacking pipes, and it is imperative that the old piping is not damaged while the installation of the new Rocla replacement jacking pipe is under way. We are confident all will be well," he added.

Pipe jacking is a technology where specifically made pipes are tunnelled through the ground by hydraulic jacks, eliminating the need to dig up the road infrastructure. It offers greater transparency in terms of time and costs and is an environmentally friendly process. ■

**Further information is available from: Malebusa Sebatane,
Tel: +27(0)11 674 6957 / www.rocla.co.za**

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Warren Mc Kenzie, Concrete Technologist, Murray & Roberts, South Africa

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An affordable alternative in self-loading mixers

A low-cost, yet high-performance self-loading concrete mixer is the ideal solution for the African construction sector, which is experiencing considerable growth, but is still generally restricted in terms of capital outlay.

The new Fiori DBX35 self-loading concrete mixer is designed specifically for emerging markets in Africa that require high-quality concrete on demand at a more affordable price. The DBX35 was officially launched locally in January 2015 by Pan Mixers South Africa (PMSA).

PMSA sales and marketing manager Quintin Booysen notes that the new Italian-designed and manufactured DBX35 self-loading mixer will be part of a range of equipment, with a smaller and then larger unit being available as entry-level machines in the Fiori range.

"To make the DBX35 more affordable, all non-essential parts were removed from the mixer and certain design aspects were adjusted. Fiori's quality standards have remained uncompromised."

Two major changes are the introduction of front loading-arms and a grab bucket, which replaces the standard bucket found on other Fiori machines.

"The Fiori DBX35 is ideal for customers who have not budgeted for a separate weighing system to measure all the aggregates, as the grab bucket allows the user to more accurately measure materials when loading the bucket, which can be filled up to 90%. This is not possible with a standard bucket," Booysen adds.

The Fiori DBX35 offers additional benefits to the African market, including more accurate volumetric loading, as well as shortened loading times thanks to the positioning and



PMSA DBX35 self-loading mixer will be part of a range of entry-level machines from Fiori.

inclination of the drum. Its compact design also results in considerable transport savings.

"Two Fiori DBX35 self-loading mixers can fit into one standard 140-m³ shipping container, which halves the transport costs, compared to other similar-sized competitor mixing machines. This is another major value-add in terms of ensuring affordability, without compromising on efficiency or reliability," Booysen continues.

"It is the ideal self-loading mixer for the price conscious customer, and I am confident of obtaining measurable market share across Sub-Saharan Africa in the foreseeable future," he concludes. ■

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

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Portable toilet solutions at special events are a prerequisite to success. Event organisers and planners know that Sanitech's products not only boast state of the art quality, design and performance but also adhere to all environmental and health and safety regulations. The range is vast and competitively priced. Sanitech is a division of Waco Africa, South Africa's leading industrial and commercial services provider for over 50 years.

Having more than two decades of local experience as well as the support of Waco Africa, Sanitech is one of the leading portable sanitation suppliers in South Africa. With over 15,000 toilets in the fleet, and branches throughout all major cities in South Africa, the company is able to meet the needs of even the biggest events in all sectors, from the private individual to the larger sporting festivals or corporate events.

Sanitech specialises in the prestigious Xquisit™ trailer units which are fully automated, solar powered, eco and environmentally friendly. Combined with the Xclusive™ range of portable toilet configurations (including units for paraplegic or disabled users) the company is able to provide clients with the complete sanitation and hygiene solution for all their event requirements. In addition to the above, construction sites are regularly serviced.

Sanitech is a Level 3 BEE company renowned for its superior sales and service, and the high standard of on-site janitorial



Sanitech provides its services to construction sites.

and maintenance personnel. A practical management approach and the commitment of every one of Sanitech's employees is the clients' guarantee that their away-from-home environment will be clean, hygienic and safe.

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**More information from Michelle Dalton,
email: michelled@sanitech.co.za or call 083 385 0451**

BASF opens concrete admixture production facility in Nairobi, Kenya

BASF recently inaugurated its new production plant for concrete admixtures in Nairobi. The production site will enable BASF to better meet the increasing demand for construction chemicals of customers in East Africa. There, BASF produces standard and custom-made performance admixtures from the MasterRheobuild® as well as the MasterGlenium® product line.

“We are now able to rapidly supply our customers with admixtures for all cement and aggregate types, whether their construction projects are located in the urban areas or in more remote sites,” said Dick Purchase, head of BASF’s Regional Business Unit Construction Chemicals Middle East, West Asia, CIS and Africa. BASF’s admixtures produce concrete with higher strengths and increased workability retention. This is critical in urban areas like Nairobi or Kampala in Uganda, where heavy traffic can delay delivery of concrete to the construction site.

Kenya is a particularly strong growing market for construction chemicals in East Africa. “Growth in emerging markets is an integral component of BASF’s ‘We create chemistry’ strategy,” said Laurent Tainturier, senior vice president Europe East, CIS, Middle East and Africa at BASF. “In line with this, BASF’s Africa strategy aims to double sales on the continent by the year 2020. The new production facility will strengthen the product portfolio in the region, and meet the demands for multi-storey buildings, durable infrastructure and more energy-efficient construction techniques,” he said. Cement is expensive and scarce in East Africa. With BASF products, it can be partially replaced in concrete mix designs. Solutions from BASF also aid with compliance to energy efficiency certifications for LEED or GBCSA Green Star-rated buildings.

The new production site in Nairobi is a further step in strengthening the Master Builders Solutions® global network. The solutions offered by this brand will also be of benefit to contractors from other regions working on construction projects in East Africa, as they may be familiar with the product portfolio and technologies.

At the opening ceremony, Kenya’s Cabinet Secretary of Foreign Affairs and International Trade, Ambassador Amina Mohamed, said: “Not only will BASF now be able to further contribute to building sustainable structures in East Africa, it will also bring employment opportunities and expertise to the region’s construction sector.”

Located in the Mlolongo area of Greater Nairobi, the production plant has good access to the road network and Mombasa Port to receive raw materials, deliver to customers

in Nairobi and Kenya and to export to South Sudan, Uganda, Rwanda and Tanzania. BASF has been actively selling construction chemicals to the East African market for over 25 years. There are production sites in Africa in South Africa, Algeria, Egypt and Morocco.

About the Construction Chemicals division

BASF’s Construction Chemicals division offers advanced chemicals solutions for new construction, maintenance, repair and renovation of structures: The comprehensive portfolio encompasses concrete admixtures, cement additives, chemical solutions for underground construction, waterproofing systems, sealants, concrete repair and protection systems, performance grouts, performance flooring systems, tile fixing systems, expansion control systems and wood protection solutions. The Construction Chemicals division’s 5,700 employees form a global community of construction experts. To solve customers’ specific challenges from project conception through to completion, BASF draws on the experience gained in countless construction projects worldwide. BASF’s global technologies are leveraged, as well as the in-depth knowledge of local building needs, to develop innovations that help make our customers more successful and drive sustainable construction. The division operates production sites and sales centres in over 50 countries and achieved sales of about €2.1 billion in 2013.

About BASF in Africa

The BASF Group has been active in Africa for 90 years. The company has been exporting colourants and intermediates to Kenya from its headquarters in Ludwigshafen, Germany, since the end of the 1920s. Today, the BASF Group has more than 1,000 employees in Africa (excluding the oil and gas business). In North Africa, the company is represented in Egypt, Algeria, Morocco and Tunisia. The key industries are construction, textiles, agriculture, automotive and the health care and plastics sectors. The BASF Group company Wintershall has produced oil onshore in Libya since 1958, and is also involved in an offshore oilfield. In South Africa, BASF has production facilities for emission catalysts, construction chemicals, coil coatings, dispersions and polyurethane plastics. ■

More information on BASF is available at www.basf.com



New specifications, new product and new branding for fly ash

The introduction of the new fly ash specification, SANS 50450, also heralds the rebranding of Ulula fly ash into Ulula Ash Classes S and N.

