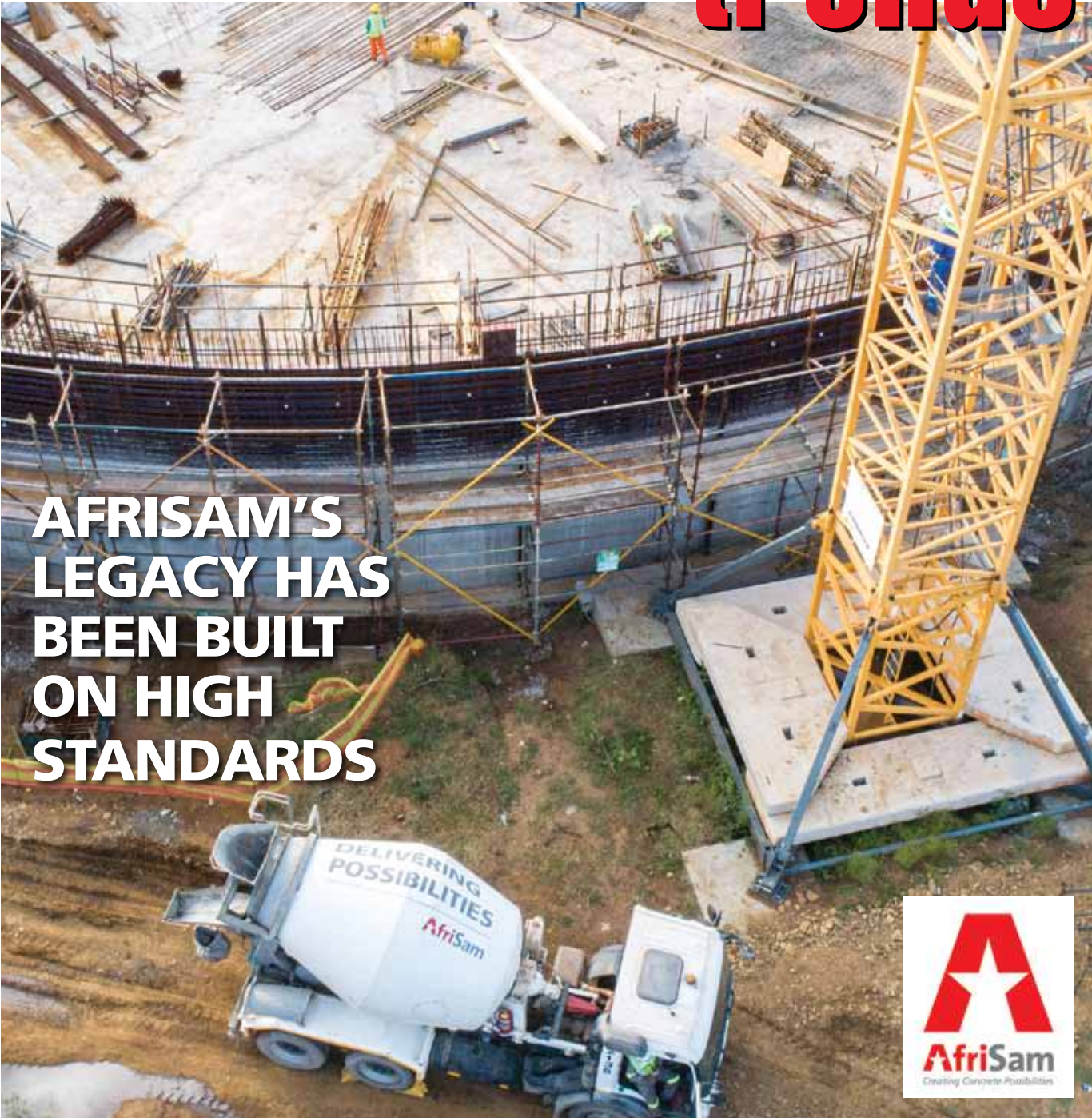


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AfriSam's legacy has been built on high standards and good systems to ensure quality.

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Editor's comment



Eamonn Ryan

This issue of *Concrete Trends* is timed to come out simultaneous with the Big 5 Construct Southern Africa, previously African Construction Expo, commencing on 7 June at the Gallagher Convention Centre. *Concrete Trends* is the official host publication of the Big 5 and will be there in full force. Read more about this Expo in the pages within.

