

# CONCRETE

Journal of the African Cement and Concrete Industry

# trends

VOL 22 No 4 November 2019



**Precast concrete**  
playing a prominent role

**Preserving the**  
Owl House

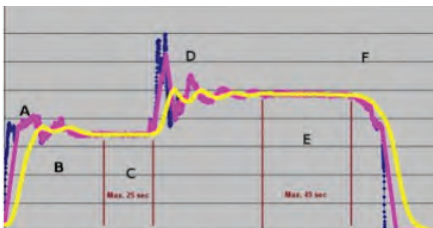
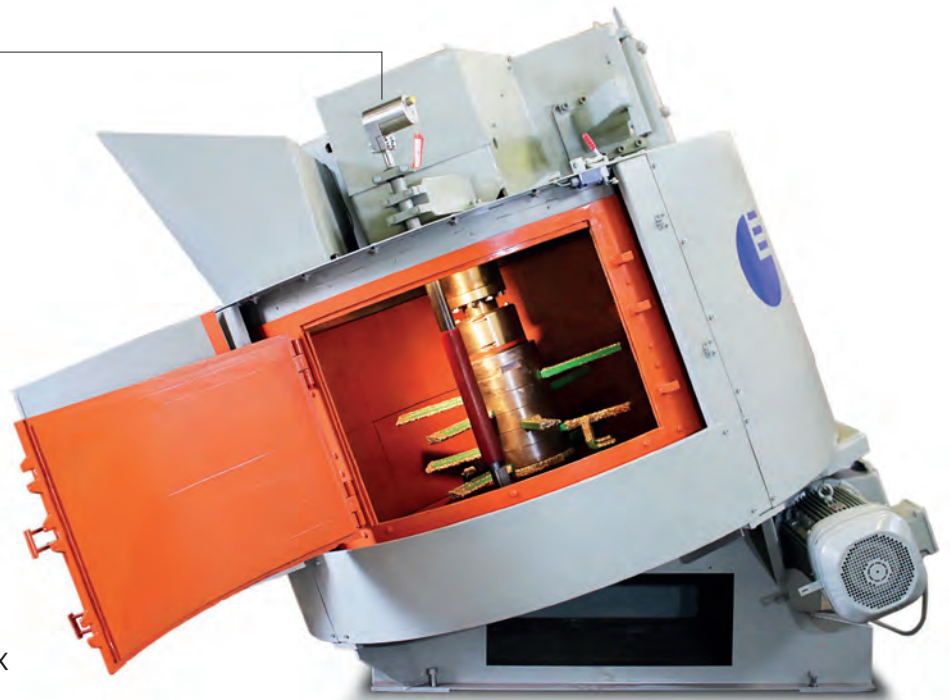
**Wet batch vs**  
Dry batch

**PPC warns against**  
sub-standard cements



**BIRKENMAYER**  
EIRICH GROUP

## EIRICH R-TYPE MIXERS + HYDRONIX MOISTURE CONTROL = TOTALLY CONSISTENT CONCRETE WITH EVERY BATCH



### HYDRO CONTROL AUTOMATES MIXING

- A. BATCH IN MIXER
- B. CEMENT DISCHARGE BY TIMER
- C. MONITORED FLAT LINE FOR DRY MIX AND MOISTURE MEASUREMENT
- D. WATER DISCHARGE
- E. MONITORED FLAT LINE FOR WET MIX
- F. TIMED DISCHARGE

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WATER AND CEMENT IS DRAWN THROUGH THE MIX BY A VORTEX CREATED AT THE SHAFT

COMBINED FLOOR AND WALL SCRAPER DIVERTS MATERIAL INTO THE PATH OF THE AGITATOR

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# CONCRETE trends

Volume 22 No 4 November 2019

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**AFRICAN CONSTRUCTION EXPO**



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**Dates:** 9 - 11 June 2020

**Venue:** Gallagher Convention Centre, Johannesburg

**More information:** [www.africanconstructionexpo.com](http://www.africanconstructionexpo.com)

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RSA Litho Printers Cape Town

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



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ISSN 1560-2710

## Not just a game – a roadmap for the future?

**W**hile it is undeniably a game, the notion that rugby is, for South Africans, 'just a game' is outrageous. The influence that winning the rugby world cup has had on the public mood is nothing short of miraculous.

In an environment where the daily news is enough to make you weep, this shining example of our national team working together for the common good is inspiring. It is also evidence that working together can and will work.

President Ramaphosa said of the victory: "... We momentarily forgot our woes (on Saturday). And now, our sails swelled by the wind of victory, our pride must not deflate, our euphoria must not dissipate and our optimism must endure. Let the goodwill brought by our success at Yokohama inspire us to put our collective shoulder to the wheel as we confront our economic, political and social challenges together – and overcome them. More than ever, we need to be single-minded in our determination to build an economy that can benefit all our people."

If we take the sterling performance of our 'Boks' as an example and heed the President's call for cooperation and a

sense of common purpose in working for the greater good, then that win could form the roadmap for the future.

It could be a future where politicians act in the interests of those who elected them and not in blatant self-interest. It could have Government overcoming their distrust of the construction industry – one of the country's major employers – and start spending the long-awaited billions allocated for infrastructure. It could have officialdom cutting through the unnecessary red tape that hog-ties entrepreneurs and discourages foreign investment. If only.....

As a year the construction industry would much rather forget draws to a close and, since this is the time for hopes and resolutions, here are mine. I hope that we will heed the advice of experts, avoid the mistakes of the past and embrace a new and positive way forward.

Finally, we at *Concrete Trends* would like to thank you our advertisers, contributors and readers for your continued support and wish you all a happy, peaceful and safe festive season – one that will have us all recharged and 'punching above our weight' in 2020. ■



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# Wet batch vs Dry batch

The debate rages on like a RWC final game between the Springboks and England. The topic of, sometimes heated, conversation is the differences between wet batch plants and dry batch plants.

## Let's clarify the obvious difference:

- Dry batching plants do not actually produce concrete; they batch material into a truck, which then mixes the material with water to form concrete.
- Wet batching plants produce ready-mixed concrete, discharge into an agitator truck, ensuring homogeneity before leaving the plant yard.

It is in this simple explanation that the biggest advantages of a wet batch plant is locked up.

Interviews with readymix concrete production staff and plant owners, who have experienced both dry batch plant and wet batch plant, revealed the following advantages of wet batch plants.

- By mixing concrete thoroughly before discharging into the truck mixer, wet batching plants allow for fuel savings because the truck mixers do not need to mix the concrete at high revs; the concrete is slowly agitated in transit to prevent segregation.
- Because the truck mixers do not need to do high-speed mixing, wet batching plants reduce wear and tear across the fleet of truck mixers. Truck mixers are typically the highest capital investment in a ready-mix concrete operation. Reducing wear and tear on the largest expense makes economic savings.
- Traditionally there is also less cement required in a wet batch plant mix design that adds to the saving. This stems from the singular, thus better, control of the mix, that

pushes SD's down on the plant. Anybody in the know, will tell you that lower SD's allow for tighter mix designs and lower cement contents. Less cement equals a more cost efficient mix and a lower carbon footprint

- Time savings are a crucial part of wet batching. Wet batch plants normally do loads that are smaller than the capacity of the truck. Several loads will be mixed to fill up the truck, each mixed for about 1 minute. Time savings stem from the fact that the slump of the concrete is already correct by the time it goes into the truck and thus the driver does not have to stop the truck at checkpoint, spin the drum at high speed, for at least 5 minutes, then check the slump and make corrections. The slump can be measured inside the plant mixer through electronic and mechanical means.
- The concrete is sent out of the plant faster and so creates more time for the casting of the concrete on site, before the concrete sets. It also diminishes the turnaround time on trucks and time is money. You might even need fewer trucks to achieve the same production rate than a dry batch plant.
- The truck will need less energy to keep the mix agitated, rather than mix and then agitate the mix on the way to the site. This translates into less wear, less fuel usage and ultimately a lower carbon footprint.
- It really has been observed how the dry mix concrete plant often result in concrete balling problems but no such problem occurs by using a wet mix plant.
- The better control on a wet batch plant, lends itself to the production of highly specialised concrete mixes.

In today's competitive market, readymix suppliers are looking for any advantage to provide cost effective, consistent and fit for purpose concrete, to keep customers happy.

Contact Rudy Myburgh on 0832874841 or Rudy.Myburgh@putzmeister.com for more information on how to save with a wet batch plant. ■

**More information from Johan van Wyk,  
Cell: +2782 589 6016**





# MT -

## Ultimate Wet Batching Plants

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**1.0** 60m<sup>3</sup>/hr

**3.0** 120m<sup>3</sup>/hr

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**WANT TO KNOW MORE?**  
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Close to  
your business



# Africa Gateway offers insights into promising African markets

**A**frica Gateway, a website that presents data and analysis related to the growing markets of Africa, has been launched by the Dubai Chamber of Commerce and Industry (Dubai Chamber).

The online portal acts as a knowledge resource designed to equip users with information about business opportunities in African countries, providing elements such as statistics, strengths and weaknesses, challenges and opportunities.



The portal currently provides a business overview of ten African countries, with more countries to be added in future upgrades. The countries featured on the website are Angola, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Mozambique, Nigeria, South Africa, Tanzania and Uganda.

Information provided about each country includes demographics, political outlook, economy, key sectors, trade, foreign investment, business environment and current relationship with the United Arab Emirates (UAE).

The platform is seen as part of Dubai and the UAE's drive to step up business relationships with Africa. It was established to provide country profiles of African markets seen as most important or strategically significant for Dubai and the UAE and to assist businesses in their evaluation of countries that are considered as potential investment destinations. It is one of the main tools in Dubai Chamber's efforts to increase commercial relations with public and with private sector entities across the African continent.

The content of the website is being developed in collaboration with The Economist Intelligence Unit and it aims to provide data and trend analyses to help guide the decision-making process for businesses that are considering making investments in Africa or conducting business on the continent.

Data provided also includes rankings on ease of doing business and risk assessments measured over previous years to the present. This kind of data gives an indication of a country's general direction and trends over time, which can help prospective businesses gauge strengths and weaknesses when assessing commercial opportunities.

The website was launched ahead of the fifth edition of the Global Business Forum on Africa to be held in November 2019 and can be accessed via Dubai Chamber's website at <https://africagateway.dubaichamber.com/>



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# The real threat of using sub-standard cement

**T**he cement industry is seen as a good indicator of a country's economic growth as it is the key input material in infrastructure, development and much like the rest of the modern world, the foundation of South Africa is built on this premise. Yet, according to Njombo Lekula, Managing Director of PPC RSA, sub-standard cement products are threatening the built environment industry and placing South African lives at risk. Usage of sub-standard cement has various implications that may negatively affect the sustainability of buildings and structures thereby leading to increased repair or maintenance costs, injuries and fatalities due to structural failures or collapse.

During a normal market surveillance exercise whereby competitors' products were all tested for comparison, PPC found that some products supplied by cement producers were sub-standard and warranted further investigation.

