CONCRETE trends

Journal of the African Cement and Concrete Industry

VOL 19 No 2 May 2016

BUILDING AFRICA FROM THE GROUND UP

PPC's purpose-driven approach to sustainable growth in Africa

PPC STRENGTH GUARANTEED

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In this issue:

JG AFRIKA

EXPERIENCE QUALITY INTEGRITY

Proudly South African, JG Afrika (previously Jeffares & Green) provides civil and structural engineering and environmental consulting services throughout Africa. With a century of in-depth industry experience, a rich history, and strong African roots, JG Afrika continues to offer clients sustainable solutions of uncompromising quality and integrity.

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When opportunity knocks – be sure to answer

While it sometimes seems as though nothing's happening on the building front, quite a lot is in fact going on – albeit very little in the much hoped-for infrastructure spend.

However, daily we hear about massive developments – like Waterfall City in Johannesburg, Shanghai Zendai's R84-billion smart city in Modderfontein, and the R44-billion, 950-ha mega city in Hazeldean, Pretoria.

In addition, Human Settlements Minister Lindiwe Sisulu very recently launched a national campaign to celebrate the 4.3 million houses and housing opportunities delivered in the past 20 years, and the 20+ million people who now have a roof over their heads.

The launch was held at Cosmo City, Johannesburg, and coincided with the tenth anniversary of the Cosmo City Integrated Mixed Development Programme, which completed 12,500 mixed-income houses and saw 70,000 families moving into the area.

Despite this progress, with the current extremely rapid rate of urbanisation, at least 2.1-million more houses are needed to clear the backlog. So, as accommodating people remains critical, attending the Housing for Africa Conference and Expo on 9 May at Gallagher Convention Centre in Midrand, becomes a must.

The event, co-located with the African Construction and Totally Concrete Expo, aims to help Africa close the affordable housing gap by uniting senior government officials, loan providers, developers, financial institutions and investors to identify opportunities for development finance and new technologies for better building and construction for affordable housing delivery.

With Africa's population expected to double and hit 2.4 billion by 2050, there can, surely, be no better place to tap into this burgeoning market.

Networking, as we all know, is a very effective means of building a business. And when times are tough, these contacts become even more indispensable. The African Construction and Totally Concrete Expo from 9-11 May will, together provide countless opportunities to meet and network with leaders and vendors and learn about the latest building and construction methods, products, tools and technologies for Africa, as well as gathering insights into the latest developments and technologies in the concrete industry.

There is also much to be learned about every aspect of the building and construction industry at the co-located events: Civilution, a platform to enable engineers to bring about transformation, diversity, leadership and evolution through collaboration between communities and government; the Construction IT Summit & Expo where vendors and solution providers can access and assess the entire construction IT lifecycle; and the Gauteng Construction Conference and Trade Expo which offers a unique opportunity to meet the entire Gauteng building and construction industry, making it the best knowledge and networking platform for the regions' construction professionals.

It's going to be an awesome three days – hope to see you there!

Gill Owens, Editor

CONCRETE trends
Volume 19 No 2 May 2016

CONTENTS

Host publication of Totally Concrete Expo and African Construction Expo

Gallagher Convention Centre, Johannesburg: 9 - 11 May 2016

22 | COVER STORY

PPC considers what a new approach to partnerships could mean for mega-projects in Africa.

25 *Zaha Hadid's Azerbaijan Cultural Centre, Baku.*

31 *The Souk Waqif in Doha.*

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REPRODUCTION & PRINT:
RSA Litho Printers Cape Town

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

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

ISSN 1560-2710

After many months of hard work - the icing on the cake as the JG Afrika brand is officially launched.

JG Afrika: engineering a new future, developing together

Then and now, our journey continues …

South Africa remains the beloved country; a land of great opportunity. So too the continent of Africa.

One engineering and environmental consultancy has pledged its commitment to the country, its love for the continent, and its dedication to a transformed and democratic Africa. To express this commitment, and in celebration of its continued independence, the firm, formerly known as Jeffares & Green, embarked on a rebranding exercise at the end of 2015.

Paul Olivier, Managing Director, JG Afrika.

Phaks Ngqumshe, Director and Johannesburg Branch Manager.

Now known as JG Afrika, the company and its staff are excited about the message they are sending – a message that tells the world that Africa has a lot to offer.

"Our name change speaks to our commitment to being proudly South African. We want to make a bold statement that we are locally owned and managed and plan to remain so. The company has a rich heritage and history in Africa. We are very excited about the future and remain committed to our beloved continent," confirms Phakamile Ngqumshe, director and Johannesburg branch manager.

The inclusion of 'JG' in the company's new name denotes its acknowledgement of and appreciation for its history, while 'Afrika' indicates its independence, its love for the continent, and is a nod to the traditional spelling of 'Africa'.

"This is most obviously represented in our first democratic National Anthem, Nkosi Sikelel' iAfrika and this is how I would spell and pronounce it if I were sitting with family and friends. I can personally relate to this spelling. With this name, we will show the world that we are true to our African roots, while remaining unique and maintaining our independence," believes Ngqumshe.

The brand development started with the selection of a new name, and after much research the selected options were presented to our staff and a vote held. "We really enjoyed the process of evaluating the naming options and involving our staff," says Paul Olivier, managing director at JG Afrika. "After all, our success is built on their strengths."

The firm announced its new name to clients in February 2016 and launched the new brand throughout Africa in April.

"The brand identity was developed and designed with a purpose; to remember the company's history, to reflect its ethos and project its future," says Olivier. "The logo's icon is representative of man-made, engineered, symmetrical lines. These lines are contrasted with organic shapes which represent the environment (green) and water (blue), denoting the environmental sphere of JG Afrika's services. The design and name incorporates the three pillars of the Company's ethos, experience, quality and integrity while displaying fresh innovative thinking."

The JG Afrika personality is perfectly portrayed through the new brand colours, being blue and green. In addition to the environmental connotations of these colours, they are associated with trust, dependability, strength, peace, growth and health. These characteristics reflect the company's culture.

"In planning for 2016, part of our goal for the new year was to sustain the advancement and success that we have achieved for the past 94 years. Over this period, the company has progressed and evolved to keep pace with fluctuations in demand, the industry and customer requirements. To remain relevant, this must be a continuous process," says Olivier. "As such, a strategy plan was meticulously devised to take JG Afrika to the next level on all fronts."

"We have also taken the strategic decision to increase our empowerment shareholding to 51% from March this year. The time has come to look to the future and to align our corporate identity with our diverse expertise, our modern approach and the great future Africa has a growing continent.

As the African Proverb goes; 'If you want to go quickly, go alone. If you want to go far, go together.' This is the basis of JG Afrika's long-term plans.

"Together, we will continue to grow, learn and develop, with a focus on continuous improvement. The time has come to look to the future and to align our corporate identity with our diverse expertise, our modern approach and the great future Africa has as a growing continent," explains Olivier.

Celebrating the rebrand to JG Afrika in the Cape Town office.

"As JG Afrika looks to the future, it recognises the importance of maintaining what the industry considers best practice – especially when it comes to the company's ownership structure. As a result, JG Afrika is moving to an employee-owned model and has established 51% empowered shareholding. "This model enables us to retain the young stars that we have developed (through our Accelerated Development Programme), provide a platform for rewarding and mentoring key staff members, and moving towards achieving majority empowered ownership from within our own ranks," confirms Olivier. ■

More information at www.jgafrika.com

About JG Afrika

JG Afrika (formerly known as Jeffares & Green) was founded in 1922 and is a proudly South African engineering and environmental consulting firm. It draws from its rich history, in-depth experience and strong African roots to ensure that all interactions reflect its ethos of sustainability, quality and integrity.

The company provides consulting services in all fields of civil and structural engineering, as well as environmental services, throughout Africa. The Group also features specialist companies that operate in the fields of geotechnical, environmental and geosciences, pavement technology, traffic and transportation, materials testing, and institutional support.

JG Afrika is a member of Consulting Engineers South Africa (CESA) and is affiliated to FIDIC and GAMA. All offices are certified by Dekra according to ISO9001.

Saint-Gobain awarded Top Employer Global 2016 certification

Saint-Gobain recently became one of eight companies worldwide named Top Employer Global 2016 by the Top Employers Institute, an independent body that studies corporate human resources practices.

Saint-Gobain scored outstandingly in their focus on talent management and skills development. The company's corporate culture, rooted in strong values at the foundation of its Corporate Social Responsibility policy also contributed to their success.

"Top Employer certification is part of our open and continuous improvement approach. The audit enables us to identify innovative human resources practices outside the company and to discuss our short- and long-term challenges. The label also strengthens our employer brand," says Claire Pedini, senior vice president in charge of human resources at Saint-Gobain.

Six hundred practices and indicators regarding working conditions were approved and audited for each of the 21 countries which were certified and where Saint-Gobain is present: Brazil, Canada, China, the Czech Republic, Denmark, France, Germany, Ireland, Italy, Japan, Malaysia, Mexico, the Netherlands, Poland, South Africa, South Korea, Spain, Sweden, Thailand, the United Kingdom and the United States.

This illustrates the strength and cohesion of the Group's human resources policy at an international level, a policy that has four key priorities: professional mobility, team diversity, employee commitment and the development of talent.

"Saint-Gobain is the perfect example of a company that has harmonised its operations in a way which has not only benefited its employees but also its operational efficiency on a global scale," points out David Plink, CEO at Top Employers Institute.

This is the third year in a row that Saint-Gobain has been certified for Europe and the first year that it has won the labels for North America and Asia-Pacific. ■

More information at www.saint-gobain.com

Aurecon among top five best partners of leading global architects

Aurecon was again ranked one of the global top five 'Best Partners' in both the 'Service Engineers' and 'Structural Engineers' categories In the 2016 annual World Architecture 100 (WA100) survey of the world's leading architectural practices.

The comprehensive WA100 survey is conducted by the prestigious UK-based *Building Design* magazine. Architects were asked to rank their preferred professional associates based on wide-ranging criteria demonstrating outstanding commitment to clients, contributions to creativity and project oucomes, collaboration and chemistry, ingenuity and technical expertise.

"The Aurecon team thrives on developing close and collaborative design relationships with its architect partners to create innovative solutions which extend the boundaries of inspirational built environment concepts. I'm pleased to see the success of our collaboration with architects evidenced by our climbing rankings in the WA100 survey," says James Bennett, Aurecon MD – Built Environment.

Some examples of recent high-profile Aurecon projects include the iconic Asian tall buildings, Landmark 81, Ho Chi Minh City and SM Megamall Tower, Manila, as well as the 'Hollywood in the desert' theme park, Motiongate Dubai, Abu Dhabi's St. Regis Saadiyat Island Resort, Australia's multi-award winning Melbourne School of Design and in South Africa, Newtown Junction.

With an office network extending across 27 countries, Aurecon has an extensive track record of projects in over 80 countries worldwide. It is able to deliver a full range of experience and services globally to ensure clients have the best teams for their projects.■

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New mobile app promises to boost employment

A new mobile app developed by two South African entrepreneurs recently went live after months of Beta-phase trials and tests.

The developers of the Honest Abe app hope it will help thousands of people economically by playing a role in stimulating employment as well as building trust between homeowners and local tradesmen across South Africa.

"My partner and I work in the building services industry and we have seen how many smaller tradesmen struggle to find regular work. This isn't because there isn't work for them, it's because many homeowners are wary of inviting strangers into their homes to quote on jobs and to do the work," says James Mittan, co-founder of Honest Abe.

Through Honest Abe, homeowners can list jobs they would like done and the Honest Abe app sends an alert to all relevant tradesmen working in the area. These tradesmen can then send the homeowner their quote or arrange for a site inspection.

Tradesmen can also be given a rating by the homeowner based on their completed work, helping the tradesmen get new work based on their track record. Fly-by-night operators who give the industry a bad name won't be listed on Honest Abe and, through this form of informal verification, homeowners will have the confidence to stop doing dangerous DIY themselves and rather start hiring experienced people to do the job for them.

"The country desperately needs to find ways of giving unemployed South Africans work opportunities, and help struggling tradespeople to find more work to build up their businesses," adds Derick Bolton, co-founder of the forward-thinking Honest Abe app.

Homeowners needing help or advice with any jobs are encouraged to list them on the platform. Tradesmen not already listed on Honest Abe are also encouraged to register for the free service as soon as possible.

The platform is open to all tradesmen, from owners of large businesses woirking in the trade and services industry, through to individual painters, plumbers, electricians or any other trade professionals operating in this space.

Honest Abe can also be utilised by homeowners, businesses, organisations, clubs and municipalities, as well as other builders and trade professionals.

Honest Abe is available through Google Play as well as from Apple's App Store.■

More information at www.honestabe.mobi

Aurecon launches 'Just Imagine' – a future focused blog

Imagine a world where the physical and digital interact seamlessly; where creativity is the new corporate currency; and where business minds take lessons from children when it comes to innovation. Aurecon's new blog, Just Imagine, provides a glimpse into the future for curious readers.

"If businesses are to thrive in a future that is as yet unwritten, then creativity must shape how they operate, and design and innovation are the tools that offer the solution," says John McGuire, chief innovation officer at Aurecon.

"For Aurecon, this involves finding new ways to transform our clients' businesses and help them become more competitive through innovation.

"Innovation is grounded on deep technical expertise, but it's not enough to invest in being 'smart'. We need to foster creativity, challenge the 'status quo', explore and experiment to envision what's possible," believes McGuire.

In line with this, the company's new blog, Just Imagine, explores ideas that are probable, possible and for the imagination.

Forward thinking, imaginative and innovative, the content is everything but the ordinary. It seeks to push the boundaries and imagine what might be possible if we challenge the status quo, asking "What if…?" and "Why not…?" across a broad spectrum of leadership and business theories and ideologies, technological innovations and processes.

"Aurecon has followers on Facebook, Twitter and LinkedIn that now number well into the tens of thousands; and we are finding these digital platforms to be a powerful way to share and connect with our staff, clients and stakeholders. The new Just Imagine blog is an exceptionally powerful vehicle to engage with our audience around big picture thinking and ideas that will shape our collective future," says Danielle Bond, Aurecon's Head of Marketing and Communications.■

More information from Danielle Bond,
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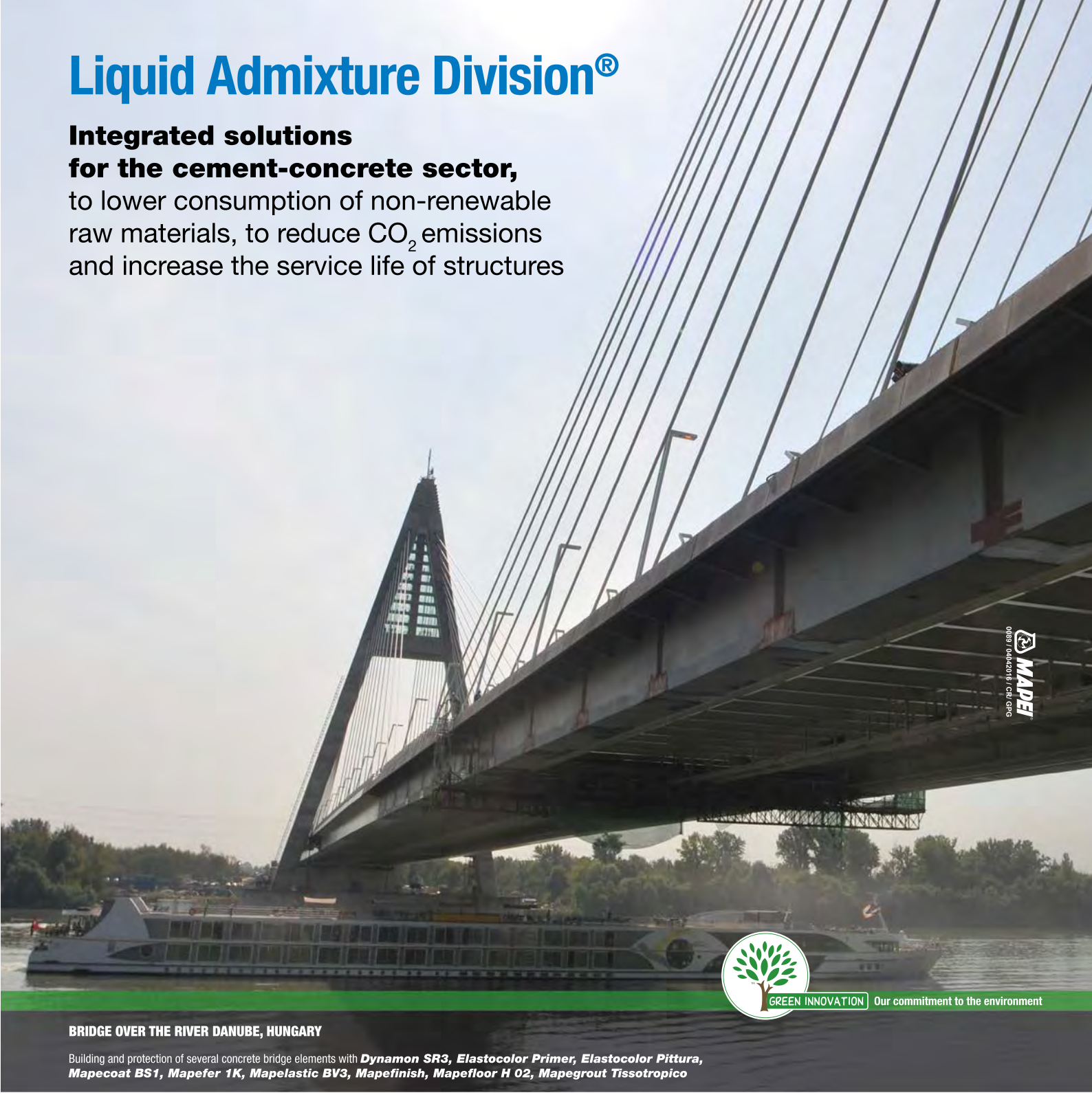

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Unit for Construction Materials launched

We are like concrete," said Prof Billy Boshoff at the official launch of the Unit for Construction Materials in the Department of Civil Engineering, Stellenbosch University. "Concrete consists of different materials, some more expensive, some unpredictable, but together they make concrete. No ingredient is more important than the other one, because if you take one ingredient out, the concrete will not work." Hereafter he acknowledged all present – individuals, institutes and industry – for their important roles in the Unit.

From the left: Dr Riaan Combrinck (UCM), Prof Eugene Cloete (Vice-Rector Research), Prof Billy Boshoff (Head UCM), Ms Wibke de Villiers (UCM) and Prof Hansie Knoetze (Dean: Engineering).

The Unit for Construction Materials (UCM) was officially launched on 13 April 2016 at a dinner held appropriately in the new concrete laboratory. The event was well attended and numerous prominent figures in the construction industry were present, including Hanlie Turner and John Sheath, the President and the CEO of the Concrete Society of Southern Africa (CSSA) respectively, and Bryan Perrie, the MD of The Concrete Institute (TCI).

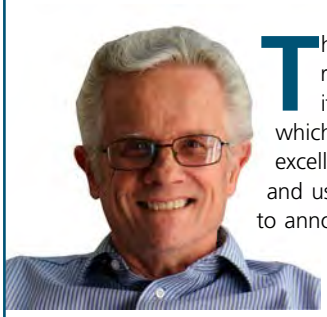
The UCM strives to be a centre of excellence and a top institute for construction materials in South Africa for teaching, research and consulting. Research and student training are at the core of the UCM. During his speech, Prof Boshoff highlighted the importance of industry collaboration and partnership. Special emphasis was put on the fact that research must have both academic value and relevance for the industry in the short or long term. Providing a consultation service to the industry, especially where these services at not available at commercial laboratories, is also a high priority of the UCM.

The UCM is interested in all aspects of construction materials, but the four main areas of the current focus are:

- Eco-friendly construction materials
- Fibre reinforced concrete
- Fresh and young concrete
- High-performance concrete■

More information about the UCM can be found at www.sun.ac.za/ucm or bboshoff@sun.ac.za

Fulton Awards 2017: calling for nominations



John Sheath, CEO and Director of the Concrete Society of Southern Africa.

The Concrete Society of Southern Africa NPC is calling for nominations for its prestigious biennial Fulton Awards which recognise, celebrate and honour excellence and innovation in the design and use of concrete. The Society is proud to announce that PPC are, once again, the Anchor Sponsor of the event.

The 2017 awards have a new look, new categories and a new approach to judging. John Sheath, CEO and Director of the Concrete Society, said: "After over 30 years, the Awards needed an update. We had drifted away from identifying all that was special and exceptional in the concrete, focusing too much on the total project and considering aspects that had little to do with this most versatile material."

So, irrespective of category, the criteria for adjudication that the judges will be using are:

- Quality of concrete – focusing on finish
- Sustainability – green building initiatives
- Inventiveness/innovation in the application of concrete technology
- Innovation in concrete construction methods
- Innovative geotechnical use of concrete
- Overall aesthetic impact of the concrete aspects of the structure
- Rational behind the chosen concrete finish
- Standard of workmanship of the concrete
- Effect of the concrete on the architectural landscape and environment

Some unique criteria will apply to the Innovation in Concrete category:

- Significance of the use/application of the innovation
- Industry need for this innovation
- Does it address or contribute to sustainability issues?
- Will it make concrete more competitive and therefore, grow the market?

The categories for 2017 are: Buildings up to three storeys; Buildings of more than three storeys; Flatwork; Infrastructure Innovation in Concrete; Architectural Concrete and Mining

Nominations can be made online through the Society's website and will require a short motivation. After assessing the nominations, the judges will draw up a short list for adjudication on site.

The deadline for nominations is **31st August 2016**, while the completed Entry Packs must be submitted by the end of November 2016. The Award winners will be announced at a gala weekend in the Drakensburg from 2nd to 4th June 2017. Full details of the 2017 awards are available on the Concrete Society website at www.concretesociety.co.za■

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

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AfriSam invests in the economic development of Lesotho and its people

As a leading supplier of concrete materials in southern Africa, AfriSam has been supplying the Lesotho nation with superior-quality cement for over half a century. The company established a physical presence in Lesotho when it opened its distribution centre in Maseru in 1999.

This year AfriSam has, once again, actively demonstrated its commitment to the economic development of Lesotho and its people by establishing the first cementitious manufacturing facility in the country.

Minister of Trade and Industry of Lesotho, Honourable Joshua Setipa (far left) with AfriSam CEO, Stephan Olivier (centre) and the Deputy Prime Minster of Lesotho, Honourable Mothetjoa Metsing (right) officiating the ground-breaking ceremony.

This forms part of the company's growth strategy and its commitment to enable development on the African continent by providing access to quality building materials.

AfriSam has received the required authorisations from local authorities to construct a blending and packing plant with an initial production capacity of 200,000 tons per annum at the company's existing distribution centre in Maseru. This production capacity can be increased according to the cement demand of Lesotho. Following a ground-breaking ceremony held on 9 March 2016, construction of the plant has commenced and is planned to become operational in the third quarter of 2016.

Over and above the benefits derived from the products that will be produced, a cement plant can be a powerful factor in economic and social development. "It is AfriSam's intent to make use of Lesotho citizens as far as possible for any requirements relating to the operation of the facility", says Stephan Olivier, CEO of AfriSam. "This includes for example, using local transport companies to transport the required raw material as well delivering products from our plant to customers. A new pallet repair facility will be established on site and will be outsourced to a local Lesotho start-up business."

To further demonstrate its commitment to the development of Basotho people, AfriSam has partnered with a local company, Cement Industries Limited, to co-invest in the new plant project. "AfriSam considered various companies, taking into account a number of criteria. We are proud to announce that Cement Industries Limited was deemed the most suitable partner for this project," says Olivier.

The design of the plant enables a number of products to be manufactured, providing AfriSam's customers in Lesotho with a total solution offering to meet their complete cement and concrete requirements.

"AfriSam's new plant will comfortably meet the local cement demand and will be capable of manufacturing specialised products for large infrastructure projects such as the Lesotho Highlands Water Project," says Olivier. "This will mean that Lesotho will have access to cement made in Lesotho for the Basotho nation."

Over the years, AfriSam's products have been used in a number of iconic buildings and infrastructure projects in Lesotho such as the Katse Dam, various roads, bridges, commercial buildings, hospitals and schools. "At AfriSam, we are most proud of what our products make possible. Our products are used to build structures that provide safety and security, connect people, provide an education for the youth and heal the ill. AfriSam is all about creating concrete possibilities," adds Thato Tsuene, Lesotho country manager for AfriSam.

AfriSam's relationship with Lesotho extends further than the enablement of infrastructure development. The company has also created countless possibilities through its investments in the sustainable upliftment of the Basotho nation.

AfriSam is one of the main sponsors of the annual Moshoeshoe Walk. It has invested in various community upliftment initiatives and built schools and amenities such as ablution facilities and kitchens, donated lap desks to school children, supported children's homes and orphanages and donated substantial quantities of bagged cement to organisations in need.

"We are extremely proud of our association with the Kingdom of Lesotho and its people. We look forward to the part we, as AfriSam, can play in the continued growth and development of this beautiful mountain Kingdom," concludes Olivier.■

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About AfriSam (Pty) Ltd

AfriSam is a leading concrete materials group in Africa, having a 98% shareholding by historically disadvantaged South Africans and with operations in South Africa, Lesotho, Swaziland and Tanzania. The group supplies cement, readymix and aggregate products and technical solutions from its seven cement production facilities, 17 quarries and 43 readymix operations. Founded in 1934, the group employs over 2,000 staff and is a proud Level 2 Broad Based Black Economic Empowerment (BBBEE) contributor.

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New National President for the CSSA

At its AGM on 30 March 2016, Hanlie Turner was inaugurated as the Concrete Society of Southern Africa's new National President for 2016/2017. Turner, a technical information specialist with cement company PPC, has been a member of the Concrete Society for many years and has held several voluntary positions in the organisation including Chairperson of the Inland Branch and more recently as National Vice-President.

Outgoing President, Tseli Maliehe of Ibhayi Contracting in Port Elizabeth, said he was confident that the Society was being placed in good hands under Mrs Turner's leadership, guidance and enthusiasm for all things concrete.