We invite all readers and exhibitors to pop by our stand, get a complimentary issue, tell us what's trending in your business or just say hello.

This is the second issue of *Concrete Trends* to come out in its new partnership with the Concrete Manufacturers Association, and the results of this partnership are evident in the greater insight into the cement and concrete industry as it relates to the precast sector. Indeed, this issue is filled almost end to end with information relevant to precast concrete.

However, this does not mean that *Concrete Trends* has abandoned its broad mandate to serve every sector of cement and concrete and indeed we welcome partnerships with diverse industry associations which are connected to our sector and which at present might welcome a more powerful media voice. Please feel free to contact me at eamonnryan@dmgevents.com if you are interested in learning more.

For instance, our third edition of 2022 edition will come out together with a separate magazine, *Pumping Handbook*, dedicated to concrete pumping, looking at the array of equipment used as well as all issues relating to training, health and safety in the pumping of concrete.

In addition, the third edition of 2022 of *Concrete Trends* will have a special focus on condition inspection, assessment, repairs and maintenance. The broader context will be an in-depth look at all issues of sustainability in cement and concrete, particularly already embedded structures. Inspection and asset management is central to sustainability, which is an ongoing subject featured in almost every issue, such is its importance to our industry.

The embodied carbon value of South Africa's existing structures is as significant a factor as is the design of carbon neutral construction materials. The true value of quality inspection, repair and maintenance of all South Africa's structures, including energy, water/ wastewater and transport infrastructure, includes the productive value of assets reaching their full design-life (and possibly beyond) as well the value of freeing up funds for new, much needed residential and commercial buildings and infrastructure. Concrete is the dominant contributor to embodied carbon, and equally the space of most possible remedies. ■

Eamonn Ryan, Managing Editor



Ndllovu pump

Pushing boundaries in concrete pumping

Established in 2007, Foxcrete has built up one of the most impressive fleets of concrete pumps. To uphold the highest level of efficiency and service to its clients, the Company strives to invest in only the best concrete pumping equipment.

In collaboration with Zoomlion Heavy Industry Science & Technology and Scania South Africa, Foxcrete introduces the Southern African region's largest Zoomlion concrete pump. This 43 meter Zoomlion concrete pump is the first in South Africa to be fitted to a Scania truck. Mounted on a Scania XT P-Series, the truck is perfect for demanding site conditions.

Specifically designed to comply with the region's legal requirements, this concrete pump has a compact boom design for site adaptability, accurate pumping control, and adaptive pumping technology for difficult concrete mixes.

THE GREEN SIDE OF THINGS

The 43 meter Zoomlion concrete pump allows for self-adaptive variable power technology that saves fuel by 10%. Together with Scania's award-winning engine technology, this Zoomlion concrete pump proves to be more environmentally friendly, paving the way forward for Foxcrete to achieve its goals in sustaining the natural environment.

SPECIFICATIONS

With a vertical reach of 43 meters and a horizontal reach of 39 meters, this concrete pump is suitable for medium to large concrete placing projects. The concrete pump can pump 140 cubes of concrete per hour and with a five-section Z-fold boom type, the boom can navigate easily into difficult spaces.

THE FOXCRETE FLEET

Foxcrete aspires to exceed expectations and set new standards and thus the new 43 meter Zoomlion concrete pump is a welcoming addition to the Company's fleet that consists of 36 meters, 37 meters and static concrete pumps.

Foxcrete's branches are situated in Kempton Park, Gauteng, and Mbombela, Mpumalanga. ■

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The CMA's 2022 Awards for Excellence – upping the tempo via social media

The 2022 Concrete Manufacturers Association Awards for Excellence Competition is in its final lap. Entries close at the end of May to be followed by the judging in June and the announcement of winners in July.

Historically a biennial affair, the 2020 event had to be cancelled due to the pandemic but it was resurrected in a new electronic format for the 2022 competition.

The Awards are open to all individuals, partnerships and companies in South Africa and neighbouring countries and entries must include the use of one or more precast concrete element produced by a CMA member.

“The 2022 competition is quite a different animal to its forerunners,” explains CMA general manager, Henry Cockcroft. “It is now entirely electronic, a development which has enabled the extensive marketing of all entries on several social media platforms. Written entries and photographs are converted into videos which are then aired on several social media platforms such as Facebook, YouTube and LinkedIn.

“This model has proven to be an unprecedented success, achieving considerable reach among the broad public and industry. By comparison, the competition was previously a private, closed process culminating in a function published in a single magazine.