In an effort to protect the greater South African cement industry and consumer, PPC appointed, Beton-Lab, a South African National Accreditation System (SANAS) accredited independent laboratory in September 2017 to physically purchase the bags themselves in order to maintain the chain of custody and assure no interference from any outside party. Part of the process was to take photographs of each bag (front, side, back panels and bag weights) to verify Letter of Authority (LOA) numbers, cement type and strength class. The weights of the bags were checked and the EN strength testing in accordance with SANS 50197 for 2, 7 and 28 days was performed. The South African Bureau of Standards (SABS) prescribed uncertainty of measurement allowance of 2.5% was applied when analysing the resultant data. The results show the inability to produce a consistent quality product and thwarting of standards. Alan De Kock, MD of Beton-Lab says, "As an independent laboratory our work is tightly controlled, ensuring accurate data that is in no way influenced by outside parties."

The report was recently released and the findings were shared with the SABS and the National Regulator for



*From left: Alan De Kock, MD Beton-Lab, Roland van Wijnen, PPC CEO and Njombo Lekula, PPC MD.*

Compulsory Specifications (NRCS), showing continued non-performance of the cements tested. According to Lekula, non-conformity of strength and weights of some products ranged from 11% to 73% of the sample set. "This failure to conform to local standards not only has an impact on the structural integrity of buildings, but also poses a threat to possible damage of property and even loss of life should the walls come tumbling down."

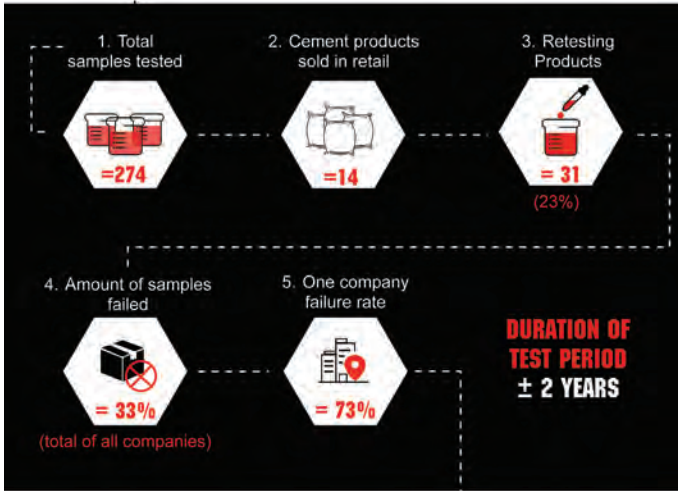
It was also found that most of the sub-standard cement products carry the SABS mark. The SABS stamp is a mark of regulatory approval, instilling trust in the product being sold and, if used in accordance with the instructions, will result in a structure that is robust and safe.

Local cement producers have stringent internal quality regulations in place to ensure compliance of their products.

# CEMENT TESTING RESULTS

PPC appointed, Beton-Lab, a South African National Accreditation System (SANAS) accredited independent laboratory in September 2017 to prove intentional thwarting of standards by cement producers who continuously supply the South African public with sub-standard cement. The tests were done over a two year period.

It takes up to **28 DAYS** for cement to develop the strength as indicated on the bag.

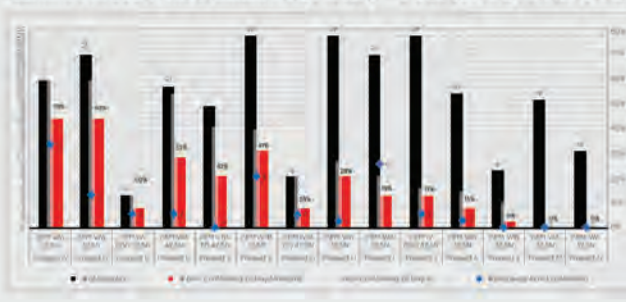


The data has been collated in a table below, which provides the totals for each cement producer product tested. The SABS prescribed uncertainty of measurement allowance of 2.5% has been applied when analysing the resultant data allowing for some leniency. There would be more non-conforming 28 day results if this was not applied.

The data below shows the total number of samples tested, the ratio of sub-standard (30 - 32.5 MPa) 28 day strength cement non-conforming and single result limit test failures (< 30 MPa), number of bag weight failures and the High / Low / SD of the 28 day strength. The 28 day strength was used as the primary common criteria, however similar trends can be seen on the other strength (2 & 7 day) requirements.

Cement Producer Conformity - Independent Laboratory									
		#NON-Conforming 28Day Strengths	%NON-Conforming 28Day Strengths	#Bag weights not conforming	# of Samples	28D SD	28D High	28D Low	28D Avg
Product A	CEM VA 32.5N	16	73%	13	23	11.48	44.1	3.4	23.7
Product B	CEM VA 32.5R	16	62%	5	26	4.20	36.8	16.3	30.2
Product C	CEM FA (BV) 30.0R	3	60%	2	5	4.33	37.5	16.3	37.4
Product D	CEM VA 42.5N	7	52%	2	11	4.90	51.3	30.4	41.2
Product E	CEM II (BM) 42.5N	8	47%	0	19	5.43	50.4	33.6	42.0
Product F	CEM IV B 32.5R	13	41%	8	29	4.80	48.4	26.4	33.5
Product G	CEM VA (V) 42.5R	3	38%	3	8	4.70	47.2	23.3	40.7
Product H	CEM VA 32.5N	9	28%	1	29	3.25	36.9	27.6	33.1
Product I	CEM VA 32.5N	5	19%	10	26	3.65	47.2	25.7	37.2
Product J	CEM FA (BV) 32.5R	6	17%	2	29	7.32	54.5	26.6	40.3
Product K	CEM VA 32.5R	3	15%	1	20	4.81	45.1	26.3	36.5
Product L	CEM VB 32.5R	1	11%	0	8	3.58	46.9	21.6	36.9
Product M	CEM VA 32.5R	0	0%	0	16	2.43	41.4	21.8	37.4
Product N	CEM VA 32.5R	0	0%	0	12	1.60	47.6	11.63	44.8

Cement Producer: Independent Laboratory – Strength and Weight Tests



However, with cement producers supplying the market with sub-standard extended products, Lekula questions the long-term effect on the South African built environment as well as the sustainability and impact on our infrastructure. With non-compliance of quality and durability standards, consumers are unaware of the risk they face.

It takes up to 28 days for cement to develop strength and fly ash does not start developing strength before 28 days. The durability of mortar or concrete is primarily dictated by the amount and the strength performance of the cement that is used.

Retailers, builders and construction companies are also at risk of future legal action or loss of income as selling and using these sub-standard products can have a negative effect on the perception consumers have of their businesses and standards.

Lekula concludes, "The use of sub-standard cement products has been identified as one of the main causes of building collapse globally. PPC has decided to take a stand against sub-standard cement products to ensure the safety of consumers and longevity of structures." ■

## About PPC

A leading supplier of materials and solutions into the basic services sector in southern Africa, PPC has 11 cement factories in South Africa, Botswana, DRC, Ethiopia, Rwanda and Zimbabwe. PPC's capacity is around eleven and a half million tonnes of cement products each year. PPC's Materials business comprises of Pronto Readymix (including Ulula Ash) and 3Q Mahuma Concrete. PPC's footprint in the readymix sector has grown to include 26 batching plants across South Africa. PPC also produces aggregates with its Mooiplaas aggregates quarry in Gauteng having the largest aggregate production capacity in South Africa. PPC Lime, one of the largest lime producers in the southern hemisphere, produces metallurgical-grade lime, burnt dolomite and limestone.

## About Beton-Lab

Beton-Lab was established in April 1999 and is an independent company specialising in cement and concrete testing. Beton-Lab strives to attain the highest standard of quality testing and service to its customers.

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

# Preserving the Owl House, Nieu-Bethesda

By Daniel van der Merwe, Leaf Architects

*"Helen's work encapsulates in varied and complex ways the events and experiences of her life: the light and the dark, the sun and the moon, the joy and the shadow. The Owl House and the Camel Yard are great works of imagination, both original and passionate, through which runs a cohesive and thematic thread of yearning, a quest for meaning and for wholeness, conceived with a commitment which makes her work unique and at many levels, profoundly moving." Sue Ross author of This is My World: The Life of Helen Martins, Creator of the Owl House.*



▲ The 'welcome' of the arch is contradicted by the high fence and plants barring the way.

◀ An owl atop an arch surveys a yard filled with a vast variety of sculptures.



be that most people can identify, on a subconscious level, with the Jungian archetypal expressions of suppressed darker desires as well as with the need for psychic transformation.

The welcome to her world is expressed in the arched entrance presiding over the street entrance – guarded by a double-faced owl, like Janus, the Roman god of portals. Yet this obvious intention is contradicted by the high fence barricade and the stand of cacti, which she then erected as a boundary around her expressions. Woven with wire words it sent out messages to the surrounding world.

**H**elen Martins was driven by a passion to transform her environment. She sought to worship, dream and convene her message of spirituality and meaning through the symbolism of her unique concrete sculptures supplemented by bottles and glittering surfaces created by embedding crushed glass.

Miss Helen's imagination transformed humble materials such as cement, glass, mirrors and wire into a secret, magical world that she shared with few, drawing upon Bible stories, the Rubaiyat of Omar Khayyam, the Orient, the work of William Blake – all of which blended to create a personal cosmology of an extraordinary, other-worldly home of concrete and ground glass sculptures.

The legacy left behind includes approximately 469 cement sculptures and other structures in the Camel Yard and in the house, and 44 bas-reliefs in the yard and on the front and back porches.

Her creativity conjures up an array of emotions: from wonder to excitement, curiosity and sadness. Visitors are variously awed, inspired, and fascinated by these magical figures. One of the reasons for the powerful impact of her works could

## Concrete workshops to empower marginalised artists

Most of the Owl House sculptures were created in a collaborative fashion with local illiterate labourers. Their offspring have become a unique community of crafters who are continuing the tradition and selling concrete work outside the museum.



*Local crafters enthusiastically participated in a series of creative concrete workshops to improve the quality of their work and knowledge of concrete applications.*

Traditionally, these cement artists have used a 'building up and carving away' technique to create the artworks that they sell. This is laborious and time consuming.

I obtained sponsorships from various companies such as PPC and Chryso to provide materials for a series of workshops, teaching the crafters new techniques, insights into other creative concrete applications and how to improve the quality and durability of their work.

Crafters were given simple found objects such as plastic containers, pieces of cloth and other items to be used as moulds. They were introduced to various alternative mould making techniques and how to mix, cast, de-mould and cure concrete using their own artworks as prototypes and using cheap materials such as bathroom silicone.

New technologies in cement and concrete and unusual inspirational concrete products were showcased and preceded a Creativity and Design Module. The workshops also introduced artists to the various additives and admixtures such as fibres, pigments, superplasticisers, accelerators, and release agents and how to cast their objects. I taught them about accelerators to enable their work to set quickly and to allow faster de-moulding of the artworks.



*Crafters' wares outside the museum. A master plan was approved and is far advanced to create more permanent structures for shelter, storage and art work production.*

### The need for repair and renovation

Over the years, water penetration and wind damage have contributed to the degradation of the structures. Water penetrates the sculptures through cracks and then freezes in the sub-zero winter conditions. This causes breakage, exposes the wire frames to corrosion and breaks the glass component of Martins' creations. Urgent remedial actions were needed and after much research it was decided to use Chryso and a.b.e. products which are designed for external concrete rehabilitation and renovation work.