In accepting the chain of office, Turner said that she was honoured to accept the responsibilities that went with it and thrilled that in some small way she is a part of the industry that shapes our skylines and in many aspects defines our civilization. "It is a task I will not take lightly, as I cherish what the Concrete Society stands for, and that sense of belonging," she continued. "The Concrete Society ticks all the boxes of what a professional interest group is all about, the real value-add being the networking opportunities created at both branch and national level."

"Members' personal level of involvement with the Concrete Society will determine the value they can add to their job, their personal and professional development, and the strategic insights they could gather. I urge all members to leverage their membership of the Society at all these levels".

In conclusion she thanked PPC for making it possible for her to accept the position and allowing her the time it will take to fulfil certain duties of this position.■

Mrs Hanlie Turner with outgoing President Mr Tseli Maliehe.

More information from John Sheath,
Tel: +27(0)12 348 5305 / email: ceo@concretesociety.co.za
www.concretesociety.co.za

About the CSSA

The Concrete Society of Southern Africa is a technical, non-profit organisation whose members comprise like-minded professionals with a passion for concrete, and who keep themselves up to date in the latest technology and thinking in all concrete-related matters. Its mission is to promote excellence in concrete and provide a platform for networking and sharing of knowledge.

New SA construction guidelines launched

The National Home Builders Registration Council (NHBRC) recently launched a series of building guidelines that are set to make a significant impact on the way the local construction sector operates. Attended by various industry bodies, a comprehensive manual outlining the guidelines was released at a function in Fourways, Johannesburg.

The revisions to the guidelines were made in conjunction with the South African Bureau of Standards (SABS). Speaking at the launch, NHBRC Special Projects advisor Dr Jeffrey Mahachi said the revisions to the guidelines had been "a long time coming."

"More than 15 years after the original guidelines were released, we embarked on a process of putting together a new manual to address current challenges in the sector," he said. "The development of the manual involved various stakeholders across the South African construction sector and we are highly satisfied with the final document."

Mahachi explained that the new manual would address a number of issues that had become concerns for the NHBRC and the industry as a whole.

"Our mandate is to assure quality homes," he said. "The new guidelines address issues which include the standard of building materials, the rules governing new building technologies, training and development."

A representative from the SABS, Dr Sadhvir Bissoon said that the manual was an important first step in establishing and implementing national standards to ensure effective quality assurance in the built industry. "One of the things that this will help us to do is get into international markets and lock out sub-standard products from the South African market," he said.

A number of technical publications developed by the NHBRC's Centre for Research and Housing Innovation were also launched:

- *Eric Molobi housing innovation*
- *Housing consumer brochure*
- *Home builders brochure*
- *Energy efficiency guidelines*
- *Promoting innovative building technologies*
- *NHBRC "Here to help you" cartoon booklet*
- *Housing typologies for disabled persons*

At the launch the NHBRC chairperson Abbey Chikane encouraged builders and housing consumers to continue to engage with the Council.

"We will continue to educate the built industry through various publications such as those launched today," he said.■

More information from Molebogeng Taunyane,
Tel: +27(0)11 317 0070 / email: molebot@nhbrc.org.za

International post for TCI's Bryan Perrie

Bryan Perrie, the managing director of The Concrete Institute, has been elected vice-president of the International Society for Concrete Pavements (ISCP).

Perrie is one of South Africa's leading authorities on concrete pavements and is globally respected in this field, having delivered papers on the subject at dozens of top-level international conferences all over the world.

He was elected to the new ISCP post at a recent ISCP meeting which coincided with the Transportation Research Board's 95th annual meeting in Washington. Perrie is the first South African to serve in this capacity.

ISCP, of which Perrie has been a board member for several years, has since its establishment in 1997 aimed to 'facilitate the advancement of knowledge and technology related to concrete pavements through education, technology transfer and research at an international level.'

The ISCP's current Board of Directors includes concrete pavement authorities from many countries including Chile, Germany, Australia, USA, Canada, and Belgium.■

More information from Bryan Perrie,
Tel: +27(0)11 315 0300
www.theconcreteinstitute.org.za

SAPMA training puts enterprising women in the pink!

The SA Paint Manufacturing Association (SAPMA) recently provided free training for 10 unemployed women who are in the process of forming a painting contractor company to be called The Pink Painters.

The training was provided also as a SAPMA donation to the Kagiso Day Care Creche and was handled by SAPMA's training arm, the SA Paint Industry Training Institute (SAPITI), with Toni Stella, national training manager, Pogiso Matlala, training and development manager and Terrance Mvundla, a qualified paint contractor who assists SAPITI on training projects, in charge.

Pogiso Matlala says that the 10 jobless – but extremely enterprising – women from the Vosloorus area were trained on paint application for two weeks while giving the creche a much-needed facelift with paint donated by Dulux.

"The ladies fared extremely well and were very enthusiastic. They really rolled up their sleeves and got down to work. With their positive attitude and more experience their proposed new enterprise is bound to succeed," Matlala says.

The Pink Painters are being assisted by Liz Sangion and Sindi Dastile of African Women Coordinated Investments (AWCI) to establish their new business.■

More information from Deryck Spence,
Tel: +27(0)11 615 1195 / www.sapma.org.za

Nigerian government to review cement standards

In the wake of a recent rise in the collapse of buildings, the Nigerian government intends to revisit the review of cement standards in Nigeria in order to place new restrictions on the use of certain classes of cement.

Reliable information indicates that the stakeholders are the board of the governing council of the Standards Organization of Nigeria (SON) that will be constituted to drive this agenda.

In 2014, the Commodity Composition and Conformity Criteria for Common Cement and Specification of Mandatory Industrial Standards NIS 444-1, was unveiled by the Federal Ministry of Industry, Trade and Investment. It prescribed requirements for packaging and labeling of cement bags and the use of certain types of cement grades.

Following the planned implementation of the new Mandatory Industrial Standards Order for cement manufacturing, distribution and usage, three cement companies instituted different suits against SON. These companies are, Lafarge Cement WAPCO, Ashaka Cement and Unicem. The companies are petitioning for the court to establish whether or not SON complied with all the mandatory provisions of the law in establishing these new standards.■

Source: http://goo.gl/3ZuOpu

Flowcrete Africa launches East African office

Flowcrete East Africa, a new resin flooring business based in Nairobi, Kenya, was officially launched on 5 April at an event attended by Flowcrete South Africa's management team, prominent members of Kenya's construction industry and many of the company's key clients.

Although Flowcrete South Africa has been trading in Kenya since 2009, the East African office will supply and service the whole East African Community (EAC) – Uganda, Rwanda, Ethiopia, South Sudan, Somalia, Tanzania and Burundi. This new office will mean shorter lead times for customers and provide Flowcrete with a platform to grow its business within the region's burgeoning construction sector.

A new warehouse, located at Unit 13 Norda Industries, Plot 12715/609, Mombassa Road, Nairobi, Kenya, will enable Flowcrete East Africa to rapidly supply large-scale construction projects with high-quality resin flooring materials.

The 1,000-m^2 warehouse has served as Flowcrete's distribution centre for all of East Africa since it officially began operations in January 2016. The warehouse stocks large quantities of finished goods from Flowcrete South Africa's manufacturing plants to ensure prompt delivery to clients.

The MD of Flowcrete Africa, Craig Blitenthall, said: "Unveiling Flowcrete East Africa and its state-of-the-art warehouse is an important milestone for the company.

"Not only does this investment exemplify our commitment to meeting the East African construction industry's flooring needs, but it's also a significant step in our growth plan – to see the Flowcrete East Africa warehouse combined with a production plant in the near future."

Blitenthall added: "Our customers depend on the timely delivery of our products, as for most developments there is often only a small window of time in which to supply and complete a flooring project.

"This facility will build on our strong logistics foundation so that Flowcrete can better support our current customers and expand our business with a new customer base."

About Flowcrete SA (Pty) Ltd

Flowcrete SA (Pty) Ltd is part of Flowcrete Group Ltd - a world leader in the manufacture of seamless industrial and commercial flooring with manufacturing facilities in Europe, North and South America, Asia and Africa.

Flowcrete supplies seamless flooring solutions that include decorative seamless resins, waterproof car park deck coating systems, seamless resin terrazzo, durable antimicrobial flooring, corrosion protection, self-levelling underlayments, underfloor heating and now underfloor acoustic insulation.■

More information www.flowcretesa.co.za or Daniel Ash, email: dan.ash@flowcrete.com

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THE KENYAN HOUSING MARKET
An Article by the Kenya Property Developers Association (KPDA)

Over the past decade, Kenya has experienced increased economic development, leading to an expanding middle class with a higher purchasing power than ever before. This in itself has led to an obvious growth in the real estate industry accelerated by (but not limited to) the following factors:

- **Demographics:** Both the development of the local population towards a middle class, and the increased influx of foreign residents, has contributed to the overall well-being of the economy. The real estate market has vastly benefited from this trend evidenced with an increase in commercial and residential real estate. The median age in Kenya is 19 years, indicating that a large portion of the population is only now entering the working force and gaining the ability to potentially invest in real estate. This also indicates that there is a strong focus on family life within the general population, with a fast-growing young demographic and 3.7% of adults being over the age of 55 which in itself has increased the demand for housing.
- **Foreign Investment:** Foreign direct investment (FDI) is a crucial element of any developing country's future development. Cross-border investment, aimed at obtaining sustainable interest and future growth is valuable to any economy, as it fosters competition and builds relationships across the globe. Kenya has attracted increased foreign capital in recent times with the real estate sector attracting external attention from both expatriates looking to relocate to Kenya, and corporations interested in expanding their operations to Africa. The Kenyan real estate market remains strong with a high demand for housing that is not matched by current supply.
- **Green Building Incentives:** The construction designs help in conserving resources, controlling climate changes and reducing negative impacts on human health and the environment. Emerging trends have been made popular by an incentive of a certification that recognizes the efforts of firms which are promoting Eco-friendly designs within Kenya. The certification, Leadership in Energy and Environmental Design (LEED), recognizes best-in-class building strategies and practices and has been adopted by a growing number of commercial developers. In the long run, it is anticipated that the trend will be adopted by more residential developers.
- **Modern Infrastructure:** With modern construction of world class roads, most developers have shifted their developments to places where developments were low in number. A good example is the Thika Super Highway which has seen developments coming up along the highway, facilitated by the demand for houses around that area. Construction of the Standard Gauge Railway has also shaped up the real estate industry with most developers focusing on the Naivasha Area.
- **Technology Trends in House Hunting:** Research has shown that 82% of all Kenyans own a cell phone and 19% have a smartphone, with which they can access the Internet. Additionally, mobile payments have gained widespread popularity in the country, which can be attributed to its young, agile, and tech savvy population. Analytics have shown that 36.21% of Kenyans searching for property listings are between the ages of 25 and 34, reinforcing the theory that young individuals and families are house hunting online.

THE IMPACT OF FINANCE AS IT AFFECTS THE KENYAN HOUSING MARKET

According to Raphael Kieti 2015, over 70% of urban households in Kenya experience severe housing affordability challenges. Affordability problems are manifested in the high levels of homelessness, poor human settlement conditions, the high price of housing relative to the income of households, mortgage delinquencies, defaults and foreclosures.

Access to finance is a key challenge faced by numerous Kenyans when it comes to meeting affordable or even just basic housing needs. The rates of mortgage interest in Kenya have been high over the last decade with the average interest on mortgages ranging between 17% and 19%. As a result of these high

interest rates, only a tiny proportion of the urban population in Kenya can afford a mortgage. The average monthly income based on wage earnings in Kenya is Kshs. 41, 000 (USD 405) and is insufficient to meet the monthly loan repayments of Kshs. 99, 000 (USD 978) for the average mortgage size at current mortgage interest rates.

RECOMMENDATIONS TO BRIDGE THE GAP

1. **Use of Alternative Building Solutions:** The market needs to be educated to accept different building solutions which are more suitable cost-wise to reaching medium/lower income segments. For instance greater investments into pre-fabricated houses can be more cost effective, and drastically reduce construction time.
2. **Local Government Support:** To allow for the effective supply of off-site infrastructure and land servicing (i.e. development of trunk infrastructure, water and sanitation, etc.) needed to support real estate development.
3. **Adequate Funding System to Facilitate Mortgage Provision:** The banking system is still not in a position to offer the long-term finance that the housing sector needed. Beyond the provision of long-term mortgages, alternative financing schemes such as "lease-to-own" arrangements in partnership with local financial institutions could be deployed for instance.
4. **Local Bank Capacity Building:** To strengthen mortgage underwriting skills and instigate competition in the sector. This should also include microfinance providers with tailored products for the housing sector, in particular given the role that such institutions can have with regards to home improvements loans. A key challenge is the banking of those in the informal sector.
5. **Equity Provision for Developers:** This will limit excessive debt leveraging of real estate developments. Private equity funds can be an interesting avenue to be pursued.
6. **Technical Assistance:** To both developers and contractors to increase their capacity to deliver housing units in larger quantities so as to benefit from economies of scale.

HOW KPDA CONTRIBUTES TO BRIDGING THE HOUSING PROVISION VIS A VIS DEMAND GAP IN KENYA

KPDA was established in Nairobi in 2006 as the representative body of the residential, commercial and industrial property development sector in Kenya. It is an emerging Business Member Organisation which works in proactive partnership with policy-makers, financiers and citizens to ensure that the property development industry grows rapidly but in an organized, efficient, economical and ethical manner.

The Association's strategic objectives include:

- Working with the Government and other stakeholders to promote policies that stimulate the property sector;
- Contributing to excellence in building through promotion of world-class ethical standards and educational programs;
- Compiling focused research and analysis to inform investment decisions, policy analysis and public education;
- Developing new financing mechanisms to help low and middle income Kenyan families own homes through collaborations with strategic partners;
- Providing forums where property investors can share expertise and build business contacts;
- Harmonising development activities with citizen concerns, like focus groups and associations.

KPDA supports the property development industry in the following ways:

- Improving the industry capacity and image by making it a pre-requisite for all members to the KPDA Code of Conduct;
- Promoting public policies that make it easier to do business;
- Hosting educational seminars on (amongst other themes) upcoming building technologies, legislation governing the industry and the provision of affordable housing;
- Working with government and private sector players to identify issues of mutual concern and jointly address them;
- Forging relationships between industry partners for positive collaboration
- Providing forums where developers network not only with each other but also, potential business partners as well as local and international investors;
- Linking our members to new financing, marketing and project management opportunities;

The Association is proud to highlight the following achievements:

1. KPDA members can now make payments towards the National Construction Authority (NCA) Construction Levy in instalments. We have also been granted a specific Liaison Officer to handle queries raised by our members;

continued on page 20

continued from page 19

2. The successful organization of over 15 events over the last year, both solely organized by KPDA and also co-organized by some of our external international and local partner organizations;
3. Our strengthened collaboration with the public sector resulting in KPDA being nominated into the Ministry of Land, Housing and Urban Development Affordable Housing Contact Group;
4. Continued goodwill from the Nairobi City County Government who continue to share data on Building Permitting Approvals in Nairobi County. This data is then analysed into reports which we share with our members and partners;
5. The consistent and informed release of data to our mailing list through our Media Weekly Review Reports and our bi-monthly e-newsletter, *The Developer's Digest*;
6. The renewed vibrancy of member engagement through our two committees, the Membership and Outreach Committee and the Public Policy and Advocacy Committee.

KPDA remains optimistic that through strategic forging of relations between the private sector and the public sector, the growing demand for affordable housing in Kenya can be met in line with our Vision 2030 Millennial Goals.

Development Brings Development

Deloitte report ranks Kenya top in infrastructure projects

Kenya continues to lead the continent in terms of infrastructure development with 20 roads, energy, harbours, water and energy projects. Ethiopia comes second with 12 projects according to a report compiled by consultancy Deloitte.

Large mega projects for the last three years occupied up to 20% of all the total capital investment in Africa with a cumulative worth of US$568 billion, a big chunk of it coming from financiers and foreign aid such as the World Bank and even China.

According to the report transport infrastructural development took a bigger portion of Africa's development budget kitty with 51% of the projects being transport-related, energy and power (30%), water (8%) and social development (4%).

The continent has also been treated to a new trend of infrastructural investment especially in the real estate sector where countries like Kenya and Tanzania have recorded significant growth. Other upcoming sectors are entertainment, retail, modern office parks, hotels and lifestyle facilities.

Mushrooming of urban centres, characterised by a strong growing middle-class economy that has richly embraced the use of green energy and open spaces, has attracted foreign direct investments in an area where investors are reaping huge yields from technology, real estate rentals, innovation and sustainability. ■

Source: http://goo.gl/hH0YSr

CIOB calls for an independent building regulatory authority in Ghana

The current vice president of the Chartered Institute of Building (CIOB) Africa, Rockson Dogbegan, has called for the establishment of an independent building oversight authority in Ghana to regulate Ghana's construction industry. He said the establishment of the independent body would ensure high standards in the building sector as well as eliminate shoddy work. This will go a long way towards stimulating economic growth in the country.

He said despite the industry's immense contribution to the county's GDP, it is faced with many challenges due to the lack of proper regulation.

According to Dogbegah, an independent construction authority would help wipe out shoddy work associated with local industry players by building the capacity of construction firms and enriching professionalism, while at the same time formulating policies for sustained industry development.

"We have many high-rise buildings springing up, construction of roads and many development projects in the country. Anyone just gets up and, because they know someone who can secure them a government contract, they claim they are contractors," he said.

For a number of years, both industry practitioners and academics have been urging the state to set up a regulatory authority to oversee the industry in Ghana.■

Source: http://goo.gl/X8ujfZ

Is China building everything in Africa?

Road under construction in Kenya.

Not quite, is the answer. But no other single country is building as much as China is.

Scanning the headlines, it can appear as if Chinese companies are building everything. For example: the 1,600-ha new city in Modderfontein, South Africa; a $2.7-bn railway linking Mali to the West African coast through Senegal; A $3.8-bn, 609-km railway in Kenya between Nairobi and Mombasa; and Airports in Nigeria.

But according to the latest edition of the *Deloitte African Construction Trends*, released in February, China was building 14% of all major projects in Africa as of June last year.

China's share of African construction is almost as much as the domestic private sector's share of 15%. Governments are building 27% of projects, while Deloitte puts 40% in an unspecified 'other' category.

China's share is also growing fast, nearly tripling from 2014 when Deloitte recorded China's project share as 5%..

Deloitte only considers projects valued at over $50m which have broken ground by 1 June 2015. The number of projects qualifying for the study in 2015 rose 17%, from 257 in 2014 to 301. The total value of projects under construction increased 15%, from $325bn to $375bn.

China is most heavily involved in Central Africa (including Cameroon, Central African Republic, DRC), where it is building 26% of projects and funding 4% of them. In East Africa, China funds 8% of projects and is building 21% of them.

In December Chinese President Xi Jinping pledged $60bn worth of assistance and loans for development in Africa at a cooperation forum in South Africa.

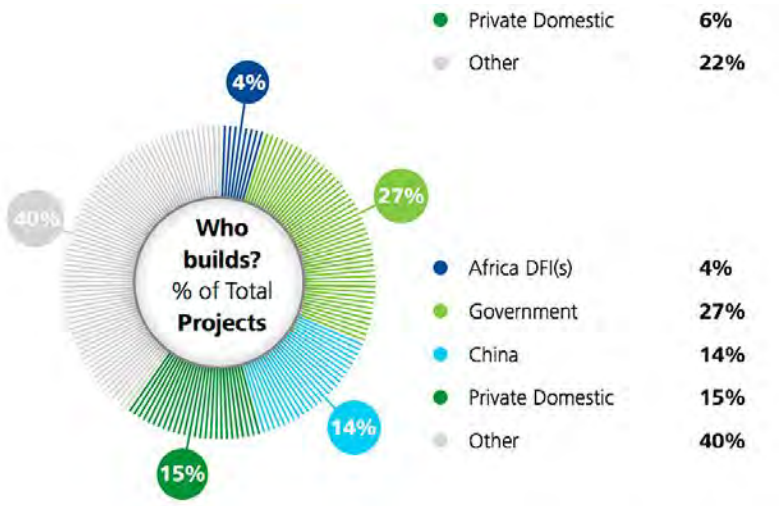
However, slowing economic growth in China, coupled with plummeting prices of minerals, may be conspiring to put projects on hold.

Apart from China's involvement, Deloitte's latest report shows a robust level of development work in Africa, driven by rapid urbanisation and a rapidly expanding middle class.

International DFIs remain the biggest funders, with participation in 145 of the 301 projects, currently under way.

An interesting trend is the rise of public-private partnerships (PPPs) being used as a procurement model. Only 14 projects were PPPs in 2013, but last year there were 39, a rise that contrasts with the fall in privately funded projects.■

Source: http://goo.gl/MZdGHb



Of synergies and opportunities: what could a purpose-driven approach to partnership mean for mega-projects in Africa?

By Kevin Odendaal, Executive Business Development: PPC

As Africa's economic growth trajectory continues upward – defying the current global trend – its critical need for infrastructure development mirrors this path. With the private sector increasingly being called upon to answer this need, our concept of 'successful public private partnership' needs to be reconsidered and a longer-term and legacy view of return on investment taken. This will require a fundamental shift in our thinking and approach for us to ultimately unite as Africans and build Africa.

"If businesses do not uplift the communities in which they operate, there will be no businesses with which to do business in the future.

We are currently on the continent of opportunity – living at a time like never before. This is especially so for cement producers and the construction industry, given the IMF's forecast that 11 of the world's 20 fastest-growing economies will be in Africa by 2017. The next 35 years will additionally see the continent having to accommodate another 900 million new urban dwellers according to the Mo Ibrahim Foundation. This is equivalent to the collective urban expansion seen in the USA, Europe and Japan over the past 265 years.

With the investment by value of mega-projects under construction growing by 46.2% in 2014 – from US$103 billion to US$326 billion (Deloitte's African Construction Trends Report 2014) – and Africa expected to host nearly a quarter of the global urban population by 2050, players in the space are clearly being offered significant opportunity if they are able to convert it. But what does meaningful conversion look like in Africa – a continent of extremes where challenge and opportunity coexist side by side? And is there an overarching vision that we should be striving towards together as opposed to seeing the land beyond our country's borders as the 'next frontier'?

Understanding Africa's vision for Africa

Africa's dream is not new – nor is it unique. It is one which generations of people and communities have striven to achieve. Most recently it has been articulated by the African Union's (AU) vision for 2063, the 'Africa we want: an integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the global arena.'

In considering what this means to our industry as an enabler, it's important to note why this vision was created: as an approach to guide "how the continent should effectively learn from the lessons of the past, build on the progress now underway and strategically exploit all possible opportunities available in the immediate and medium term, so as to ensure positive socioeconomic transformation within the next 50 years."

The AU's Agenda 2063 explains our industry's role in achieving these aspirations: "By 2063 the necessary infrastructure will be in place to support Africa's accelerated integration and growth, technological transformation, trade and development. This will include high-speed railway networks, roads, shipping lines, sea and air transport, as well as a well-developed ICT and digital economy."

This will not only require the successful rollout of a series of mega-projects, but also a sustainable supply of concrete to enable this development. Our sector is being given a clear call to action since concrete is essential for strong, reliable and durable infrastructure.

Concrete will be used for these projects because, as an infrastructure building material, it performs exceptionally across all aspects of sustainability – economic, social and environmental. Without concrete, it would be difficult to provide Africa's current and future large cities with the cost-effective, efficient, long-lasting and low-maintenance infrastructure they need.

However, concrete in itself is not enough. The European Cooperation in Science and Technology (COST) categorises mega-projects of the likes needed to deliver on Vision 2063 as having 'extreme complexity' (both in technical and human terms) and 'a long record of poor delivery' – bringing us back to the concept of partnership.

We clearly require a new approach for Africa – in how we do business individually and how we develop partnerships. Vision 2063's mega-projects also need to be developed against a backdrop 'which places the African people at the centre of all continental efforts'. Our collective mandate is clear: people, and not only profits, must lie at the heart of all the continent's development efforts, transforming communities and building caring and inclusive societies to ensure legacy enablement. Is this possible for us as an industry and, if so, how?

Challenge? Or opportunity?

Africa's history has left it with ageing infrastructure. To change this will require over US$93 billion per year in infrastructure spending according to the World Bank. This equals 15% of Africa's GDP, of which 67% relates to capital expenditure and the rest to operation and maintenance. As only half of this is available, demand for infrastructure currently outstrips supply. According to McKinsey, current investment is skewed towards the transport, energy and power sectors, with investment focused in a few countries – four countries own half the continent's infrastructure. So, once again, we find ourselves in an 'opportunity space' of extremes – where the investment and infrastructure have taken on 'chicken and egg' attributes, with private-sector players each waiting for the other to make the first move.

Mega-projects will require mega resources – which will mean non-conventional partnerships both up- and downstream within the construction value chain. Resources, including cement, will need to be manufactured and supplied locally wherever possible to boost local economies and ensure sustainable job creation.

This is not so simple given PPC's own experience on the continent. While there is a definite opportunity for growth, one cannot simply 'cut and paste' business models in Africa. There are too many differences between countries and within regions.

- While some economies are growing at double-digit figures, others remain in a cycle of weak governance, poverty and violence.
- Populations vary, from 185 million in Nigeria to just over one million in Swaziland.
- Distribution of natural resources is not uniform (a concentration of precious metals in South Africa and oil in Angola).
- Infrastructure services and mobile connectivity are similarly unevenly distributed.

continued on page 24

The Dwaalboom factory in Limpopo Province.

Inside the CIMERWA factory in Rwanda.

Africa also has some of the greatest levels of inequality and poverty in the world – with those living on US$1.25/day doubling in the past 30 years.

Therefore, for our sector to catalyse meaningful change and enable growth and development, we need to redefine 'best practice' partnership and ensure it becomes 'next practice' – or purpose-driven.

We need to expand the single-minded, delivery-focused approach to completing a project or JV to encompass everything from innovation and modernisation, to strategic collaboration, empowerment and transformation, skills development and training, to adopting green business practices wherever possible. Active and demonstrable leadership is critical throughout, with sustainability becoming common practice.

Our view of stakeholders must also change: looking beyond government and investors to engage with key communities including women and youth as a priority. 'Investment' needs to similarly be redefined to include people; both current and future employees.