“The judging for this year’s competition is also new and takes two forms. The one is based on the level of interest shown in each YouTube presentation by our industry and is given a certain weighting. The other, which carries the remainder of the weighting, is based on the traditional format comprising a panel of judges drawn from the professions.

“This year’s awards ceremony will be an online public event, in which all the projects and the winners will be presented on a global platform. This will give unprecedented exposure to our members’ accomplishments.”

Since they were first staged in 1985, the Awards have become the undoubted highlight of the precast concrete industry’s calendar. The main purpose for the Awards is to recognise excellence in the use of precast concrete across its numerous and varied applications and to honour those professionally associated with them.

“This will be the biggest industry market segment (precast concrete) collective virtual marketing event, to the benefit of CMA Producer Members, which the industry has seen to date.”

Awards entry categories can be viewed on: www.cma.org.za and the award entries can be viewed on: https://www.youtube.com/channel/UCXJwSNAYQ3zLXF9JK01e_Mw or by searching “Concrete Manufacturers Association” on YouTube and then clicking on the CMA logo. ■





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Cement production starts with mining: Aspasa's initiatives

By Eamonn Ryan



Nico Pienaar, director of Aspasa on the left.

Aspasa members are an integral part of cement and concrete production: the most mined mineral in the world is aggregate and sand. Without aggregate and sand there would be no concrete, and consequently no dams, roads, schools or any type of infrastructure.

"Ninety-five percent of any road is made of these two products, bound together either with cement or bitumen," says Nico Pienaar, director of Aspasa, the voice of the surface mining industry in South Africa. "It is crucial to the manufacture of concrete and consequently vital that people who manufacture cement and concrete buy quality sand and aggregate. Not all sand or aggregate is the same – there are vastly different qualities. For instance, if you take sand from a beach and make concrete with it, that concrete will fail because the sand contains seasalt, while concrete made from inferior aggregate that is too fine may break up.

"This is the explanation for the many public roads on which we see rutting: the foundations aren't right and the aggregate hasn't been correctly compacted.

Limestone is one of the key components of cement and is also widely mined by Aspasa members and put through a furnace to make the cement.

"Illegal mining is taking place and it is a major threat to the mining industry – not just of aggregate and sand, but of gold, platinum, diamonds and every mineral. We are working on this threat at tempo with the Minerals Council to establish a task team. In the case of sand and aggregate, illegal miners are digging sand out of rivers or beaches, destroying the environment and selling it cheaply on the market. Being illegal, it is also anti-social as they pay no tax to the country and do not comply with any regulations, including health and safety.

"There would be no illegal mining of sand and aggregate unless the industry itself was buying it. It is like the people who steal copper cables – if there wasn't a purchaser then they wouldn't steal it. There is a ready market. If legitimate construction companies, municipalities, road builders and the entire value chain were to request a certified copy of the mining licence to accompany each purchase of sand and aggregate, and a record of source, then illegal mining would decline. Readymix companies buy sand because it's cheap but have no knowledge of the quality of that sand because it isn't tested or audited, and no understanding of what environmental damage was perpetrated while mining it.