The new standard caters for a new category of classified fly ash – Class N – which was previously an uncontrolled class that could include fly ashes of variable quality and also frequently with inconsistent properties.

“Under the new specification, Ulula Ash was the first South African producer to receive the SABS mark for Class N fly ash,” says Mark Hovy, general manager of Ulula Ash.

“This is because we have been producing a well-controlled, extremely consistent and reactive Class N fly ash since 2008. Our fly ash quality has always been controlled by ensuring that we only select the best of the best fly ash from Kriel Power Station,” Hovy explains.

A product with a history

Fly ash, in the form of volcanic ash, was used by the Romans to build structures in Rome that are still standing. Today cement producers continue to use ‘volcanic ash’ as an extender to cement in the form of fly ash from coal-burning power stations. “In South Africa we are fortunate to manufacture a ‘volcanic ash’ in a controlled manner – unlike in nature, where each outburst of volcanic ash is produced at different temperatures and with differing burning conditions.

“South African ‘volcanic’ ash comes from the burning of coal in power stations under excellent and optimal conditions. These perfect conditions start from the coal source, which would ideally emanate from a dedicated area thereby providing coal that is of consistent quality. A good example of this is the coal mined and sent to Kriel Power Station to be pulverised and blasted into a boiler to be ignited. This ignition and burning process is completed in a fraction of a second at temperatures that liquefy all the minerals in the coal which are not carbon or combustible. These non-combustibles rise up the boiler in the form of steam and upon cooling, form micro-spheres which we all know as fly ash,” Hovy continues.

“This is where it is important to know what is happening from day to day, hour to hour. Eskom are faced with certain

constraints which can affect our perfect production conditions. Examples of these constraints are:

- boiler start up
- burning alternative fuels
- burning coal from different mines
- reducing the load on the boilers at times when the grid has an over-supply of power

“Under these circumstances, our perfect ‘volcanic ash’ is not as perfect as we think.”

Fortunately, the Ulula Ash plant at Kriel was designed to take this into consideration. The amount of flexibility at the plant allows the operator to only select fly ash from boiler conditions that are perfect. The operator can literally select or unselect the feed supply of fly ash from the power station within 10 seconds. That is how quickly the valves can be opened or shut to each of the six boilers from which Ulula receives fly ash.

What is the significance of the new fly ash specification?

The previous SANS 1491 specification only catered for a single fine grade of fly ash. The only way of achieving this was through a classification process.

The new specification SANS 50450 caters for 2 grades, Class S and Class N. More than 50% of all fly ash used in South Africa falls within the Class N category which was previously an uncontrolled product which could be subject to any of the undesirable boiler conditions mentioned above.

Due to the Ulula Ash plant design we have, since inception in 2008, produced what was then branded an unclassified ash. However, this fly ash has always been controlled by ensuring that we only select the very best fly ash that can be obtained from Kriel Power Station.

“We are very proud to be ahead of the game with our fly ash already complying with the new specification’s Class N fly ash. It is good to be the first in South Africa to carry the SABS mark for this product,” concludes Hovy. ■

**More information from Ulula Ash,
Tel: +27(0)11 708 0010 / www.ululaflyash.com**



Kaytech introduces Concrete Canvas to SA



Concrete Canvas is significantly faster, easier and less expensive to install than conventional concrete channel lining.



Concrete Canvas can be used to stabilise and protect slopes as a replacement for shotcrete and steel mesh.



Concrete Canvas can be rapidly unrolled to form a channel lining.

Kaytech has recently signed a distributorship agreement with Concrete Canvas® to supply Geosynthetic Cementitious Composite Mats into the South African civil engineering industry.

Concrete Canvas® is used specifically for lining culverts and channels, for slope protection, and for the remediation of existing concrete structures.

What is Concrete Canvas®?

Concrete Canvas® is part of a revolutionary new class of construction materials called Geosynthetic Cementitious Composite Mats (GCCM). It is a flexible, concrete-impregnated fabric that hardens on hydration to form a thin, durable, waterproof and fire-resistant concrete layer. Essentially, it is concrete in a roll. Concrete Canvas® allows concrete construction without the need for plant or mixing equipment. Simply position the mat and just add water.

Concrete Canvas® consists of a three-dimensional fibre matrix containing a specially formulated dry concrete mix. A PVC backing on one surface of the mat ensures the material is completely waterproof. The material is hydrated either by spraying, or by being fully immersed in water. Once set, the fibres reinforce the concrete, preventing crack propagation and providing a safe plastic failure mode. Concrete Canvas® is available in two thicknesses: CC5™ and CC8™ which are 5 and 8 mm thick respectively.

User benefits

Rapid installation: Concrete Canvas® can be laid at a rate of 200 m²/hour – up to 10 times faster than conventional concrete solutions.

Easy to use: Concrete Canvas® is available in shorter rolls that are manageable by hand for applications with limited access. The concrete is pre-mixed so there is no need for mixing, measuring or compacting. Just add water.

Lower project costs: The speed and ease of installation mean Concrete Canvas® is more cost-effective than conventional concrete, with less logistical complexity. Concrete Canvas® is a low-mass, low-carbon technology, which also uses up to 95% less material than conventional concrete for many applications.

Key properties

Waterproof: The PVC backing on one surface of the GCCM ensures that the material has excellent impermeability.

Strong: The fibre reinforcement prevents cracking, absorbs energy from impacts and provides a stable failure mode.

Durable: Concrete Canvas® is twice as abrasion resistant as standard OPC concrete, has excellent chemical resistance, good weathering performance and will not degrade in UV.

Flexible: Concrete Canvas® has good drape characteristics and will closely follow the ground profile and fit around existing infrastructure. Unset Concrete Canvas® can be cut or tailored using basic hand tools. ■

Download the product brochure and case study at:
www.kaytech.co.za/product/concrete-canvas/

Take the risk out of concrete waterproofing

The answers to a customer's typical questions explain why Kryton Crystalline concrete waterproofing products are ideal for new and existing reservoirs and other water-retaining structures.

Q. What is the lifespan of the product? Will it last as long as the cement does or must we reapply it at certain intervals?

A. The Kryton Crack Repair system lasts for as long as the concrete structure is sound. It does not need reapplying after its original application. It is the crystals that form within the concrete matrix which provide the long-term waterproofing to the structure, not the individual products. These crystals permanently block and prevent the passage of water through capillary pores, micro-cracks and joints. The concrete itself becomes the waterproof layer and the surface treatment is not required to remain intact for the system to be effective. As a result, the Krystol T1 & T2 Systems are extremely durable and will last for the lifetime of the concrete.

If there is further cracking in the future, the impact should be minimal so the crystals will activate in the presence of moisture, resealing cracks of up to 0.5 mm – which is 25% more than our competitors' products.

Q. Is the product nontoxic to aquatic animals and would it change the composition of the water? We pump out water back into the sea and need to know that we are not harming the environment in the process.

A. All of our products are safe for use in marine environments.

Q. Do the Abalone tanks need to be emptied in order for you to do the crack repair?

A. The Kryton Crack Repair System can be applied while the tanks are still in use as the application can be undertaken from the negative side of the structure (the exterior of the tanks). Kryton Crystals will grow within the concrete substrate rendering the concrete itself 100% waterproof

Additional product benefits

- Completely eliminates the need for costly and labour-intensive surface-applied membranes
- Is ideal for below-grade applications, reservoirs and pipelines and can withstand high hydrostatic pressure
- The waterproofing is not affected by surface wear or abrasion and will never require re-application
- Self-seals micro-cracks and stops water ingress
- Is safe for contact with potable water and certified by NSF to NSF/ANSI Standard 61 Drinking Water System Components – Health Effects
- Prevents corrosion

**More information from Sandór Dowling,
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Mayday's scabblers meet every need

Trelawny's MHS11 introduces a new concept in pneumatic floor scabblers. Using smaller heads with a 70% increase in BPM (Blows Per Minute), productivity, efficiency, cost and ergonomics are prioritised without compromising performance.