*Renovation work to sculptures was made possible by using advanced concrete rehabilitation products generously supplied by Chryso and a.b.e.*

Chryso and a.b.e Construction Chemicals generously agreed to be part of this project. Michelle Fick, Chryso, a.b.e. Executive Relationship and Project Manager explained: "When Daniel van der Merwe of Leaf Architects and Landscapers recommended Chryso and a.b.e Construction Chemicals to get involved in the restoration of the Owl House, we were thrilled to be part of this project. It is currently rated as one of the top tourist destinations in the Eastern Cape and was declared a National Heritage Site earlier this year."

Dean Botha, the a.b.e. Technical Representative in Port Elizabeth, assisted with training staff, demonstrations and product recommendation.

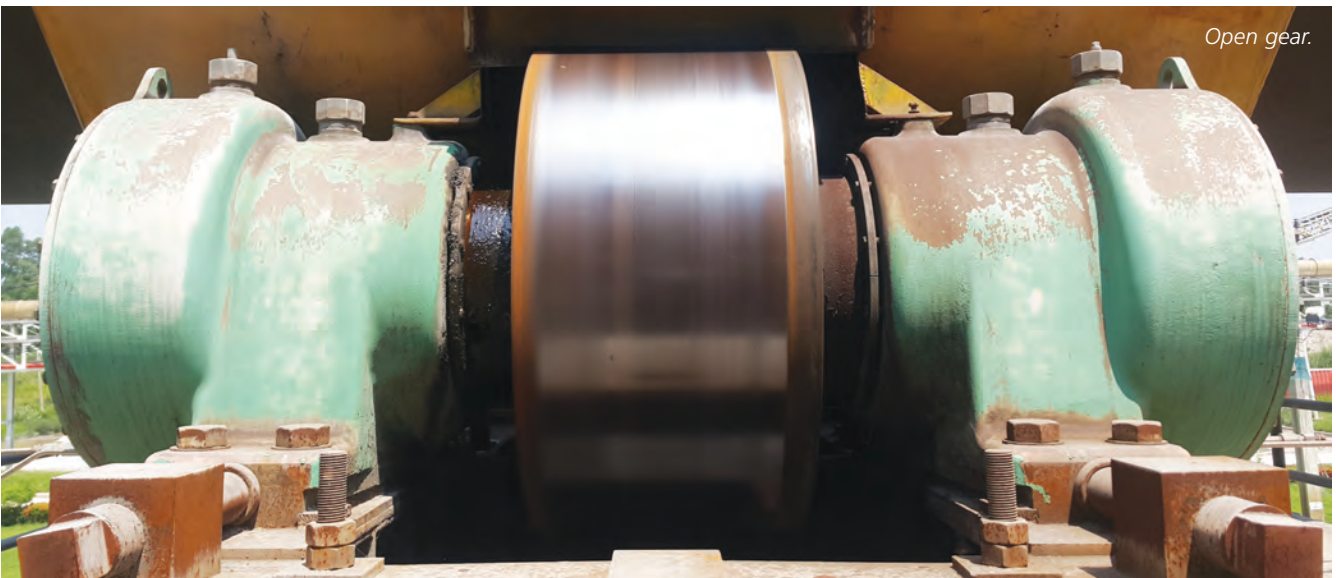
"We were also very happy to sponsor the initial batch of products which included dura.<sup>®</sup>rep ZR Primer – anti-corrosive primer for exposed rebar; epidermix 344 – structural wet/dry epoxy adhesive for bonding 'fresh' to old concrete; dura.<sup>®</sup>rep FR – fibre reinforced structural repair mortar for concrete reinstatement; epidermix 318 – epoxy mortar and abe.<sup>®</sup>silocoat – cementitious based waterproofing slurry," concluded Fick.

The Owl House, once an object of suspicion, derision and embarrassment to the community, has become the life force and single most important tourist destination to the town of Nieu Bethesda. It has been rated as one of the top twenty 'must see' attractions in South Africa.

After many years of delays, the Owl House was formally declared a site of cultural and heritage importance in June 2019 by SAHRA (SA Heritage Resource Agency). This formally accords it a special preservation and national heritage status.

Readers of *Concrete Trends* are invited to join the effort in realising the aims and objectives of the Owl House Foundation, and to contribute to the wellbeing of the Owl House and its community by becoming members of the Foundation. Details can be found at [www.theowlhouse.co.za](http://www.theowlhouse.co.za) ■

**More information from Daniel van der Merwe,  
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## LE helps mines and cement plants gear up to take better care of their equipment

In a tough economic climate, South Africa's mining, cement and other industrial sector players are facing numerous challenges, including a strained electricity supply, rising operating costs, and fuel increases. This has put them under pressure to maintain profitability by cutting costs. However, cutting costs in the wrong places could have a negative long-term impact on a business's sustainability.

Rather than looking to cut costs by opting to use cheaper maintenance products, companies need to focus on protecting and managing their equipment more carefully, particularly in harsh operating environments, such as mines and cement factories.

Open-gear lubricants and greases distributed by LE Incorporated protect against machine failures and improve the performance and longevity of important equipment.

Callum Ford, National Marketing Manager at LE says they've experienced cases where mines have attempted to cut costs by using cheaper lubricants, but have found that it is not profitable. Ford says these customers have returned to LE products due to their quality and contribution to greater equipment longevity.

"Given the abrasive nature of the requirements in these two industries, the gears used in mining and cement production experience high wear and typically have to be replaced often," he says. "Owing to the resultant downtime, loss of productivity, and the price and transportation of replacement parts, this becomes costly. This is why it's worth investing in the right lubrication solution – it can drastically cut down on the wear and tear, especially on large open gears that have to perform at a high intensity in challenging conditions. They have to withstand dust, silica, water, high heat and extreme pressures. Open-gear lubricants must be specially formulated to keep these gears and machinery operating at maximum efficiency."

Ford explains that using high-quality lubricants can also reduce the volume of lubrication products that a plant or mine needs to use, meaning that operating costs decrease over the long run when using higher-grade products.

"One of our mining clients switched the lubricant on their mill drill motor to our Pyroshield 9011 XHvy high-viscosity oil, and they saw the drill motor moving from operating at between 5,6MW and

5.4MW to between 5MW and 4.6MW – an energy savings of 400kW to 600kW or approximately 12%, while maintaining the same production output," Ford says. "They also reduced their monthly lubricant consumption from 800kg per month to 80kg, which just goes to show that buying a quality product has real benefits."

LE also offers its clients support so that they are equipped to use its gear lubricants and greases to maximum efficiency, giving mines and cement plants the greatest value possible for their money. LE technicians analyse sites to ensure the correct lubricants are being used, and that they are applied properly to achieve good equipment performance, which in turn reduces electricity consumption and wastage.

"For mines and cement factories looking to cut costs, the answer may not be to use cheaper products, but rather to find quality equipment maintenance products that require lower volumes to achieve their purpose and increase the longevity of machinery," Ford concludes. ■

**For more information, visit [www.lubricationengineers.co.za](http://www.lubricationengineers.co.za)**



### About the company

Lubrication Engineers (LE) South Africa represents the LE brand in South Africa, Botswana, Namibia, Mozambique, Zimbabwe and Zambia. We hold the rights to Southern Africa on the LE brand, recognised internationally as a specialist in lubrication.

Through LE Incorporated, we are a member of a worldwide network of companies spanning Europe, South America, Asia and Africa, while LE Incorporated operates in the USA and covers North America including Canada, Mexico and the USA.

We provide high performance, heavy-duty, quality lubricants for virtually every industry and application, as well as expert technical back-up and support.

# Marley Building Systems, an Etex company, earns Global GreenTag

It is with great pleasure that we announce that Marley Building Systems, an Etex company, has completed the global GreenTag accreditation. A GreenTag certification is renowned for enhancing a brand and its products' credibility.

Global GreenTag is the 'home of all the leading certified and verified sustainable products knowledge' and they provide consumers with 'information you can trust'. Their mandate is to encourage companies to produce and distribute eco-friendly products that won't have a harmful impact on the environment. Global GreenTag certified products pass the world's toughest standards for health, eco performance and safety.

Recognised by major green rating schemes, GreenTag is your one-stop certification to choose or evidence product selections. The following Etex products have been GreenTag certified:

- Siniat EasyBoard
- Siniat FireCheck Plasterboard
- Siniat MoistureCheck Plasterboard products.

The above mentioned products have achieved GBCSA Level B Bronze, certified under Global GreenTag Standard V3.2.



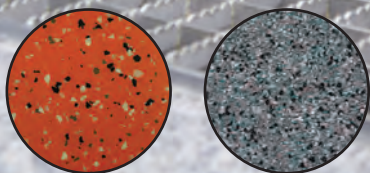
Other Etex products that have received the green stamp of approval from Ecospecifier include the Siniat plasterboard, Etex jointing compound, our metal products, and our Siniat vinyl ceiling tiles.

In addition to providing our customers with high-quality materials that enhance the look and feel of their buildings and homes, our number one priority is to develop, market, and sell products that have less negative environmental and health impacts. We endeavour to continue playing our role in ensuring the well-being of the environment. ■

More information at [www.marleybuildingsystems.co.za](http://www.marleybuildingsystems.co.za)

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**SPECIALIZED**  
COATING SYSTEMS

# MIT's carbon-free method to make cement

By Michael Irving

As the most widely-used building material in the world, it is no surprise that making cement is one of the single biggest contributors to our carbon emissions problem. MIT researchers now claim to have developed a new method that can clean up the cement production process, removing most of the carbon emissions without affecting the resulting product.

Portland cement is made by calcining the constituents at temperatures of up to 1,450° C. The energy used to heat the mixture produces huge amounts of carbon dioxide and greenhouse gas is also released. That means about 1 kg of CO<sub>2</sub> is released for every kilogram of cement produced.

While it's been argued that concrete eventually sponges up much of the CO<sub>2</sub> emitted during its production, the manufacturing process still needs attention. Researchers have experimented with a variety of solutions.

The end result of many is a different type of concrete. And the building industry may be reluctant to start using a different material. So the researchers on the new study focused on improving one step of the regular process, making plain old cement greener without changing the material itself.



An experiment illustrates the electrolysis process using dye: pink represents the acid created at one electrode and purple the base at the other end. Credit Felice Frankel.

Rather than heating the ground-up limestone, MIT's new process uses an electrolyzer, where electrodes split water molecules into oxygen and hydrogen. Doing so creates an acid at one electrode and a base at the other. The limestone is dissolved in the acid, and calcium hydroxide is created at the other end, in solid flakes. These flakes of lime can then be harvested to produce cement.

Carbon dioxide is still produced as the limestone dissolves. But it isn't released into the air – instead, it can be captured and because it's pure, used for other purposes, such as making liquid

fuels or carbonating drinks. The team even says that it can be combined with oxygen produced by the same system, and burned to fuel the rest of the new cement-making process.

The researchers demonstrated the technique in the lab, and showed that it worked on a small scale. The team says it could be scaled up quite easily, but it is still just one part of the larger process of making cement. More work needs to be done before it can be implemented in the real world, but it's a promising step. ■

Source: <http://Innk.in/FHi>

## The Opus, Dubai designed by Zaha Hadid Architects

Located within Burj Khalifa district of Dubai, the Opus by Zaha Hadid Architects for Omniyat will house the first 'ME by Melia' hotel in the Middle East. Operated by Melia Hotels International, one of the world's leading hoteliers with more than 350 hotels in 39 countries, 'ME by Melia' hotels are located in cultural capitals across the globe with their progressive, design-driven approach.