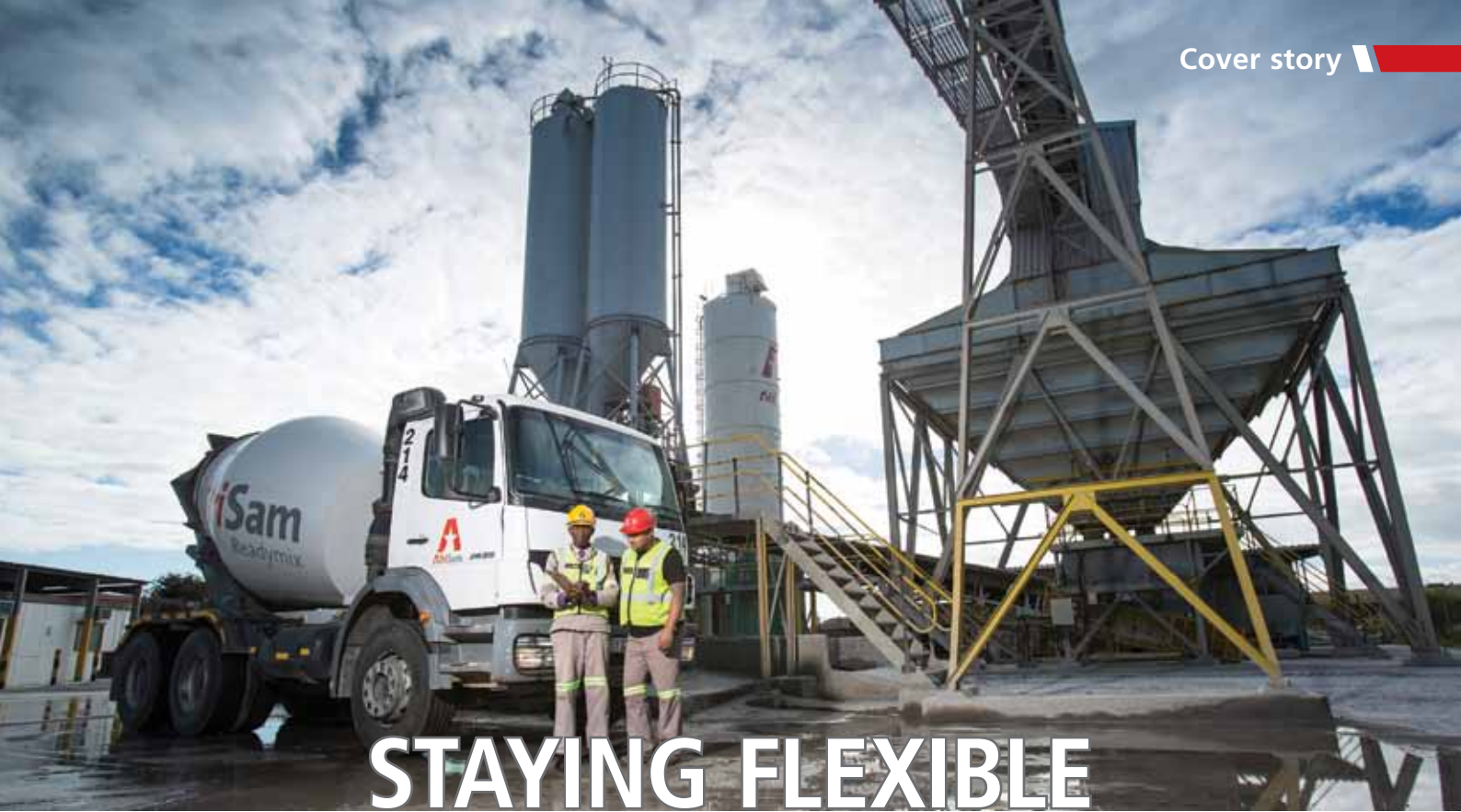
"We are in the process of bringing out a document which deals with illegal mining in the light of new environmental legislation which is shortly to be put out for comment. This will affect cement producers as the cement (in the form of limestone) has as its first step to be mined. Aspasa is involved in a number of initiatives:

- It has long been heavily focused on health and safety in mines, and the audit of mining standards.

- More recently, environmental issues have assumed equal importance, says Pienaar. "When you have a nearby community, environmental issues are key to their quality of life as they experience the dust and blasting. Unfortunately our environmental initiative had to take a back seat during the two years of Covid when we weren't allowed to audit – but we have resumed in full this year."
- Aspasa is focused at the current moment on the enforcing the quality of aggregate products, the testing of aggregate and laboratories' testing. "In the past, testing was not at a level it should be and little accountability for the process. Today, testing of the aggregate is a professional function within a mine to ensure the end product is of a high quality for the end users in the cement and concrete industry."
- Aspasa has appointed an explosives expert with military and bomb experience, who subsequently worked for a number of mines, to ensure that explosions are conducted properly on mines. "We appeal to mines to ensure that their paperwork on explosives and explosions is in order because there are criminal consequences if someone gets injured or someone's property is damaged."
- Traffic management in mines is also receiving growing attention, with Proximity Detection Systems (PDS) becoming the norm in order to limit accidents and injury to workers, similar to what many newer model cars have. "Aspasa is pushing for mines to implement a formal traffic management system based on a common-sense principle of requiring all vehicles to move in the same direction on any road, and to keep people away from where machines are working."
- Aspasa has launched a new initiative called Young Professionals to encourage young people to join the industry and gain work experience. It was prompted by Covid-19 and the trend to working from home. This meant that young people no longer had mentors or people they could gain work skills from.
- Women in mining has long been an initiative of the mining industry, and Aspasa is cultivating a more nuanced approach. A policy that singles out women can often be a step backwards as opposed to an advance. "We talk about Gender Justice in Mining instead of Women in Mining to break down gender stereotypes. It is a broader concept that embraces a range of women's agency and autonomy from sexual harassment to unfair discrimination, and more," explains Pienaar.