The MHS11's high blow rate packs the punch required for the most demanding surface preparation while reducing cracking and damage to the substrate often associated with this type of machine. It is the perfect option for concrete levelling and reduction tasks in preparation for applying new overlays. The 11 carbide-tipped scabbling heads, each delivering 2200 BPM, make easy work of the toughest of jobs. With a 250-mm cutting width, the MHS11 can reduce concrete of up to 3 mm at a rate of 30 m² per hour giving a profile perfect for bonding fresh materials.

Requiring only 55 cfm (26 LPS) of compressed air, the MHS11 is also efficient, saving operator costs. Weighing just 70 kgs, the MHS11 is easy to transport and comfortable to handle. Trelawny's unique Vibro-Lo™ vibration reduction system reduces operator vibration exposure by up to 6 times that of old style 'Pram scabblers'.

Simple and rugged construction is a part of Trelawny's design principle. Simple to operate, low and easy maintenance means the MHS11 spends more time on site earning money rather than sitting in the workshop. Sealed-in components protect

the major working parts from dust ingress while the optional dust shroud gives the operator full dust control and protection when used with a professional industrial dust collector such as Trelawny's very effective A45 model.

Potential for long-term hires with the added benefit of regular consumable sales means that while giving contractors great value in performance and cost, the MHS11 quickly pays its way on the hire fleet.

Hand-held scabblers: Mayday Equipment also offers Trelawny's SH and SC ranges of pneumatic hand-held concrete scabblers which are ideal for fast profiling and preparation of concrete. Available in single-piston and triple-piston models, they are perfect for preparing walls, edges, columns and joints for bonding and applying new material. The carbide-tipped pistons remove the weak laitance layer on the concrete leaving a keyed surface to which the new material is able to bond very effectively.

The lightweight and compact design means they can reach areas that standard hammers and breakers can't.

Fewer moving parts and easy maintenance mean all Trelawny scabblers can be fixed with the minimum of fuss and with very little downtime on site. ■

**More information from Mayday Equipment on
Tel: +27(0)11 614 2023/4**



Chryso Southern Africa offers a full range of additives to optimise cement production

Chryso Southern Africa, the largest construction chemicals specialist in South Africa, offers a full range of cement additives to optimise different stages of the cement manufacturing process, explains Trevor Smith, newly appointed general manager: Cement.

Cement-mill additives comprise grinding aids and activators. Grinding aids have been developed specifically for raw meal production, as well as for the cement grinding process itself. The productivity of a raw mill can be increased by 6% to 12% and the cement mill by 10% to 25% by the use of such grinding aids.

Chryso® activators allow for increased use of supplementary cementitious materials (SCMs), which assists in reducing the percentage of clinker in the cement. Clinker production is the most energy-intensive part of the cement-making process. Reducing clinker content decreases carbon emissions as well as the costs associated with carbon taxes. The most common SCMs are slag, pozzolan, fly ash and limestone. Most Chryso® activators are designed to work with specific SCMs, contributing to significant savings associated with lower cement production costs.

"We formulate these products with a combination of activators and grinding aids. The activators effectively react with the clinker material and/or SCMs to improve the hydration reaction of the cement in the concrete. This results in the formation of calcium silicate hydrates and other crystalline structures that give concrete its strength. Some activators provide for early strength enhancement and some for late

strength enhancement, while some do both," Smith comments.

"We have a range of formulations that allows us to select a specific product for a customer's application." The process begins with understanding a customer's cement manufacturing operation and the chemistry of his clinker and cement and what he wants to achieve in terms of cement quality and performance. For example, does he want early or late strength? Does he want improved output, which will result in improved efficiency?

Or does he require a special product for a specific application? Or a combination of all three?

"We have the capability to formulate products for a specific application. Initially we will look at our broad range and then make some suggestions and follow that up with a few laboratory and plant trials. In some cases, a customer might be importing clinker from different sources where he operates a grinding facility only.

He really does not want to use a different product for each type, so we will endeavour to supply him with a more robust, broader spectrum product that will cover all his requirements," Smith goes on to explain.

Such close working relationships often mean that Chryso Southern Africa enters into long-term partnerships with its customers. It supplies products to the mining, precast, readymix, construction and general industrial sectors. "We have the logistical capability, in addition to three manufacturing facilities, so that we are fully equipped to export to most countries in Africa at present," Smith notes.

"We have also developed innovative stock management systems to ensure that our clients do not run out of product. Initially developed in South Africa, we have now rolled this out into a number of Africa export countries due to the long lead times." Smith says Africa remains an important focus. "The growth and development on the continent is being led by a requirement for cement at all levels, from bricks and blocks to roads, major mining and oil and gas projects as well as water and power infrastructure."

Latest developments from Chryso Southern Africa include a range of cement additives developed specifically for vertical roller mills to enhance stability, which leads to reduced vibration and improved output. Traditional milling circuits comprise ball mills in tandem with separators that classify the milled product to produce a cementitious product. However, vertical roller mills, with internal classification and lower specific energy consumption, are becoming increasingly common as cement producers seek to optimise their manufacturing process. ■



Clinker production is the most energy-intensive part of the cement-making process. Chryso activators help reduce clinker content, which cuts carbon emissions and carbon-tax costs.



Chryso Southern Africa has developed a range of cement additives specifically for vertical roller mills to enhance stability, which leads to reduced vibration and improved output.

**More information from Kirsten Kelly,
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HAZEMAG machinery for cement plants in Africa

By Dr. York Reichardt and Jürgen Kintrup

HAZEMAG undertakes crusher projects for cement lines directly from Germany, whereas North African aggregate plant projects are supplied by HAZEMAG Maroc. Crushers for the African mining industry are supplied by South African company IMS, part of the HAZEMAG group. The presence of these members of the Group in Africa enables an optimised service. SINOMA, the biggest supplier of cement plants worldwide, is also a shareholder of the HAZEMAG group.

HAZEMAG has a long history in supplying crushing plants to the cement industry all over the world and of course also in Africa. The main function is primary crushing from mine limestone and additives down to a product size of $\pm 95\%$ below 80 mm or finer depending on the downstream mills. Throughput is up to 2500 t/h for big cement lines.

The main components of such crushing plants are the hopper, the apron feeder, the wobbler for scalping, the crusher and the discharge belt.

Feeding

Trucks dump the mine material into the hopper, from which a heavy-duty HAZEMAG apron feeder HAF takes it to the wobbler or directly to the crusher. The hopper design and the apron feeder's inclination of 23° ensures steady discharge and conveying. A variable speed drive adjusts throughput and a scraper chain conveyor flanged to the underside of the apron feeder collects and removes spillage

Scalping

Scalping before crushers with HAZEMAG wobblers HRS is a proven technology - also in primary crushing in a cement plant where a typical run of mine limestone is already $\pm 35\%$ below 80 mm. The wobbler removes this portion before it is conveyed to the crusher.

The main advantages of using wobblers before crushers are: lower wear, reduced energy consumption, less chance of clogging in the crusher and using a smaller crusher. Hence in general wobblers reduce energy and operational costs and/or increase operational safety.



HAZEMAG wobbler HRS and primary impact crusher HPI.

Crushing

Primary HAZEMAG impact crushers HPI are the first choice for primary crushing of limestone with feed moisture below 7%. Even higher moisture contents can be reduced to these values by removing the fines in a wobbler before the crusher. HAZEMAG impact crushers HPI are even used for higher moisture contents.

The advantages of the HAZEMAG impact crusher HPI are the heavy-duty design, easy operation and low maintenance costs and durability due to optimised geometry of the blow bars.

“HAZEMAG has a long history in supplying crushing plants to the cement industry all over the world and of course also in Africa.”

The standard application of primary impact crushers HPI with a single rotor is to crush runs of mine material of up to 2 m down to a product of 95% below 80 mm, that is suitable for downstream vertical roller mills. If required, these machines can produce 95% below ± 50 mm at reduced capacity.