CIMERWA: a case study

PPC's experience from our ongoing expansion into the continent – consistent with our vision of being a world-class provider of materials and solutions to the basic services sector – can illustrate how this new model could look.

The greater context for the partnership was 'sustainable modernisation', which has enabled intensive, committed collaboration between all stakeholders: PPC and the Rwandan government, the Bank of Kigali, KCB Bank of Rwanda, the Eastern and Southern African Trade Development Bank, the local community, and up and downstream partners (like logistics providers) in the greater value chain.

Critical milestones achieved reflect a purpose-driven approach that ultimately speaks to legacy objectives:

1) Capacity. The facility has extended CIMERWA's production capacity from 100,000 to 600,000 tons p.a. This will meet the capacity needs of the Rwandan market, reducing the need to import and catering for export demand.
2) Skills development and training. An extensive skills transfer programme will ensure that over 95% of the workforce employed at the new facility will be local. This reflects our philosophy that 'building Africa' is as much about building the capacity to build, as building the people.
3) Innovation. The procurement of support services like transport, catering and cleaning will further capacitate and build these industries.
4) Empowerment and transformation. A comprehensive CSI programme has been rolled out in partnership with the local community. Local entrepreneurs are being empowered through provision of organised networking opportunities, technical training and seed capital.
5) Long-term sustainability. Additional bricks-and-mortar social development projects have been undertaken in Bugarama. These include construction of a fully-equipped healthcare centre and a library. CIMERWA has also established a primary school and funds the school's full staff complement and facilities. It has brought piped drinking water to the broader Bugarama community, upgraded service roads from the plant to the mining area, and from the plant to Bugarama town. A collective $4m has been invested in these two projects alone – improving the lives of community members who travel these roads daily.

The above demonstrate the potential of purpose-driven partnership as a catalyst. CIMERWA illustrates how – together – stakeholders can assist in realising a country's economic potential while uplifting local communities, and stimulating greater collaboration, growth and sustainable development across the broader region.

Creating a collective vision for success

To bring meaningful change and create a new African legacy will require all of us to work mindfully, responsibly, sensitively and sustainably – against the backdrop of the challenges facing the continent. We will have to do this in partnership with government; with suppliers; with customers and the entire community ecosystem it is our privilege to grow and serve. We will also need to do it soon, so that we can transform current challenges into opportunities, and ultimately realise the full potential of our continent and its people.■

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Employees from CIMERWA outside the plant.

Zaha Hadid dies at 65






Zaha Hadid's neofuturistic style won her many prestigious awards.

Zaha Hadid, the Iraqi-born architect who was responsible for a string of landmark buildings around the world, has died at the age of 65.

She died of a heart attack on 31 March in a Miami hospital, where she was being treated for a case of bronchitis.

The architect had made her name with a structurally complex 'neofuturistic' style that became popular with clients of prestigious cultural and sporting venues all over the world.

In 2004 Hadid became the first woman recipient of the US Pritzker Architecture Prize, and she received the Stirling Prize in 2010 and also in 2011.

In 2014 the Heydar Aliyev Cultural Centre, designed by her, won the Design Museum Design of the Year Award, making her the first woman to win the top prize in that competition.

In 2015 she became the first woman to be awarded the RIBA Gold Medal in her own right. RIBA president Jane Duncan said: "Zaha Hadid was an inspirational woman, and the kind of architect one can only dream of being. Visionary and highly experimental, her legacy despite her young age is formidable. She leaves behind a body of work, from buildings to furniture, footwear and cars that delight and astound people all over the world. The world of architecture has lost a star today."

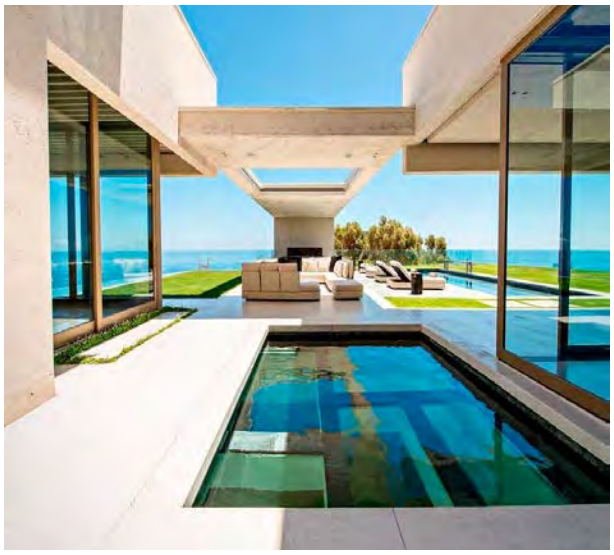
Lord Rogers, speaking to The Guardian, said: "She was a great architect, a wonderful woman and a wonderful person. Among architects emerging in the last few decades, no one ever had more impact than she did." ■

Source:
http://goo.gl/b1WKz3
http://goo.gl/jDcuZM

Lafarge rewards concrete excellence at the Artevia Awards

Smith Street Studio: Winner of Architect and Applicator categories.

Nasrec Memorial Park won an Exposed award for Horticare.



House with a view won for SAOTA's work on the project.

Lafarge South Africa awarded applicators and architects for outstanding use of the company's Artevia product at the 2016 Artevia Awards held at the Michelangelo Hotel, Sandton on Tuesday, 5 April 2016.

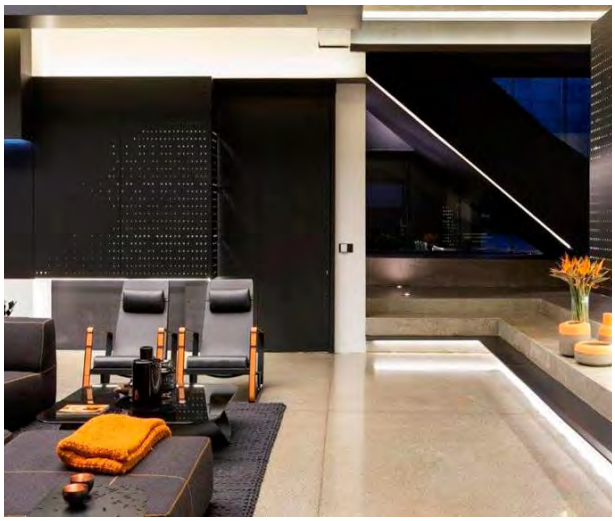
Artevia by Lafarge is a collection of decorative concretes for indoor and outdoor applications that combine freedom of design with low maintenance and durability. The product offers great aesthetics and outstanding performance, ideal for home owners, architects and landscapers alike.

Architecture and design firm, Urbain McGee and grinding and polishing contractor, World of Decorative Concrete were the big winners, being named overall winners in the architect and applicator categories respectively. They each won R40 000 in travel vouchers.

Both companies won the awards for their involvement in the Smith Studio Project, a refurbishment of a 250-year-old neglected building. They used polished Artevia concrete to make the floor robust enough to handle ground water and achieve a high-gloss finish.

The other winners were named as follows:

Winner	Artevia Product	Category
SAOTA	Exposed	Architect
Horticare	Exposed	Applicator
Nico van der Meulen Architects	Polished	Architect
Ocean Trading 49	Polished	Applicator
Alternative Concrete	Print/colour	Applicator



Nico van der Meulen Architects and Oceanside Trading won a Polished award for 95 Kloof Road.

Oceanside Trading 49's House 1878: Winner in the Exposed Category.

Alternative Concrete's work on House Uys Krige won the Inprint prize.

Nadine Engelbrecht Architects were awarded as the highly commended architect and Oceanside Trading were the highly commended applicators.

All category winners walked away with R20 000 in travel vouchers.

General Manager of Readymix for Lafarge South Africa, Alta Theron, said the quality of entries "was truly exceptional pushing boundaries and made the job of all our judges almost impossible."

"The Artevia Awards celebrate the finalists, semi-finalists and winners as a critical component of Lafarge South Africa's investment in people and in research and development. Without their brilliance, our determination to build better cities would remain nothing but an unfulfilled vision," said Theron.

Launched in 2009, the Artevia Awards take place every two years, and were sponsored by Lafarge South in partnership with Chryso Southern Africa. ■

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PPC IMAGINARIUM

Jewellery designer the Overall Winner

Mignon Daubermann with her 'Bone rings' that won her a total of R150,000.

The winning rings showed unique technical use of pigmented concrete, silver and gemstones.

Last year it was an innovatively designed – and fully functional – concrete speaker that caught the eyes (and ears) of the jury. This year, a pair of tinted cement rings set fetchingly with gemstones and shaped into organic forms inspired by human anatomy – our bones, to be precise – stole the show.

Their creator, Mignon Daubermann, scooped R100,000 in prize money for being the Overall Winner of the 2015/2016 PPC Imaginarium Awards. Her victory was announced at a Gala Event on 3 March 2016.

Her stellar pieces shone their way to the top having first been selected as a Finalist out of 660 entries, and then going on to win the Jewellery Category Prize. Before her selection as Overall Winner of the competition, Daubermann's entry competed against the winners of four other Category Winners across the disciplines of Film, Industrial Design, Fashion and Sculpture (there was no Architecture Category winner this year).

Each category winner received R50 000 while the runners–up each walked away with R15,000. In addition to the monetary incentives, category winners also receive opportunities and mentorship from various thought leaders in their respective industries.

The PPC Imaginarium Awards challenges its entrants to innovate with cement and use concrete as a medium of expression. Daubermann's intriguing, conceptually-related rings play on the idea that both concrete and human bones are resilient as well as fundamental for the strength of the entire physical entity – be it a human body or structure.

Her concept, execution and "unique technical use of pigmented concrete and silver" are what impressed the judges. According to the independent jury, made up of industry heavyweights such as Cathy O'Clery of Platform Creative Agency and renowned Fine Artists Stephen Hobbs and Wilma Cruise, Daubermann's rings show a "simplicity and elegance of design" that is both "refined and conceptual, eye-catching and beautiful."

Winning this prize will no doubt rapidly accelerate the fledgling career of this young and now rising star – which is one of the aims of this unique competition. The PPC Imaginarium offers mentorship and exposure opportunities alongside a cash component so significant that it is the country's richest art and design competition – cementing PPC Ltd's reputation as a serious patron of the arts. PPC Ltd has long been recognised for its ongoing support of South African creativity and is a previous recipient of several BASA awards.

Last year, as with this year, R500 000 in prize money went to the Overall Winner, Category Winners and Runners-Up. PPC Ltd has already committed to a further round of the competition, which opened for entry on 1 April 2016.

Previous winners have used the substantial prize money to start up design studios or invest in much-needed equipment and machinery. Others, like last year's Film Category winners, have gone on to represent local filmmaking on the international film festival circuit. It still remains to be seen how the latest, recently crowned champion will invest in her own trajectory…

All of this attests to the validity of the PPC Imaginarium Awards and their relevance in the South African art and design context as a platform for promoting emerging talent. In addition, the competition has a core focus on innovation. It looks to the future of cement and seeks to progressively further the role of concrete in our society because it is one of the key components of our current and projected built environments. The PPC Imaginarium Awards are spearheaded by PPC Ltd's own Innovation Department, and are the brainchild of resident architect and respected academic Daniel Van Der Merwe.

Says Van der Merwe: "We would like to extend our congratulations to Mignon Daubermann for exceeding the expectations of concrete in such a captivating way with these pieces of wearable art. And because the standard of this year's entries is exceptional, we need to acknowledge all the finalists.■

More information at www.ppcimaginarium.co.za

About PPC Imaginarium

PPC Imaginarium is an ambitious modern art and design awards programme aimed at promoting and supporting emerging creative talent in South Africa.

Category Winners and Runners-up

Film
Category winner: Kyle Goulden. The Catalyst: Showcases the destructive effects of the violence that so often accompanies extremist attitudes, and the costs that it incurs.

Runner-up: Francois Knoetze and Zara Julius. Optimus Usimende: A downtrodden hero undertakes to repair the chasm between privileged and oppressed.

Fashion
Category winner: Hester Erasmus. A more sustainable future: Using exaggerated A-line silhouettes, PVC plastic was mixed with cement pieces to create more sustainable clothing. By using PVC plastic and cement there is no need to wash the garments, saving water.

Industrial Design
Category winner: August de Wet. Beam: A concrete lamp conceived as a beam of light that cuts through a solid concrete mass, the design mimics the form and directional light of a lighthouse yet it does away with a visible light source.

Runner-up: Ivan Brown. Beegin: A concrete beehive that will help farmers and beekeepers to create more sustainable apiaries. The concrete beehive will reduce the risk of theft and vandalism, improve the bee colony's insulation and thermoregulation and support good beekeeping practices.

Sculpture
Category winner: Janna Kruger. Monument – intimacy: A sculpture comprising four objects that form two pairs. Each object is aligned and kept in position by four small domes at its base and consists of a ball and a rod assembled together. The visual punch of the sculpture is in the almost impossible delicacy of the rods, as well as its richness in shape and texture.

Runner-up: Ester Pohl. Traces: The cement, a material that is tangible and representing something that is real, is cast into a mirror-image of a tyre, which is known to be flexible and ridged – thus the concrete represents a lie.

Jewellery
Category winner: Mignon Daubermann. Bone rings: details in main article.

Architecture
There was no winner for 2015/2016.■

Film: Category winner: Kyle Goulden.


Fashion: Category winner: Hester Erasmus.


Industrial Design: Category winner: August de Wet


Sculpture: Category winner: Janna Kruger.

Q&A on 3D Architecture and design software

With Yashaen Luckan, President of the South African Council for the Architecture Profession (SACAP)

Q: How is 3D software transforming the architecture industry?

3D software is beneficial to both the process of design and the representation of design to clients and other stakeholders.

The historic 2D representation of architectural concepts is difficult for many clients to imagine as built liveable space. Scaled physical models, which supplemented 2D drawings, provided a better understanding of the form and general aesthetic of the building, however, 3D digital software represents architecture at the human scale. A person can now walk through a building or view it on the site as he/she would in the real built form.

For architects and also designers, 3D software provides the opportunity to engage with architecture 'inside-out', exploring spatial interconnections in volume. The scales of experience and grades of intimacy between user and space are unlimited, thereby enhancing the development of place through socio-spatial interaction, to which all good architecture should always aspire.

Q: Do you believe this is a trend which is set to grow and why do you think this is?

This trend has been growing ever since inception. The demand for high quality 3D software is on the increase. This has driven the continuous development of 3D software packages which has seen new/revised versions being released in short time. Software developers have grasped this opportunity although market competition is high.

Q: Is the cost not prohibitive or is this coming down – is this perhaps a factor in its adoption at the moment?

Cost does not seem to be prohibitive as the vast majority of architectural practices are using 3D software. There are 'Lite' versions of software at lesser cost, with obviously fewer possibilities and options. Student versions are a fraction of the cost of the full versions and this exposes young practitioners to 3D software. A significant number of these students move on to set up private practices which then purchase licensed versions of software for commercial use.

Q: How is 3D technology being used today by architects, what are some of the more innovative ideas and solutions?

Some of the more organic or amorphous architectural forms, which are near impossible to achieve through 2D drawings or physical modelling, become possible with 3D modelling. Many internationally acclaimed, award-winning architects rely heavily on 3D software for design development. Nowadays, 3D software affords interdisciplinary interfaces with engineering and construction software, which can translate ambitious and innovative design forms and structures into working drawings, details and ultimately, production / construction.

Q: What are the implications of this technology for the industry in South Africa?

3D software has to translate into Building Information Modelling (BIM), in order to realise idea / concept as built form; this is what will transform practice in South Africa, especially in the SMME sector. Computer technology has literally shrunken the office footprint and the one-person practice becomes much more possible. Access to the profession and business is therefore easier, which is of particular importance to transformation in a volatile, growing economy.

Q: Any other thoughts?

3D software and digital technology have to be harnessed and exploited to the fullest in order to benefit practices in the SMME sector. Technology has redefined the concept of the office or studio as well as access to resources. Mobility and connection are the way of professional business today – a computer with the relevant software and Wi-Fi is all that may be required to run a sustainable practice. The office and library have largely become virtual spaces, while the coffee shop has taken the place of meeting rooms. All this is to the credit of computer and digital technologies.■

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Tel: +27(0)11 479 5000 / email: president@sacapsa.com
www.sacapsa.com

Yashaen Luckan

Yashaen Luckan, President of SACAP, is a professional architect and academic at the Durban University of Technology. He is engaged with a range of projects from commercial to educational and medium-density housing.

As academic and researcher at DUT his focus is on transforming the architectural curriculum and pedagogy towards the development of responsive and relevant architecture within the context of South Africa as a developing nation. A critical approach to existing norms and traditions informs the creation and development of innovative models for architectural education in a rapidly transforming context.

Hole in the ground wins skyscraper competition

By Stu Robarts

Imagine standing on the edge of New York's Central Park and looking down into a 3.4-km^2 sunken expanse of mountains and lakes. This is the award-winning concept dreamt up by Yitan Sun and Jianshi Wu, who have envisioned digging down to the bedrock of the park to create a more natural landscape.

'New York Horizon' was conceived to contrast the city's densely-constructed buildings and towering skyscrapers, as well as to provide New Yorkers with a natural environment that they could enjoy on a daily basis. The reimagined parkland would allow for hiking, climbing and other outdoor activities for city dwellers.

Sun and Wu's concept imagines the park contained within a huge perimeter of internally reflective glass, the mirrored megastructure itself like the skyscrapers around it. Indeed, it is this aspect of the design that qualified it – and ultimately allowed it to win – the 2016 eVolo Skyscraper Competition.

The annual competition was established in 2006 and seeks to recognise visionary ideas for building high-rise structures. Previous winners have included 2015's Essence Skyscraper and 2014's Vernacular Versatility. This year's contest has seen second- and third-place prizes awarded, as well as a further 21 honourable mentions. All were picked by a jury from a total of 489 designs submitted.

In second place is 'The Hive', a 'central control terminal' for commercial drones – or, to you and me, a place where they can be docked, charged and take off from. Designed by Hadeel Ayed Mohammad, Yifeng Zhao, and Chengda Zhu, the Hive is based on the recognition that drones are becoming a greater part of our lives, with applications like fast delivery, aerial mapping, commercial advertising, government inspection and filmmaking.

Based at 432 Park Avenue in Manhatten, New York, the Hive would allow for the surrounding area's 'air-zoning' to be shaped for drone traffic to and from the building and for more efficient use of commercial drones. It would accommodate nine different types of drones based on their shape and size and would provide a safe landing environment for them.

New York Horizon by Yitan Sun and Jianshi Wu.

The Hive, a "central control terminal" for commercial drones.

Data Tower, by Valeria Mercuri and Marco Merletti.

'Data Tower', by Valeria Mercuri and Marco Merletti, placed third. Conceived in response to the growing amounts of data being created annually, the concept comprises a vertical data centre that is powered cleanly and costs very little to run.

Located in Iceland, Data Tower would provide a central place from which both US and European organizations could run their web services, it could be powered by the country's hydropower and geothermal clean energy, and could harness the country's cold climate for the cooling of its servers.

Unsurprisingly, many of the honourable mentions this year are focused on the environment. The most ambitious of these is the huge 'Global Cooling Skyscraper', which would seek to pull hot air away from the earth, allowing it to be replaced by cool air. Elsewhere, 'Cloud Craft' would seed clouds to avoid or mitigate droughts, the 'Valley Of Giants' would act as a catalyst for jumpstarting green environments in deserts, and finally the 'Air-Stalagmite' would filter a city's air and use the air particles captured to grow itself upwards as a beacon of pollution.

We often see outlandish conceptual architecture that designers hope may actually be built, but in reality is too impractical or completely unworkable. It is unlikely, though, that any of the entries to the eVolo competition will have been submitted under any illusions that they might one day be built. Instead, it is the outlandish thinking behind these designs that is important, with these most abstract of concepts potentially containing the seed of a useful idea that might otherwise never be discovered.

The winning submissions and and honourable mentions can all be viewed in full on the 2016 competition category on the eVolo website: www.evolo.us/category/2016/ ■

All images courtesy of eVolo.

Source: http://goo.gl/m4egpZ

Complex formwork for a double star system

A one-of-a-kind cast-in-place structure is currently under way near Munich: the ESO Supernova Planetarium and Visitors Centre. The building's curvature takes its cue from a narrow double star system. The architecture of the construction project is characterised by inclinations up to 23 degrees and demands the ultimate in artful engineering from contractor and formwork supplier.

The city of Garching located 15 km north of Munich is the headquarters of the European Southern Observatory, the European Organisation for Astronomical Research in the Southern Hemisphere (ESO). This is where a new planetarium and visitors' centre reminiscent of a narrow double star system is under construction. In this concept, one star transfers its mass to the other. As a result, the heavier star explodes in the form of a Supernova. It briefly shines as brightly as all the light of the entire Milky Way's stars together. The spectacular design was conceived by Darmstadt architects Bernhardt + Partner. GROSSMANN Bau & Co. KG of Rosenheim is in charge of construction. They rely on cooperating with Doka Formwork Experts from their nearby Munich branch.

Unique architecture

The formwork has to fit perfectly from the start. The convex and concave walls present significant challenges for the formwork. In the lower cycles the cast-in-place building construction sections open up towards the top before the walls start sloping toward each other again. Each pouring cycle is different. Each formwork panel is unique. It fits only in a single spot in the structure. In addition, everything has to be delivered and made available on time and then returned. For this purpose, Doka's Formwork Experts developed an efficient concept that includes 3D planning, panel assembly and disassembly and logistics.

Strong wall formwork

Element grilles of the Large-area formwork Top 100 tec are utilised here. Their heavy-duty components, WU14 waling and I tec 20 beams, allow more freedom when placing type 20 anchors. In this combination the formwork withstands maximum concrete pressures with the least deformation. These are ideal conditions for precisely fabricating the walls, some of which are 18 m high and inclined up to 23.5° and, in terms of layout, reminiscent of a lying number eight. Fine adjustments are accomplished by using top-mounted forming boxes. They are covered with an 8-mm Plex sheet and carefully screwed to an open formwork unit.

A one-of-a-kind cast-in-place structure is currently under way near Munich: the ESO Supernova Planetarium and Visitors Centre. The building's curvature takes its cue from a narrow double star system. The architecture of the construction project is characterised by inclinations up to 23 degrees and demands the ultimate engineering from contractor and formwork supplier.

Precise panel assembly

Special factors or structural requirements and unique shapes call for customised solutions. Thus, all of the assembly work for these highly sophisticated formwork panels is completed at Doka's Pre-assembly Service in Maisach. These complex wall formwork panels are produced with maximum precision west of Munich and only 38 km from the construction site. Assembly and delivery are matched exactly to the construction process and handled just-in-time and just-in-sequence. After only a single pouring operation the panels are returned to the Doka branch. There they are re-sized to fit the subsequent use cycle. When the structure is complete, the Doka team will have assembled over 7,800 m² of complicated large-area formwork Top 100 tec.

Precisely aligned

However, the right formwork panels are only the first step in the process. Correct placement in the building is equally important. In contrast to common structures with their right angles, alignment is another major challenge here. This is the reason each individual formwork panel is aligned by means of a tachymeter. This step is supported by measuring points built into the form-ply. For its part, the tachymeter takes its alignment from a grid of coordinates specified for the entire site. To ensure proper placement, it is checked by two independent participants prior to pouring.

Shoring capable of supporting the load

In the rising cycles, the inclined wall formwork units are firmly and securely supported by a shoring structure consisting of the load-bearing tower Staxo 100. Doka's Pre-assembly Service installed a 3-m wide platform level to serve as a superstructure. It allows the site crew to move without restrictions. It also provides the formwork with force-fitted support and secures it against wind exposure. Safety is ensured from the very beginning with protection screens from the Edge protection system XP attached to the outside.

Reliable cooperation

Elias Laar, MD at Grossmann Bau is impressed by the close cooperation with Doka Formwork Experts: "It simply works like a well-oiled machine. The performance is exemplary and the people backing up the brand are reliable. We are living partner-like cooperation on equal footing." ■

More information from Doka in South Africa,
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Big pours for big trucks

Murray & Roberts Infrastructure, a division of Murray & Roberts Construction, was involved in the civil construction works that support the development of a Heavy Mining Equipment (HME) filling station and two diesel storage tanks at Kumba's Sishen iron ore mine.

Part of Murray & Roberts Construction, the company has a long legacy working on mine-related infrastructure projects in the Northern Cape, South Africa. It became active in the iron ore and manganese mining province as far back as 2005, and has recorded a host of milestones since then.

This includes its involvement in the construction of the HME filling station and the two storage tanks, which will be used by the large Komatsu rigid dump trucks and other massive equipment that load and haul iron ore at Sishen mine.

One of the biggest challenges on this contract was the many interfaces and fast-track nature of the project. "We had 10 working faces at any given time on this six month contract," says Murray & Roberts Infrastructure's Tiaan Krugel, who has been involved in managing most of the leading construction company's mining-related contracts in the province.

He says these complexities were overcome by excellent team work. "It took a combined effort from the entire professional team. However, I must note that our client did a fantastic job in managing the works. They were extremely proactive," says Krugel.

One of the highlights of the project was the sheer scale of the concrete works involved in the construction of the massive forecourt of the HME filling station. This 90-m by 66-m concrete slab is 600 mm thick to cater for the sheer weight of the mining equipment. A total of 4,800 m^3 of concrete was poured on this slab alone, while the entire slab called for the placement of 570 tons of reinforcing bars. The concrete was batched at 3Q Concrete's plant outside the mine, with between six and eight readymix trucks running to and from the site each day.

Krugel says the biggest pour was 420 m^3 in 12 hours. A total of 18 pours were undertaken, with most of them ranging between 200 m^3 to 400 m^3.

One of the many other faces on the contract was the 1,500-m^2 diesel and lubrication tank area. Two 12,7-m ring beams were constructed to support the 1,500 Kl diesel tanks, as well as a 2,5-m-high bund wall on the perimeter of the area.

Complex mix designs were essential to cope with the fluctuating temperatures in the province, ranging from zero degrees Celsius in the mornings and gradually peaking at 30°C, before cooling down again.

Krugel says extensive admixtures were needed to keep the concrete workable during the nine to 12 hours that the pours were undertaken.