The Opus is designed as two separate towers that coalesce into a singular whole – taking the form of a cube. The cube is then 'carved', creating a central void that is an important volume within the building in its own right – providing views to the exterior from the centre of the building. The free-formed fluidity of this eight-storey void contrasts with the precise orthogonal geometry of the surrounding cube.

The two towers are linked by a four-storey atrium at ground level with a bridge connecting 71 metres above the

ground. This three-storey, asymmetric bridge is 38 metres wide. Together with the ME Dubai, the Opus will house 12 restaurants as well as a rooftop bar and 5,203 m<sup>2</sup> of office space.

"The Opus will be aligned with Omniyat's vision of treating each project as if it were a unique work of art," said Mahdi Amjad, executive chairman and CEO of Omniyat. "The design conveys the remarkably inventive quality of ZHA's work; expressing a sculptural sensibility that reinvents the balance between solid and void, opaque and transparent, interior as well as exterior."

"You always expect to be surprised by ZHA's designs, but The Opus for 'ME by Melia' Dubai goes beyond what we could ever have anticipated. We are proud to have this amazing project in our portfolio," explained Gabriel Escarrer, vice chairman and CEO, Meliá Hotels International at the earlier announcement of ME Dubai to be located at The Opus. ■

Source: <http://Innk.in/FPI>





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# Truly creating concrete possibilities



*Ebeth van den Berg*

**A**friSam's judicious brand positioning in the construction materials market extends far beyond the products that they manufacture.

Ebeth van den Berg, group marketing manager, explains: "Our ethos of 'Creating Concrete Possibilities' has charted a path for AfriSam's brand away from mere sales-driven promotion of products, towards a multidimensional approach which includes cause-related marketing and a strong focus on industry support. While selling products is crucial for our financial sustainability, we want to engage with customers' hearts and minds."

## Cause-Related Marketing

AfriSam's cause-related initiatives are mutually beneficial collaborations between the company and various third parties. These campaigns stem from a heartfelt resolve to invest in South African communities and to make a lasting difference in the lives of people.



*AfriSam's general manager at its Dudfield plant, Vishal Aniruth, with one of the teams that will benefit from the Ima Nathi programme.*

## Youth Soccer Development Programme

Ima Nathi is a South African Football Association (SAFA) soccer development programme, implemented by the SAFA regions at Local Football Associations (LFAs) across the country. The focus of the programme is to train coaches to develop players – boys and girls – from the ages six to 18 years.

The AfriSam Ima Nathi Soccer Development Programme has already launched in two regions: Msunduzi and Ditsobotla. The Msunduzi LFA is where two of AfriSam's KwaZulu-Natal aggregate quarries are situated, while the Ditsobotla LFA is near AfriSam's Dudfield cement plant in North-West.

For AfriSam this is an investment in the foundation of future South African footballers, building our nation's football skills from the grass-roots level up.

AfriSam's three-year sponsorship makes provision for assistance in the critical aspects of football: coaches, players and equipment.

## PinkDay

For a third consecutive year, AfriSam will be putting its weight behind the Momentum PinkDay ODI in 2020 to create awareness and raise much needed funds for the Charlotte Maxeke Breast Care Unit.

Since 2018, AfriSam has supported the fundraising efforts associated with PinkDay, by engaging its staff and members of the public with its own AfriSam PinkDay campaign.

AfriSam will once again support the initiative by Cricket SA, Momentum and Imperial Wanderers Stadium for the PinkDay ODI against England on 9 February 2020.



*AfriSam's executive team with a branded pink readymix truck as part of the PinkDay campaign in support of breast cancer awareness.*

As part of the AfriSam PinkDay Campaign, in a first for AfriSam, the company branded four of its Gauteng readymix trucks with the Proteas players dressed in pink.

Members of the public were asked to spot a pink truck and share its location on social media. Participants stood a chance to win tickets to the PinkDay ODI. With every 6th photo shared, AfriSam donated R1 000 towards the Charlotte Maxeke Breast Cancer Clinic. The 'spot the truck' campaign has received an overwhelming response from the public and over the past two years AfriSam raised in excess of R225 000.

Van den Berg expands: "AfriSam's goal is to create every possibility for proper treatment, facilitate awareness and more research on the disease as well as lend its support to those in need."

## Industry Support

Professional bodies in the built environment, while serving different disciplines, all have a common goal to create networking opportunities for the professionals they serve, to keep their members abreast of latest technologies and to recognise good practice. As an industry leader, AfriSam is mindful of its role to endorse and support these bodies.

Van den Berg describes this support: "AfriSam actively gets involved with various industry bodies such as the Concrete Society of Southern Africa (CSSA), The Concrete Institute, South African Institute of Architects (SAIA) and the universities to fund research as well as various initiatives aimed at advancing excellence in concrete. Our work is always about partnerships, as none of us can create these concrete possibilities on our own."

## Fulton Awards

Being the anchor sponsor for the Concrete Society of Southern Africa's prestigious Fulton Awards 2019, AfriSam reaffirmed

its mission by pushing the boundaries of concrete application, both in terms of sustainability and technical performance.

This event is well known for recognising excellence in concrete. It gives a platform to those individuals and companies that are pushing the boundaries in the use of concrete as this process leads to the innovative use of concrete from an architectural as well as a functional perspective. The awards honour the teams involved in the construction of each project, including the owner, developer, consultants, contractors and the specialist suppliers.

It is significant that of the 31 finalists, 15 projects were constructed using AfriSam readymix concrete or cement.

### AfriSam – SAIA Award for Sustainable Architecture and Innovation

AfriSam has been the founding sponsor of the AfriSam-SAIA Awards for Sustainable Architecture and Innovation for almost a decade.

This esteemed biennial award recognises the importance of 'green' building and acknowledges the contributions made by forward-thinking industry players towards bringing sustainable innovation to human living environments.

Since its inception in 2009, the AfriSam-SAIA Award has acknowledged and recognised excellence in various categories of sustainable development. Both AfriSam and SAIA agree that the world has entered a new era; one in which sustainable design has to be a prerequisite and an integral part of the building industry.

Through this award, practitioners who share this vision and execute projects that showcase innovative contributions towards this cause. The spotlight is on an integrated approach to planning, design and architecture as well as sustainable building practices, natural systems and technology.

### Research Support

According to Van den Berg, AfriSam is mindful of its role in influencing the industry towards more responsible and sustainable approaches in researching the most appropriate 'best practice' solutions for the future.

It follows that students' initiatives and tertiary support play a major role in AfriSam's focus.

Recognising the importance of being able to engage with students who are the future lifeblood of the concrete industry, AfriSam sponsors the membership fees of the CSSA for 5 tertiary institutions. These memberships cover academic staff and full-time post-graduate students and final-year undergraduate students undertaking programmes of study relevant in the cement and concrete field.

AfriSam's technical team also keep close contact with academics to establish the needs of researchers.



AfriSam's marketing team.

### Staff involvement

According to Van den Berg part of the success of AfriSam's multi-layered marketing approach is the involvement of staff members.

A marketing spirit is entrenched in all staff and has become the way of doing business at all levels, and at every touch point. Every employee is a brand ambassador, which is evident in the statistics which show a very low staff turnover with many staff members being recognised for substantial years of long service at AfriSam.

The creative branding of readymix trucks personifying the brand positioning of "creating concrete possibilities" is a hugely successful example where staff members were asked to come up with the slogans which now grace the trucks.

Today AfriSam's readymix trucks inspire the public to look beyond the truckload of concrete and see the promise of every delivery to create the infrastructure required for people to be nurtured and to reach their full potential.

A small yet dynamic and cohesive marketing team serves the South African business as well as the neighbouring countries in which AfriSam operates.

With a marketing budget which has only seen inflationary increases in recent years, this team has realised the importance of a focused approach, knowing that the value-add of the marketing department is recognised by and fully supported and endorsed by the AfriSam board and executive management team.

The adage of working smarter not harder has never been truer.

### Challenging Times

Talking about creating concrete possibilities is one thing but doing something about it in the current suppressed construction industry is a completely different story.

As a leading construction materials company, AfriSam understands the importance of remaining consistent in its marketing initiatives during challenging times. The brand and related marketing initiatives are seen as the heartbeat of the company, not a dispensable add-on.

They have perfected the art of creating meaningful marketing opportunities for brand awareness through cause-related initiatives and industry support, to make a difference.

"With a solid grounding in ethical business principles and the backing of AfriSam's quality construction materials on offer, taking our brand to a level above mere commercial interests is a passion and extremely rewarding for myself and my team." Van den Berg concludes.

"Creating Concrete Possibilities" is the AfriSam way towards ensuring a legacy in which the company's marketing actions and decisions talk to the hearts and minds of all they engage with, creating concrete possibilities for individuals, communities and future generations. ■



One of AfriSam's branded readymix trucks with a bespoke message linked to the ZEITZ MOCAA in Cape Town, to which AfriSam supplied the concrete.

# Innovative concrete the solution for on-time repairs to M2 Motorway

**M**onday 4 November saw Johannesburg motorists immensely relieved to see the end of navigating widespread congestion resulting from the closure of the vital M2 Motorway over a year ago. The decision to close the route, in the interest of users' safety, was made when the engineers determined that concrete structural sections of the aged motorway had severely deteriorated, and instigated an urgent Bridges Rehabilitation Project. Lafarge South Africa played a key role in ensuring high quality, durable repairs by supplying innovative ready-mixed concretes.

Lafarge South Africa (Lafarge) is a member of the LafargeHolcim international group, a world leader in building materials and solutions. The company provides innovative solutions and high-tech cement and concrete materials for building sustainable infrastructure. At the forefront of its industry, the group has advanced research and development facilities that meet the needs of today and anticipate the needs of communities in the future.

The deterioration of bridges on the motorway built in the 1960s, in particular the Selby Bridge, was largely due to alkali-silica reaction (ASR) in the materials used causing swelling and cracking within the concrete and the subsequent ingress of moisture. Casting major replacement concrete sections presented construction challenges because of the heavily reinforced deep structural sections involved. A high density of reinforcing makes compacting difficult and laborious, in addition to the time pressures associated with such a high-profile project. The client's demanding durability specifications also ruled out the use of standard concrete mixes.

## Unique global brands

The solution was provided by the LafargeHolcim Global Brands, a range of technically advanced products that have the same specification throughout the world with top quality and guaranteed identical performance. They offer solutions specifically adapted and tested in the local market to reflect South African expertise.

Agilia™, a self-compacting ready-mixed concrete, was used for the bridge reconstruction works. The innovative formulation of this Global Brand product achieves an optimum balance between fluidity and stability to achieve better productivity, high strength and durability, as well as exceptional aesthetic finishes.

The Lafarge Wynberg Readymix plant, with contingency backup provided by Cleveland, supplied over 1000 m<sup>3</sup> of Lafarge Agilia™ Vertical for casting heavily reinforced or highly congested sections of the bridge. The product comfortably exceeded the minimum strength specification of 45 MPa, while the cement extenders and aggregates used in the formulation gave

enhanced durability and minimised potential ASR problems.