If greater fineness is required (for feeding a ball mill as raw mill) a HAZEMAG compound crusher HPC with 2 rotors is used which achieves a 95% minus 25 mm.

For feed moisture up to 15% the HAZEMAG double-shaft hammer crusher HDS can be used. The fineness range is 95% below 100 mm down to 95% below 25 mm. The service life of hammers used in other brands of hammer crushers is significantly lower than HAZEMAG impact crushers and maintenance costs are higher.

Both HAZEMAG impact crushers HPI and HAZEMAG double shaft hammer crushers HDS can achieve a throughput of as much as 2500 t/h.

With sticky additives in the cement plant like clay or pozzolans with feed moisture up to 30%, HAZEMAG centre sizers HCS or HAZEMAG roll crushers HRC are a good choice. In both the crushing takes place between the two inward rotating crushing rolls. Compared to the capacity of HAZEMAG centre sizers or roll crushers in other applications which can reach up to 5000 t/h the needed throughput for crushing of additives in the cement industry is rather small.

Recent projects in Africa

HAZEMAG has supplied components for treating raw material to the new Egyptian cement line El Arish, including the primary impact crusher HPI 2225 with a wobbler for 1900 t/h limestone and a roll crusher HRC 0816 for 500 t/h clay. Also an impact crusher for 120 t/h of gypsum will be supplied in summer 2015. At Sephaku, Dangote's South African plant, a primary crushing plant with wobbler and primary impact crusher HPI 2025 for 1200 t/h limestone is being commissioned.

In February 2015 HAZEMAG is supplying a centre sizer HCS 0816 to Tanzania's Lafarge plant at Mbeya for crushing 120 t/h pozzolan with maximum feed moisture of 20%. The product size is 95% below 40 mm. ■

More information from Reichardt York,

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High accuracy as standard

Famdra's range of belt weighers welcomes an internationally patented new addition.

Famdra's range of high-accuracy scales includes five models, from the BW1 single idler to the BW6-MS six idler. All of these Famdra scales have been certified for trade accuracy. This ensures that their accuracy performance in terms of total error is within 0.5%.

Single idler weighers

The BW1 kick-started Famdra's revolutionary designs. Its patented Precision Weigh Module (PWM) was first applied on this model as an economy scale. During its development, the BW1 showed remarkable immunity to dynamic effects, encouraging refinement to mining specification.

This performance defied the general perception that single idler scales are less accurate. Its unique design has set new standards in single idler belt weighers.

Owing to its PWMs, this scale performs remarkably well on most applications – normally within 1% error on suitable applications. With its proven trade accuracy performance on a 2,000-tph application, and more recently on 3,000 tph with an unmodified standard model, the BW1 is well received by users.

Trouble-free operation over 5 years is not unexpected and the modest price tag of about US\$5,000 for the core unit ensures that it has wide appeal.

The BW1E compact ultra-economy model for small budgets is derived from the standard BW1.

Its small price tag has been achieved by optimisation of: component integration, compact installation and a narrow selection of installation packages. This choice offers the client utmost affordability.

Famdra's options for factory setup, installation kits and jigs, installation video guidance and ease of installation, together with its innovative design, make this model affordable even for small-venue operations.



Other weighers

Famdra also counts ultra-high-accuracy premium accounting weighers among its portfolio. The dual weigh-frames and middle-sensing BW6-MS model also feature Famdra's patented PWM design. This model is especially suited for high-production-rate applications, generally in excess of 3,000 tph. The model was aimed at extremely demanding applications, where long conveyors with high belt tension effects, wide belt widths and high belt speeds exist.

General features of Famdra belt weighers include:

- Advanced product design extended to idler frames, installation jigs and installation processes
- Models are designed for installation above 'top of stringer', eliminating the need for conveyor modification
- Kits and jigs enable effortless installation, ensuring high-level installation even with novice personnel ■

More information from Naran Naidu,
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www.famdra.co.za

BOLDROCCHI GROUP: the right partner for any Cement Plant

The Boldrocchi Group is headquartered in Italy and since 1909 have designed and manufactured highly engineered industrial equipment and offer excellent site service and assistance worldwide. The Group has production areas in Italy (over 35,000 m²) and India (10,000 m²) equipped with thermal, acoustic and aerualic test facilities. The subsidiaries are located in France, Germany, Egypt, India, China, USA, Mexico, Brazil.

Boldrocchi is the right partner to design, supply and successfully start up the complete gas handling and dedusting system of any cement plant. The Group has the unique advantage of having the internal know-how for each of the key components, including fans, bag filters, gas coolers, dampers and silencers.

In 1993, the Quality System was certified as conforming with ISO 9001. Boldrocchi products and services are custom engineered and manufactured to fit the customer's specific needs

With over 100 years of experience, Boldrocchi has developed a complete series of process fans for every possible application in a cement plant. Unique design features like



machined inlet cones and integral flanges are distinguishing characteristics. Boldrocchi fans will be tailor-made according to the flow process conditions, dust load, plant layout, to meet all customer requirements and to ensure the best performance and the lowest operating costs.

More information from Allegra Boldrocchi,
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Zambia : Handyman's Paradise's first Maerz Kiln installation has begun

The existence of local lime production is one of the prime indicators of a country's economic development. While there is existing lime production in Zambia, large quantities of lime still have to be imported.

Handyman's Paradise will set a milestone for production of high-quality lime using the most energy-efficient process, thus protecting the environment in which we all live.

With the rapid economic growth in Zambia and the region, there is no doubt that more beneficiation of local resources will occur. The production of lime from local limestone is only one example. Handyman's Paradise Limited, in a joint venture with Astro Holdings Limited Group of Companies, embarked on a journey to build a lime manufacturing plant in Ndola's Masaiti district, close to the border with the DRC.

The project will be developed in several stages and when all phases are complete it is expected to cost in excess of US\$50 million. Being a Greenfield project the entire infrastructure for this state-of-the-art lime plant has to be built from scratch, including the access road to the plant site.

In November 2013 the ground breaking ceremony for the new lime plant took place. With a long list of very distinguished guests – including several Ministers and Chiefs – this was a major event well publicised in national newspapers.

Construction started in May 2014 and the major part of the material and equipment for the 600-ton per day lime plant had to be imported from well-known suppliers world-wide. The project not only consists of the Maerz Parallel Flow Regenerative lime kiln, but also of all required equipment up- and downstream from the kiln such as crushers, conveyor belts, silos, coal dust mill and other auxiliary machinery.

Once the civil works were underway, the shipping of the equipment began in July 2014. Another milestone was reached on Friday 7 November 2014 when the first kiln shell steelwork was lifted onto the civil foundations at the site. The lime plant is scheduled to be ready for start-up in June 2015.

About ThyssenKrupp

ThyssenKrupp Industrial Solutions is one of the few full-range suppliers for the cement industry – from individual machines, all the way up to complete plants. We also have compelling solutions for the modernisation of existing systems. We have unique expertise in the field of process engineering. In accordance with customer-specific requirements, we develop innovative machinery, technologies and processes to create intelligent production lines.

From the planning process, to construction, to the commissioning of plants, our clients have a single contact person. This accelerates procedures, prevents conflicts of interests, and ensures fast and trouble-free commissioning.

The trend in the global cement industry is moving towards the awarding of turnkey orders: from individual grinding plants to entire production lines.

Thanks to the application of ultra-modern production processes, our plants protect resources and the environment and guarantee plant owners maximum productivity and economy of operation. ■

"More information from Pia Guertler,

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Dunlop moves forward in Africa

Despite global economic uncertainty, Netherlands-based Dunlop Conveyor Belting (Fenner Dunlop) is expanding its network of Dunlop Service centres, which supply rubber conveyor belts as well as a 24/7/365 belt-fitting service. Having already successfully established several centres in Europe, Dunlop have opened a warehouse and splicing services centre in Obuasi in Ghana. In addition, they also have a sales and technical support team based in Accra.