Works were handed over in October 2015, in time for the other contractors to take over. Jerome Govender, executive chairman of Murray & Roberts Construction, says this project is one of the last the construction company has worked on in the Northern Cape before it mobilises to another project to start working on a new contract. He adds that while the project enjoyed many highlights, he is particularly pleased that the project achieved the company's overall safety objective of Zero Harm in that no lost time injury was experienced.■

More information from Murray & Roberts Infrastructure,
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email: info.construction@murrob.com
www.construction.murrob.com

The ring beams were constructed to support the 1,500-Kl diesel tanks.

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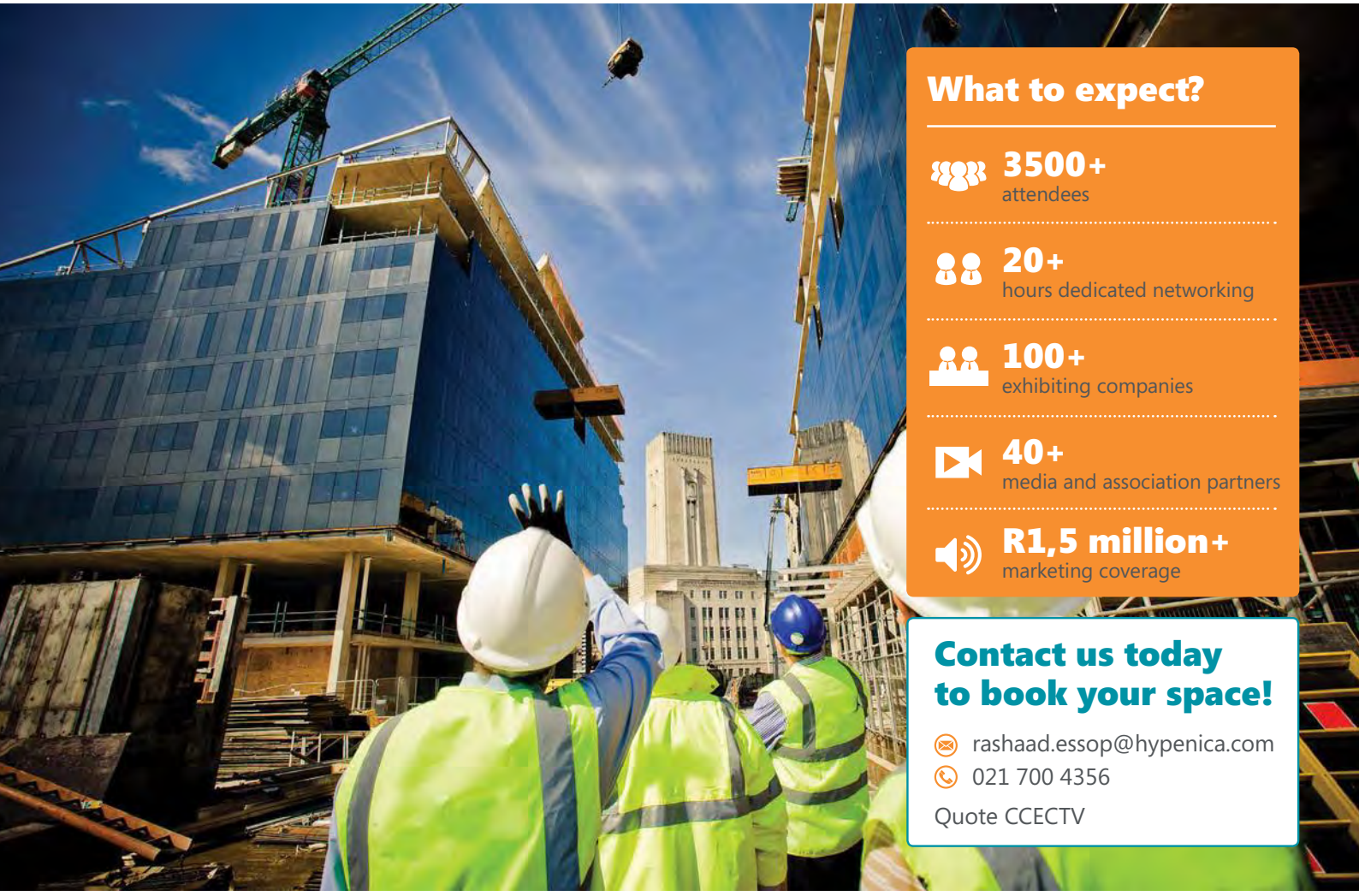

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Maitland River Mouth pipeline refurbished after 20 years

Last year Port Elizabeth's Nelson Mandela Bay Municipality determined that after more than twenty years without maintenance, the city's main water pipeline at Maitland River Mouth was in need of refurbishment. Engineers from Aurecon turned to Sika to supply its highly durable products for waterproofing and protection of the pipeline itself, as well as repairs to the concrete base structures supporting the pipeline

Forming part of Sika's Concrete Repair and Protection System, Sika FerroGard-903+ and Sika MonoTop-610 were specified by Sika's John Zehmke. "Corrosion protection provided by these products increases the service life and reduces the maintenance life cycle of reinforced concrete. SP Excel Plant & Civil were contracted to apply the numerous Sika products," explained Zehmke.

As a Migratory Corrosion Inhibitor (MCI), Sika FerroGard-903+ was spray applied onto the concrete to form a protective monomolecular layer on the surface of the reinforcing steel. This passivation of the steel delays the onset of chloride-induced corrosion and reduces the rate of corrosion. Based on organic compounds, Sika Ferrogard-903+ does not alter the water vapour diffusion of concrete, prevents development of incipient anodes and its easy application makes it suitable for use where other repair or prevention options are not affordable.

Sika MonoTop-610, a cementitious, polymer modified, one-component, bonding slurry and primer with active corrosion inhibitors, was used for protection of the reinforcing steel. It provides excellent adhesion and good resistance to water and chloride penetration. For repairs on the deteriorated concrete, Sika Rep, a one-component, cement-based multi-purpose patching and repair mortar was used. It is shrinkage compensated, vapour permeable, with excellent adhesion.

SikaGrout-212, which is a high performance, non-corrosive, cementitious grout, was used for repairing concrete. Easy to mix with an adjustable consistency, it provides rapid strength development and high final strengths. It expands by gas generation whilst still in the plastic state of curing, resisting the tendency of grouts to shrink away from restraining surfaces during the setting phase.

Remaining cracks in the concrete were injected with Sikadur-52 ZA, a two-part, solvent-free, low viscosity injection liquid, based on high strength epoxy resins. It not only forms an effective barrier against water infiltration and corrosion promoting media, but also structurally bonds concrete sections together.

"All of these high-performance Sika products used enable easy mixing and application. Upon completion of this yearlong project, 432 m^2 of concrete were completely rehabilitated thereby significantly increasing the expected lifespan of this vital pipeline," concluded Zehmke. ■

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

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Building Africa's biggest data centre

In a build comprising 17,500-m^2, Teraco, Africa's only vendor-neutral data centre, will be adding to its existing colocation facility and creating Africa's largest data centre. Gys Geyser, head of operations – Teraco, says the build is not just an extension of services and white space, but a milestone for Teraco and the African data centre industry: "In this expansion of our footprint, we are achieving what few companies have; building the largest data centre in Africa in accordance with modern international standards."

Geyser says that the build brings the total size of the Isando facility to 9,000 m^2 of white space and 18,500 m^2 of utility space. He says that the volume of data centre space is directly related to the power feed negotiated with the local council: "We now have a total of 16MVA of power, which will ensure that we can adequately power the all the data centres, as well as ensure that they are properly cooled and maintained."

Initially launched seven years ago, Teraco has quickly established itself as the leader in data centre operations in Africa. "We have seen an increase in demand based on the number of local and international cloud, content and network providers coming into Africa, as well as from existing clients. Teraco has also seen growth in the ICT sector, particularly from within the managed service provider segment."

With an estimated 18-month build time, Geyser says Teraco's new site should be operational towards the end of 2016. He says that there are some unique elements included in this build such as the approach to cooling.

"Teraco has implemented a Dynamic Free Cooling system. We have taken what has worked in our previous deployments and applied the latest technology and best practices. Additional support services have been added, such as a water supply system to ensure that our environment can operate independently from council for a period of time, guaranteeing uptime and availability. Aiming for a low Power Usage Effectiveness (PUE) rating, the new cooling systems will definitely assist Teraco to achieve greater efficiencies," says Geyser.

After completing an Environmental Impact Assessment, Teraco was granted permission to store 210,000 litres of diesel on site. Geyser says that this is a significant achievement and will enable Teraco to run all the data centres for a minimum period of 40 hours at maximum load, again guaranteeing uptime for all its clients.

The overall design and build of the new data centre is focused on achieving international data centre design, build and operating standards but with our clients' current and future needs in mind," concludes Geyser.■

More information at www.teraco.co.za

About Teraco

Founded in 2008, Teraco (www.teraco.co.za) is Africa's only vendor-neutral data centre. Teraco builds and operates data centres for the most demanding IT infrastructure requirements. With 24x7 monitoring, Teraco guarantees 99.999% uptime and is staffed by colocation and facility management specialists. Teraco has three state-of-the-art data centres in Cape Town, Durban and Johannesburg. It is also home to NAPAfrica (www.napafrica.net), Africa's largest Internet exchange (IX) point. In 2014, Teraco received the backing of global investment firm, Permira Funds, when it acquired 100% of the equity in Teraco in partnership with management.

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The ultimate QS challenge: QS: building almost entirely with scrap materials

The Namibian Habitat Resource & Development Centre with its tyre retaining walls, rooftop solar installation and downdraft ventilation system.

Walls and retaining walls were built with old car tyres.

Old beverage cans were used to build attractive single-skin perimeter walls.

For many centuries, quantity surveyors were regarded as financial managers for conventional building projects. But the 'green revolution' has changed that. Nowadays, a quantity surveyor (QS) has to be able to control costs for the most unusual type of structure – even one built almost entirely with scrap materials.

This has been the challenge for De Leeuw Namibia, a subsidiary of South African quantity surveyors, the De Leeuw Group, a long-standing member firm of the SA Association of Quantity Surveyors (ASAQS).

Chris de Wet, chairman of the De Leeuw Group and ASAQS former director, says the Group has in its 58 years been involved in a wide variety of building projects. Till now, the QS's Bills of Quantities formula applied, but a new era, with immense sustainability challenges, excites this veteran QS.

De Wet explains: "Green building calls for unique thinking from the entire project team. The quantity surveyor plays a leading and vital role in estimating the costs and managing financial control until completion of a project. So, when faced with a green project, even the most experienced QS has no previous records from which costing models can be drawn. Indeed, past experience was no guideline when my colleagues in Windhoek were appointed as QS for a building that is a monument to alternative and cost-effective construction methods," De Wet comments.

Designed by Nina Maritz, of Nina Maritz Architects in Windhoek, De Leeuw Namibia had to manage the total financial process applicable to the new Habitat Resource & Development Centre on behalf of the Namibian Ministry of Regional & Local Government, Housing and Rural Development. "This project employed alternative building techniques that showed that not all man-made structures need to impact the environment adversely, and emphatically endorsed recycling. It posed the kind of challenge seldom faced by a QS: adherence to design while working with reclaimed materials," De Wet recalls.

The 2,110-m^2 structure built in Katutura, outside Windhoek, is used to advise and train the public on how to start small businesses in the housing market.

Herman Martins, director of De Leeuw Namibia, says some of the materials required by Maritz's design included:

- Old motor vehicle tyres for both interior and exterior walls, retaining walls, roads, and flower beds.
- Pre-owned hardware, door and window frames, iron-mongery, and scrap sheeting, including discarded fridge racks forming part of a decorative security gate, and steel sheeting used to back fluorescent light fittings.
- Bags filled with wool and lavender, stitched together to form a wool and reed ceiling.
- Bricks made from natural soil and as little cement as possible to reduce the overall embodied energy of the structure and its cost.
- Recycled oil drums and dried branches of the Namibian prosopsis tree to make the roof of the Centre's refuse yards.
- Sandbags for building walls – with viewing 'windows' to show the visitor the startling, but effective, contents of the walls.
- Gabion walls, made from concrete test cubes, concrete rubble and stone.

- Droppers made from prosopsis tree trunks soaked in motor oil as protective coating, replacing more ecologically hazardous alternatives for wood protection.
- Old beverage cans to build single-skin walls.
- Recycled ceramic tiles as ablution décor, motor car oil filters and old printing plates used as lamp shades, and discarded CDs employed as part of novel lighting chandeliers.

Martins adds: "What is more, Nina Maritz came up with innovative ways to improve the building's energy efficiency. All of its energy needs are supplied from a roof-top solar system. Her novel design to reduce the building's total draw on energy includes a passive down-draft system that cools the conversance facility and library, while natural light and cross ventilation further reduce the structure's electrical demand."

He says one of the challenges of the project De Leeuw Namibia faced was getting the professional team and the builders to think beyond construction conventions. Some of the challenges to be overcome included:

- An unusually high number of design changes equired because scrap dealers sell to the first buyer so that many of the windows and door frames originally selected had been sold to a third party by the time a contractor was appointed;
- Estimating the cost of the building materials was extremely difficult. "We had to resort to informal discussions with contractors and our 'gut feeling' of how much some of the materials would cost," Martins recalls;
- The government tender insisted on transparency so the awarding of tenders could not be based on selection nor negotiations;
- De Leeuw Namibia had to undertake weekly site visits to assess the unpredictable waste factor of some materials, and establish whether some of the waste could be re-used to minimise the financial impact of the waste volumes; and
- The concept of 'actual-cost-plus-profit' had to be employed for items like old wheelbarrows which were cut in half, flattened and welded together to form screens.

Martins and his colleagues also organised a special workshop for tenderers who were in contention to handle the project to provide and share as much information as possible between the various parties so that an acceptable Bill of Quantities could be drawn up.

Other key members of the professional team for this landmark project were Burman & Partner, the civil and structural engineers; G.S. Fainsinger & Associates, the electrical and mechanical engineers; and Groenewald Properties, the main contractors.■

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Can bamboo make for more sustainable reinforced concrete?

By Marc Howe

Composite bamboo materials could have a transformative impact upon the global construction sector by raising the sustainability and economy of key building materials such as reinforced concrete.

The potential use of bamboo to dramatically raise the sustainability of the construction sector has long been touted by green building advocates, while use of the material is currently undergoing a renaissance among environmentally minded architects.

The gargantuan grass plant grows at an extremely rapid pace and possesses high tensile strength. Its long tubular shape also makes it intrinsically suited for use as a structural component in various building sections.

It has served as a traditional construction material in Asia since time immemorial, and is still frequently seen on building sites throughout the region in the form of sturdy, multi-storey scaffolding structures.

Modern architects are now increasingly turning to this organic building material for their latest designs, with one of the most prolific amongst them being Vietnam's Vo Trong Nghia, who is using bamboo for community centres and spa resorts in South-east Asia.

Dirk Hebel, a professor at the Swiss federal Institute of Technology Zurich, believes the sturdy grass plant is also highly viable as a sustainable, economic substitute for all the steel in reinforced concrete structures.

Speaking at the World Architecture Festival in Singapore last year, Hebel said the use of bamboo in lieu of steel had the potential to "revolutionise our building industry and finally provide an alternative to the monopoly of reinforced concrete."

His words are not hyperbole, given that steel-reinforced concrete is the most widely used building material on the planet, and is still in very high demand throughout the developing world.

To abet its usage by the construction sector, Hebel has developed a bamboo composite material that is strong and highly versatile, and could serve as an effective replacement for steel in reinforced concrete.

Hebel's research efforts were at first directed specifically at the construction sectors of developing economies that consume copious amounts of reinforced concrete for the development of much-needed infrastructure.

Such countries often lack sizeable steel industries of their own to supply the building material's key structural ingredient, however, making them heavily dependent upon expensive imports from developed countries.

Using bamboo in reinforced concrete as an environmentally-friendly cure-all for countries that lack their own steel industries is viable, given that it's a hardy, fast growing plant that is particularly well suited to those global climate zones that are host to a large proportion of emerging economies.

Bamboo possesses some of the same sustainability benefits as timber when employed as a building material, because as a form of plant matter, it's a completely renewable resource that can be rapidly replenished by means of natural processes.

It has its own advantages compared to timber as well, given that it's harvested from grass plants as opposed to trees. Harvesting bamboo does not destroy the plant that produced it, because the root system is left unaffected in the soil.

Thus bamboo does not need to be replanted in the way trees are after harvesting, as the root system remains in the soil where it will continue to produce new shoots.

In order to better exploit these intrinsic advantages, Hebel has developed a new method for incorporating bamboo into reinforced concrete, making it a more effective replacement material for steel when it comes to shoring up strength.

Instead of using bamboo in its natural tubular state as is traditionally the case, Hebel's method first extracts the plant's natural fibres before combining them with an organic resin.

This new composite material, termed BambooTECH, is extremely versatile and lends itself to tooling and manipulation in a manner similar timber once it's pressed into shape.

When fashioned into thin rods, the composite material can be used as the reinforcing structural matrix for concrete in the same way as steel. Another major advantage is that unlike steel, bamboo isn't susceptible to rust or corrosion in maritime environments.

At the time that Hebel made his presentation at the World Architecture Festival, a Singaporean laboratory conducted testing of reinforced concrete made using BambooTECH. In a development hailed as a breakthrough by Hebel, machinery was unable to break the material.

Hebel is far from the only research experimenting with composite bamboo building materials. Researchers at MIT are attempting to use bamboo to produce a structurally sound material that functions in a manner more akin to plywood, by slicing the stalk into smaller pieces to produce composite blocks that resemble traditional timber.

The efforts of these researchers could mean that architect Vo Trong Nghia's prediction that bamboo will be the 'green steel' of the 21st century will be vindicated by the global construction and building sector much earlier than expected.■

Photo credit: Future Cities Laboratory

Source: https://goo.gl/acwUSl

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Concrete: the quest for sustainable infrastructure construction

By Daniel van der Merwe, Architect at PPC

Concrete continues to play a pivotal role in economic growth both locally and globally. As the infrastructure investment and development across Africa takes on a new sense of urgency, the construction industry is recognising that a different approach is required on and for the continent. However, we cannot simply take textbook-type economic models and apply them across this diverse space if we are committed to taking a long-term view of sustainability.

Africa's context demands that we innovate across the full value chain, from planning right the way through to design, construction and building management. As such, much of this sustainable innovation will have to do with the use of concrete as a building material.

In order to improve the sustainability of all concrete structures, we have to understand the interdependencies from 'cradle to grave' in the design phase, during construction and end-of-life and, most importantly, how these impact the levels of energy savings achievable during a structure's life cycle and use.

While the industry has worked hard to quantify 'embodied' impact of the materials used in infrastructure development, effectively measuring the 'whole-life' impact and full effects of the infrastructure's existence during its usage phase continues to challenge the industry. This type of measurement is however critical if we are to meet future targets of 'zero net-energy' buildings. Understanding the full impact of concrete is therefore central to this equation.

PPC's De Hoek plant is burning tyres to replace fossil fuel (coal) in their kiln.

Much of the world's CO_2 come from electricity generation.

Due to its flexibility and durability concrete is the most widely consumed substance on earth after water, with approximately 12 billion tons being created globally each year. Cement is a constituent of concrete (approximately 10–15% by volume). The energy used in cement manufacture is a key component of the environmental cost of concrete production due to the high kiln temperatures involved in production. This must however be viewed in context. The operational use of buildings in the United Kingdom for example, accounts for some 50% of that country's carbon dioxide emissions, with transport responsible for a further 30%.

Here at home, cement manufacture accounts for less than 2% of South Africa's CO_2 emissions. This is set to decrease further as the cement industry is already reducing energy consumption by decreasing the volume of non-renewable fossil fuels used in the manufacturing process by introducing more modern technology and equipment. This includes the use of alternative fuels and resources in kilns, including waste- tyre burning – a process that is being effectively trialled by PPC at its De Hoek plant in the Western Cape, reducing the site's coal consumption by an estimated 10% and decreasing nitrous emissions. (It is simultaneously addressing the sustainable management of used tyres.)

Cement extenders also have an important role to play in the sustainability space. Because they reduce the CO_2 per ton of cement (as well as offering other benefits ranging from better workability of fresh concrete through to the creation of more durable, impermeable concrete), more effective awareness of their qualities can ensure better planning and use of concrete as a sustainable building material.

With concrete's full impact – right from more sustainable manufacture all the way through to its low-embodied energy properties – still being fully quantified by players in the industry, perhaps the most important thing to note is that collaboration and technical partnerships are critical in realising its full potential. As such, the industry will have to innovate together if we are to positively redefine the continent's future and root its development in sustainability.

Key facts to note

Almost half of the continent's population is now urban – resulting in increased consumer spending and a desperate need for accommodation and associated infrastructure.

Africa has the fastest urbanisation rate in the world and there are now more than 1,000 cities in sub-Saharan Africa that are playing a critical role in driving the economic growth of their respective countries. Lagos and Cairo, for instance, are in the ranks of the world's megacities, while Kinshasa is also rapidly approaching megacity status.

By 2050, the absolute number of people living in cities will increase to one billion – equivalent to the continent's total population in 2010.

(Source: RMB's latest 'Where to do business in Africa' report)

Concrete benefits per user group

For the owner, concrete offers both aesthetic appeal and cost effectiveness. Its strength, durability and natural thermal mass result in buildings that require low maintenance, offer high durability and have high operating energy efficiency.

For the developer, concrete offers a competitive building solution based on first cost, long-term economic benefits, energy efficiency, lower maintenance, and overall operating costs, as well as opportunities for future reuse should the occupancy of the building change.

For the designer, concrete offers a dramatic range of colours, finishes and unlimited design possibilities, difficult to match in other materials. At the same time, a structure is created that provides superior environmental and energy performance. Designs that take advantage of the thermal mass and structural integrity of concrete have resulted in many award-winning projects throughout the world.

For the country, concrete is a low impact, environmental material which can serve as the cornerstone for building construction and infrastructure to put our society on the road to a sustainable future.

About PPC Ltd

A leading supplier of cement and related products in southern Africa, PPC Ltd has nine cement factories, four milling depots and nine readymix batching plants in South Africa, Botswana, Zimbabwe and most recently Rwanda, with a current capacity of around 8.5 million tons of cement products each year.

As part of its strategy and long-term plan to more than double its business every 10 years, PPC is expanding its operations in existing markets and extending its footprint into the DRC and Ethiopia. The recent acquisition of Safika Cement and Pronto Readymix (including Ulula Ash) forms part of the company's channel management strategy for South Africa.

PPC also produces aggregates, metallurgical-grade lime, burnt dolomite and limestone, with PPC's Mooiplaas aggregates quarry in Gauteng having the largest aggregate production capacity in South Africa.■

Follow PPC on Twitter @PPCisCement, like us on www.facebook.com/PPC.Cement and visit us at www.ppc.co.za.

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Smart pavements a mainstream option after Pavegen slashes price

Pavegen installed at the finishing line of the 2013 Paris marathon.

Heathrow airport.

The cost of 'smart' paving tiles that generate electrical power from human footfall will drop below £600/m^2 this year, bringing them closer in line with high-end landscaping options for the first time, their inventor has claimed.

Pavegen tiles generate about 7W of power from every footstep and store it in a battery to power street lighting or other street-side uses.

The tech start-up became a crowdfunding success story last year when it won more than £750,000 of investment in just two days, through the website Crowdcube, then went on to attract more than £2 million.

That money has been channeled into R&D to develop a more efficient tile, due for launch in June, that will also be cheaper due to the economies of large-scale manufacture. Last year, the company costed its product at £1,250/m^2.

Laurence Kemball-Cook, entrepreneur and founder of Pavegen, explained: "The aim of the capital was to upscale and bring on board leaders in the technology, science and the energy sectors to take the product forward.

"We now have clout with some of the biggest manufacturers in the world, making it possible to deliver volumes not possible two years ago. We aim to have our product retailing for sub-£600/m^2 this year, where currently one square metre of granite floor at King's Cross station costs around £1,000."

The new product will be launched on a live project at a London retail site, followed by a series of international launch installations to be built in Washington DC, Singapore, South Korea and Australia.

It will be more energy efficient than the previous version, says Kemball-Cook, and offer increased data functionality for smart city applications, such as monitoring levels of foot traffic in specific locations to help facilities managers better manage properties, or allow property owners to raise advertising revenue based on footfall.

Kemball-Cook added: "The new product will really change the way we have even looked at the issue of energy, completely flipping it on its head. We have a data and energy proposition we are really excited about. We can provide a granular look at how people move, which is really important for the smart city of the future, as every footstep has a unique ID.

"Link it to peoples' smartphones (with their permission) and it gets really exciting because you can know who a person is and where and when they are going somewhere."

Pavegen has already completed 100 projects in 30 countries and plans to have millions of tiles installed in every major city in the world within the next five years. The largest UK installation, at Heathrow, features 65 tiles across a corridor, which are used to power LED lights.

The firm recently worked with Shell, in Lagos, Nigeria, to install tiles under a football pitch where the movement of players is harnessed to power floodlights at night.

"In Nigeria there is a big issue around access to energy, with no real power grid that often means using noisy and pollutive generators for power," says Kemball-Cook. "We partnered with Shell, on the Make the Future campaign, to improve access to energy in environments that really need it.

"It is about disrupting change in the way people see energy, improving communities, and showing that kinetic energy can really improve economies that require a huge amount of development."

An industrial design engineer by training, Kemball-Cook started out working in a PFI team at E.ON to develop a new form of sustainable off-grid street lighting. Although the team failed to find a viable solution, the issue of how to produce renewable energy in busy urban areas stayed with him. He started the company in 2009 with an initial £150,000 in seed funding.

The company's goal is to bring the costs down to a level that make it a viable option to deploy in many developing countries. ■

Source: http://goo.gl/45edwo

Turku University to study hemp uses in construction

Turku University of Applied Sciences has been given a €70,417 grant to research how industrial hemp could be used more in construction. The goal is to see whether the energy-efficient and eco-friendly hemp and lime-based hemp concrete could in future become an attractive alternative to builders.

Hemp is technically the same plant as the one grown to be used as marijuana, but with one major difference – industrial hemp contains just a small fraction of the active ingredient THC as marijuana cannabis plants.