## Focusing on the contractor's needs

With the major structural works on the bridges finished and the contract completion deadline approaching, time was of the essence for the contractor, still having to repair various smaller sections of the motorway.

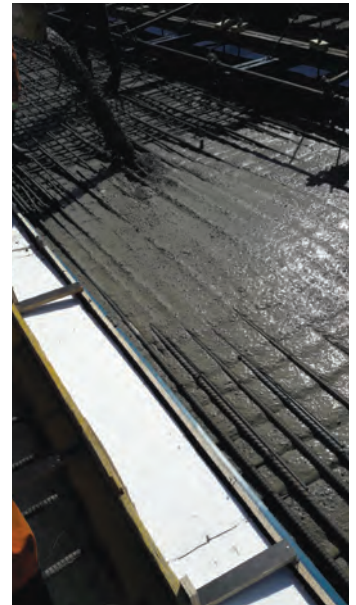
"There was a need to have a concrete that could be transported and handled in the same way as conventional ready-mixed concrete, but would guarantee strength development when it optimally suited the contractor's programme," said Darren Jacobs, Technical Global Brands manager of Lafarge South Africa. "This generally meant wanting to effect the repair far quicker than could be achieved with a normal concrete mix. Our innovative Chronolia™, another LafargeHolcim Global Brand product, was the solution to these seemingly contradictory requirements."

The range of Lafarge Chronolia™ grades has the same workability as conventional ready-mixed concrete and can be used on all construction site applications. The formulations give at least two hours of slump retention followed by the selected rapid strength gain. For the motorway repair, Lafarge readily met the client's stipulation to have a minimum strength of 25 MPa guaranteed at 24 hours.

The high early strength of Chronolia™, makes it an ideal solution for repairing road surfaces and civil engineering structures, enabling them to be brought back into service with minimal disruption to users.

"Offering Lafarge's innovative ready-mixed concrete solutions to address the huge challenges in this vital motorway project made a significant contribution to the successful on-time delivery of the rehabilitated structural works," concludes Jacobs. ■

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*Lafarge Agilia™ was the solution to the concrete repairs for the challenging M2 Motorway repairs*



*Cutting the ribbon are JRA board chairperson Siphso Tshabalala, Prince Mangosuthu Buthelezi, Gauteng Premier David Makhura, City of Johannesburg Mayor Herman Mashaba, MMC for Transport councillor Nonhlanhla Makhuba and the JRA acting MD, Siyabonga Nodu. Photo: Southern Courier.*

# Quality Control

**S**o... Construction Thor has been accused of flying the Bifrost like a "slow old man". Translation, for those not familiar with the superhero realm: I adhere to the speed limit on the road.

The reason for me adhering to the speed limit is partly because my insurance provider monitors the speed of my mode of transport, through a tracking system, and then rewards good driving behaviour by paying back half of my fuel spend every month. The other reason for sticking to the speed limit is simply because it is the law.

In explaining this to the person who called me a "slow poke", the reply was that he didn't like that kind of control. That kind of control? Translation: You don't like that your insurance provider can see that you are a law breaker or that you are driving in an unsafe manner?

This is a rather disconcerting thought when you tell me that you produce a quality controlled precast product especially as there are rules to follow when you control the quality of concrete. Do you choose which laws to follow and which ones not to? Do you like to control that comes with the laws you do adhere to? Do you even follow the necessary concrete rules or do you too rape the use of the word "quality" when referring to your product?

This is where the inherent rules, that you need to follow to show that you produce a quality product, comes from. You cannot choose which rules to follow and which not, because



breaking only one of those rules in mix design, production and testing will render the whole process moot.

## Let's think about the safety aspect of the following rules:

Do you wear safety goggles or compel your horticulturalist to wear safety goggles when using your weed eater on a Saturday morning at home? Do you wear safety goggles when quickly using your angle grinder at home? Do you enforce the use of safety goggles on your concrete production facility? If the answer to any of these questions are no, it is clear that you choose which rules to follow and when to follow them. The fact remains that the rules are set to protect you and those around you. The rules will continue to protect you whether you choose to follow them or not.

If you don't follow the rules of the road, you have no right to complain about the fuel consumption of your chosen mode of transport or the unsafe behaviour of certain minibus mass transport systems for that matter.

Similarly if you don't follow all the rules for producing quality concrete, you have no recourse if the concrete is not fit for its purpose.

This is Construction Thor reminding you to put the hammer down, bring the thunder and follow the rules. I'm back on the Bifrost, within the speed limit, even it seems slow to some. ■

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**TECHNICRETE**

# Cinderblock construction showcased at Emantini Seed Bank

The Emantini Seed Bank in Swaziland has showcased simple construction methods and the innovative use of materials to sculpt the user's experience in an unexpected and inspiring way. It is hoped that this landmark project by the Paragon Group will encourage its replication as a template for similar seed banks elsewhere.

The Emantini Seed Bank is a hi-tech form of conservation to safeguard genetic diversity whereby scientists collect and document seeds, and then store them in a refrigerated facility, effectively creating a 'library' of plant genetics. The project comprises two well-insulated refrigerated storage facilities, a laboratory, amenities, and a courtyard space that has been designed to host functions.

The project brief specified a tight budget. "Our success is testament to how we, as a practice, can add value to any project by making the most of any budget. It also demonstrates our mastery in design, and a capability to work in any market sector," Paragon Group architect Dewald Veldsman explains. Mouaz Sabha assisted with the construction packages, while Kim Newell carried out the initial 3D visualisations.

Due to the budgetary constraints, the most cost-effective construction method was to use cinderblocks. "The humble cinderblock is no stranger to a rural context. By demonstrating that one can use unfinished, cost-effective concrete blocks to create a beautiful piece of architecture, you hopefully inspire and encourage others in the community to do the same," Veldsman highlights.

The cinderblocks used were manufactured locally, which means minimal transportation costs. Some of the blocks were altered by placing them on their sides on a shutter board, and pouring in concrete to form a base. These altered blocks were then used for the 'holes' in the wall, as well as for planters

and lights. The faces of the blocks were topped off with a matt sealer.

The Emantini Seed Bank is located on a private estate, and forms part of a private nature reserve, nursery, and botanical garden. The main contractor was AMS Construction, under the leadership of director Carlos dos Santos, who collaborated with the Paragon Group on the Malkerns Square Estate and Matsapha Link Shopping Centre, both in Swaziland. These projects also focused on the use of conventional construction methodologies, materials, and non-specialised skills.

Commenting on the importance of the seed bank as a specialised conservation measure, Veldsman says humans are eradicating our fauna and flora at an exponential rate, while the earth's human population is rapidly nearing its limit. "The client is a future thinker, and realises how our perceived value of all genetic diversity will change in the near future – especially when it is too late.

"He is a keen plant enthusiast, and would like his personal legacy to be a priceless gift back to society. Thus he had this



Paragon Group  
architect Dewald  
Veldsman.



The Emantini Seed Bank is located on a private estate and forms part of a private nature reserve.



*It consists of two refrigerated storage facilities, a laboratory, amenities and a courtyard.*

vision of popularising the idea of safeguarding plant genetics. The first step in this mammoth task has been to create the cost-effective and beautiful Emantini Seed Bank as a prototype, in the hope of inspiring other like-minded people to do the same. He is convinced that the only way to save the planet is by changing the way we think, and this project was a good place to start," Veldsman concludes. ■

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*The Emantini Seed Bank in Swaziland aims to safeguard genetic diversity.*

#### About Paragon

Paragon, established in October 1997, is an internationally-active design business, based in Johannesburg. We deliver commercial architecture, masterplanning, interior design, and space planning to visionary clients in all property sectors, from retail to residential and education.

We are committed to global urban development. We are able, agile, flexible and diverse in our approach to design. Each project is unique and not driven by style, but by lifestyle and a response to user needs. We understand the needs of our clients, and can generate ever-new architectural forms in a competitive property market.

We are known for hands-on engagement with all opportunities present in the modern global building industry. The true measure of our skill is our ability to engage at all levels and with all players in the colourful world of construction and property development. Our buildings look forward. We embrace the future, because we will be a part of it – part of its problems and responsibilities, and part of its great freedoms and achievements.



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# Eirich Intensive Mixers for preparation of fibre-reinforced extruded concrete

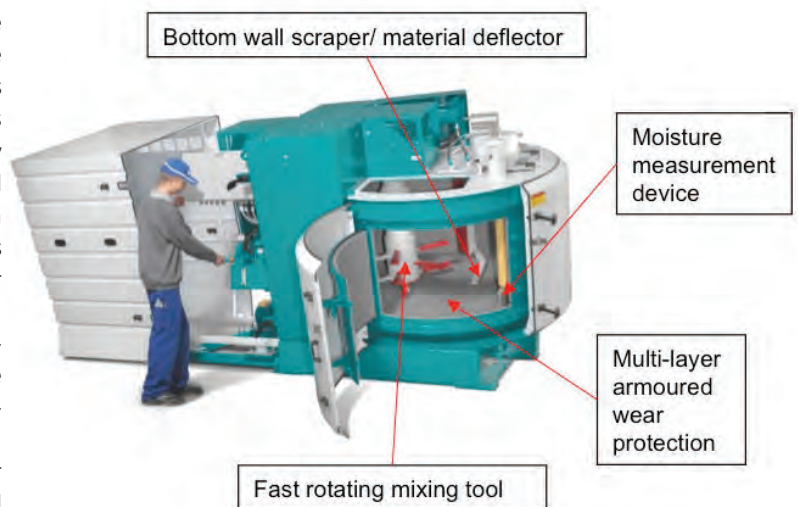
**F**ibres – preferably steel, glass or plastic fibres – are added to concrete to improve its cracking and fracture behavior. To achieve the expected properties, the fibres must be distributed as evenly as possible in the concrete. This places tough demands on the mixing technology, particularly if concrete with little water and fine grain sizes is processed into small precast elements – concretes where the largest grain size is < 6 mm. For this reason, more and more manufacturers of precast elements made of extruded concrete are opting for mixing technology from EIRICH BIRKENMAYER.

The fine-grained concrete used for small extruded components / precast elements has a stiff-plastic consistency. To ensure that the products taken from the extruder offer sufficient cohesion, plasticisers and plastic fibres are added to the concrete. This ensures the homogeneous distribution of the plasticiser and a defined separation of fibres, which are often entangled or matted, presenting a major challenge for concrete mixers.

When processing fine-grained concretes of any consistency, with or without added fibres, the system design of the EIRICH INTENSIVE MIXERS offers major advantages. The mixing system (inclined rotating pan and fast rotating mixing tool) is a further development of the ring-trough and planetary mixer and was brought to the market 40 years ago.

What sets this design apart for other mixing processes is the fact that the rotor can run at any speeds up to 30 m/s – and this with or against the direction of rotation of the pan. As a result, the power input into the mix can be carefully adapted to the relevant process and to its specific requirements.

Depending on the geometry and speed of the rotor, very high specific mixing energy input (> 10 kW/100 kg) into the mixing material is possible. With the mixing pan and rotor normally running in opposite directions to each other, high-speed differences are generated, with correspondingly high shear forces. As a result, the EIRICH INTENSIVE MIXER is also ideal for preparing very stiff concrete mixes with added fibres. Furthermore, addition of cement can be reduced by up to 10%.