Dunlop Conveyor Belting has been supplying conveyor belts made in their production factory in Holland to its customers in Africa for many years. However, despite their success, they feel that the time has come to provide a more local and more personalised service.

Dunlop Conveyor Belting's executive director, Edwin Have, sees this move as a strategically important for the company. "Africa is a very important player on the world economic stage," says Have. "We want to play a physical role in that success. We have been supplying conveyor belts to our customers in the region for many years, but now we want to go one step further and not only supply top-quality conveyor belts but also provide the services and technical support that end-users need so that we are offering them a total service".

Have also believes that this will save money for the end-user. "By supplying goods and services direct we cut out the middle-man so our customers get a better service as well as much better value for their money".

Identity Theft

Another reason why Dunlop is increasing its physical presence in Africa is to make it even more difficult for others to supply low-quality imitation Dunlop belts. An increasing number of cases are coming to light where end-users have mistakenly purchased what they believed to be genuine 'Made in Holland' conveyor belts, only to find that they are not genuine at all.

"It is a growing problem," explains sales and marketing director Andries Smilda. "The Dunlop brand has always been associated with quality. The belts we manufacture in our factory here in The Netherlands are widely seen as being the world benchmark for quality and extended operational lifetime. The problem is that a number of companies based in Africa, Asia and South America are legally entitled to use the Dunlop name despite having no connection with Fenner Dunlop. It is almost impossible to control," added Smilda. "Fortunately what we can control is the quality of our products, which are far superior in every respect compared to those of any imitator."

New branding

Dunlop believes that the best form of defence is attack. Having invested millions in a new steelcord production line, expanded production capacity and introduced their own service network in Europe, Africa and the Middle-East, they have applied the same approach to overcoming the threat of poor quality imitations by investing in hi-tech water-jet cutting machinery to create rubber branding (usually bright yellow) and the statement 'MADE IN HOLLAND' that is embedded in the surface of the belt. They have also introduced much bolder branding on every form of packaging.

"If the belt and the packaging does not say, 'Dunlop, Made in Holland', then it almost certainly is not the real thing," cautions Smilda.

Exciting times

James Cammock, regional manager for Western Africa believes that these are very exciting times for Dunlop and is especially keen to visit more and more cement plants. "Being able to provide a belt-fitting service as well as supplying the belts themselves is a big leap forward for us. We have a wide range of belts designed to meet the tough demands of the cement industry, especially heat-resistant belts that can handle very high temperatures, but which also have excellent abrasion resistance. That is very unusual for heat-resistant conveyor belts".

Dunlop face tough competition. "Most service companies and traders in Africa do not want to supply high-quality belts like Dunlop because good belts do not require replacing for a long time. This is not good for their businesses. Their philosophy is to sell cheap and replace often. Our approach is the exact opposite," says Cammock. "When people realise that one Dunlop belt can easily last longer than two or three low-quality belts, then they keep coming back to us for more. That has what has kept Dunlop at the forefront of the market for all these years!" ■

More information from Les Williams,

Tel: (00)31512585513 / les.williams@dunlopccb.com



Dunlop has a wide range of belts to meet the demands of the cement industry, especially heat-resistant belts that can handle the very high temperatures common in that sector.

CEMTEC: offering the most effective and efficient solutions

Founded by Franz Plochberger in 1990, CEMTEC Cement and Mining Technology GmbH with its headquarters in Enns, Upper Austria, is today one of the leading global specialists in wet and dry grinding technologies for the most wide-ranging bulk materials, industrial minerals and ores.

In addition to systems for grinding processes, CEMTEC's product range also includes solutions for thermal (for instance, drying and cooling) and mechanical (such as mixing, washing, conditioning and pelletizing) treatment of bulk materials, minerals and ore. CEMTEC offers complete turnkey projects, as well as single items of machinery, from planning all the way through to commissioning.

The parameters for each individual application can be verified in CEMTEC's pilot test plant and laboratory. With this kind of pilot test, CEMTEC can guarantee that the selected solution will perform according to customer requirements. CEMTEC is able to offer wet and dry grinding tests in open and closed circuits, along with grinding tests with vertical roller mills, batch tests and drying tests. Many other material testing methods complete CEMTEC's testing portfolio.

Until now, CEMTEC has delivered more than 350 ball mills, rotary drums, dryers and pelletizing discs to locations as diverse as the Australian outback, Siberia and Panama. Of these machines, about one quarter was sold to the cement industry. Outside this sector, CEMTEC also supplies ball mills in all practicable power ranges and designs for virtually all conceivable applications.

CEMTEC mills daily prove their capabilities in the comminution of all types of ore, up to and including the grinding and preparation of additives for the paints and coatings industry, and also fly ash, coal, rubble, waste and for flue-gas desulfurization (FGD) installations.

CEMTEC has not only manufactured Europe's largest cement mill of 5.20 x 16.75 m with an installed main motor capacity of 2 x 4,200-kW and a capacity of 200 tph, but it has also manufactured one of the world's largest ball mills. This 18-MW wet-grinding ball mill, which operates in overflow design and

closed circuit (with hydro cyclones), has a dimension of 8.2 x 14.0 m and is designed for a fresh-feed quantity of 1,230 tph of gold ore.

Whether it is required to grind raw meal, solid fuels or if potential clients are looking for finish grinding of clinker and gypsum or limestone, pozzolans, granulated blastfurnace slag or fly ash, CEMTEC strives to offer the most effective and efficient solution.

Based on the in-house grinding technology featuring high pressure grinding rolls in combination with ball mills and dynamic separators of the latest development, CEMTEC is capable of adapting the project to meet individual needs. Only recently CEMTEC has been appointed EPC contractor for several cement grinding terminals in Western and Sub-Saharan Africa. One of these new grinding facilities for Ciments de l'Afrique, which is to be installed 15 km outside Abidjan, Ivory Coast, will have a capacity of 500,000 tons per annum which doubles the existing production capacity.

The key components of the plant are a 3.8 x 11.0-m shell-supported ball mill with installed motor power of 2,250 kW and a separator CTC-110 with improved rotor design to reduce power consumption and increase separation efficiency.

The scope of supply includes the raw material handling, including intermediate silos, grinding section, cement silos with bulk loading, transport to existing packaging plant, the electrical and control system, the structural steel building, civil works and complete erection.

The main challenge is the integration of the new grinding facility into the existing plant structure with minimal interference and in the shortest possible time. This is ensured by the clear vision and technical specification of Ciments de l'Afrique and the professional flexibility CEMTEC towards the fulfillment of the specification even before contract signing. The plant will be fully operational towards the end of 2015. ■

**More information from Marlies Lehner,
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Cemtech offers complete turnkey projects, as well as single items of machinery, working with clients all the way from the planning stage through to commissioning the plant.

Unshakable: even under the harshest conditions.



The more extreme the environmental conditions, the more resilient the technical systems must be. This particularly applies to industries such as cement and gypsum production. Schenck Process Group offers these industries a wide range of reliable systems and sound application know-how. There are Individual solutions for even the most extreme conditions.

Our products and applications provide control of continuous material flows; continuous weighing and feeding systems for coarse bulk materials, powders, dusts, fossil fuels and alternative fuels; screening technology; vibratory and also volumetric mechanical feeding systems; pneumatic conveying systems; heavy load acquisition; and discontinuous weighing solutions.

Efficient, economical and reliable at every stage of the cement production process

From raw meal and clinker production through to the high-quality final product, Schenck Process measuring and feeding technology plays a starring role in cement manufacturing, delivering perfect mixing, pulsation-free precision feeding and accurate weighing. At every stage of the process, under the toughest conditions and no matter how difficult the application, Schenck Process offers the cement industry a range of reliable and robust systems, economical solutions and extensive application know-how.

First the raw material for making the cement is broken up in a crusher. LinaClass® linear vibrating screens increase the effectiveness of the system by allowing pieces of the right size to bypass the crusher.