There are the usual ad hoc issues which Aspasa has to respond to in the field of regulation. Pienaar says that with the demise of Sarma (South African Readymix Association) that growing industry has become "a free-for-all" with no order or audits, and no cooperation.

"However, the major challenge facing all of us in this industry is infrastructure development, or the lack of it. The government has repeatedly said it will allocate money for infrastructure, as recently as the latest National Budget and President's State of the Nation speech. It is crucial that we have a proper infrastructure, and it will also be a boost for all the sectors involved in the value chain of the construction industry. However, once this does start to take off it is crucial that companies buy sand and aggregate from a legal source," says Pienaar. ■



STAYING FLEXIBLE

to deliver quality despite tough times

Supplied by AfriSam

South Africa's construction material players continue to grapple with a depressed economy, but pockets of opportunity have emerged, says AfriSam construction materials executive Avi Bhoora.

With a lifetime of experience in construction, Bhoora acknowledges a tough decade since the end of major infrastructural investments related to the FIFA Soccer World Cup. When it looked like conditions could not get any worse, the Covid-19 pandemic precipitated an even further decline from early 2020. For suppliers of construction materials, the task has been to continue adapting and cutting their coat to suit the cloth, he says.

"The Covid-19 lockdown was when the industry hit a real cliff and projects dried up overnight, with just no activity," he says.

The company was also realistic about the future, anticipating not a quick bounce-back but a slower recovery. This describes an economy with a slow improvement, accompanied by persistently high unemployment and low growth. Indeed, this forecast has been generally correct, he says, although there have recently been pockets of opportunity that AfriSam has grasped.

"In the Cape, there has been the N7 highway project and some smaller private developments which we have served with our Peninsula quarry," he says. "While important road projects in KwaZulu-Natal are taking time to finalise, some of these have gone ahead and are bringing some relief to contractors and their supply chains."



Avi Bhoora, AfriSam construction materials executive

However, while the coastal provinces have seen some progress the inland areas remain in the doldrums. Low business confidence levels have even subdued the pipeline of privately funded projects. He also notes that ongoing challenges include the efforts of illegitimate 'business forums' to stall projects, and a long spell of inclement weather since the last quarter of 2021.

RIGHT-SIZING

A proactive Covid-19 recovery rescue plan at AfriSam has demonstrated the company's strategic flexibility and its solid in-house core of industry knowledge and tactical expertise. Bhoora highlights that the experienced management team, with the support of the board, was able to navigate this difficult process independently – without having to rely on

outside consultants.

"We put our operations into three categories," he says. "In the first category, operations would continue as required. In the second category they would be put on care-and-maintenance, and in the third category we would exit from the operation completely."

Where operations would be continued, production was adjusted to suit demand. Guided by the 'tonnes per man' measurement, the head count was aligned and work schedules



The company's Peninsula Quarry has been supplying the N7 project



Important road projects in KwaZulu-Natal has also brought some relief to contractors and the supply chain

fine-tuned. Those facilities put on care-and-maintenance continue being serviced to allow a prompt return to operation when required. Arrangements were also made with the Department of Mineral Resources and Energy to fulfil the requirements of the mining licence during this period.

"This has ensured that we are focused on our core business and are doing all the right things to succeed in these demanding times," he says.

INDUSTRY BODIES REALIGN

He explains that the state of the industry has also been reflected in the re-alignment of sector bodies, with the Association of Cementitious Materials Producers (ACMP), the Concrete Society of Southern Africa (CSSA) and The Concrete Institute (TCI) merging to form Cement & Concrete SA (CCSA). The Southern African Readymix Association had to close altogether in December 2019 due to financial pressures on members. The Aggregate and Sand Producers Association of Southern Africa (ASPASA) has extended its membership to producers of other related commodities.

"The simple truth is that if there is not enough work in the market, it becomes very difficult for industry players to keep

these important industry organisations alive," he says. "It is regrettable, though, as they contribute to the wellbeing of the sector. For instance, there are structures and sub-committees that deal with standards, specifications, monitoring and continuous improvement – all adding considerable value over time."