*Eirich Intensive Mixer RV type for concrete industry.*

The mixing principle with a rotating mixing pan, rotor and material deflector ensures complete agitation and homogeneous mixing of all the material with every rotation of the mixing pan. Material transport inside the pan is separated from mixing zone which allows a very efficient use of mixing energy. With the EIRICH INTENSIVE MIXER, the dead zones are prevented because all the mixing material is fed to the mixing tool blades. This also reliably rules out segregation in the mixer.

Technical trials regularly demonstrate improved mixing results particularly in terms of preventing fibre segregation. For production plants, in addition to the mixers, EIRICH BIRKENMAYER can also supply the entire plant engineering including conveyor systems, dosing systems, weighing equipment and plant control systems. Table feeders allow material from a batch mixing process to a continuous process.

EIRICH BIRKENMAYER can look back on many decades of experience in many applications, including the production of concrete roofing tiles or spacers. The EIRICH BIRKENMAYER brick and block machines also benefit from the EIRICH INTENSIVE MIXER design to reduce the amount of cement used in a given mix design. All this experience will benefit new and old customers to produce high-quality concrete for every application.

Birkenmayer South Africa is part of the Eirich Group, a company that operates in 14 countries on six continents across the globe. Birkenmayer is backed by world-class manufacture within the world of concrete mixers and brick and block plants. ■



*A typical Eirich Birkenmayer brick and block plant layout with an Eirich RV19 mixer.*

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# A humble kerb that serves South Africa

The widespread construction of kerbs only began in the 18th Century despite them having been around since the days of Pompeii. Originally utilised for the beautification of the city and to separate transportation from pedestrians, the humble kerb has evolved into an infrastructure necessity, preventing for example drivers from parking on pavements and lawns in addition to the providing of structural support for pavement edges.

Technicrete's precast Barrier Kerbs have been successfully installed on numerous regional infrastructural projects throughout South Africa due to its 100% local manufacture and excellent quality. The kerb uses the 'Half-Battered' profile. This more vertical face offers a type of 'barrier' to motorists for them to be sufficiently aware that they are dangerously close to the edge. The 'sloping back' profile enables road rollers to operate right up to the edge of the pavement without scratching or damaging the kerb face when the surfacing is laid.

On slower rural roads the kerb can provide an element of safety through impact redirection. On fast moving freeways and highways, the kerb is more often used for drainage and often applied near bridges, where erosion is a possible factor and to ensure a clear and visible separation of people and motor vehicle lanes is established.

A combination of a Technicrete Fig.3 Barrier Kerb and a C900 Gutter Section will convey drain water to the nearest kerb inlet. Any road resurfacing requirements will not require realignment with the kerb line either. The Technicrete semi-mountable



*Technicrete's humble kerb is an infrastructure necessity.*

kerb can also be utilised in conjunction with the C900 Gutter Section for drainage purposes on roadways and elsewhere.

The company's Barrier Kerbs have been specified for such projects as medical centres, national roadways, private and commercial residential developments, gutter systems and rural infrastructure upgrading.

Technicrete and Rocla are part of the Infrastructure Specialist Group of companies (ISG). ■

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# Leading with passion and innovation – a lifelong commitment

Ten years ago, Reyno van Rooyen, Group MD of The Revaro Group of Companies (since 1999) identified a gap in the market for affordable, innovative equipment. He has since built concrete industry-focussed Revaro Concrete Equipment (Pty) Ltd into a very competitive company, and travels constantly worldwide to ensure that his product range is new, of high quality and affordable. Being a one-stop shop, Revaro caters for both small and established companies, supplying both equipment and consumables to the concrete industry.

Revaro Concrete Equipment (Pty) Ltd boasts the widest product range in the industry with over 100 different products, all complemented with service and replacement parts, extensive product training and strong aftersales support for each product. Revaro has many happy customers who have seen the value offered by the company and who have stayed loyal over the years often referring friends and family.

Revaro has grown tremendously and sources machinery and equipment from six countries, including India, China, Germany, Austria, UAE and now also Spain. Revaro currently serves customers in over 20 countries in sub-Saharan Africa.

## Exclusive agent for Spanish brands HORPRE and POYATOS

Revaro Concrete Equipment (Pty) Ltd is proud to announce that they are now the exclusive agents for HORPRE and POYATOS in Southern Africa. These are both well-known and reputable Spanish manufacturers of brick, block and paver-making machines.

HORPRE, S.A. is dedicated to the manufacture of precast concrete machinery and was established 1984 with the endorsement of the experience of its founders in the precast industry. Their fully automatic mobile machines are designed for the manufacture of blocks, slabs, kerbs and pavers.

POYATOS was established in 1975 and specialises in concrete block machines. It provides complete solutions for concrete blocks and plants that manufacture products with outstanding finishes.

POYATOS manufactures a broad range of static hydraulic block making plants with the latest technology, offering 14 different models of block making machines with a production range from 800 to 6 000 6" blocks/hour. All concrete machines are equipped with the most advanced systems and can produce a variety of concrete products.

### Revaro's mission

The Revaro Group of Companies' mission is to create value for their customers through affordable, innovative equipment, backed by extensive training and after sales support as well as stocking ample service and replacement parts. Using Revaro's equipment either increases turnover or reduces expenses – resulting in increased profits.

### The Revaro Group of companies

Revaro Concrete Equipment's range includes:

- Brick making machines
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- Concrete mixers (pan, twin-shaft & planetary)
- Aggregate batchers
- Lintel, slab, pole, beam and dry-walling machines
- Hollow-core slab machines
- Automatic pallet feeders
- Brick & block splitters
- Roof sheet forming machines
- Concrete roof tile machines
- Wet block stackers
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**Revaro Engineering** designs and manufactures the following:

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- Wet block stackers
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**Revaro Brick Pallets** offer a variety of production pallets for brick and block making machines, and supply:

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- Plywood pallets ■

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## Affordable seating for the first Green ICT school in the Western Cape

**A**t the start of 2017, construction of a new Information and Communications Technology (ICT) school building began at Botha Halte Primary, off the R43 near Botha Wine Cellar in Worcester, South Africa.

Initiated and privately funded by Farmprops (Pty) Ltd, representing the Bosjes Family Trust, the school forms part of the LitNum Hub for the Breede Valley area, providing tuition in Mathematics and Afrikaans to primary school learners up to grade seven.

Great pains were taken to make the school as environmentally friendly as possible, which included specifying sustainable materials and products, such as solar panels, water storage and wind turbines, wherever possible.

When retaining walls and steps were specified for the outdoor recess area, Tiaan Meyer, architect and director of Meyer & Associates Architects and Urban Designers, suggested using the Terraforce 4x4 Step block for cost-effective and robust seating and the Terraforce L11 block for plantable and permeable earth retaining walls on the school grounds.

The Terraforce 4x4 Step blocks were designed specifically to provide efficient and economical steps in conjunction with the L range Terraforce retaining blocks and have, over the last two decades become popular for practical stair and seating arrangements at leisure amenities and school sports facilities.

Says Meyer: "The blocks offer a good looking and neat finish, and Decorton Retaining Systems – sub-contracted by JJ Dempers Group – specialising in the construction sector, did a great job installing the blocks. The seating also fits in seamlessly with the rest of the architecture, which showcases modern, clean finishes, fresh colours and sustainable technology."



Roof garden, skylights and wind turbine.



Solar energy bank and play area.



Planter boxes, stairs and seating.

Meyer also adds that the project is one that has the potential to effect real change for future generations in the Breede Valley: "This is a love project, to give back and to uplift the local community, while implementing the same technology and applications in a rural environment as are normally seen in an urban environment."

After completion of the project in September 2019, landscaping was undertaken by Square One Landscape Architects together with Afri Landscapes. All future learning activities taking place at Botha Halte will be provided by Bosjes Trust, in partnership with the Western Cape Education Department. ■

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L13, L18, L22,  
M10, M15



Terrafix



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4x4 Step Block



L11, L12, L15, L16

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## Armorflex specified for attenuation pond

**A**rmorflex 165, Technicrete's erosion control system that provides an alternative for a wide variety of erosion control and drainage projects, was specified for the recently completed attenuation pond for EnviroServ at their Rosslyn premises.

Armorflex blocks offer an excellent lining for drainage channels. At aprons at pipe inlets and outlets, Armorflex eliminates pipe undercutting that can lead to severe problems such as surrounding bank failure and siltation downstream.

The Rosslyn project ran from February to June 2019 and was undertaken by MK Africa Civils. "We have worked with MK Africa Civils on other projects, and we understand that at times, all does not run smoothly on site. Upon excavation of the pond's designated area, unexpected rock was discovered which had to be removed with chemical blasting before the required pond level could be reached. We halted deliveries of the Armorflex 165 loose blocks to site until the blasting issue had been resolved" said Luan van der Berg, sales consultant for Technicrete.

"We supplied 7,000 m<sup>2</sup> of Armorflex 165 blocks for the attenuation pond which will serve as a storage for run-off dump water and any other excess water components at

site. The product was supplied in palletised loose block form for manual installation, which upon completion formed the Armorflex mat formation.

"The beauty of the Armorflex system, is that it is flexible and sophisticated in design, conforms to ground contours (even if settlement occurs after installation and the blocks have a specially tapered design to allow for this flexibility), settles without fracture, and requires only limited ground preparation," Van der Berg concluded.

Technicrete manufactures the Internationally Licensed Armorflex system in South Africa. It is the only system available locally with the facility to wire tie adjacent blocks together into long mats. The interlocking design allows the surface to remain flexible to movement, eliminating the cracking and spalling issues that plague solid concrete surfaces, even when exposed to regular inclement weather. The openings in each block and between blocks are perfectly sized to benefit from enough vegetation growth to make the surface appear 'natural' while still maintaining structural integrity.

Armorflex is suited to other drainage applications such as ditch linings, spillways, headwalls, sediment basins and traps, pipe inlet protection, and protection of barriers. ■

## Virtually indestructible bus shelters

**C**limate change has brought about major changes in weather cycles, and the need for commuters to find shelter from the dramatic heavy rain storms and the parched heat of summer has increased the requirement for solid, safe and indestructible bus shelters for those using municipal and local transportation.

Rocla, one of South Africa's leading precast concrete manufacturers, has developed a virtually indestructible and vandal-proof precast concrete bus shelter, that offers shelter from heat and rain as well as seating in its modular design. The durability of the concrete product guarantees decades of maintenance-free life, an important fact for cash-strapped



local municipalities wanting to ensure budgets for street furniture are well spent. It also prevents structural vandalism.

The Rocla bus shelter can also be supplied with wind walls for one or both sides of the shelter, and although supplied in a light grey colour, the surface is easily painted for advertising, roadside markings and community notice purposes.

Offering commuters shelter from inclement weather with the Rocla solid bus shelter can also lead to the creation of centrally situated community transportation points, thereby increasing commuter safety and convenience. Rocla also offers concrete taxi rank shelters and bus stops as well as other related street furniture such as concrete vendor stalls, sanitation units and concrete street lighting poles.

Contractors are easily able to transfer the bus shelter installation skills to members of local communities which can form part of their community outreach programmes.

Technicrete and Rocla are part of the Infrastructure Specialist Group of companies (ISG). ■

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# Precast concrete features prominently in new JRA pedestrian bridges

**P**recast concrete features prominently in the design of three pedestrian bridges being built by the Johannesburg Roads Agency (JRA) in low-income communities.