From here the material moves to the storage area, where the crushed stone is stored and homogenised in mixing beds. The mixture required to make a high-quality raw meal is mixed with MULTIDOS®

weighfeeders and ground in ball or bowl mill crushers. The weighfeeders, which are precisely matched to the properties of the material, ensure smooth discharge from the silos.

The heating of the raw meal to make cement clinker takes place in rotary kilns at a temperature of around 1,450°C. The raw meal is fed into the kiln by MULTICOR® mass flow feed devices, which exploit the Coriolis effect. The fuel supply is also managed by Schenck Process weighing and feeding equipment. The coal dust is precisely measured by the MULTICOR® K measuring devices and fed by the MULTICELL horizontal rotary feeders. The system can handle an output of a few hundred kilograms to 50 tonnes per hour with a feed accuracy of $\pm 0.5\%$. The pulsation-free transportation of the material to the main burner and calciner is also engineered by Schenck Process. The clinker is then cooled to around 200°C and weighed en route to the storage bins.

Alternative fuels such as fluff, sewage sludge and biomass are used as additional fuel sources. We offer complete solutions and components for the highly accurate feeding of these materials.

In the final step the clinker is mixed with gypsum and with other additives to make the finished cement. MULTIDOS® weighfeeders ensure the precision of the mix. It is then transported to the terminals for loading on to road or rail vehicles or on to ships.

This stage is automated by the loading automation system LOGIQ®. Cement works are controlled from state-of-the-art, microprocessor-based control rooms, which receive all the data from the process. All weighing and feeding data is made available via field bus thanks to the electronic system DISOCONT® Tersus. ■

More information from
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Plug&Grind®: the new solution in small and medium-sized modular and portable grinding stations

By Moises Rodriguez Nunez

Cemengal's history encompasses over 25 years of experience in building grinding stations. Today Cemengal is active in projects in Kuwait, Uganda, Kenya, Zambia, Mauritania, Colombia and Brazil. In all these countries the company is building clinker grinding stations of various sizes, from the world's biggest, a nearly 12,000-kW unit for Holcim Brazil which produces 460 tph to the smallest and portable one, called Plug&Grind® Classic, that produces 12 tph.

Three years ago, Cemengal developed a new concept: modular, portable grinding stations. The company identified a market for small grinding units, which was not being supplied by any other company.

We designed and engineered a product to fulfill the needs of these clients. This new product was not only a small grinding station. In aiming for something different, we came up with the Plug&Grind® Classic which is able to produce 12 tph of cement in a very small space with easy installation. This has become the fastest way to produce cement today. So far we have sold more than a dozen Plug&Grind® Classic units, mainly in Africa.

Last year we launched an evolution of this first Plug&Grind® Classic. The new Plug&Grind® XL was released last summer and we have already sold two units. The new XL is able to produce 30 tph following the same concept as the original Plug&Grind® Classic.

Today, we are proud to introduce the new Plug&Grind® Fuels. This new product is able to grind petcoke and/or coal, again following the concept of a portable and modular system based on the original Plug&Grind® Classic. All these products and

ideas are patented world-wide and the trade mark registered.

The Plug&Grind® Classic comprises only nine regular 40-foot containers. These containers are pre-assembled in Cemengal's workshop in Madrid and after eight months are sent to the client to be erected and commissioned in six more weeks. This means that you can have the first cement production in less than 10 months with no risk at all due to the portability of the grinding station.

The Plug&Grind® XL consists of only eight regular 40-foot containers and four special modules. These containers and modules are pre-assembled in the Madrid workshop and after nine months are sent to the client to be erected and commissioned in 6 more weeks.

This means that you can have the first cement production in less than 11 months – again with no risk due to the portability of the grinding station.

The Plug&Grind® is fully designed, engineered, and also fabricated in Western Europe. The best companies supply components to the Plug&Grind®. These include Siemens, Abb, Haver&Boecker, Hassler, SKF, FAG, Maggoteaux, Atlas Copco and many others.

Today, there is only one original Plug&Grind® on the market with more than 15 units sold on three continents, supported by Cemengal's three years' experience in the modular and portable grinding station solution and over 25 years' experience in the cement industry.

The main market, which accounts for 70% of all total Plug&Grind® sales, is Africa. And in Africa we have different types of clients. These range from big multinationals like Lafarge Zambia and local players like Mombasa Cement Kenya, to companies related to world-wide businesses in Uganda, Kenya and Mauritania.

The Plug&Grind® is a unique way to start a cement business in a new and remote area or in a fast-growing market. It enables you to use the grinding station's advantages to become a real cement manufacturer – producing your own cement by importing clinker. And in comparison to a conventional grinding station, the Plug&Grind® equips you to start producing cement in a record time and to reduce the amount of investment needed to build a grinding station.

The exciting and successful story of the Plug&Grind® started only three years ago, and today the family has grown substantially and will continue to do so in the coming years.

Landmarks

- 2012: launch of the Plug&Grind® Classic
- 2014: launch of the Plug&Grind® XL
- 2015: launch of the The Plug&Grind® Fuels
- 2016 onwards: new products in the pipeline ■



Cemengal's modular, portable grinding stations offer the fastest way to produce cement.

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www.cemengal.com

Getting you up-to-date in no time

BEUMER Customer Support ensures reliable intralogistic processes world-wide

African company Dangote Cement, based in Lagos, Nigeria has two ambitious goals – to compete with the leading cement manufacturers world-wide and to prepare for an upcoming construction boom. Africa is an emerging continent, where the demand for cement is steadily increasing due to the continuously growing population and the need for infrastructure development. Dangote has been using BEUMER systems such as loading systems, belt conveyors and bucket elevators for years. Systems from third-party suppliers are also used. “When it came to a belt misalignment on a bucket elevator used for feeding silos that are over 60 metres in height, we repeatedly had to endure production downtimes,” explains Kornelius Thimm, head of Customer Support for BEUMER in Beckum, Germany. This is a typical problem, according to Thimm. The system had to be stopped repeatedly for the workers to correct the error. In the long run, however, this needed to be corrected.

The cement manufacturer had made various service agreements with BEUMER Customer Support. The agreements can range from only maintenance and inspection to a long-term placement of service personnel on site. BEUMER Belt Management, for example, helps to avoid downtime through regular inspections and timely replacement of bucket elevator belts.

BEUMER specialists work together with the customer to find a sustainable solution. “Our goal is to further improve trouble-free intralogistic processes in order to guarantee value-added material flow”, explains Thimm. In this case, the modernisation of the plant was recommended. “We didn’t just want to repair the errors, but to actively support the company to meet upcoming capacity and technology requirements”, says Thimm. After an in-depth consultation with BEUMER specialists, the belt and the buckets were replaced with the latest heavy-duty technology developed from BEUMER. This solution offers buckets that are mounted firmly to the back of the belt by segments and bolts. Belts with wire-free zones are used for the heavy-duty bucket elevators just as with all BEUMER belt bucket elevators. The buckets can be fastened to the belt without damaging the steel wires or even cutting them. The traction forces of the bucket elevator belt are maintained to the full extent. The new bucket shape also allows for smoother running and therefore less noise generation. This solution helps the cement manufacturer to increase the availability of the bucket elevator, reduce energy consumption and extend service life and makes the company more competitive in the long term, as opposed to the replacement of only one belt. “If we assume that the new BEUMER solution lasts twice as long as the old belt, the modification would have paid off within a very short period,” confirms Thimm.

The BEUMER Group is an international manufacturing leader in intralogistics in the fields of conveying, loading, palletising, packaging, sortation and distribution technology. Together with Crisplant a/s and Enexo Teknologies India Limited, BEUMER Group employs about 3,500 people and achieves an annual turnover of about €512 million. With its subsidiaries and sales agencies, the BEUMER Group is present in many industries worldwide. ■

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www.beumergroup.com**



The highly qualified personnel of the BEUMER Customer Support offer technical support and machine maintenance world-wide.