A hemp field in France (Barbetorte/ Wikimedia Commons)

The research will involve investigating the sound-proofing and fire-proofing properties of the substance. Researchers will also look at how hemp decomposes to establish how it could be used as fertiliser in order to determine how eco-friendly hemp's waste materials are.

Hemp-based concrete is already being marketed with names like Hempcrete and Canosmose, and is made up of a mixture of hemp fibres, lime and other materials. The mixture is not as strong as conventional concrete however and must be used in conjunction with additional framing support.

Throughout history hemp has been used in the production of rope, fabrics, waxes, paper and fuel – among several other applications.

The grant was arranged by the Regional Council of Southwest Finland, as well as the European Regional Development Fund and the Finnish state.■

Source: http://goo.gl/UdZSRj

Creating green concrete using recycled plastic

By Mark Howe

Finding substitutes for portland cement is one of the most widely investigated means for raising the sustainability and efficiency of concrete production – from the use of copper slag to incinerated sludge as a replacement ingredient for cement.

Instead of merely replacing portland cement, the team of researchers from James Cook University have joined up with Queensland's Fibercon to create a process for converting industrial plastic waste into an effective substitute for the steel matrices used in reinforced concrete.

"We've produced recycled polypropylene fibres from industrial plastic wastes," said Dr. Rabin Tuladhar, who supervised the development of the technology by JCU PhD student Shi Yin. "With our improved melt spinning and hot drawing process we now have plastic fibres strong enough to replace steel mesh in concrete footpaths."

In addition this latest technology solves two major environmental challenges; it disposes of industrial plastic waste by recycling it into concrete, thereby dramatically reducing the carbon footprint of reinforced concrete by dispensing with the need to produce energy-intensive steel reinforcing.

"Using recycled plastic, we were able to get more than a 90% saving on CO_2 emissions and fossil fuel usage compared to using steel mesh reinforcing," said Tuladhar. "The recycled plastic also has environmental advantages over using virgin plastic fibres."

The technology has already earned plaudits from local industry, winning the prestigious Manufacturing, Construction and Innovation category at the 2015 Australian Innovation Challenge.■

Source: https://goo.gl/f3C3uM

CMA Awards: judges reward bold advances in precast concrete applications

Concrete Units won the Aesthetics Commercial trophy for the precast panelling of No. 1 Silo at the V&A Waterfront.

Shukuma Bricks took the Community Upliftment trophy for paving roads in Walmer Township, a project with a skills transfer component.

The Technical Excellence trophy went to Concrete Units for their innovative precast wind tower segments at the Gouda Wind Farm.

The results of the CMA Awards for Excellence competition, announced at a gala dinner in Johannesburg on April 23rd, indicated that advances in precast concrete technology significantly influenced the judging process.

The judges had no hesitation in awarding the concrete cladding of No. 1 Silo at Cape Town's V&A Waterfront the Aesthetics Commercial Trophy. Besides its striking visual appeal, which showcases the beauty of precast concrete construction at its best, the project also involved high levels of skilled precast concrete engineering.

Similarly, the judges were unequivocal in nominating the Gouda Wind Farm concrete tower project for the Technical Excellence Trophy, which again reflects substantial levels of technical engineering input. It is a project with a pronounced innovative bias, being the first time that a South African wind farm used precast concrete segments in the construction of its towers, which in this instance were 100m high. Not surprisingly, the project was also entered into the Innovation category where it prevailed as a Commendation Winner.

Entries closed mid-October 2015 and judging took place on November 23rd at main awards sponsor PPC Cement's offices in Johannesburg. The five judges, all leading professionals, were:

- Landscape architect and director of Arla Consulting, Antoinette de Beer
- Architect and media manager of Paragon Architects, Hugh Fraser
- Civil engineer and president of SAICE, Malcolm Pautz
- Civil engineer and a director of Nyeleti Consulting, Abe Thela
- Quantity surveyor and MD of Bert van der Heever Bourekenaars Ingelyf, Bert van der Heever.

Entries in the Awards increased from 77 in 2012 (CMA's 40th Anniversary year) to 117 this year. Aesthetics Commercial was the dominant category, attracting 47 projects. Submissions in the other categories were: Aesthetics Residential 12; Community Upliftment nine; Technical Excellence 26; Innovation 15; and eight in the Precast for Life category. Some projects were entered in two or more categories.

CMA executive director, Frans Minnaar, said that although this year's entries were of a very high standard, the judges only awarded a single commendation for Aesthetics Residential, but no winner.

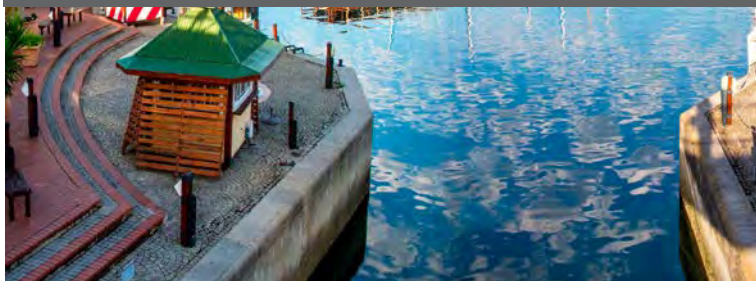
"The CMA has always advocated maintaining high standards in the manufacture and application of precast concrete products. This year's entries again reflected this and the absence of a trophy winner in the Aesthetics Residential category does emphasise that CMA awards are made on merit only.

"However, many other projects, especially those in the Aesthetics Commercial, Technical Excellence and Innovation categories, which were good enough to win an award, did not do so due to the stiff competition.

This year's five trophy winners were as follows:

- Concrete Units – the Aesthetics Commercial trophy for the precast concrete panelling for No. 1 Silo at Cape Town's V&A Waterfront.

Bosun won the Innovation award for introducing the Castle Bottom Kerb.



Smartstone's Fan Cobble paving at the Knysna Quays won the Concrete for Life Trophy.

- Shukuma Bricks – the Community Upliftment trophy for providing concrete pavers for the paving of gravel roads in Walmer Township, Port Elizabeth.
- Concrete Units – the Technical Excellence trophy for manufacturing 782 precast concrete wind tower segments for the Gouda Wind Farm project in the Western Cape.
- Bosun – the Innovation trophy for introducing the Castle Bottom Kerb.
- SmartStone – the Precast for Life trophy for supplying Fan Cobble paving blocks for the Waterfront at Knysna Quays project in Knysna.

Apart from the Aesthetics Residential category all other categories posted two commendation winners each.

The Aesthetic Commercial commendation winners were: SmartStone Midrand and Bosun, the former for supplying pavers and coping for the Thaba Moshate Hotel Casino and Convention resort in Limpopo, and the latter for drycast paving blocks for the courtyard of BMW's head office refurbishment project in Midrand.

C.E.L. Paving Products and Hydraform each won a Community Upliftment commendation. C.E.L. produced 6,400 m² of paving for surfacing gravel roads in Kassiesbaai/Arniston, Western Cape, and Hydraform supplied concrete block-making machines for the Radway Green Housing project in the same province.

Technical Excellence commendation winners were Concrete Units and Aveng Infraset. Concrete Units won the award for manufacturing precast concrete rock-print panels for the Mouille Point Sea Wall Project in Cape Town and Aveng Infraset for providing non-standard portal culverts for the Tweefontein Optimisation project in Mphumalanga.

Concrete Units' precast concrete expertise was rewarded a fourth time, with an Innovation commendation award for the Gouda Wind farm towers for which it also won the Technical Excellence trophy. The other Innovation commendation award was won by Rocla precast concrete cabins for housing photovoltaic equipment in the Free State and Northern Cape.■

More information from Frans Minnaar,
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The Souk Waqif in Doha: a place to gather

Revived in the last decade as the social heart of Doha in Qatar, the Souq Waqif, a historic shopping hub, is a must-see highlight of the city. There has been a souq on this site for centuries. The Bedu would bring their sheep, goats and wool here to trade, and the entire market area has been skillfully redeveloped to look like a 19th-century souq, with mud-rendered shops, exposed timber beams and some beautifully restored original Qatari buildings.

To provide parking for large numbers of visitors, an underground parking facility, located opposite the Msheireb, Downtown Doha, Qatar, became necessary. The design of the car park offered architects some extra space above-ground to facilitate place making, a collaborative process that shapes the public realm to maximise shared value.

With this in mind, in 2012 Dragana Lutic Djokic, landscape architect at Parsons Qatar, contacted Consent LLC (Terraforce licensees in the UAE), requesting an amphitheatre design. Specifically, the engineers at Parsons were in search of a product that could be used both for retaining and seating purposes.

Consent LLC subsequently proposed an arena design utilising the Terraforce 4x4 Multi Step block, a light, dry-stack concrete unit, generally used for constructing low terrace walls, stairs and seating arrangements.

Project team

Client	: Private Engineering Office (PEO)
Project Consultant	: JAIN Sustainable Engineering Solutions
Design Consultant	: Parsons, Qatar
Main Contractor	: UrbaCon trading and contracting
Sub Contractor	: Palmera Agriculture Business L.L.C
Wall design	: Terrasafe
Block Supplier	: Consent LLC

Aimed at providing efficient and economical steps in conjunction with the original Terraforce retaining blocks, in this case the L16, they have become very popular in South Africa and abroad, not only for stairway access, but for comfortable, practical stair and seating arrangements at leisure amenities and school sports facilities.

Initially Djokic specified another precast system for the proposed amphitheatre design, but after a presentation by Consent LLC on the Terraforce 4x4 Multi Step block and L16 retaining block and their colour options, the design was re-rendered with Terraforce blocks.

The final design, completed by Fred Laker of Terrasafe, Terraforce's international retaining wall design service, was approved by Parsons, and in October 2013, Palmera Agriculture Business LLC ordered the 4x4 Multi Step and L16 blocks.

Approximately 5,100 4x4 Multi Step blocks and 4,757 L16 blocks were used, and LED lighting was installed at intervals to create the delightful night-time ambience. The amphiteater was completed 2014.■

More information from Terraforce,
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Rocla awarded ISO 9001:2008 certification

Rocla has been certified ISO 9001:2008-compliant after an audit by TÜV Rheinland Inspection Services was conducted in November 2015. The audit covered Rocla's processes for design, development, manufacture and delivery of precast concrete products for the infrastructure sector.

Said Rocla's quality assurance manager, Vernon Gounden: "We are delighted to have received international recognition by our compliance with ISO 9001:2008 standards. It enables Rocla to meet SABS requirements as well as enabling us to meet tender requirements."

"All of our products and processes were audited by TÜV Rheinland Inspection Services who audited our Roodepoort, Virginia and Newcastle sites. This certification shows that we at Rocla implement industry-recognised design and manufacturing processes with stringent quality controls in place which ensure customer confidence in the performance of our products."

TUV Rheinland Inspection Services congratulated Rocla on their achievement stating that it gave Rocla a unique opportunity to present its 'outstanding quality standards' not only within South and Sub-Saharan Africa, but globally.

The company is a leading manufacturer of precast concrete infrastructural products throughout South Africa, Namibia and Botswana. Rocla is able to offer design and manufacture of products to meet customer's specific requirements.

In addition, Rocla has developed the mobile plant concept, which involves the manufacture of products on site in order to minimise transport costs. Although the products are not manufactured in a 'factory environment', the attention to quality is not neglected. The SANS specifications in respect of product quality and manufacture are followed, and the SABS identification symbol to show compliance with relevant specifications is displayed.■

More information from Guinevere Thomas,
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email: Guinevere.Thomas@isgroup.co.za
www.rocla.co.za

Double Zig-Zag paving and kerbs for the new Medi-Clinic in Limpopo

Medical facility design strives to create an ambience that pleases and reassures both patients and visitors to a medical establishment. To achieve an aesthetically pleasing and safe finish, paving and kerbs around walkways, parking and emergency drop-off zones need to comprise quality products that are professionally installed. The Double Zig-Zag (DZZ) paving and kerbs from Technicrete were chosen to meet such criteria at the new Medi-Clinic in Polokwane, Limpopo.

The 200-bed clinic required an area of 2,550 m^2 to be paved. Technicrete ISG, part of the IS Group of companies, supplied: 80-mm DZZ (Grey) 2,360 m^2 , 60-mm DZZ (Slate) 65 m^2 , 60-mm DZZ (Tan) 65 m^2 , 60-mm Trojan Square 60 m^2 as well as 96 x 1.00 m Fig.7 semi mountable kerbs.

Hendrik Steenkamp, Technicrete ISG sales consultant in Polokwane, said "The scheduling on this project was extremely tight, and we were pleased to be able to meet all deadlines presented to us by the developer and building contractor. We overcame product availability challenges and sourced the correct quantities required from our Technicrete Stilfontein manufacturing plant, and still met all delivery deadlines."

"The safety of people who utilise the parking and visitor areas at medical facilities is crucial to us at Technicrete ISG, and it is critical that all walkways and kerbing are professionally installed with a flawlessly evenly-laid finish.

"The final appearance of the parking and the emergency areas at the Polokwane Medi-Clinic is aesthetically pleasing and functional. Technicrete products were chosen above other paving bricks due to our excellent product quality and durability. Our preferred paving supplier status is based on our service, on-time delivery reputation and after-sales support." said Steenkamp.

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

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Mammoth precast concrete culverts chosen for Tweefontein Stacker Tunnels

Close on 800 giant precast concrete culverts, three-and-half metres high and just over five metres wide, were deployed in the construction of two buffer (stockpile) tunnels at Glencore's Tweefontein Optimisation Project near Witbank in Mpumalanga.

Manufactured by the Concrete Manufacturers Association (CMA), member, Aveng Manufacturing Infraset, and designed by the company's technical marketing manager, Coenraad Groenewald, these were some of the country's largest culverts thus far and could well have been its biggest single culvert order ever. Weighing 12.8 tons each, they were produced at Aveng Manufacturing Infraset's Brakpan manufacturing facility.

International consulting engineering concern, DRA Mineral Projects, was responsible for the engineering, project management and construction work on the entire project. DRA also designed the coal handling system in collaboration with civil and structural consulting engineering company, Holley and Associates. Wilson Bailey Holmes was the main civil and earthworks subcontractor and won a Construction World Best Projects 2013 award in the Civil Engineering Category for its involvement in the project.

This is the first time that DRA has used precast concrete culverts for erecting coal stockpile tunnels. Although steel and in-situ concrete were also considered, DRA project engineer, Arthur Oosthuizen, said durability and maintenance concerns with steel tunnels and time constraints with in-situ concrete construction prompted the decision to opt for precast concrete.

"Although the precast concrete approach had been untested in this type of application until this project, we believe it will become our default choice on future projects," says Oosthuizen.

"Produced from solid steel-reinforced concrete, the culverts were designed to handle well in excess of the maximum 20-ton loading they are likely to encounter at the Tweefontein buffer zones," says Groenewald. "Each contains 600 kg of reinforced steel and measures 3.5 m (height) x 5.3 m (width) x 1 m (depth). The walls are tapered, with a maximum thickness of 350 mm at the top end which narrows to 300 mm at the base of each foot."

The initial requirement was for a height of 4.7 m but this would have rendered the culverts too large for transportation by road. To make up the required height, the foundations have been built with elevated uprights measuring 500 mm.

"Given the culverts' non-standard dimensions, six custom-made steel moulds were used for the casting, which is done horizontally. The moulds were designed and supplied by local steel fabricating company, Mario Meano Engineering. Seven 200 x 200 mm steel utility plates were cast into the inner sides of each culvert to be used as attachments points for the channelling electrical cabling and other types of conduit. Once cured, the culverts were loaded horizontally onto low-bed trucks, each bearing two culverts," said Groenewald.

The simple and safe handling of the culverts, both at the Brakpan plant and at Tweefontein also required some additional engineering and special steel lifting beams were designed by Groenewald. Rather than using custom-made machinery to shift the culverts into the vertical plane on site, Groenewald adopted an innovative approach by using gravity. This was done by attaching a steel beam to the upper end, and then by simply lifting this end with a crane, the culvert gains its vertical elevation. It is then easily raised and lowered into position on the foundation.■

More information from Coenraad Groenewald, Tel: +27(0)11 876 5100 / www.infraset.com

Two culverts are loaded onto a low-bed delivery truck at Aveng Manufacturing Infraset's Brakpan factory.

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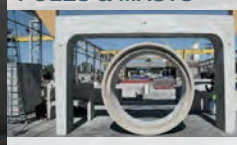

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Reducing plastic shrinkage cracking using micro fibres

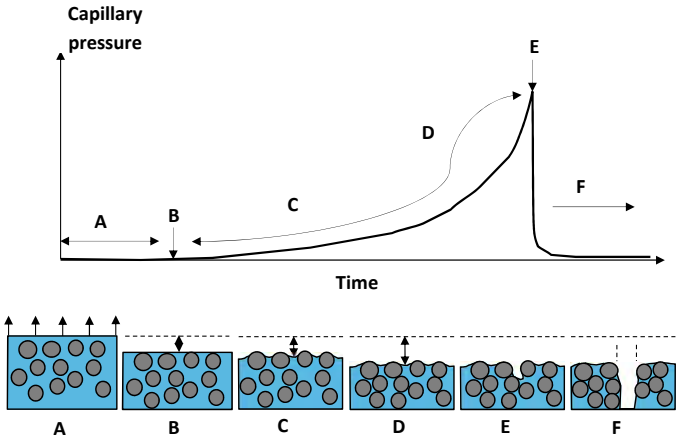
Plastic shrinkage cracking (PCS) is one of the earliest forms of cracking in concrete and can be a major headache for engineers, contractors and property owners. These cracks occur within the first few hours after the concrete has been cast and are not only unsightly, but also reduce the durability and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

Environments with high evaporation rates increase the capillary pressure in the concrete and are characterised in South Africa by conditions with a low relative humidity, direct sunlight as well as high wind speeds and high ambient temperatures. Concrete elements with large exposed surfaces, for example: slabs or pavements, are especially vulnerable to evaporation and therefore also to PSC. The process of capillary pressure build-up due to evaporation and the consequent cracking are illustrated below.

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

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

Internal measures influence the internal structure and behaviour of the concrete. Tests at Stellenbosch University have shown that the most common and successful internal measure to reduce PSC is the addition of a low volume of polypropylene micro-fibres to the concrete. The fibres reduce crack widening by transferring the stress induced by capillary pressure across the crack. Image top right: a direct tensile test on plastic concrete clearly shows the fibres bridging the crack even after extensive crack opening. In general, the higher the dosage of fibres the less severe the cracking will be. However, the addition of fibres also influences fresh concrete properties such as bleeding and workability. It is therefore important to conduct trial mixes, especially at higher dosages, although a typical dosage of 0.6 kg/m³ can be prescribed as a proven dosage that effectively reduces PSC without negatively influencing the workability of the concrete.



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

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

Finally, although fibres provide resistance to PSC, they do not always result in a 100% crack reduction and the addition of fibres does not justify neglecting the application of external preventative measures.

Another common and worrying practice in the construction industry is the use of steel mesh to reduce PSC. This is a misconception as the steel mesh may, in certain cases, even aggravate the PSC of concrete by providing vertical and horizontal restraint. The steel mesh is meant to control drying shrinkage cracking which occurs long after PSC has finished.

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

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

More information from SAPY on Tel: +27(0)31 736 8700 www.sapy.com

Inspired by ancient Suzhou gardens, two Chinese courtyards are 3D printed

By Alec

In 2014, Shanghai-based company Winsun made headlines when it built ten 3D printed houses in under 24 hours. Since then, Shanghai WinSun Decoration Design Engineering Co has followed their initial success with many 3D printed concrete creations. They have just revealed their latest achievement: two gorgeous 3D printed Chinese courtyards, inspired by the ancient Suzhou gardens.

Currently in their 13th year of business, WinSun holds ±100 national patents for construction materials, and have remained at the forefront of concrete 3D printing.

In 2004 and 2005, the company developed a 3D printing spray nozzle and automatic material feeding system. This was followed by a 3D printed wall in 2008. Their biggest achievements were realised a year ago, when they finished work on two extraordinary 3D printed creations: the world's tallest 3D printed building and the world's first 3D printed villa.

These Chinese courtyards were inspired by the 1000-year-old Classical Gardens of Suzhou. And the results are truly remarkable. When entering the garden-style courtyard through the red door, you immediately see the unique rhythm wall texture of the 3D printed building. The courtyard includes a gallery, a garden, windows, vertical green walls, and even 3D printed chairs and tiles.

The green walls have also been specifically designed to add to the landscape of the courtyard, and feature space-saving pockets in which vegetables and fruit can be grown. According to its designer Ma YiHe, the courtyard even features specially added wells and fish tanks that form an aquaponics system.

Every detail of the two courtyards (80 m^2 and 130 m^2), has been carefully designed. According to Ma YiHe, every detail has been compared to the actual floor loft, while calculations were made for each scale pitch, every angle and height. All have been integrated based on established principles for acoustic, optical and physiological resting needs.

The design has also been carefully set up to create the illusion of far more space through surrounding lines and the connections to surrounding rooms. According to Ma, the 80-m^2 courtyard feels more like 100 m^2. Throughout, however, the links to the Suzhou gardens can be seen.

Visiting industry experts were very impressed and praised the site as an architectural masterpiece that combines traditional Chinese culture with modern technology. One representative of tourist attractions even said that they were planning to construct a 3D printed hotel inspired by the gorgeous courtyards.

The WinSun Suzhou plant is becoming something of a theme park for lovers of 3D printing. Apart from the office building, the villa and the courtyards, WinSun also has a 3D printed mobile office on display, which is set to be exported to Dubai, as well as a 3D printed nursing home for two patients, and a 3D printed urban underground pipe network infrastructure. Previously, they also exported several 3D printed housing modules to Egypt. A truly remarkable location, in short, for 3D printing fans.■

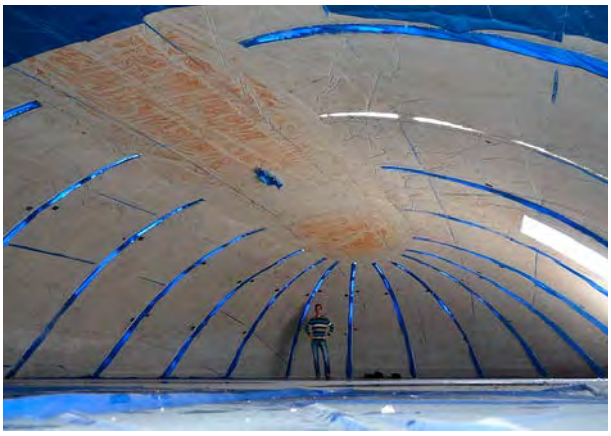
From 3D Printing Application

Source: http://goo.gl/9VlKdz

New construction technique allows concrete domes to be 'popped up'

By Ben Coxworth

There probably aren't many domed concrete structures where you live, and there's a reason for that – they're difficult to build. Doing so usually requires the construction of a supporting wooden structure that holds the concrete in place while it hardens. Now, however, a team at the Vienna University of Technology has devised a system that allows concrete shell structures to simply be 'inflated' and cinched together with a steel cable.



Inside a test dome built using the pneumatic wedge method.

Flat rebar forms are laid out on top of a deflated plastic air cushion.

Concrete is poured into the forms and allowed to set, creating a series of flat slabs.

Called the pneumatic wedge method, the technique has been likened to peeling an orange and laying its skin flat on a table – except in reverse. Here's how it works:

First, a number of flat rebar forms are laid out side-by-side on the ground at the building site, on top of a deflated plastic air cushion.

Concrete is then poured into those forms and allowed to harden, resulting in a series of flat slabs. Metal beams and a steel cable are subsequently attached to those slabs, linking them all together.

Next, the dome-shaped air cushion is inflated. As it fills with air, it lifts the slabs up from underneath, causing them to bend with it in the process. At the same time, the cable is tightened in order to snug them in against one another, with the connecting beams ensuring that they all move in unison. All of the slabs have wedge-shaped edges that allow them to securely interlock with their neighbours.

Once the shell is up, the air cushion is deflated and removed, and the beams and cable are taken off. The bending of the hardened concrete does cause some small cracks to appear, but these reportedly don't affect the stability of the structure. "If the shape is right, each stone holds the others in place and the construction is stable," explained project co-leader Prof. Johann Kollegger.

Finally, the whole thing can be covered with a layer of plaster, adding a bit more strength (and perhaps also keeping people from wondering about those cracks).

In a test of the system, a concrete dome measuring 2.9 m in height was built in approximately two hours. According to Kollegger, shells of up to 50 m in diameter should be doable. The other project leader, Benjamin Kromoser, believes that the technique should reduce the construction costs of such buildings by about 50% – along with savings in time and also in materials.

Austrian Federal Railways has already commissioned a design for a wildlife overpass that incorporates the technology and the technique could also be used for building band shelters.■

Source: Vienna University of Technology

Source: http://goo.gl/9PzIiU

The dome-shaped cushion is inflated, lifting and bending the slabs. The cable is tightened to bring slabs together.

UCLA researchers turn carbon dioxide into sustainable concrete

The new building material could transform polluting emissions into a valuable resource

By George Foulsham

Imagine a world with little or no concrete. Would that even be possible? After all, concrete is everywhere – on our roads, our driveways, in our homes, bridges and buildings. For over 200 years, it's been the foundation of much of our planet.

But the production of cement is also one of the biggest contributors to greenhouse gas emissions. An even larger source of carbon dioxide emissions is flue gas emitted from smokestacks at power plants around the world. Carbon emissions from those plants are the greatest source of harmful global greenhouse gas in the world.

A team of interdisciplinary researchers at UCLA has been working on a unique solution that may help eliminate these sources of greenhouse gases. Their plan would be to create a closed-loop process: capturing carbon from power plant smokestacks and using it to create a new building material – CO2NCRETE – that would be fabricated using 3D printers.

"What this technology does is take something that we have viewed as a nuisance — carbon dioxide from smokestacks – and turn it into something valuable," said J.R. DeShazo, a Professor at UCLA's Luskin School of Public Affairs and director, UCLA Luskin Center for Innovation.

"This technology tackles global climate change, which is one of the biggest challenges that society faces now and will face over the next century," DeShazo said.