These structures were designed by consulting engineer, BMK Group, which is also supervising their construction by Axton Matrix in Kaalfontein, Diepsloot and Soweto.

Both bridges in Kaalfontein and Diepsloot comprise exactly the same design. Hollow-core slabs are supported by 14 precast concrete beams, two per span and 15 m in length.

Cast-in-place methods were used to construct the four piers, two approach ramps, two abutments and sides of both bridges. This is in addition to the 150-mm-thick concrete slab on top of the hollow-core elements that reinforce the superstructure. The hollow-core slabs are first covered with polystyrene moulds with voids to reduce loading of the final concrete slab on the precast concrete beams. Services are then installed on top and covered with a steel mesh and the final concrete slab cast.

BMK Group worked with CoreCivils, a precast concrete specialist, to refine the design of the superstructures, which initially comprised a rib-and-block system. The use of hollow-core slabs provided a faster alternative of constructing the deck.

Already sized at the factory, the hollow-core slabs could be placed immediately on the precast concrete beams to complete the entire installation in a day. This also mitigated the need to coordinate delivery of construction materials in already-confined working environments.

Jaco de Bruin, MD of CoreSlab, says that hybrid-concrete construction (HCC), a combination of in-situ and precast concrete methods, has given them direct control over quality, as well as significantly fast-tracking production.

"The various elements are manufactured in a controlled setting removed from the many variables encountered on a traditional construction site and then delivered to the project to be quickly and efficiently installed," De Bruin says.

He is also the RE for the pedestrian bridge being constructed in Soweto and for which CoreCivils manufactured and installed two precast concrete beams as part of the project.

It crosses a railway line to provide a safe and quick connection between the large communities in Chiawelo and the commercial node of Klipspruit.

This bridge is 11,6 m at its highest point and 3,1 m wide. It comprises two long approach ramps on either side with a slope of 1:12 to also cater for people who are wheelchair bound. On the Klipfontein side, the approach ramp is 55 m long and on the other side 13,1m.

The deck of the structure is supported by two 15-m-long and 1,2-m-deep reinforced concrete beams that were swiftly installed by CoreCivils' team.

He says that the use of precast concrete beams also provided a safer means of constructing the deck as it eliminated the need to erect scaffolding close to a densely-populated area.

Notably, precast concrete has also complemented labour-based construction methods on all of these projects.

There are 19 locals working alongside Axton Matrix's team in Soweto on this standard Expanded Public Works Programme

*The bridge approach ramps on either side are sloped to accommodate wheelchairs.*

project. Meanwhile, four black-owned small- and medium-sized enterprises have also benefitted from this build.

The in-situ works on the two projects in Kaalfontein and Diepsloot were also labour intensive. For example, about 17 locals worked alongside the main contracting team on the pedestrian bridge in Kaalfontein and an additional 20 people will be employed to work on the extended work scope, which includes the construction of about 70 m of asphalt roads and sidewalks. This is in addition to the installation of storm-water drainage, kerbing and wing walls.

De Bruin says he is proud of his team's role in helping the JRA and its professional team deliver critical social infrastructure to poor areas. ■

**More information from Corestruc,**

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# Twinstar: a 'can do' specialist precast manufacturer

*Twinstar Precast's managing director, Annemerie Hilhorst, chatted to Concrete Trends about her company, its specialised product range and her future plans.*

## Tell us how your company was established – and the market niche it satisfies.

Most precast product manufacturers are geared for high-volume production of a limited range of products. The time to design and build moulds for relatively small quantities of non-standard products disrupts their production lines so that is seldom a service offered.

Manufacturing one-off products is time consuming and often requires additional skills and supervision, making it unprofitable for companies with set-ups geared to high-volume production.

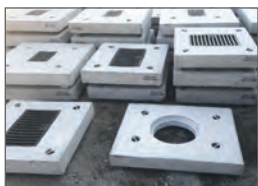
Twinstar was established after we identified a gap in the market for custom precast products and one-off items.



Electrical combiner boxes



Custom slab.



Grid inlet slabs.

## What products do you typically manufacture?

We specialise in manufacturing precast concrete products which are not already or readily available on the market, as well as once-off items. We can manufacture products ranging from 20 kg up to 6 tons in weight! We manufacture most of our own moulds and can therefore produce almost any design. Twinstar aims to turn clients' dreams into reality.

## What projects are you currently working on?

We are supplying to contractors across South Africa and are currently working on the Non-motorised Transport Park in Ekurhuleni as well as providing plinths for the windfarms being built in Noupoot, Loeriesfontein, Springbok and Touwsrivier. We have also manufactured and supplied entrance signs in Wattville and pump houses in Burgersfort.

## What would you describe as your most rewarding project to date, and why?

In 2017 we cast slabs to close six abandoned mine shafts on the East Rand. This was a challenging project, as the site conditions were difficult and the open mine shafts were very big and deep. We also had to ensure that the slabs we made would be able to withstand malicious damage from illegal miners in these areas. We successfully closed six shafts and they are still sealed off two years later.

## And the most interesting and unusual custom piece you have manufactured?

On the Non-motorised Transport Project in Wattville, we were commissioned to manufacture concrete bicycle stands. This was a huge challenge but was, at the same time, very exciting. From designing the moulds in such a way that it would be possible to fit the reinforcing and cast the concrete, to demoulding without breaking the separation beams, it was a unique application and we manufactured and delivered 30 units in total.

## How big is your team, where are you based and what areas do you service within South Africa?

We are based in Olifantsfontein, Gauteng and my team, including management and admin staff, consists of 18 people. We deliver all over South Africa and we offer a service of site visits to assist customers in Gauteng, North West, Mpumalanga or Limpopo.

## Where do you see Twinstar in five years?

Twinstar will never become a very large corporate-type business. I believe in giving personal attention in the manufacturing process and would like to keep it small enough that I can still be involved in the everyday production of my customers' products.

Our production plan is different every day because of the specialised products we manufacture. This needs special attention throughout the day. Our aim is to become the obvious choice when ordering bespoke precast products.

## What sort of clients do you prefer and why?

For me, working with upcoming contractors and architects is much more satisfactory than working with big companies who have already made a name for themselves. As I had to start on my own, and learn from my mistakes and knowledge shared by people who have been in the industry for years, I get a lot more enjoyment and satisfaction in helping a young contractor to achieve his or her end goal on a project.

## We now promote and celebrate strong women in the industry; how have you found working in a male-dominated industry?

Being a woman in construction can be tough as the industry is regarded as being for men. Contractors don't always take you seriously as they believe women do not understand construction, especially in civil engineering.

Successful people are not necessarily gifted. They mostly just work hard, and see their efforts crowned with success. A woman in a man's world must work twice as hard, so succeeding brings a special satisfaction.

Elizabeth Cady Stanton, an early women's rights campaigner, once said: "The best protection any woman can have is courage. Have courage and a passion for what you do. Nobody will stop you." ■

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# Avoid these five costly concrete housing errors



The role that the various mix constituents play to produce quality concrete for housing is often not fully understood resulting in a series of costly errors, Bryan Perrie, managing director of The Concrete Institute, has cautioned.



Bryan Perrie

Perrie says that using the correct mix proportions and ensuring good site practice affects the strength, durability and economy of the finished concrete. "Firstly, the quality of the cement is crucial. This is particularly important at present when tons of imported cement of questionable quality are arriving at our ports. Building contractors should note that all producers and importers of cement must have a Letter of Authority (LoA) from the National Regulator for Compulsory Standards (NRCS) for each different cement type sold in South Africa. The NRCS issues a LoA only if the cement standard complies with the required South African standards," he explains. The validity of a LoA can be checked with NRCS.

Perrie says five errors in particular tend to occur when producing concrete for housing:

- Not realising that the ratio between the water and the cement in a mix determines the strength of the concrete. "When site batching for small quantities of concrete, contractors tend to use a builder's wheelbarrow as unit of measurement but this practice often produces inconsistent concrete mix proportions. The contractor should ensure that the wheelbarrow is always levelled off at the top when measuring materials for mixing, to ensure that the correct, consistent mix proportion is achieved throughout. It should also be noted that two bags of 50 kg cement is equivalent to one builder's wheelbarrow," Perrie states;
- Another common mistake on site is the addition of extra water to improve the workability of the concrete after an extended period of time. Simply adding more and more water significantly reduces the strength of the concrete;
- Concrete is often not cured using the proper technique and/or is not cured long enough. "Newly-cast concrete must be cured to ensure that hydration continues until the full potential strength of the hardened concrete is achieved and to minimise the tendency to crack. The concrete

should be kept damp and not allowed to freeze during this time. The concrete should be cured for at least five days after placing it and longer in cooler weather," he advises;

- There is often confusion between client, specifier and contractor when it comes to finishing a concrete floor, specifically relating to the application of a sand-cement screed to the finished concrete floor. In general, a sand-cement screed should not be applied as the final wearing surface. The appropriate application of sand-cement screeds and concrete toppings is described in detail in The Concrete Institute publication: *Sand-cement screeds and concrete toppings for floors* which is available free of charge from the Institute and downloadable from its website [www.theconcreteinstitute.org.za](http://www.theconcreteinstitute.org.za);
- Cracking in plaster and floors is a very common problem on most sites – a problem that can be avoided or reduced through the use of the correct type of joints to allow for movement of the structure at appropriate intervals. "Care should also be taken to allow for movement joints between different material types, such as clay bricks and concrete blocks," Perrie adds.



More detailed information on this subject is available from The Concrete Institute's publication *Concrete basics for building*. This publication, as well as several other specialised information leaflets on these issues can also be obtained directly from the Institute. The Concrete Institute's School of Concrete Technology also presents a variety of educational courses on concrete for all levels of experience. ■

**More information from Tel: +2711 315 0300  
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In the face of a challenging local and worldwide economy, one thing is certain – now is the time to ensure that every employee and employer in the construction industry stays abreast of the latest industry trends and technology.

In June 2020, that opportunity comes in the form of the construction industry's leading calendar event – the 8th annual African Construction and Totally Concrete Expo, which will be taking place at the Gallagher Convention Centre in Johannesburg from 9 to 11 June 2020. The expo is conveniently and purposefully co-located with WoodEX for Africa, Deck & Flooring Expo, African Smart Cities Summit, Pumps, Valves and Pipes Africa Expo and the African Construction Awards to attract buyers, sellers and contractors from over 45 countries.

Stephan Jooste, Director of WoodEX for Africa, "African Construction Expo is Africa's largest gathering of buyers and sellers that represent the entire built environment value chain. We are extremely proud to present WoodEX for Africa, which is firmly established as the continent's leading timber industry showcase, at the same time and location as African

Construction Expo. We believe this partnership will offer our exhibitors and visitors an ideal platform to do business, network and learn."

The African Construction Expo is the only event in Africa that brings together over 9,000 stakeholders involved in construction and infrastructure projects in Africa. With over 250 exhibitors featured across the indoor and outdoor exhibition, African Construction Expo offers access to the most innovative building materials and technologies in Africa. The expo provides workshops, training, demonstrations and other interactive features that facilitate commercial networking opportunities and drive private- and public-sector collaboration.