BEUMER can upgrade bucket elevators with the heavy-duty technology to increase their capacity. The new bucket shape ensures smoother running and less generation of noise.



The new belts for the heavy-duty high capacity belt bucket elevators can be designed with a tensile load up to 3,300 N/mm.

Photos: BEUMER Group GmbH & Co. KG

KORFEZ ENG: tailor-made solutions for ball mills

KORFEZ ENG. is a technical consultancy located in Neubeckum, North Rhine-Westphalia, Germany. The company delivers high-alloy wear- and heat-resistant steel castings for the cement and mining industries.

The products are manufactured in collaboration with Turkish partner, KORFEZ DOKUM, which, since 1988, produces steel castings from 0.500 kg to 6.000 kg on a built area of 12,000 m². KORFEZ has over 300 employees and a production capacity of approximately 10,000 tons per year. Since 2011, KORFEZ ENG. has increasingly focussed on engineering and manufacturing tailor-made solutions for ball mills used in the cement and mining industries, primarily system components such as mill shell linings and mill diaphragms.

In November 2014, KORFEZ ENG. was chosen to perform a complete mill conversion project for a new customer in South Africa. In close collaboration with the slag cement producer, an optimised solution to replace the currently installed clamped mill shell lining was determined. The reason for choosing a bolted wave lining system for the 3.80-m-diameter slag mill, was due to the fine grinding media composition with very small grinding balls. For this lining system it is considerably easier to perform the assembly and installation, as well as the



maintenance of the wave liner plates, and storage is also made easier as it has many equal parts.

The KORFEZ shell lining system is expected to provide significant process improvements. The mill components are currently being delivered to the customer.

In January 2015, the installation of KORFEZ ENG's second compartment mill shell lining was successfully concluded for a cement producer in Germany. A combination of lifting and classifying liners made of extremely durable cast steel with

27% chromium content was delivered, not only to protect the mill tube from wear, but also to ensure a well-balanced material flow throughout the complete grinding chamber. The mill shell lining system, for application in a two-compartment cement mill with a diameter of 4.40 m, has a total compartment length of approximately 10.25 m and has been designed in the technical sales office in Neubeckum. The cement plant staff reported that the assembly was completed in only one week – properly and successfully. ■

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Unitherm Cemcon for innovative rotary kiln burners

Unitherm Cemcon manufactures state-of-the-art burners for rotary kilns. Located in Vienna, Austria, Unitherm has been involved with the cement industry for over 70 years. The core of the company is the patented M.A.S. rotary kiln burner system which, after its introduction in 1997, was purchased by 400+ top-level clients.

Contrary to other rotary kiln burners, the M.A.S. burner is designed with a unique setting device for flame shaping. When air for flame shaping is supplied through a number of hoses (with nozzles on the tips), and through two fixed ring nozzles with bores or slots, the large number of bores or slots and the mixing of these air streams for flame shaping (commonly radial and axial air) create high energy losses. The M.A.S. burner with its 12 high-velocity air jet streams (supplied through hoses) provides free penetration into the flame, without energy losses. Hoses can either all be aligned axially, creating a long flame, or can be bent together to deflect the jet streams, creating a swirl of primary air and a short intense flame. Together with the primary air pressure (hard or soft flame), all-important flexibility of flame shape adjustment is provided.

Primary air handling is the key issue for proper kiln burner operation. The burner momentum is defined as the mass of primary air flow exiting the burner multiplied by the injection

velocity. The burner momentum is the aerodynamic force available for the kiln operator to control the combustion process in the rotary kiln.

The main advantage of the M.A.S. burner is that at any swirl adjustment (long or short flame) the adjusted burner momentum remains constant. A mechanism inside the burner, protected by cooling air and hidden under the jacket tube, allows this setting, adjusted at the cold side of the burner with a rod and pinion drive. A scale refers directly to the bending angle and in this way to the recent flame adjustment.

To achieve the M.A.S. system's lower energy losses, radial air fans instead of energy-consuming blowers are installed. The effective momentum, not usually considered in comparisons, is in the highest range compared with other burner brands.

M.A.S. kiln burners are designed to burn oil, gas, coal, liquid and solid alternative fuels as multi-fuel or single-fuel burners. The range includes calciner burners, horizontally or vertically arranged, valve trains for oil and gas and hot gas generators for oil, gas and coal. ■

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Advanced air cannon design for improved material flow

By Rafael Junqueira

Founded in 1936, Votorantim Cimentos (VC) is one of the world's leading manufacturers of cement, concrete and aggregates. The firm supplies 40+ products from 50 production facilities in Brazil. Outside Brazil, VC operates six factories and over 150 concrete and aggregate units in North America, while maintaining substantial investments in Bolivia, Chile, Paraguay, Argentina, Uruguay and Peru.

Company officials were aware that air cannons had proven themselves in cement plant applications, helping eliminate build-ups in preheater towers, riser ducts, feed pipes, silos and cyclones. They appointed Martin Engineering to conduct an audit of the processes, and together they developed the optimum solution, including air cannon design, nozzle selection and specific locations to best achieve the firm's goals.

Cost of Ownership

One of the primary reasons Votorantim officials selected Martin Engineering for the air cannon work is the low operating cost of the company's equipment. "Compared to other sources of energy, compressed air is relatively expensive," Martin Engineering national sales manager Rodrigo Trevenzoli explained. "There are many factors in computing the exact cost within a given plant, but most estimates currently place it between 20-30 cents (USD) per 1,000 cubic feet (28,317 litres). As energy costs continue to rise, so does the value of cannon technologies that can reduce compressed air consumption."

Recently, new valve technology has produced significant performance advancements in air cannon designs. The new family of positive-action valves from Martin Engineering produces about twice the blast force output of the valve generation introduced just a decade ago, while using about half the compressed air volume. If the two designs were set to deliver the same discharge force, the new valve would operate at about half the pressure of the old. Air cannon networks with more advanced valves cost more up front, but the air savings more than pay back the difference over the life of the system.

After studying the plant designs and potential accumulation spots, engineers from the two companies identified the optimum locations for the air cannons. Crews are now collaborating on

the installation of 110 Martin® Hurricane Air Cannons in the plants, covering preheater towers, additive silos and cyclones. The units will fire a powerful discharge of compressed air in a prescribed pattern to remove material that becomes adhered to vessel walls and ductwork. In the Cuiabá plant, 56 cannons are being installed, with 54 placed at Rio Branco.

Global Technologies & Service

Work at Votorantim illustrates Martin Engineering's global effort to make bulk materials handling cleaner, safer and more productive. Brazil and the African continent are key regions in the company's expanding programme to deliver leading-edge technologies and expert technical service to customers all over the world.

VP of Operations Robert Nogaj said: "They are areas of significant and growing activity in cement manufacturing, power generation and coal mining." Some of Martin Engineering's global customers are expanding into Brazil and Africa, and the company is growing its business in line with those customers.

The firm has had a major impact on the countries' cement industries by focusing on the development of equipment that promotes more efficient bulk material handling, mitigating product loss and keeping air pollution control devices working at peak efficiency.

The company's policy of hiring and training employees from each region creates local experts in maintaining and running conveyor systems.

Martin Engineering supplies conveyor products around the world in a wide variety of bulk material applications, including cement / clinker, rock / aggregate, coal, biomass, feed pellets, grain and other materials. Founded in 1944, the firm is headquartered in Neponset, IL (USA), with manufacturing, sales and service from factory-owned business units in Brazil, China, France, Germany, Indonesia, Mexico, South Africa, Turkey, India and the UK, and under exclusive license with ESS Australia. For global representatives visit www.martin-eng.com/rep-finder. ■

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Founded in 1936, Votorantim Cimentos is one of the world's leading manufacturers of cement, concrete and aggregates, with more than 40 products and 50 production facilities.



New air cannon valves from Martin Engineering produce about twice the blast force of the previous valve generation, from approximately half the compressed air volume.