DeShazo has provided the public policy and economic guidance for this research. The scientific contributions have been led by Gaurav Sant, associate professor and Henry Samueli Fellow in Civil and Environmental Engineering; Richard Kaner, distinguished professor in chemistry and biochemistry, materials science and engineering; Laurent Pilon, professor in mechanical and aerospace engineering and bioengineering; and Matthieu Bauchy, assistant professor in civil and environmental engineering.

This isn't the first attempt to capture carbon emissions from power plants, but the challenge has been what to do with the carbon dioxide once it's captured.

"We hope to not only capture more gas," DeShazo said, "but we're going to take that gas and, instead of storing it, we're going to try to use it to create a new kind of building material that will replace cement."

"The approach we are trying to propose is you look at carbon dioxide as a resource – a resource you can reutilise," Sant said. "While cement production results in carbon dioxide, just as the production of coal or the production of natural gas does, if we can reutilse CO_2 to make a building material which would be a new kind of cement, that's an opportunity."

The researchers are excited about the possibility of reducing greenhouse gas in the U.S., but even more so in China and India. "China is currently the largest greenhouse gas producer in the world, and India will soon be number two, surpassing us," DeShazo said.■

Source: http://goo.gl/OhKfNh

J.R. DeShazo, left, and Gaurav Sant show off a sample of the new building material they have created to replace concrete.

The Jamming Phenomenon: 3D printing with string and rocks

By Bridget Butler Millsaps

Just pull the string and the whole thing comes down. While that's some highly engineered string, the concept may simplify the world of architecture and construction in terms of materials and structure forever. Using reversible concrete, the Self-Assembly Lab at MIT and Gramazio Kohler Research of ETH Zurich are shaking up the traditional idea of what we use this particular and very common material for – and how.

Concrete brings to mind strength, durability, and construction that is meant to last. With reversible concrete, you still have all those qualities, but it's up to you as to how long you want things to last. With 3D printing showing nearly all of its benefits in full force, the team completed an architectural installation at the Chicago Architecture Biennial in the form of Rock Print – a towering vertical shape, and one that is strangely stunning.

As soon as the term 3D printing enters the picture, you most likely assume the material mass (here, concrete rocks) is what was somehow being extruded, but this is where you have to turn your thinking around, grasping the new world of opportunities being offered by the new process the team is demonstrating. The extruder is responsible for producing only the string, placed according to strategic algorithms, within supplied volumes of rocks. And the string is ultimately the controlling mechanism within the structure as well, which in this particular case was a column, 13 feet tall.

"We are using a similar technique to powder-based printing," Skylar Tibbits originally explained to The Creators Project. "There is a container, material is deposited layer by layer and a binder, (in this case the string) is applied to each layer in the specific pattern of the slice."

The architectural team was inspired several years ago by Chicago University Professor Dr. Heinrich Jaeger. He hosted a conference which was attended by a number of architects, physicists, and those engaged in the study of materials sciences and presented his idea for 'the jamming phenomenon,' wondering how they might all make it work—with the idea of simply, yes, shoving a bunch of materials together into one place. This is where team members from both MIT and ETH Zurich began work on the eventual column, which would certainly seem to be a perfect response to Jaeger's query.

"This is the beginning of the research and a step towards an alternative to concrete," said Installation project lead Andreas Thoma of Gramazio Kohler Research.

Undeniably, it's a different way of using concrete (or other materials), that may lead to so far untold levels of customisation and portability, considering that you can wind the string up and pull the plug on the whole piece, left with some sweeping in the end – and eventually, no trace of the structure whatsoever.

"When structures are aggregated from crushed gneiss, we get load-bearing structures that can withstand enormous forces," says Thoma. "The ability to digitally fabricate, disassemble, and reassemble structures with no material losses changes the paradigm of architecture as well as the view of permanent / temporary architecture."

As we've waited to see what would truly pan out for 3D printing, infrastructure concerns, construction, and far more, this is a very exciting concept that allows for so much choice, and also employs some of the 4D printing concept in going further to offer materials and structures that can be intuitive and morph into required shapes as necessary. Many concepts (emphasis on concepts) have been introduced, with stories about changing the world of road construction by rolling out everything from 3D printed asphalt to mobile printers fixing potholes, to aerial 3D printing drones that will work as mini-factories from the air, constructing buildings and even emergency shelters.

This could translate to offering fluid customisation in terms of populations, occupancy requirements, and basic changing times. Just imagine a world where when the needs change for a structure, it's not left standing abandoned and in disrepair for years, or torn down, or 'imploded.' This new concept allows for the idea of sustainability in many areas of the world, speed in both putting together and taking down, and undoubtedly, much greater affordability.■

[Source: Green Building Elements / All images © Gramazio Kohler Research, ETH Zurich, and Self-Assembly Lab, MIT, 2015]

https://3dprint.com/123825/3d-printing-string-and-rocks/

Don't take a break when you're curing concrete

Interrupted curing of concrete will inevitably have a negative effect on the final quality of the concrete, cautions Bryan Perrie, MD of The Concrete Institute.

Perrie says the need for continuous curing of concrete is most critical during the first few days after the concrete has been cast. "When curing is interrupted in this period, and the cement paste is allowed to dry out, hydration of the cement ceases. More importantly, it becomes more difficult to get water back into the pore structure during subsequent wetting to re-activate the hydration process," he says.

The difficulties for water to effectively reach the pore structure is caused by the following developments which take place when the concrete dries out:

- The pore water is saturated with calcium hydroxide and when the water evaporates, this is deposited in the pore structure near the surface of the concrete;
- The calcium hydroxide reacts with atmospheric carbon dioxide to form poorly soluble calcium carbonate which occupies a larger volume than the original calcium hydroxide; and
- This volume increases which, coupled with the fact that calcium carbonate is considerably less soluble than calcium hydroxide, reduces the access of water back into the pore structure.

Don't allow concrete to dry out during the curing process, The Concrete Institute has advised.

"In this way, when concrete is allowed to dry, pockets of unhydrated cement are created which are surrounded by hydrated material and pores blocked with calcium carbonate. Because of their inaccessibility to water, these pockets of cement will not be hydrated when the concrete is wetted again and the cement will end up serving only as fine aggregate particles.

"This is why the quality of concrete exposed to interrupted curing, or intermittent cycles of wetting and drying during the early stages of hydration, will always be inferior to that of continuously cured concrete," Perrie adds.■

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

Silicones – a sustainable protection for construction materials

By Dr. Anke Reinschmidt, and Markus Roos, Evonik Germany

The beading performance of polysiloxanes.

Silicone-based products are finding widespread use in the construction industry due to the unique properties embodied in the molecular structure. This article explains their function as water repellents to increase the durability of building materials.

Introduction

Silicone-based water repellents have been used in private and industrial applications, such as textile, leather, paper, household care, paint and construction industries for many years. Starting from simple silicone oils up to sophisticated organomodified siloxanes, silicones hold strong positions in water repellency.

Water repellents based on silicones add value to building materials. Whether you are sourcing additives for integral or topical building protection, silicone chemistry is present everywhere. They are being used as performance and processing aids for various applications such as pavers, prefabricated concrete, readymix concrete, drymix and construction materials.

Properties of silicones

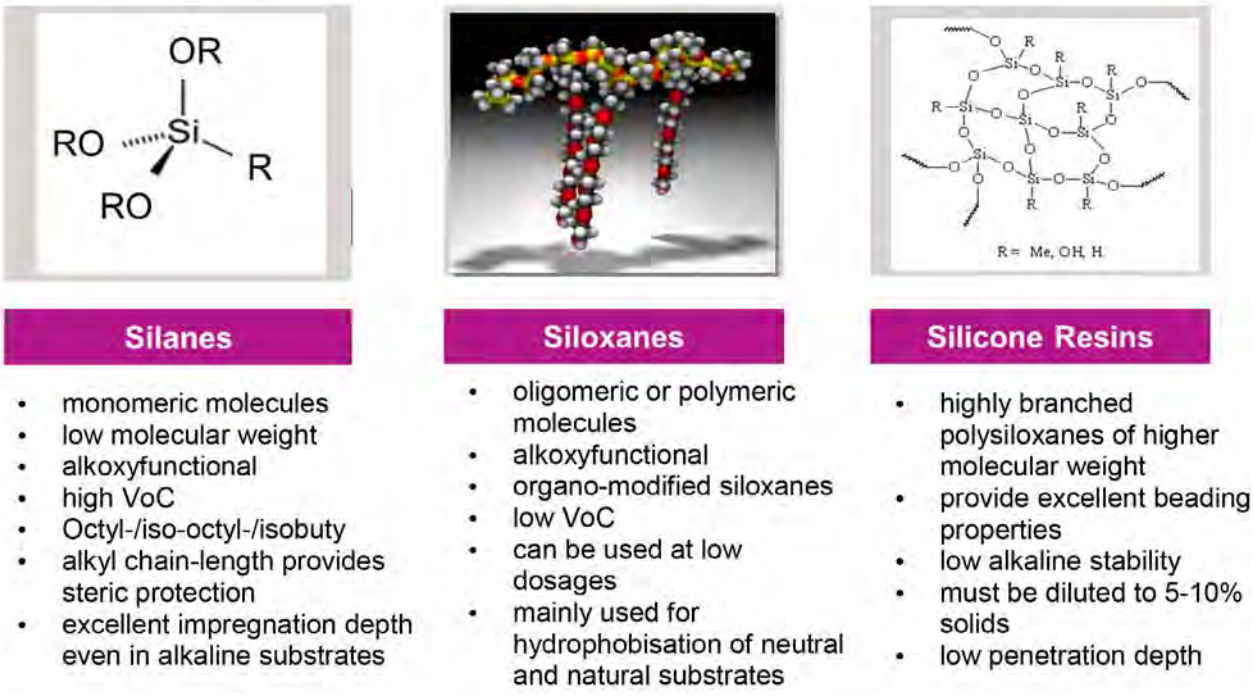
Silicones cover a broad physical spectrum of low-viscosity oils, greases, rubbers and resins. Polaric siloxane functions like SiCl, Si-H or SiO-alkyl have a higher reactivity compared to the equivalent carbon compound and can be readily transformed by esterification, transesterification, condensation, addition and hydrosilylation to silicone copolymers for the synthesis of modified siloxanes.

The major success of silicones is related to the diversity of their properties. Beside their thermal stability and high weather resistance, their viscosity is less influenced by temperature changes. Even at low freezing points they keep their elasticity. The relatively low surface tension of 22 mN/m provides water repellency and high surface activity which reflects the low intermolecular interaction of silicone oils for their use as release agent, lubricants or defoamers. Almost all silicones are biologically inert and nontoxic.

Because silicones are highly efficient, the dosages in the applications are relatively small compared to other non-silicone based materials. Dosages of 0.2% or less are mostly used in applications to improve the quality as well as the durability of the final materials.

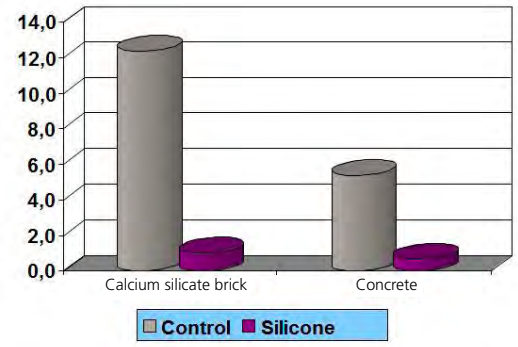
Silicone-based water repellents for use in cementitious construction materials

The major properties of silicones in cementitious construction materials are: water repellency, efflorescence control and foam control.



The different silicone-based water repellents.

Water uptake reduction of silicones in %



Efflorescence control by silicones

TEGOSIVIN® HE 328

control

Water repellents based on silane/siloxane technology

Among the various kinds of hydrophobic products developed for the building industry, silicone resins, silanes, oligomeric and polymeric siloxanes have proven to perform best in protecting construction materials from water penetration and environmental influences. They are supplied in several conditions depending on applications. Silane/siloxanes provide superior water repellency and excellent beading along with true long-term performance resulting in sustainable protection of buildings and architectural constructions.

Performance advantages of silicone-based water repellents in mortars and concrete

By adding silane/siloxanes to concrete or mortars the water uptake can be reduced by more than 90% referred to the untreated reference. Admixtures based on silicones prevent primary efflorescence during the curing of the concrete. As a result, fading of pigmented products can be strongly reduced or even eliminated. Furthermore, salt blooming which is known as secondary efflorescence is also significantly reduced.

Evonik is a creative industrial group, and is one of the world leaders in speciality chemicals. Evonik is driven by innovation in products, processes and solutions that make a difference for our customers. At the same time we are committed to environmental responsibility and sustainable socio-economic development.

Based on over three decades of experience and continuous improvement, water repellents from Evonik set the benchmark in terms of efficiency and performance. Additives for admixture applications like defoamers and our innovative powdered products for dry mortar applications complement our portfolio. Our leading position in interfacial chemistry, broad product technology, global technical service and distribution network make Evonik a valuable partner for all formulators in the construction industry.■

More information from Rashid Jaffer,
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Polymeric binders improve construction materials

By Mohammed Sanaobar, Wacker Chemicals Middle East

Usually invisible, but always indispensable: Wacker's polymer dispersible powders have been leaving their mark on the construction industry for over 50 years. Enabling high-quality building materials with precisely defined technical properties, as well as opening up many novel applications and techniques, polymeric binders have revolutionised the construction sector.

Until the 1950s, mortar was prepared directly at the construction site from the individual raw materials. But 'traditional' mortar comprising cement, sand and water can only be used with porous substrates. That's why ordinary mortar was soon unable to meet growing demands of the construction sector. Therefore, liquid polymer binders were added to mortar to enable better adhesion to a wider range of substrates. The drawback to this system, however, was that exactly the right amount of polymer binder had to be added to the mortar – at the construction site – which meant that metering errors were common.

Pre-mix dry-mortars invented

The invention of dispersible polymer powders made it possible to pre-mix dry-mortars at the factory. On construction sites, these dry-mortar systems only needed to be stirred with water, simplifying site procedures and bringing economic advantages. Dispersible polymer powders – such as Wacker's leading brand Vinnapas® – constitute what are known as spray-dried dispersions.

When water is added, the particles disperse, hence the name 'dispersible polymer powder.' As the mortar sets, flexible polymer bridges are formed between the brittle, mineral constituents of the mortar, thus rendering possible, or greatly improving, its adhesion to a wide range of substrates. The polymer bridges simultaneously increase the system's flexibility.

For high-quality, low-emission tile adhesives: with the aid of VINNAPAS®, even modern large-format or very thin tiles, and porcelain or natural stone materials, can be bonded reliably (photo: Wacker Chemie AG).

Additional properties, such as thixotropy, flow, water retention and water-repellency, may also be conferred on the mortar.

Modern tiling: flexible handling, cost-efficient application

A good example for the benefits of modern dispersible powders are polymer-modified tile adhesives: When using polymer binders, the tiles need not be 'tapped' into a thick layer of mortar – a thin layer of adhesive is perfectly sufficient. With the thin-bed technique, much less adhesive and working time is needed, cutting costs substantially.

For example: whereas, in the past, 10 kg of tile adhesive were needed per square metre, only 3 kg of dry mortar containing Vinnapas® powders are needed if the mortar is spread with a toothed trowel. After being pressed into the mortar, the tile will adhere immediately without slipping. In modern construction units such as skyscrapers, polymer binders are particularly beneficial as they reduce the overall weight of these buildings, impacting positively on the steel frame and foundations.

Enhanced thermal insulation

Another example of the benefits of polymer powders is external thermal insulation composite systems (ETICS). Effective thermal insulation is the best way to save energy: modern ETICS lower costs for heating and cooling, as insulated walls balance the indoor climate.

Because of its excellent insulating properties, expanded polystyrene board is generally the material of choice. However, its disadvantage is that it does not form a stable bond with the cement. Polymer powders can overcome this. Adhesive mortar containing just a low percentage of Vinnapas® powder will form a stable and permanent bond with the polystyrene board, thus ensuring mechanical stability of the system.

Competence Centre for Construction Chemicals

The flexibility of Vinnipas® grades applies to regional distinctions. Locally available raw materials such as sand, cement and fillers are not always the same, so the formulation must be optimised for those ingredients and take account of specific climatic conditions.

That's why Wacker runs Technical Centres all over the world. The Technical Centre in Dubai supports customers from all over Africa in the development of new products and applications for the region's markets. Additionally, a dedicated training facility is catering to the specific needs of the African construction-chemicals sector. The Wacker Academy provides an opportunity to learn about all the relevant aspects of modern polymer and silicone chemistry and related applications.

To address the individual requirements of the upcoming construction industry in Africa, Wacker is further creating tailor-made solutions for its local customers, such as mobile labs or individual consolation hours for technical support.

The worldwide construction boom is driving demand for sophisticated specialty products and high-tech applications. Modern high-quality construction, however, requires the use of polymeric binders and a broad knowledge of these construction chemicals.■

More information at www.wacker.com or www.wacker.com/cms/en/mea/mea_home/home.jsp

Water tight construction and repair of concrete

Using Kryton Cystalline Concrete Waterproofing Technology. The only concrete waterproofing solution!

Kryton Crystal Growth can self-heal cracks guaranteed to 0.5 mm and in some cases 0.7 mm.

To make concrete completely waterproof – which means both preventing water passage and resisting hydrostatic pressure – the use of crystalline technology is imperative as these integral systems block water passage from any direction by working from the inside out, making the concrete itself the water barrier.

In contrast to water repellents such as conventional positive side sheet membranes, crystalline technologies enable self-sealing. The admixture (such as Kryton KIM) is a blend of cementitious and proprietary chemicals that actually work with the available water and un-hydrated portland cement in concrete to form insoluble crystals. These needle-like crystals grow until all pores are blocked and no water can penetrate the concrete. The crystalline formula can enable concrete to self-seal hairline cracks guaranteed to 0.5 mm and in some cases 0.7 mm, even years after the original construction.

Concrete treated with these admixtures contains chemicals that lie dormant within. If a crack forms, any water influx causes more crystals to grow, re-blocking and sealing the passage against water and waterborne contaminants. Whenever new water enters the concrete through changing water levels or new cracks, crystals continue to grow and seal the concrete. The crystals within the concrete are impervious to physical damage and deterioration; there is no danger of punctures, tears or seam leaks. As a result, a building's durability increases when crystalline admixtures are used.

Kryton has waterproofed thousands of high-risk concrete waterproofing projects around the world using Krystol Technology, including the luxurious 5-star Saadiyat Resort in Abu Dhabi, Singapore's Marina Bay Sands, and the mega-project CityCenter in Las Vegas with tremendous success.

South African success stories include the Kakamas Hydroelectric Scheme in Upington, the Finsch Mine Reservoir in the Free State and Anglo American's smelter silos in Polokwane.■

More information Tel:+27(0)11 425 3061
info@sanika.co.za / www.sanika.co.za

Paraiso Bay beach towers stand tall – and well protected

Located in the Edgewater district of Miami, this luxury residential waterfront complex is situated on approximately two hectares with 152.5 metres of frontage on Biscayne Bay. It features two 53-storey condominium towers, each with 325 units, and includes amenities that include a beach-entering pool, beach club, marina, spa and fitness centre.

With the initial phase of construction using Penetron crystalline concrete technology completed recently, the Paraiso Bay project now moves to the first two of four luxury residential towers. This remarkable development, outsized even for Miami, is designed by Arquitectonica, an international architecture and urban planning company in Miami.

Water everywhere: These views of the Paraiso Bay construction site show its proximity to the Atlantic Ocean, which explains the high water table.

Superior to conventional solutions

Traditional waterproofing systems were rendered ineffective by the site's oceanfront location, which exposed the building to chloride ions in the groundwater as well as salt spray. Penetron Admix (with green tracer in the bleed water) was added to the concrete during batching, providing a permanent and effective waterproofing solution.

Soluble bags for easy dosage

The integral admixture, Penetron Admix SB (in soluble bags), was added to the concrete during batching. The product is a non-toxic, third-generation crystalline admixture in powder form that is added to new concrete during batching.

Once inside the concrete, it reduces concrete permeability by permanently sealing microcracks, pores and capillaries and effectively protecting the concrete against water penetration and the effects of deterioration, even under high hydrostatic pressure.

Penetron Admix provides projects with self-healing concrete with the ability to reseal cracks that develop during the lifetime of the concrete.

The soluble bag packaging provided a quick and accurate dosage form, which also saved time. The treated concrete was used for the mat foundations of the towers, as well as several elevator pits.■

More information at www.penetron.com

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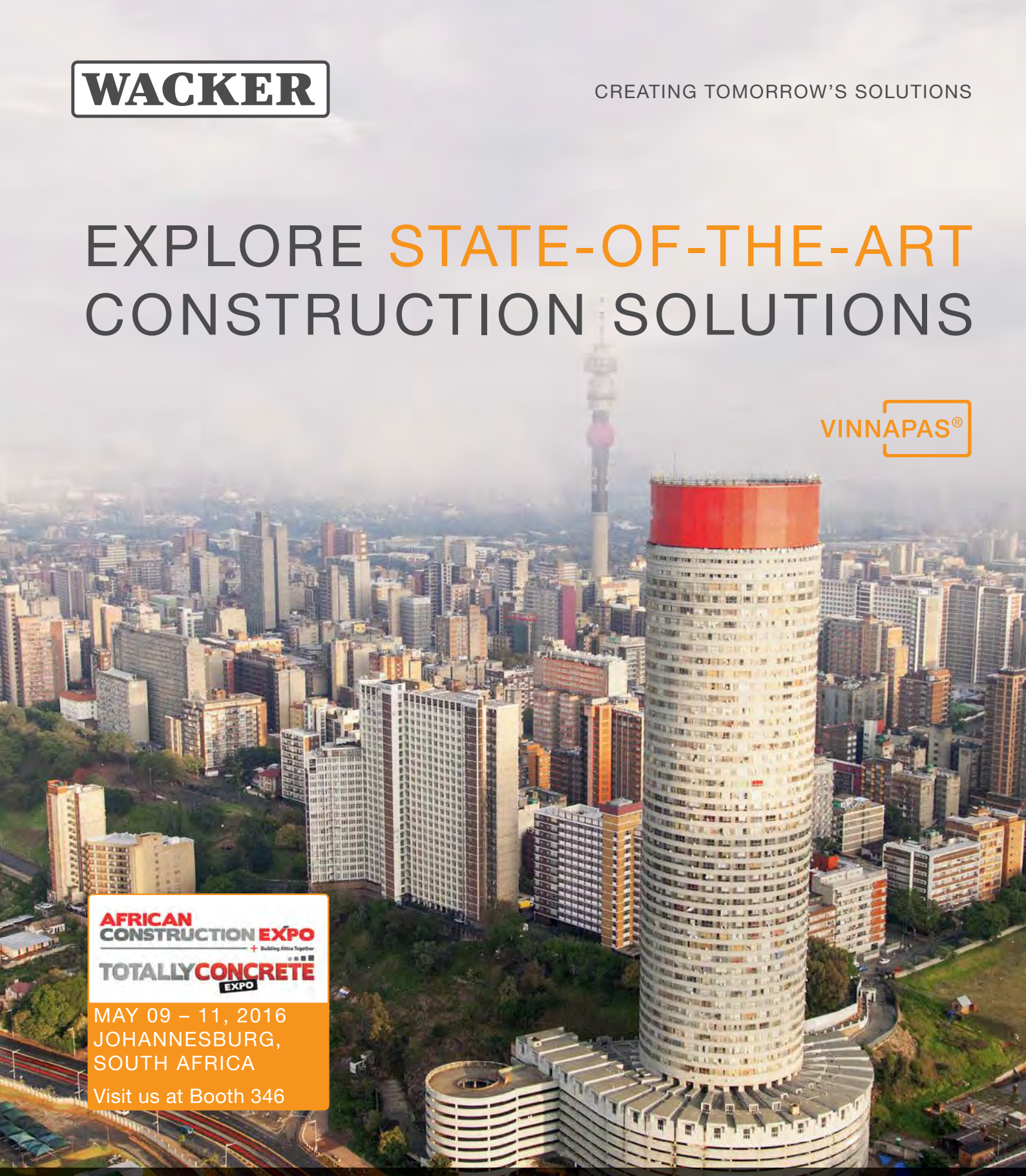

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Polymer modification is used worldwide to improve the properties of architectural coatings and cementitious building materials like tile adhesives. WACKER is a leading manufacturer of polymer dispersions and dispersible powders that can make your products more effective, more durable, more cost-saving and more sustainable. To do so sucessfully, we offer you extensive technical service and specific trainings in our Technical Center and the WACKER ACADEMY in Dubai. Find out more and visit us at the African Construction Expo and at www.wacker.com/construction

Wacker Chemicals Middle East FZE, Dubai, Tel. +971 4709-9999
info.dubai@wacker.com, www.wacker.com, www.wacker.com/socialmedia

Admixtures help avoid pumping bottlenecks

While achieving a dense, cohesive concrete mix with sufficient paste volume will enable the correct level of concrete workability, contractors must also pay attention to avoiding practices that will result in risky segregation during concrete pumping on construction sites.

"Where material segregates and the water separates out of the mix – where water washes out of the paste – there is a strong possibility of blockages occurring in the pipeline," says Eddie Correia, executive vice president at Chryso Southern Africa, a leading producer of superplasticisers.

These water-reducing agents facilitate good aggregate coating by dispersing the cement grains, thereby minimising agglomeration of the mix and increasing plasticity and therefore workability of the concrete.

Superplasticisers from the Chryso® Fluid range will assist in creating a favourable water:cement ratio by reducing the amount of water, and this also prevent shrinking, cracking and porous concrete.

Significantly, Chryso® has developed Fill Free® technology which assists contractors to produce concrete that is cohesive yet still has a moderate viscosity. This modified PCE-technology was developed to have non-thixotropic properties and makes use of Chryso® superplasticisers.

Correia explains that other factors that could contribute to segregation are pumping pressure and material grading. If the pumping pressure used is too high excessive pressure is placed on the mix and this could force segregation of the concrete during pumping. Likewise if the grading of the aggregates is incorrect, they will be pushed out during pumping and this will result in blockages in the pump and/or pipeline.