Devi Paulsen, Vice President of dmg events South Africa, says "We are very excited about the co-location of WoodEX for Africa with African Construction Expo next year. Not only will it see two large-scale events collaborating to create an exceptional experience of value for our attendees, but it also enables us to create a platform that allows for more engagement and solid business opportunities across a wider range of sectors. This means visitors and exhibitors are able to save time and effortlessly conduct more business over the three days than ever before." ■

**For more information about exhibition space, contact Johan van Wyk on Tel: +2721 700 5500 or e-mail: [info@africanconstructionexpo.com](mailto:info@africanconstructionexpo.com)**

## Experience the Progress.



### Benefit of Liebherr wet concrete batching plants

- Liebherr have been supplying wet concrete batching & mixing plants to the South African readymix and precast market for several decades.
- Liebherr offer a range of wet batching & mixing plants for various outputs and applications
- Our factory-trained service technicians and original parts ensure that the life of the plant is maximized. We are supporting Liebherr plants which are over 20 years old and we will continue to support all our customers into the future.
- Liebherr wet batching & mixing plants produce consistent-quality and homogenous concrete
- Liebherr batching software such as BCS and MPS offer high accuracy in batching, allowing for reductions in the mix design margin which results in a saving of cement.
- Liebherr plants are designed for a long lifespan which allows for a lower cost of ownership
- Liebherr ring-pan mixers are designed to ensure that the concrete is always in the path of the mixing blades with the proven ring-channel effect. This results in concrete being mixed quickly and efficiently.
- Dry batching plants do not actually produce concrete; they batch material into a truck, which then mixes the material with water to form concrete.
- Wet batching plants produced ready-mixed concrete, ensuring homogeneity before leaving the plant yard.
- With dry batching plants, concrete is mixed in the truck which essentially means that concrete which comes from a dry plant operation is mixed by diesel engines, which is generally far less efficient than electric motors.
- By mixing concrete thoroughly before discharging into the truck mixer, wet batching plants allow for fuel savings because the truck mixers do not need to mix the concrete at high revs; the concrete is slowly agitated in transit to prevent segregation.
- Because the truck mixers do not need to do high-speed mixing, wet batching plants reduce wear and tear across the fleet of truck mixers. Truck mixers are typically the highest capital investment in a ready-mix concrete operation. Reducing wear and tear on the largest expense makes economic savings.

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# LIEBHERR

The Group

# Chryso VerticArt carves a place at The Leonardo

**C**HRYSO, a global specialist in the chemistry of building materials, supplied its innovative VerticArt to The Trinity Session for an iconic artistic creation in the foyer of The Leonardo in Sandton.

VerticArt was the material of choice when The Trinity Session, a creative production team, embarked on the curation of a sculpted representation of a cross-section through earth, showing the strata formed by tectonic plates shifting and colliding, to form the intricate patterns of geological formations.

Marcus Neustetter, a director of The Trinity Session, explains that this ambitious project called for an earthy, robust medium. CHRYSO VerticArt, a cementitious mortar which is designed for application to vertical surfaces, presented the ideal material.

The chemical makeup of VerticArt allows for a vertically applied maximum thickness of 150 mm, making it ideal for relief three-dimensional (3-D) artwork.

CHRYSO VerticArt was applied in various thicknesses and then carved and textured using palette knives, trowels, chisels, straight edges and wire brushes, to the exact creative brief. A zero to 48-hour carving window ensured that the artists had sufficient time to perfect the application and sculpting processes necessary to create the required 3-D effect.

The mural was intentionally not pigmented, resulting in a very realistic artistic rendition of a cross-section through the crust of the earth. This is further enhanced with focused lighting, giving the effect of an upwards journey through geological eons as visitors ascend the staircase.

This project used 4,5 tonnes of CHRYSO VerticArt, covering 140 m<sup>2</sup>, scaling a height of 15 metres (three storeys). It required the specialised skills of eight individual artists, in conjunction with the CHRYSO technical team and took seven weeks to complete.

The scale, innovative material, product methodology and conceptual approach ensured that the programme was not just a financial prospect for the materials supplier and the artistic curating team, but rather an opportunity for upliftment and growth for many of the artists, including some emerging creative talent.



*VerticArt was used to create reliefs and textures which were sculpted and carved.*

*The earth's surface is represented by the sculpted rock layers that wrap the staircase vertically.*



The artists, Damien Grivas (the team leader), Angelique Koekemoer, Ciara Struwig, Marlecia Marais, Patrick Rapai, Paul Setate and Zanre Van Der Walt brought their own technical and creative touch to realising the vision of this work.

Neville Wearne, CHRYSO Southern Africa's project manager: concrete aesthetics, says that VerticArt was developed to enable artists to create reliefs and textures, which can be sculpted and carved.

"This massive and bold statement artwork is a first for CHRYSO's VerticArt in both South Africa and worldwide, challenging architects, designers and artists to further explore the decorative potential of concrete," he concludes. ■

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

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**Hashtags #construction / #concrete / #innovation**



1



2



3

1. VerticArt is a cementitious mortar specifically designed for application to vertical surfaces, to create reliefs and textures which can be sculpted and carved.
2. The off-shutter concrete substrate was prepared by affixing a stainless-steel mesh to the vertical wall as reinforcement. A skim key coat was applied to this mesh before application of the VerticArt.
3. The VerticArt mural called for artists, who were identified based on the relevance of their previous work and interest, to fabricate the artwork.



## New a.b.e. products to protect against corrosion

**a**.b.e. Construction Chemicals has launched two new products: a.b.e. Rustopak Red Penetrating Sealant and a.b.e. Rustopak Top Coat that in conjunction deal with challenging existing corrosion, and inhibit the formation of new rust on metal while protecting concrete.

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

Ivor Boddington, technical manager of a.b.e., says a.b.e. Rustopak Red is a low volatile organic compound (VOC) rust-penetrating liquid sealant for metal and concrete. "It is a single-component compounded system bound together with a calcium sulfonated alkyd and aliphatic hydrocarbon that can be applied over surfaces with tightly-adherent rust – particularly in hard to reach areas such as crevices – without the need for dismantling equipment on the area being treated. After the product's application, a.b.e. Rustopak Top Coat – which is also a low VOC – is applied to provide UV protection, and film building," Boddington explains.

Among the advantages of a.b.e. Rustopak Red penetrant sealant and a.b.e. Rustopak Top Coat are:

- Excellent penetration into inaccessible jointed areas, mounting bolts and crevices
- Exceptional durability and corrosion resistance
- Easy to apply by brush or spray
- Excellent corrosion resistance
- Outstanding wetting properties
- Cost-efficiency compared to frequent and on-going maintenance or equipment replacement costs; and
- Long lifespan of protection to the structure.

Boddington says the sealant and top coat can be applied directly to metal that is clean and free of loose corrosion deposits. The two products are ideal for:

- Structural steel work
- Bridges and gantry cranes
- Nuts and bolts
- Concrete foundations and plinths
- Transmission towers
- Metal roofs
- Factories with aggressive chemical spillage; and
- Metal cross-bracing where the galvanised sections have been abraded off.

"The products can also be used to combat and cure corrosion at harbours, shipyards, railway stations, the mining industry above ground, and on steel structures and supporting bases in chemical environments but, in both cases, an a.b.e. technical consultant should first inspect the areas of application," he states.

a.b.e. Rustopak Red penetrant sealant is available in one, five, and 20-litre containers as well as in a 400-ml spray can clear format. a.b.e. Rustopak Top Coat is available in blue, green, grey, white, aluminium, and black standard colours. ■

**More information from Elrene Smuts,  
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In 2008, we developed a lighter Ring System for facade application use in industries such as petrochemical, energy, manufacturing and wall refurbishment. It has been enthusiastically endorsed by our many clients and end users. Sucoot is the first and the only company in Taiwan to obtain EN-12810-1 certification.

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**More information from Sucoot,**

**Tel: +04 23598338**

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# Mapei's advanced additives are improving the quality of SA's cement

**M**apei is best-known for its vast range of construction chemicals, admixtures and adhesives, yet few realise that its influence begins far earlier in the construction cycle with the provision of advanced chemicals that aid cement manufacturers in the production of high-quality cement.

In South Africa, and worldwide, Mapei is a major supplier of cement additives and grinding aids that improve the characteristics of cement, enabling producers to increase throughput and so achieve better efficiencies and lower costs per ton of cement sold.

Mapei's product manager for cement additives, Laurence Gopane, says cement is produced with a complex recipe of clinker and other ingredients including gypsum, fly ash, slag and limestone amongst others. Each additive is tailor-made for each plant to support the particular ingredients and manufacturing processes.

## Careful selection

"Regardless of the mix, even plants within the same organisation may have different recipes with their own unique challenges. That's where our team comes into its own. We are able to partner with the producer and recommend products that will assist in meeting the specific requirements," adds Gopane.

"For example, some additives are grinding aids that improve the grinding action of the mills by preventing particle agglomeration and adhesion to equipment; and there are different types available that improve the strength of performance. Mapei Grinding Aids (M.A.G.A) as well as performance enhancers (M.A.P.E) influence the properties of the final cement. Producers are therefore able to 'tweak cement' to have different properties, like optimising early and late strength gains etc.

"The country's major cement manufacturers rely on these additives to achieve their production goals. Needless to say, since Mapei's entry into the local

market some ten years ago, the game has changed and our modern additives have brought many advantages to the market that ultimately improves the quality of cement to end users," says Gopane.

## Live tests

He explains that due to the technical complexity of the cement manufacturing process, there are many different variables that need to be considered when adding additives. These include the type of clinker being used, mix ratios of slag, fly ash, and other ingredients, as well as equipment type, grinding media and a host of other variables.



▲ The MAPEI Facility in Mediglia Italy.



◀ Intense analysis and testing of raw materials.

The selection of the cement additive starts with laboratory testing of the specific raw material.

This usually results in an initial prototype of grinding aids, which is then tested in the mill and adjusted according to the actual outputs and requirements. In the end, however, the result is the best possible product that can be produced cost-efficiently from each manufacturing plant. And, for the end user, it results in the best-quality cement at the best possible price per bag or ton.

"For contractors and other users – the use of quality cement is critical in producing high-quality concrete for local building sites. It also enables cement producers to keep up with the high demand for quality cement in either bulk or bags. This is when our team from Concrete Admixtures will be able to add further technical support and benefits," Gopane concludes.



The C-ADD seminar takes place annually.

## Giving back

Mapei also hosts an annual Cement Additives Seminar which is open to all cement producers and blenders; regardless of being a current customer or not. Specialists and technical consultants from our C-ADD division in Milan come out to South Africa to interact, educate and present relevant content to the attendees about the Cement Additives industry. The event sheds light on the latest best practices, technologies and products available to help cement producers to keep up with new and challenging demands. The 2020 Cement Additives Seminar is anticipated to take place during the second quarter of 2020. ■

**More information from Geoffrey Green,**  
**Tel: +2711 552 8476 / e-mail: g.green@mapei.co.za**  
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A hand is shown from the bottom, palm up, holding a glowing, golden-yellow cloud of sand. The sand particles are dense and bright, creating a shimmering effect. From the top of the sand cloud, a city skyline with several tall, modern skyscrapers is visible, appearing to rise from the sand. The background is dark, making the sand and city lights stand out.

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