Fundiciones Estanda: servicing the global cement industry

Fundiciones del Estanda, SA is a Spanish company offering the cement and mining sectors knowledge, experience and a wide variety of services designed to help improve the processes of its customers worldwide.

The company has specialists and technical professionals devoted exclusively to these services and who are ready to offer customised solutions that can be translated into profits.

With over 60 years of experience in these industries, ESTANDA's designs, manufactures, installs and advises on high-quality, technologically advanced steel products geared towards industries like cement and mining and involving processes to break up, crush, grind and pulverise materials in operating conditions of high abrasion, corrosion, impact, temperature and oxidation.

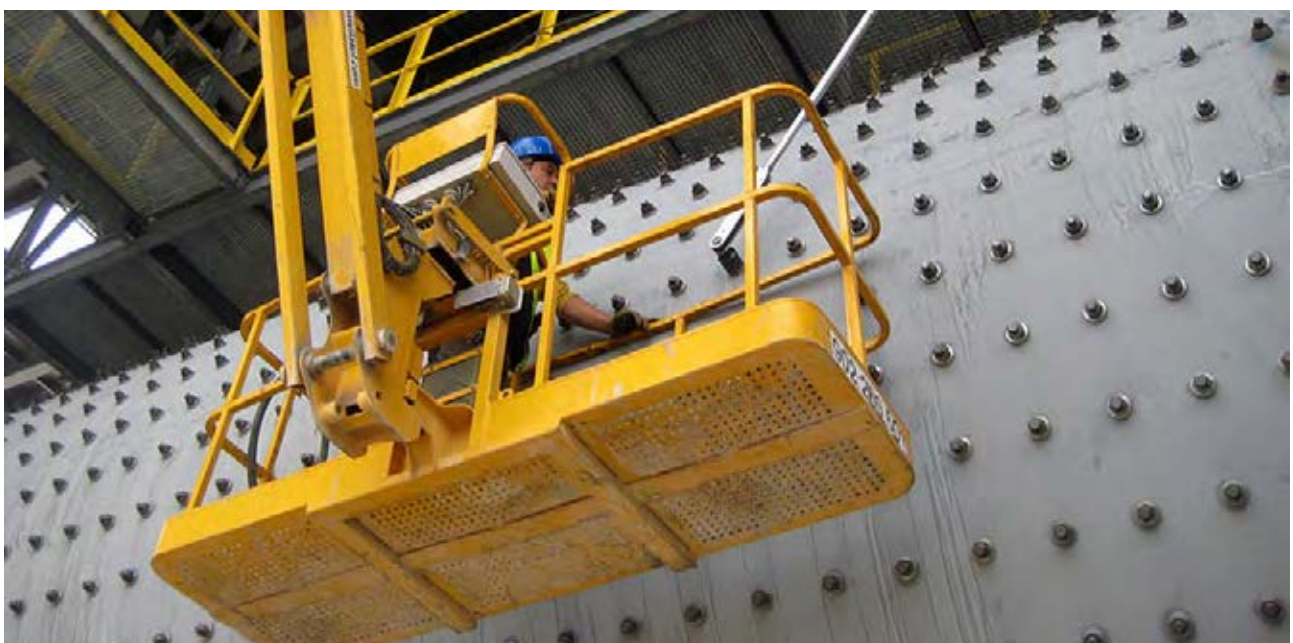
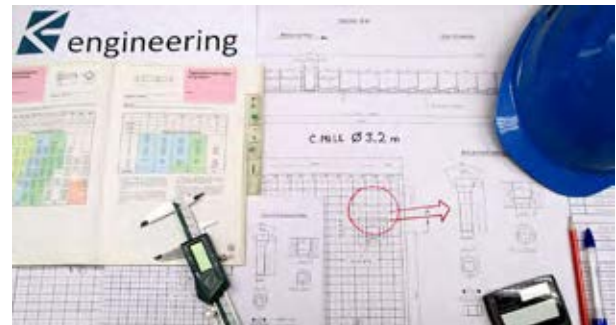
ESTANDA's projects for the cement sector include supplying the integral cement manufacturing process with parts and components for the grinding circuits of raw materials and cement, for kiln and clinker cooling, as well as for the feed systems. It also offers additional services in process engineering, optimisation of solutions, assembly and commissioning, technical after-sales service and diagnosis, and adapts to the most demanding technical requirements of its customers.

ESTANDA's Engineering R&D&I department provides qualified engineers and advanced equipment (graphic design applications, simulation software) to develop full-scale projects for customers.

ESTANDA not only supplies the components it manufactures, it also has a team of qualified, experienced technicians that control and supervise not only the fitting of the components at the customer's installations but also their commissioning.

Through its sales network, ESTANDA exports 95% of its production to over 80 countries worldwide, thus positioning itself as a trusted international supplier among the main engineering companies, cement producers and multinational groups in the railway and other sectors. ■

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Thanks to concrete: indestructible toys at last!

But just duck when Junior throws a tantrum, writes Jan de Beer.

Now that the 2014 festive season is history and we are well into a New Year, it's probably a safe bet that many of the toys your kids found under the Christmas tree are also history. Haven't you sometimes thought: "If only someone would invent indestructible toys..."

Well, here's great news: as future Christmas or birthday gifts, you can now buy the destructive little ones durable concrete toys.

From that great purveyor of scandal and innovations, Google, comes the news that the German design company, Studio Paulsberg, has now developed construction toys made from wood and actual concrete, instead of metal. The sturdy concrete mixers and steam rollers depicted on the studio's website look like they could withstand bashing even by a contingent of Arnie Schwarzenegger's grandkids.

Paulsberg design studio, located in Dresden, has already developed some revolutionary concrete products in the past, including a range of carbon fibre-reinforced concrete furniture.

The toys are now selling at around €90 each. You can order the *Petite Rouleau Compressor* or the *Petite Betonneuse* version of the new concrete toys, which are now available in either light or dark solid concrete variants.

The renowned developmental psychologist, Jean Piaget, years ago found that children's 'Concrete Operational Stage' comes when they are about 7 to 11 years old, and heralds the arrival of the child's capability to perform a variety of mental operations and thoughts using concrete concepts. Piaget was using the word 'concrete' as a noun to describe a material object. However, when you peruse some of the online reviews of Studio Paulsberg's new concrete toys, the very thought of kids playing with decidedly tangible – and not all that light-weight – concrete toys somewhat ominously enters the scene.

"You'll just want to make sure that when a tantrum temper is brewing, the



Petite Betonneuse and the *Petite Rouleau Compressor* are well out of reach of your kids because the toys can do some real damage if thrown. Not to the toys themselves but to all walls and furniture in your home.

The toy building vehicles can probably survive a lot of abuse and, at their price, had better last for decades," was one comment.

Another review was even more cautionary, and to the point. "When your kid learns

to throw, and beans you in the brain with a small handmade concrete toy, you will probably have to learn the basics of life – like speaking – all over again. That is always assuming that you ever regain consciousness at all...."



So, perhaps for paranoid parents who don't want to walk around with hard hats all the time, Concrete Legos would be a much safer option. The concept has apparently been tackled before, but now the latest Concrete Lego collection features some 21st Century improvements. For instance, not only do the blocks appear exceptionally clean-cut, but the Lego logo has been embossed on every protrusion and, when flipped over, the blocks have the

familiar Lego hollow detailing. "Aside from the very impressive craftsmanship, the fact that they are hand-cast means that every block comes with its own imperfections and colour variations, making them true works of art," we are led to believe. In the world of contemporary marketing, imperfection is not that much of a problem when you're chasing sales.

Created by a Californian artist, the Concrete Legos are impressive and look as though they could actually be used to construct a house or building – providing you have the budget to buy a few thousand sets. Anyway, Dad might just diarise to slip quite a few into Junior's 2015 Christmas stocking so that he could secretly use the blocks to erect a scale model of his next building project when Mom takes the youngster to swimming lessons. ■



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