"When being pumped concrete moves in the form of a cylinder and is separated from the pipeline wall by a lubricating layer made up of water, cement and fine aggregate or sand. It is essential that this lubricating film is achieved on all sides of the pipe and that the requisite workability is attained so the concrete can be pushed or transported through this channel," he says.

Chryso® Fill Free® technology facilitates a cohesive concrete paste which is less sticky. This is important as stickiness can produce lower cleaning efforts in the pipeline and also increase the resistance of the flow of concrete in the pipeline. A paste that is too sticky will also make it difficult to maintain a constant rate of pumping.

Again, this is where superplasticisers from Chryso Southern Africa are invaluable in achieving the plasticity and workability needed for the concrete paste to pass easily through reducers and move through bends in the pump and pipeline without causing blockages.

Buildings are getting taller, an international trend that responds to growing global urbanisation patterns. The correct solutions and advice on how to use them from a reputable admixture producer, such as Chryso Southern Africa, have become a prerequisite for successfully tackling these projects. ■

More information from Kirsten Kelly,
Tel: +27(0)11 395 9700 / email:kirsten@chrysosa.co.za
www.chryso.com

It is vital to look at the concrete pumping application and determine the most appropriate admixture that will fulfil the requirement.

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For more information, go to www.master-builders-solutions.basf.co.za, or call Tel: +27 11 203 2405.

BASF
We create chemistry

Why floors fail: six main reasons

Most of the problems our technical staff deal with relate to concrete floors on the ground," says Bryan Perrie, MD of The Concrete Institute. "The number of problems seems to be increasing with the Institute reporting on some nine floors in the last two weeks."

Perrie says problems generally result in surface, joint and/or structural defects, and an analysis to determine why they occur identified six primary reasons:

Design by structural engineers

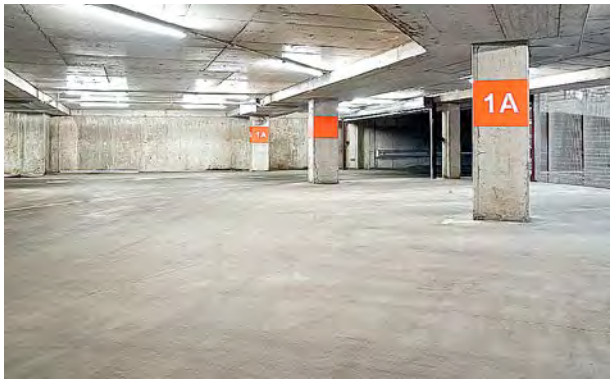
Concrete floors on the ground are, in effect, concrete pavements and should be designed, detailed and constructed as such by pavement engineers. The use of structural concepts such as using reinforcement to increase load-carrying capacity and reinforcement through construction joints will result in unacceptable cracking and, in some cases, overstressing of the floor and structural failure. There may be a lack of understanding of restrained drying shrinkage in floors on the ground. "Frequently engineers are unaware that design guides and software for designing concrete floors on the ground are readily available," Perrie states.

Inadequate detailing and/or specifications

Joint detailing, location and layout are all critical factors in the behaviour of concrete floors on the ground. There is a tendency to mix and match joint types and details from different design technologies which often results in poor joint/floor performance and even joint/floor failure. "An example of this is to use reinforcement in floor panels to control cracking when panel sizes are larger than 4 m – but then still using sawn contraction joints or keyed construction joints which are incapable of providing adequate load transfer due to the larger than normal opening of the joints at larger spacings ."

To date there is no standard specification which deals with floors on the ground. There is however SANS 10109 Parts 1 and 2 for the design, detailing and surface finishes, as well as a book entitled *Concrete industrial floors on the ground* available from The Concrete Institute. These documents provide guidance on detailing and specifying floors on the ground. The structural concrete specifications, SANS 1200 G or SANS 2001 CC1, are often used but these do not cover specific requirements for floors on the ground.

Perrie says employing outdated tolerance specifications – such as those using straight-edge measurements – can result in not achieving the tolerances required by the client. The best specification for tolerances is contained in the 4th edition of the British Concrete Society's Technical Report No 34 (TR34). Use of this specification may require special equipment or a specialised contractor to measure the floor to ensure compliance with the specification.



Concrete floors on the ground are effectively concrete pavements and should be designed, detailed and constructed as such by pavement engineers, advises The Concrete Institute.

Split responsibility on site

Typical issues include:

- The earthworks contractor's tolerances not being compatible with those for the concrete floor and resulting in the floor being too thin;
- The main contractor supplying to, or purchasing inappropriate concrete for, a flooring subcontractor; and
- The flooring subcontractor being only responsible for placing and finishing the concrete, but not for installation of shutters, joint cutting or curing.

Lack of skills or knowledge

This can stem from the client not knowing what he wants; the engineer not understanding the client's requirements and being unable to design and specify accordingly; the main contractor not understanding the risks for subcontractors working under certain conditions; main contractors doing specialised flooring contractors' work and subcontractors not understanding joint and tolerance details. "A good floor needs all parties to be involved at all stages of the project and to have open communications," Perrie advises.

Inadequate knowledge of materials and their behaviour:

"There is a distinct lack of knowledge about concrete's constituent materials and their effect on both plastic and hardened concrete. This includes cement type, water content and cement-water ratio's effect on concrete behaviour, and specifically on concrete floors, which may be unreinforced and have a very large surface-area-to-volume ratio. These all affect the rate of moisture loss, drying and therefore the risk of cracking," Perrie observes.

Inadequate appreciation of construction techniques

A lack of understanding of different construction techniques and their effect on concrete arises from the use of terms such as power floating and power trowelling interchangeably when they are different processes and produce very different finishes. "One of the least-appreciated procedures is the need for adequate protection and curing of floors on the ground. Protection should start as soon as the concrete is discharged and continue until the required finish is achieved, after which effective curing measures should be implemented."

Perrie says addressing the above issues will result in better-quality floors with fewer defects.

To assist industry, The Concrete Institute runs a one-day training course on the design and construction of industrial floors at which all of the above issues are covered. It also sells the publication mentioned in this article.■

More information from The Concrete Institute,
Tel: +27 (0)11 315 0300 or
email: info@theconcreteinstitute.org.za

Flextool Australia: specialists serving the ‘flat floor’ market

Flextool Australia Pty Ltd was founded in 1951 and is a specialist in design, manufacture and distribution as well as offering what is the most complete range of concrete equipment designed for the Flat Floor market. The company’s product line represents a complete system for site preparation, which includes the innovative concrete screeding machines sourced from Ligchine USA which Flextool distributes across Australasia and other markets.

The Ligchine screed machines can travel through difficult job sites via remote control, ensuring operator control with concrete placement control specifically designed to help improve the tolerances of concrete flat floors (as measured by F-Numbers) and increase daily production. This, of course, translates into better profit numbers. Further to laser screeds, Flextool offers a full complementary range of associated products and accessories including ride on and walk behind trowels to assist in the finishing process. All these products are available from and are backed by Flextool Australia’s sales network in Australia and Asia.■

More information from Peter Paras,
Tel: +61 418 552 369
email: peter.paras@parchem.com.au

The Ligchine screed machine in action on a building site.

Tough flooring products for new car workshop

The floors of the new Car Service City branch at the Carnival Mall in Brakpan after the application of a trio of robust a.b.e. flooring products.

A special epoxy coating system, with an exceptionally strong chemical resistance, has been supplied by a.b.e. Construction Chemicals to protect the floors of a new branch of Car Service City that recently opened at Carnival Mall in Brakpan.

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

Ryan Nel, technical sales consultant of a.b.e. in Boksburg, says the company supplied two products to sub-contractor, Spec-Floors, for painting the 350-m^2 floor. Spec-Floors have extensive experience in industrial flooring and have for many years been an approved a.b.e. applicator.

"We needed a floor coating that could withstand the brake fluid, oil and other liquids that are inevitably spilled in a motor vehicle workshop. Consequently, main contractor, Anastasi Construction, decided that the solution would be abecote SF 217, a solvent-free (SF) and high chemical-resistant clear resin system, to be preceded by a priming coat of a.b.e.'s Tough Epoxy Paint.

"Spec-Floors prepared the floor with a three-phase diamond grinder, and then applied two priming coats of abecote Tough Epoxy Paint: the first with a 10% water dilution, followed by an undiluted second coating. The paint – which is also solvent free and therefore equally environmentally-friendly – is a water-dispersed polyamide-cured paint. It is widely used as a protective, decorative and oil-resistant coating for cementitious, masonry and asphalt surfaces. Spec-Floors then applied two coats of abecote SF 217, a clear resin system for sealing, laminating, screening and grouting applications. This product offers high chemical resistance not possible with standard epoxies," Nel explains.

Finally, the workshop's demarcation lines were applied, using a.b.e.'s Tough Polyurethane Paint in Golden Yellow. This relatively new product from a.b.e. is also solvent free, and offers excellent chemical and stain resistance. It also resists hot tyre pick-up marks, scratching and scuffing.

Peter Jones, a.b.e. product manager: Flooring, says: "Ryan Nel should be commended for not only supplying a winning combination for the refurbishment of existing Car Service City floors as well as new floors of the Group, but also for providing extensive and invaluable technical input to the contractors," Jones added.

a.b.e. Construction Chemicals has also subsequently supplied the same product combination for refurbishing the 600-m^2 of concrete flooring at the Car Service City outlet in Northmead, Benoni.■

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

The Concrete Institute answers

Craze cracking in concrete floors

Q: Some time after completion of power trowelling on a concrete floor on the ground the surface exhibited a crazed appearance. What are the causes of this phenomenon, and how can it be rectified?

A: Crazing is due to shrinkage of the cement paste at the surface. It does not penetrate far below the surface. Crazing is especially noticeable when the slabs are damp. Factors that promote crazing are:

- Drying instead of curing before the floor develops much strength, particularly after hard trowelling;
- Curing with water much colder than the concrete, causing thermal shock;
- Alternate wetting and drying at early ages;
- Overuse of vibrating screeds and bull floats;
- Overworking and overtrowelling especially when the surface is wet;
- Premature floating and trowelling;
- Dusting dry cement onto the surface before trowelling;
- Excessive clay and dirt in aggregates;
- Water applied to the surface during finishing operations.

Although crazing is unsightly and may collect dirt, it is not of serious consequence. Hence repairs are usually not appropriate. However, grinding may be considered where crazing is shallow and the quality of the concrete is adequate.■

More information from the TCI Information Centre.
Tel: +27(0)11 315 0300
email: info@theconcreteinstitute.org.za

Packing a hefty punch

STIHL is a global leader in developing innovative power tools and its new cordless TSA 230 cut-off machine is another world-first winner. Powerful and effective yet compact and lightweight, the TSA 230 quickly cuts through concrete, bricks, pipes, tiles and metal with ease. Working environment is not an issue: indoor or outside, wet or dry cutting, the TSA 230 is ideal for precision tasks, with the bonus of being emission-free. Fitted with a standard-fitted water connection and optional vacuum adapter for clean, dust-free cutting, the TSA 230 is suitable for exterior and interior work, wet or dry conditions.

It is designed for numerous on-site applications, precisely cutting through walls, roofing, pipe-laying and interior décor. In addition to being versatile, the TSA 230 is convenient, simple and comfortable to use. The ergonomic handle allows the machine to be smoothly guided to a depth of 70mm for maximum efficiency. Tough, innovative, convenient and powerful – a typical STIHL professional grade performer that can handle any on-site challenge.

Like any premium item, STIHL products are only available at specialised dealers nationwide, for expert advice and superior after-sales service.

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BASF's Construction Chemicals division offers advanced chemicals solutions for new construction, maintenance, repair and renovation of structures. Our very comprehensive portfolio encompasses concrete admixtures, cement additives, chemical solutions for underground construction, waterproofing systems and sealants as well as 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 approximately 5,500 employees form a global community of construction experts. To solve our customers' specific construction challenges from conception through to completion of a project, we combine our know-how across areas of expertise and regions and draw on the experience gained in countless construction projects worldwide. We leverage global BASF technologies, as well as our in-depth knowledge of local building needs, to develop innovations that help make our customers more successful and drive sustainable construction.

BASF

We create chemistry

The division operates production sites and sales centres in more than 50 countries and achieved sales of about €2.3 billion in 2015.

BASF in Africa is divided into four country clusters, with headquarters in Midrand, South Africa for Southern Africa; Nairobi, Kenya for East Africa; Lagos, Nigeria for West Africa and Morocco for North-West Africa. BASF employs around 1,600 people in Africa. Since 2016, the BASF African headquarters is based in Nairobi.■

More information from BASF, Tel: +27(0)11 203 2400
www.basf.com/za

Ciolli Readymix (Pty) Ltd

Established in 1951 by Anthony and Vincenzo Ciolli, the company is now run by the third generation of Ciolli's who continue the proud tradition and uphold the reputation for personalised service built up over the last 61 years.

Ciolli Readymix is the latest addition to the Ciolli Group, launched in September 2008 with the full backing of the Ciolli Bros Group.

Investing in a German-designed wet batch concrete plant and new Mercedes trucks has proved to be a good decision. In a very difficult market, the company has expanded substantially by providing high-quality concrete, and good service with personal interaction.

Ciolli Readymix has successfully supplied to many major contractors, including WBHO, Power Construction, Steffanuti Stocks, Grinaker LTA and Group Five.

Current contracts include Curro School Century City; SANRAL Bellville Green Star Office Building; China Shoprite Park Parow; and Alan Grey Silos Waterfront, an award winning Green Star five-storey office and residential block situated in the V & A Waterfront.

The company's distribution plants in Philippi, Stellenbosch and two in Durbanville, along with a fleet of 20 Mercedes mixers, are capable of delivering over 800 m^3 of readymix concrete each day.

This is complemented by a team of highly qualified staff with many years of experience in the readymix industry.

As a proud member of the Southern African Readymix Association (SARMA), Ciolli Readymix batching plants are annually audited to ensure compliance with the highest standards and quality.■

More information from Tel: +27(0)21 557-1111
email: sales@ciollireadymix.co.za
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Upholding ethics during economic hardships

At a time when cash flow is tight, competition fierce and customers unrelenting, building professionals still need to put quality first and procure only quality assured materials to successfully complete projects.

With a myriad of new suppliers offering far better pricing for seemingly similar products, it is important to realise the critical nature of the houses and structures that we build and to realise that failure of the materials can have dire consequences for inhabitants of these structures, as well as having the potential to ruin the reputation of companies found to have used inferior products.

Southern African Readymix Association (SARMA) general manager, Johan van Wyk, says that readymix concrete is a prime example of a product that cannot be produced much more cheaply without cutting corners. In instances where one supplier is much cheaper than the other, they are probably using inferior non-SABS approved cement, or illegal aggregates, unqualified labour and also non-purpose-built equipment.

Construction in progress

"It is interesting to note that most SARMA-accredited readymix manufacturers' prices will be within a fairly narrow band as a result of fixed input costs. These relate to raw materials, capital equipment, labour, transport and other costs and do not differ very much from supplier to supplier. Where larger producers may gain a cost advantage over smaller operators for materials, the smaller ones can make up for these on lower capital repayments or payrolls. This ultimately has the effect of levelling the playing field and resulting in a threshold where prices are acceptable and producers remain profitable.

"Alarm bells should be sounding for all building and procurement professionals when a supplier suddenly emerges that far undercuts the usual suppliers. Then the question should be asked whether the supplier is SARMA-accredited or has any other quality certification in place such as ISO 9001 or similar. While anyone can afford to buy a mixer truck and raw materials to produce concrete, not everyone does it right and that is where certification is the only documentary proof that the supplier complies with anything.

Upholders of standards

"Not all suppliers have what it takes to produce the kind of quality concrete that is required in South Africa. Dishonest suppliers may even try to provide concrete that does not comply with specifications and which may lead to the premature failure or even the collapse of the entire structure. No matter how genuine or professional the readymix supplier may seem (or how big the company they represent) if they are not SARMA members and are not SARMA-accredited, the quality of their concrete can simply not be assured.

"That is why SARMA was established – to regulate and formalise the industry, as well as to accredit only readymix suppliers who comply with all the necessary requirements to produce quality concrete. We conduct stringent annual audits on all SARMA member plants to ensure compliance with quality standards, as well as all relevant health, safety and environmental regulations.

"The plants are also operated with the safety of workers as a top priority and are meant to have a positive influence on surrounding communities. Considering the size and number of mixer trucks, road safety forms an integral part of the annual audits and helps to prevent unnecessary accidents on our roads.■

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AfriSam: creating possibilities

AfriSam is the largest black-controlled concrete materials group in the southern African region, and has operations in South Africa, Lesotho, Swaziland and Tanzania

It has an annual cement production capacity of over five million tons, produced from its seven production facilities and distributed to its customers through strategically-located distribution centres.

With a readymix production capacity of over two million cubic metres of concrete, AfriSam's readymix operations can produce almost any concrete mix required by customers from any one of its 43 readymix concrete plants. It also has the capacity to produce in excess of ten million tons of aggregate from its 17 quarries and aggregate operations every year.

Its Slagment business unit, located in Vanderbijlpark, has produced Slagment over the last 50 years that has been used in the construction of major structures, including buildings, dams, bridges, roads and water retaining structures.

AfriSam is a Level 2 Broad-Based Black Economic Empowerment (BBBEE) contributor and is the majority shareholder in Tanzania-based and listed Tanga Cement Company Limited.■

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CHRYSO's range serves the whole construction industry

CHRYSO Southern Africa manufactures sells and distributes admixtures and cement additives that service the mining, readymix, precast, gypsum and cement sectors as well as the building and construction industries.

Our product offering to the readymix market comprises:

- Accelerators - CHRYSO®XEL Range
- Air entrainers - CHRYSO®Air Range
- Environmentally friendly concrete cleaners - CHRYSO®Barracuda
- Fibres - CHRYSO®Fibre Range
- Pigments - CHRYSO®Colour Range
- Plasticisers - CHRYSO®Omega Range
- Retarders - CHRYSO®Tard Range
- Superplasticisers - CHRYSO®Optima Range
- Water repellants - CHRYSO®Fuge Range, CHRYSO®CWA 10

We have an extensive footprint in South Africa with three manufacturing plants and seven branches. A responsible company, CHRYSO Southern Africa complies with ISO 9001 and OHSAS 18001.

CHRYSO Southern Africa can give daily technical support to its customers while ensuring high levels of quality control through the concrete laboratories at its various production sites and the excellent relationship that we enjoy with local commercial laboratories countrywide. In addition, CHRYSO has academic partnerships with universities around the world as well as with an international network of technical specialists who can provide technical advice.

The CHRYSO Group has 23 industrial sites and a presence in 70 countries. CHRYSO Southern Africa is one of 20 subsidiaries.■

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www.chryso.com

Putzmeister: economical and safe machines

Putzmeister develops, produces, sells and serves its customers worldwide with technically high-quality and service-oriented machines in the following areas: concrete placing, truck-mounted concrete pumps, stationary concrete pumps, stationary placing booms and accessories, concrete mixing, industrial technology, pipe delivery of industrial solids, concrete placement and removal of excavated material in tunnels and underground, robot and materials handling technology, mortar machines, plastering machines, screed conveying, grout injection and special applications.

The M 47-5 truck-mounted concrete pump is extremely economical to run, as the operating cost of the machine has been reduced across the board. The individual components of the machine are highly resistant to wear. A high proportion of the components are completely maintenance-free. Overall, the machine achieves an exceptionally long service life and an attractive resale value. This has enabled the quantity of costly functional fluids such as hydraulic

fluid used to be significantly reduced. The operating cost of the 47-5 remains extremely low throughout the entire service life of the machine.

In terms of the safety, 47-5 is a clear winner. All current standards have been taken into account in full.■

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www.putzmeister.co.za

Bates Technology Group: South African agents for Zoomlion products

The Bates Technology Group introduced the Zoomlion range of concrete machinery products into the South African market in 2014. Its product range includes truck-mounted pumps, stationary pumps, placing booms and concrete mixers.

The Zoomlion-Cifa group is the leading supplier of concrete machinery products globally.

Since 2014 The Bates Technology Group has successfully commissioned both 33-m and 36-m pumps using Mercedes Axor 2628 and 3335 models respectively, and have installed their first concrete placing boom in Sandton, Johannesburg.

Their commitment to quality build and spare parts supply should provide the building blocks for a strong and competitive alternative brand in South Africa.

They share superior workshop and warehouse facilities with the Zoomlion Crane division situated in Midrand, Gauteng.

BATES GROUP ZOOMLION

Zoomlion Capital Finance in Johannesburg will provide financing for your new concrete pump. All the products are covered by Zoomlion warranty, and service support is provided nationwide by a trained in-house technical team.■

More information from John Paul,
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www. batesgroup.co.za

PPC always moving forward

As the leading supplier of cement and related products in Southern Africa, PPC Ltd has nine manufacturing facilities and three milling depots in South Africa, Botswana and Zimbabwe that can produce around eight million tons of cement products each year. PPC is expanding its operational footprint into the rest of Africa, including Botswana, DRC, Ethiopia, Mozambique, Rwanda and Zimbabwe. Our building materials and solutions proposition includes aggregates, metallurgical-grade lime readymix, ash, technical support and superior customer and relationship support.■

For more information visit www.ppc.co.za
or call 0800 023 470

Lafarge building better cities

Lafarge South Africa, a member of LafargeHolcim, is one of the major building material manufacturers in Southern Africa, offering cement, aggregates, ready-mixed concrete, and pulverised fly ash. The company applies its unparalleled technical strength to continually develop innovative building material solutions for the construction industry and contributes to Building better cities and communities across the country, while reducing the environmental footprint of its products and manufacturing processes.

The company has over 50 batch ready-mixed concrete plants throughout South Africa. In addition, Lafarge has a fleet of mobile and semi-mobile concrete batch plants that enable it to provide a rapid response on urgent projects, together with the benefits of an on-site service in remote locations.

The Aggregates business line operates a number of quarries to service all sectors of the local construction industry. Lafarge quarry materials fall broadly into three categories: road, concrete and specialised materials – washed or blended aggregates for use in the road, paving, brick and block industries.■

More information at www.lafarge.co.za

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Carmix South Africa puts their machines through their paces

The new agents for Carmix South Africa recently hosted a demonstration day to exhibit the functionality of the Carmix 3.5TT unit.

The Carmix 3.5TT is the mid-sized unit in the Carmix range with a drum capacity of 4,850 litres and concrete yield per batch of 3.5 m^3. The Carmix 3.5TT is a perfect balance of batch size capabilities and productivity which makes it the most popular unit worldwide. However, Carmix has an established and diverse range of self-loading concrete mixers varying in size, manoeuvrability and price. There is a mixer to meet all job-site requirements.

The demonstration was held at the Carmix yard in Modderfontein, Johannesburg where two full batches of 25-MPa concrete were loaded, mixed and dispatched. The simplicity of operation was evident during the demonstration with each batch being completed in under 20 minutes with only six fully-loaded buckets required to make the 3.5 m^3 of concrete that was required.

A detailed explanation of the advanced Load Cells system showed how accurately materials can be added to the drum – which highlights Carmix's goal of producing high-quality concrete consistently. The Load Cells allow operators to completely control the quality of concrete output which can classify Carmix as not only a self-loading concrete mixer, but a mobile concrete batching plant.

Carmix emphasised the durability of their units in the harsh South African environment and explained that electronics, which often create problems by malfunctioning, have been avoided at all costs. All functions associated with loading, mixing and dumping, excluding the electronic weigh system, are hydraulically operated making the Carmix units robust and user friendly with functional simplicity once again being immediately apparent.

The Carmix South Africa agency has recently been adopted by Pilequip, a geotechnical equipment supplier, with over ten years of experience in the concrete and equipment servicing fields. This enables Carmix South Africa to provide post-sale service and technical support of the high standards associated with Pilequip.■

More information on Carmix rental or purchase at www.carmixsa.co.za

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New spreader machine for seamless concrete flooring

CLF's new Titan Top dry shake spreader machine in action providing strong, abrasion- and slip-resistant flooring for a new warehouse in Boksburg.

Concrete Laser Flooring (CLF), specialists in the construction of jointless concrete floors have, in conjunction with a.b.e. Construction Chemicals, introduced a new innovative spreader machine to meet the growing demand for harder, flatter, and more abrasion-resistant concrete surfaces.

a.b.e. Construction Chemicals, part of the Chryso Southern Africa Group, is supplying CLF with Titan Top, a dustless, non-metallic floor surface hardener for use with the Titan Top Dry Shake Spreader machine imported for use by CLF. The dry shake surface hardening powder, which combines high-strength portland cement with selected aggregates, achieves maximum suppression of steel fibres where these are used to reinforce a floor.

Brian Norton, director of CLF, says the unique, versatile design of the imported Dry Shake Spreader features low dust loading technology with inlet brushes, storage for twenty 25-kg bags of surface hardening powder, all contained in a compact machine which is easy to transport.

"The spreader's high maneuverability allows effortless close work around columns and other obstructions during flooring operations. It also provides exceptional spreading accuracy, allowing for the application of fine materials as well as large aggregates. With this high-tech machine, CLF is now able to increase productivity and efficiency by covering larger areas in shorter time while reducing labour cost and worker fatigue," Norton states.

He says among the other advantages of the Titan Top Dry Shake Spreader when used with the a.b.e. surface hardener, are:

- Optimised distribution of the surface hardener to ensure a uniform and homogenous layer;
- Floor surfaces with increased strength as well as abrasion- and slip-resistance;
- Improved surface quality as a result of the suppression of steel fibres;
- Double the serviceable life of the concrete floor;
- Uniform colour that enhances the appearance of the high-density floor, which is also easy to clean;
- Improved floor tolerance levels because flatter floors are more efficient and require low maintenance;
- Increased resistance to liquid penetration;
- Improved light reflection to conserve energy; and
- Dustless application.

"CLF, as a leading flooring contractor, is committed to innovation and constantly striving to develop products that provide greater value and benefits to the end user. By joining forces with a.b.e. Construction Chemicals, CLF now has the equipment and material to provide seamless factory and warehouse flooring that could match the best in the world," Norton adds.

Michelle Fick, executive relationship and project manager of the Chryso Group, says the dry shake surface hardener supplied to CLF by a.b.e. is one of a growing number of dustless cementitious products manufactured by the company, all welcomed by the South African construction industry which is increasingly aiming for 'green' building.

"The surface hardener, developed and marketed by a.b.e. as 'abecron LA Dustless', provides a low-cost solution for hardening new industrial, commercial or residential concrete floors. Used conventionally, the self-leveller greatly assists the power-floating process and, when applied with CLF's innovative Dry Shake Spreader, the benefits are enormous.

"The surface hardener requires less water which substantially reduces delamination risk, while the dustless technology reduces health risks and area contamination. The product, which is supplied in 25-kg bags, is helping CLF to provide floor surfaces with increased strength and exceptional wear resistance," Fick adds.■

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Sika bridges the gap

Two high-performance Sika products were chosen for the technically challenging Simon Vermooten bridge-widening project in Pretoria East. The SANRAL project to double the width of Simon Vermooten Road, the main arterial route linking Mamelodi and the eastern suburbs to the city, commenced in 2012 and in 2015 the bridge spanning the N4 Highway was widened. The scope of works included lowering a 2,200-ton newly constructed bridge deck by 700 mm and lifting the 3,100-ton existing bridge deck 750 mm in order that they align perfectly.

DSC Zendon, which specialises in the rehabilitation of bridges, was awarded the contract.

Engineers from Aurecon specified SikaGrout-212, for general repairs to both the newly cast deck and the existing bridge structure, and as a leveling medium for the bridge jacking connection plates. SikaGrout-212, a cement-based, fluid, expanding grout has an adjustable consistency and excellent flow characteristics, enabling easy application. Providing rapid strength development and high final strengths, this grout expands by gas generation while still in the plastic state. It is non-corrosive and shrinkage compensated.

For bonding the new bridge bearing pads to the bridge structure and abutments, Sikadur-30, a thixotropic, structural two-part adhesive based on a combination of epoxy resins and special filler, was used. It is designed for bonding reinforcement, particularly in structural strengthening works. Sikadur-30, with its excellent adhesion to concrete and many other substrates, hardens without shrinkage and provides high creep resistance under permanent load. With high initial and ultimate mechanical resistance, as well as high abrasion and shock resistance, Sikadur-30 is impermeable to liquids and water vapour. It is easy to mix and apply and requires no primer. In total, 820 litres of Sikadur-30 was used in the bridge-widening project.

Doubling the size of Simon Vermooten Road not only improved traffic flow, but also provided for the Tshwane Rapid Transport (TRT) system, leading to a revision of the original plan to widen the bridge to six lanes, to include a seventh TRT lane. Besides the major technical challenges of this project, heavy rains caused further problems and delays. Fortunately, the many advantages in using Sika's products greatly assisted the contractor.■

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

Ensuring the optimal water:cement ratio of precast concrete products

The FL-Mobi Mic Profi-Check is supplied in a handy and compact carry-case including charger and tablet.

Manfred Ludwig is managing director of Ludwig Moisture Control of Germany represented locally by PMSA.

Checking the aggregate moisture content before making concrete on site is now a cinch with a new handheld device for convenient on-site batch testing now available from PMSA.

Quality control is a critical factor in the manufacture of concrete products, and responding to this need for reliable testing, German company Ludwig Moisture Control has now developed the FL-Mobi Mic Profi-Check.

This testing device is used to accurately determine the moisture content and temperature of a specific aggregate before batching, during the mixing cycle and after discharge of the mixed concrete. Key to the device's versatility is that it can be used in several places during the process.

"The exact moisture values can be determined rapidly and exactly upon delivery of the raw materials," says Manfred Ludwig, MD of Ludwig Moisture Control. "In addition, it delivers valuable and measurable results on the water:cement ratio and temperature during production of no-slump or plastic concretes in the plant, laboratory or construction site."

The measuring head of the FL-Mobi Mic Profi-Check is manufactured from high-quality stainless steel. It is designed for easy insertion and/or penetration into the aggregate or concrete being measured. The moisture measuring probe, protected by a ceramic coating, is also integrated into the measuring head itself.

The measuring head is connected to the evaluation and transmission part of the device by a 250-mm-long V2A connecting cable. The robust IP65 die-cast housing protects the measuring head from mechanical wear. An adjustable carry handle attached to the housing facilitates simple insertion and replacement of the measuring unit if need be.

Ludwig explains that the tried-and-tested microwave technology used in the device is based on the 433 MHz frequency. Major design criteria were user-friendliness and compactness. "This makes the FL-Mobi Mic Profi-Check highly suited to emerging contractors who wish to guarantee the quality of their precast products, but who do not yet have the necessary capital to invest in major moisture control systems."

The device forms part of a comprehensive suite of concrete production technology available locally from PMSA, the largest manufacturer of concrete brick, block and paving machinery on the African continent. ■

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

About Pan Mixers South Africa (PMSA)

Celebrating its 40th anniversary this year, PMSA is a leading manufacturer of a wide range of concrete block, brick and paving machinery, turbine and counter-current pan mixers and batching plants for the concrete, refractory and ceramic industries. PMSA brick-making machinery produces two million bricks a day in the Johannesburg area alone.

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Chryso appointed Adfil Construction Fibre distributor in Africa

In a considered move and one which underpins the strength of Chryso Southern Africa's position on the African continent, the Adfil Construction Fibre division of the UK-based Low & Bonar Group has announced it is partnering with this leading supplier of concrete and cement admixtures and ancillary products as a vehicle for the growth for its fibre business into Africa.

From left: Mark Mitchell, Adfil technical sales manager, who flew from the UK to train Chryso Southern Africa sales personnel as well as a few customers, and Izak Louw, operations manager of Oxyfibre.

Initially Chryso will distribute Adfil's micro fibres and then roll out their macro fibres as well as a concrete slab design program in the next few months.

"Many of the countries in Africa have huge infrastructure programmes to build roads, water systems and power stations to meet the demands of the world's second most populous continent. Adfil recognises the growth opportunities and chose Chryso as its preferred partner with the view to increase our fibre market share in Africa," Mark Mitchell, technical sales manager for Adfil Fibres, explains. Adfil has almost three decades of experience in the development, production and distribution of fibres in over sixty countries.

Adfil will also be doing a lot of development work with Oxyfibre, a South African company which has treated and supplied fibres to Chryso Southern Africa for nearly 20 years. Oxyfibre has developed patented surface and nano technologies for polypropylene fibres to offer the construction and mining markets bespoke fibre solutions for every application.

Oxyfibre and Chryso will also be able to utilise Adfil's design service for concrete slabs and precast concrete elements. This programme examines certain parameters specified by engineers and calculates fibre dosages for cost-effective and optimum performance.

"Fibre-reinforced concrete is being increasingly specified by engineers. There are an expanding number of project references, case studies and test results that engineers can consult proving that the use of fibres in concrete can create cost savings, good performance results, safety benefits and a reduced carbon footprint. However, it is important that concrete is designed to accommodate fibres and this brings in Chryso's much needed admixtures and technical expertise with regards concrete mix design," Mitchell adds.

Chryso Southern Africa's Hannes Engelbrecht, general manager: marketing and inland sales, believes that distributing Adfil fibres will bring significant benefits to all of the company's many customers.

"Initially Chryso will distribute Adfil's micro fibres and then roll out their macro fibres as well as a concrete slab design program in the next few months.

We believe that Chryso now has a fibre solution that no other admixture company can offer. Both Chryso and Adfil are respected brands synonymous with quality and Adfil will provide technical backing and resources to support our customers with any fibre-related requirements. We have already supplied technical fibre training to our own sales staff as well as to some of our customers," he says.

Adfil is a brand of Bonar, a subsidiary of the London Stock Exchange listed Low & Bonar Group. The brand stands for over three decades of experience in the development and application of synthetic fibre concrete reinforcement. Serving the construction industry in over 60 countries, Adfil's high-performance fibres are used in a wide range of applications. Examples include: concrete floors, pattern imprinted concrete, precast concrete products and tunnelling.

Backed up by broad expertise and knowledge of the Construction Industry, Adfil can supply bespoke solutions in terms of engineered proposals, concrete mix designs, packaging configurations, and high standards of distribution.■

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www.chryso.com

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Daimler opens Regional Centre for Commercial Vehicles in Southern Africa

Mercedes-Benz South Africa (MBSA), together with its brand divisions Daimler Trucks & Buses and Mercedes-Benz Vans, is strengthening its continued drive for excellence and customer dedication with the opening of the Regional Centre Southern Africa (RCSA). The RCSA will be responsible for Daimler's full commercial vehicles portfolio in the region, from the full offering of Mercedes-Benz Vans, heavy-duty Mercedes-Benz trucks and buses as well as trucks and buses from FUSO. The RCSA will cover South Africa, Namibia, Botswana, Zimbabwe, Mozambique, Malawi, Zambia, Lesotho and Swaziland.

"Opening our new Regional Centre Southern Africa, we are able to respond even faster to our commercial vehicle customers and their requirements. This will help us to further tap the growth potential of this emerging region," said Dr. Wolfgang Bernhard, member of the Board of Management of Daimler AG responsible for Daimler Trucks & Buses.

Clear focus on the needs of commercial vehicle customers

Based in Pretoria, South Africa, the RCSA will be a catalyst in ensuring highly efficient business processes and an even higher level of customer satisfaction. MBSA and its parent company Daimler AG are confident that the RCSA is poised to provide excellence and ultimately a competitive advantage to its growing number of southern African-based customers through superior products and custom value chain offerings.

Kobus van Zyl, executive director: Daimler Trucks & Buses Southern Africa: "Having a stronger presence in the southern African markets means that we are able to react faster and

be in touch more frequently with our commercial vehicles customers and the various General Distributors in their respective countries. The Regional Centre Southern Africa provides further opportunities for all our commercial vehicle endeavours, including sales, after-sales, marketing, client services and parts," he explains.

Region with long-term potential

Southern Africa is a promising growth region for all of Daimler's commercial vehicles. In line with the global outlook, the region is facing a tough economic cycle but is still expected to grow at a rate of 3.75% in 2016. Improved external prospects and domestic policy improvements will support gradually stronger growth rates from 2017, with the regional average back up to more than 4.5% annually during 2018-2020. Moreover, southern Africa possesses large reserves of untapped natural commodities such as copper, oil and gas. In 2015, Daimler sold approximately 5,500 trucks and buses in the region.

About the Commercial Vehicles Regional Centres

The Regional Centre Southern Africa is the third of six Regional Centres being opened for Daimler's commercial vehicles business around the world. Very recently, the Regional Centre for East, Central, and West Africa started its operations based in Nairobi, Kenya. The first Regional Centre was opened in October 2015 in Dubai as Daimler Commercial Vehicles Middle East North Africa (DCV MENA). Similar bases will follow for South Asia, Southeast Asia and Latin America within months.

In the past, Daimler had managed these regions primarily from its group headquarters in Stuttgart. Further decentralisation will keep the business even more in tune with the market and more responsive to the needs of customers.

The many years of product and service-related expertise pay off in this respect just as much as the broad portfolio of products offered by the group's various commercial vehicles brands.■

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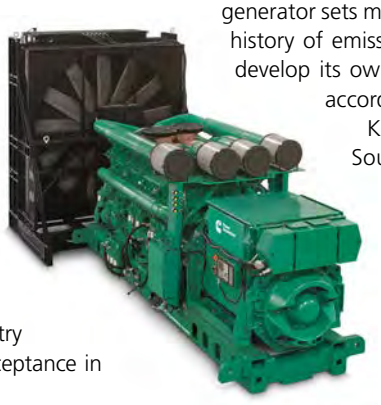
Cummins showcases QSK95 at PEWA 2016

Cummins, the global power leader and corporation of complementary business units that design, manufacture, distribute and service diesel and natural gas engines and related technologies, showcased the long-awaited QSK95 Series of high-horsepower generator sets at the Power & Electricity World Africa (PEWA) Exhibition.

PEWA is the annual forum for industry professionals to acquire ideas on developing sustainable, clean and bankable world-class energy for projects on the African continent.

The QSK95 Genset is specifically designed and engineered for critical applications that demand an extremely robust, reliable source of power to ensure uninterrupted operations. Its applications include hospitals, sports stadiums, office buildings, data centres, etc. For operators that seek to maximise uptime, the QSK95 Series of generator sets exceeds industry standards by providing 100%, one-step load acceptance in less than 10 seconds.



QSK 95 Genset.

At the launch, Andre Kuhn, GM of Power Generation for Cummins Southern Africa said: "This incredible innovative product enjoys ratings of up to 3,500kW and delivers high-horsepower output while achieving installation economies with an innovative small-footprint design. Innovation is about unlocking and unleashing new ways of thinking, doing and delivering against a background of continuous improvement. We are very excited about bringing this product to the southern African market, especially in light of the current energy situation."

Cummins enjoys 90 years of experience in power generation and as a world leader in the design and manufacture of pre-integrated generator sets, ranging from 17kVA to 3750 kVA, produces its own components; from engines, alternators, transfer switches to control systems. Leading the industry in advanced emissions solutions, the company ensures that generator sets meet the required emission standards. A strong history of emission leadership has enabled the company to develop its own emission solutions which are packaged in accordance with regulations and requirements.

Kenneth Gaynor, the PowerGen Leader Southern Africa concluded: "Innovation is much more than a word at Cummins, it is also a value that we live by. It is our pledge to our customers that we are committed to bringing them innovative, sustainable and reliable power solutions. More Dependability. It's what we call The Power of More."

Cummins Southern Africa has its headquarters in Johannesburg, with branches in Longmeadow, Bloemfontein, Cape Town, Durban and Port Elizabeth; as well as in Zambia, Botswana, Mozambique and Zimbabwe. An extensive dealer network offers support to the company's widespread Southern Africa footprint.■

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Beneficial batching with load cells

The first task in preparing a concrete mix is batching the raw materials. Batching involves collecting raw materials, by using methods of weighing, checking volume or by a combination of the two. During batching, there are certain permissible tolerances that are typically part of the project specifications and/or noted in the *NPCA Quality Control Manual for Precast Concrete Plants*.

A load cell, together with a read-out, is used to accurately weigh the correct amounts, producing a mix design which produces the concrete of the desired consistency.

Cementitious materials are usually stored in hoppers or silos, with the material being loaded into the hopper by means of a screw drive (or auger), a pneumatic system, or a gravity-feed chute, loading from above.

It is important to ensure that should an auger be used, it is specifically designed for use with cement. Retrofitting old grain augers is not advisable, as this can lead to excessive wear and less than optimum performance.

Physical inspections of the silo should be undertaken routinely. By using load cells to weigh the content of the hopper, an accurate measurement of the contents of the hopper or silo can be made and maintenance issues, such as water leaks or holes, can easily be detected as the weight of the contents of the silo will change.

Water is batched by volume or weight. Flow meters are used as a measuring device to quantify the volume of water that passes through the valve, but flow meters cannot distinguish between air and water. Leaky valves also allow water to dribble through when closed. Considering the importance of the water-cementitious ratio, it is advisable to rather use load cells, as measuring weight rather than flow is a much more accurate.

Admixtures are typically batched by volume through a dispenser usually provided at no cost by the admixture supplier. Dispensers reduce the likelihood of improper dosing. Always introduce admixtures into the concrete mix in strict accordance with the manufacturer's recommendations.

Aggregates are generally batched by weight. Whether in a hopper, on weigh belts, or directly from storage bins, load cells are used to measure the weight of the material. The most common method used is weigh belts. However, 'weigh belt' is a misnomer. A true weigh belt weighs while it is moving. In most batch plants, Live Bottom-Weigh Hoppers (LBWHs) are used. An LBWH's belt is stationary while weighing aggregates. This type of belt may be started under load to move the weighed aggregates to a transfer belt, hopper or skip hoist. Overall, accuracy in all of the above processes can be improved by installing load cells. By weighing each component, the batched material can be accurately measured, and the desired consistency can be achieved using a continuous and time-saving method.■

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Assured protection with Mapei technology

Duresil EB is an epoxy coating applied by hand to protect the substrate.

Mapecoat DW 25 is a two-component protective coating for surfaces which come into contact with foodstuffs and water.

Mapei South Africa has recently introduced to the local market two new innovative Mapei products, Mapecoat DW 25 and Duresil EB that are formulated to protect concrete and steel surfaces.

Whether the surfaces are exposed to foodstuffs, drinking water or even sewage, there is a reliable solution from Mapei, the world leader in the production of adhesives, sealants and chemical products for efficient and sustainable building. Developed in the group's renowned research laboratories, the products have proven their quality and effectiveness on international markets.

Surfaces in the food production and processing industry have to meet demanding requirements for hygiene as well as durability. Mapecoat DW 25 is a two-component epoxy paint that forms a tough, durable protective coating on concrete surfaces that are in contact with drinking water and foodstuffs, which in themselves can be moderately aggressive agents for concrete. Some typical applications for Mapecoat DW 25 include lining tanks used for storing drinking water, providing chemical and mechanical protection for industrial concrete floors, as well as coating storage tanks for foodstuffs.

The product is certified to comply with the requirements of EU 10/2011 regulations for materials in contact with foodstuffs. For example, the regulations cover all fruit, freshly chopped vegetables and processed meat (Category A); fats and natural or processed animal oils (Category D2); and processed and unprocessed cereals, flour, sugar and coffee (Category E).

Duresil EB paint is designed to provide a highly effective and durable protective coating in conditions that are extremely aggressive to concrete and steel. In particular, it was developed as the solution for protecting concrete and steelwork in sewage treatment works. The innovative two-component epoxy paint is modified with hydrocarbon resins and special additives to create a film that is resistant to acids, alkalis, hydrocarbons, detergents, salts and oils. The successful formulation is also resistant to sunlight degradation and frost. It complies with EN 1504-9 standards governing the protection and repairing of concrete structures, as well as the regulations for coatings in EN 1504-2 for concrete surface protection systems.

Some typical applications for Duresil EB include protecting sewage treatment tanks and sewer mains against acid attack; providing a coating for recycling sewage tanks that resists oils and hydrocarbons; anti-corrosion protection of sandblasted steel surfaces; protection of reinforced concrete and steelwork exposed to salt air; and protecting concrete support beams on bridges and viaducts.

"Mapecoat DW25 and Duresil EB are designed to meet the demand by municipalities, as well as the construction, mining and manufacturing industries, for effective concrete and steel protection," says Mapei South Africa's product manager, Paul Nieuwoudt. "Mapei technology is the cost-effective solution for right-first-time quality and long service life protective coatings." ■

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STIHL: tough enough for any and all construction tasks

Partner with STIHL to effectively perform the many challenging tasks on a construction site that must be done as quickly, professionally and safely as possible. STIHL offers a diversity of quality power tools to choose from, no matter what needs to be accomplished, no matter how tight the deadline, no matter what the working environment and on-site conditions may be. STIHL has a global reputation founded on a proud German-based legacy that dates back to 1929 and are experts in manufacturing high-performance equipment for specialist users.

Having to cut through hard, resistant materials such as concrete, metal, tiles, pipes and bricks is a back-breaking job, tough on the tools being used, and tougher on the operator. Using tools of inferior quality means taking longer, with less impressive results and increased user fatigue. Don't compromise – trust in the STIHL range of power tools to get the job done. There's a STIHL product for any on-site application, from cut-off saws and concrete cutters that get the job done right first time, to high-pressure cleaners and sweepers that make light work of cleaning up afterwards.

STIHL products are consistently the leaders of the pack, and the STIHL TSA 230 cordless cut-off saw is another worldwide first. Lightweight, compact and easy to work with, it's the first battery-powered cut-off machine with a 230-mm cutting wheel. Despite weighing less than 4 kg without the battery, the TSA 230 is a powerful performer and quickly and smoothly slices through tiles, bricks, pipes and metal.

The standard-fitted water connection and optional vacuum adapter ensure clean, dust-free cutting, plus the STIHL cordless design offers the convenience of battery power.

So, forget stressing about access to power points or the hassle of ensuring consistent power supply. Working environment is not an issue with this innovative piece of equipment: indoors or outside, wet or dry cutting, the TSA 230 has been designed for precision work with the bonus of being low-noise and emission-free for user comfort. This cordless cut-off machine offers a speedy and powerful performance plus convenience and new applications for those who work on site and around the house.

Another invaluable piece of equipment is the GS 461 concrete cutter. It handles like a chain saw but has the power and grunt of a cut-off machine. Specially designed to be ultra-robust for construction and renovation applications, the GS 461 is ideal for free-hand cutting of concrete with reinforcing, natural stone, masonry and sewage pipes. Its impressive power-to-weight ratio and smooth handling guarantee accuracy and manoeuvrability, and it copes easily with working in tight corners and angles. The guide bar features nozzles that aim forward to precisely provide water to the chain, while standard fittings include side-mounted chain tensioning, a decompression valve, STIHL ElastoStart, a water- and wear-resistant starter cord, a long-life HD2 filter to catch even the finest dust particles to prevent damage to the machine, and a toolless bayonet fuel cap for easy and upright refuelling.

The GS 461 offers brute power without being brutal on its users. As with all STIHL products, the GS 461 is easy to work with and comfortable to use, thanks to its fuel-efficient and environmentally-friendly 2-MIX engine which ensures reduced emissions and an anti-vibration system that reduces user strain, even when working hour after hour.

STIHL also has a range of resilient cut-off saws for heavy-duty work on construction sites. There are various models with different-sized cutting wheels to cater for every need, all capable of taking on the tough work of cutting concrete, stone, bricks and asphalt. Each model is light and compact, easy to work with, easy to start, and powerful enough for numerous demanding on-site applications.

When buying any STIHL product, you become part of the company's global family of valued customers. STIHL guarantees knowledgeable after-sales service, advice and maintenance through its nationwide network of dealers who offer buyers expert guidance on how to use and maintain their STIHL product. So you'll never find a STIHL product at your local supermarket, only at STIHL servicing dealers.■

For more about how to improve your work and working conditions by partnering with STIHL, visit www.stihl.co.za

To explore the world of STIHL, visit our show truck at the Totally Concrete Expo, stand number 004 in the outdoor arena.

Edison's concrete dreams never saw the light

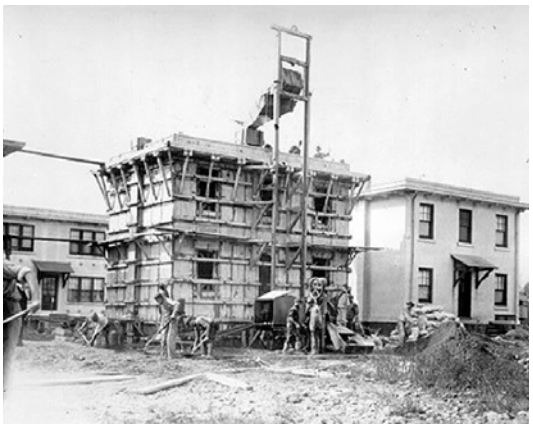
The man who gave us the electric bulb was way ahead of his time when it came to precast housing, writes Jan de Beer.

Thomas Edison, the world's most prolific inventor with over a thousand patents to his name, would have loved to have given the world more than just electric lights, moving pictures and phonographs. He also wanted to be remembered as a concrete visionary. But, alas, America was not ready for his applications of the world's oldest building material.

In the early 20th Century, Edison's laboratory in Menlo Park (a town in New Jersey, USA) was so productive that he promised to turn out a minor invention every 10 days and a 'big thing' every six months. Some say Edison blatantly pinched some of his inventions, but then they also say that about Steve Jobs today – and most Apple users couldn't care less how their iPad started life.

At the pinnacle of his inventing tsunami, 'The Wizard of Menlo Park' decided that US city slums could be replaced with sturdy, fire-proof houses built inexpensively on a mass scale. The solution, he believed, was concrete, with the cement supplied by Edison's own Portland Cement company, a business interest Edison had established after inventing an improved rotary kiln. The company's biggest contract, by the way, was to build the iconic New York's Yankee Stadium in 1923.

Thomas Edison with a model of the concrete houses he hoped would replace US slums.



For Edison's houses a giant mould was erected and concrete poured in floor by floor.

One of the early versions of Edison's innovative housing concept is still standing today; 303 North Mountain Avenue in Montclair, New Jersey, built in 1912. A giant mould was erected, steel rods set in place, and – floor by floor – the concrete was poured, cured, and stripped of its mould to reveal a complete house. The process took a few weeks and just about everything was included in the moulds: even roof shingles, bathtubs, and picture frames. The house even had a moulded concrete fireplace and a basement resembling a grotto with an arched, swooping ceiling. A strip of wood set into a moulded concave groove at the edge of every room was in the original mould to allow for carpeting installation or wooden floors. The two-storey structure has classical pilasters at its corners and a classical parapet along the roof.

Edison said these dwellings would sell for around US $1,200, about a third of the price of a regularly constructed house at the time. Owned for many years by an acclaimed American actor and director, Thomas Brennan, this house is now a heritage structure in New Jersey and Brennan, who died recently, regarded it as a work of art. He was mystified as to why Edison's idea had never caught on.

One of the major contributory reasons was that the moulds and equipment required to make the houses were just too expensive. It needed a huge financial investment that few builders were able to make. Image was another problem as not many families wanted the social stigma of moving to a home that was touted as 'getting people out of the slums'. And some thought the houses were just ugly.

For Edison, this was a massive disappointment since he had also wanted to furnish the houses with concrete furniture that would last for eternity. Made with air-impregnated foam to keep the weight at only one-and-a-half times that of wooden furniture, Edison's line of concrete furnishings would be sanded and smoothed into a mirror-like finish or stained to look like wood grain. He claimed he could furnish an entire house with concrete fittings for less than US $200.

In 1911, just to prove his point, the Edison company moulded a piano, bathtub and cabinets that could house the phonographs he had invented earlier. The company shipped all the phonograph cabinets around the country as a publicity stunt, and Edison affixed stickers on the packaging, asking the shippers to 'Please Handle Roughly' (the man clearly was also a shrewd – albeit optimistic – marketer).

The cabinets were to be unveiled in New York City at an annual cement industry show, but Edison did not show up, and the cabinets were never heard of again. There were suspicions that the cabinets had not survived the trip, perhaps because the packing crew had complied with Edison's request and had thrown the cabinets around all over the place, destroying them in the process.

The great man took it in his stride and put it all down to experience. As Edison famously said: "I have never failed. I've just found 10,000 ways that won't work."

One suspects that he was also a little more careful in wording his shipment stickers after that.■

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