He notes that, in addition to weak demand, the sector is also seeing considerable cost pressures including those of coal and other fuels. The Covid-19 pandemic has disrupted global supply chains, pushing up shipping costs by as much as 300% in certain segments. Equipment and chemicals used by construction material companies have become more expensive, and are often not available due to international supply chain bottlenecks.

LOOKING AHEAD

With less work available, there are signs of some contractors 'buying down' when it comes to readymix, he says. One indicator is the decline in average strength of concrete that AfriSam has been asked by customers to supply over recent years. Bhoora warns against any compromise on quality in the long run, however.

"Precision and quality engineering have built up our industry to world class standards, and we must be able to maintain the levels we have achieved," he says. "AfriSam's legacy, for instance, has been built on high standards and good systems to ensure quality."

There has also been ongoing investment in people, leading to many former AfriSam managers occupying key positions for other firms in the sector. The company's approach was always to develop skills so that the whole industry could improve, creating a firm foundation of responsible players to advance sustainable economic development.

"Despite the trying conditions, AfriSam is today in a positive space, with a strong board and progressive management team," he says. "With 88 years of experience behind us, we have our eyes firmly on the 100-year landmark."

Technical facilities remain well maintained in line with its asset management policies, and AfriSam's people have demonstrated the positive attitude necessary to take the company and industry forward. ■



AfriSam has always believed in developing skills so that the whole industry could improve



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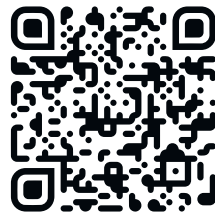


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CHRYSO grows its labs to push cement technology

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CHRYSO Southern Africa has continued to enhance its laboratory facilities in its quest to help customers generate more sustainable construction materials. The latest expansion within its Centre of Excellence in Jet Park near Johannesburg has been a cement laboratory, in which the company has invested extensively.

In its quest to help customers generate more sustainable construction materials, CHRYSO Southern Africa has continued to enhance its laboratory facilities – even during the disrupted years following the onset of the Covid-19 pandemic.

The latest expansion within its Centre of Excellence in Jet Park near Johannesburg has been a cement laboratory, in which the company has invested extensively. According to research and development (R&D) manager Mpume Mlalazi, these investments will continue into 2022 to ensure the latest tools are available.



“Much of our work in the cement laboratory is focused on the growing global concern to reduce carbon dioxide emissions from cement manufacturing,” says Mlalazi. “We are also now fully equipped to align with international standards in cement testing.”

CHRYSO Southern Africa’s other facilities include a research and development laboratory for new product for-

◀ *Mpume Mlalazi is the R&D manager at CHRYSO Southern Africa, responsible for Southern and Eastern Africa.*



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Testing with the electronic air permeability instrument, designed to determine the a-specific surface area of cement.

mulation and evaluation, a concrete laboratory conducting physical tests to evaluate concrete properties, a quality control laboratory and a colour laboratory.

There are also satellite laboratories at the company's Cape Town, Port Elizabeth and Kwa-Zulu Natal branches to support customers. Amongst the equipment recently acquired is an isothermal calorimetry and permeability tool; in addition to basic tools for cement setting time, specific surface Blaine, pycnometry and cement compressive strength determination auxiliary equipment.

“As experts in the field of admixtures, we have the necessary chemistry knowledge and products to help customers drive their sustainability agendas and meet their carbon reduction targets.”

“Our cement laboratory works closely with cement industry players, and supports our customers with product development to find solutions for their ever-changing applications,” she says. “Of course, cement is the main contributor to concrete performance, so it is vital that we understand exactly what impacts are achieved by the changes we can make.”

This is why CHRYSO Southern Africa's wide breadth of facilities – combined with its depth of expertise – is so effective, with its cement and concrete laboratories under one roof, she explains. Whatever is achieved in the cement laboratory can be closely assessed and tested in the concrete laboratory.

“As experts in the field of admixtures, we have the necessary chemistry knowledge and products to help customers drive their sustainability agendas and meet their carbon reduction targets,” says Mlalazi.

She highlights that CHRYSO Southern Africa re-invests at least 4% of its sales revenues into R&D each year, emphasising that the laboratory capacity has a strategic role in supporting customers' key concerns into the future. These include carbon emissions, clinker factors, cement performance and energy saving. The exciting projects underway in its cement laboratory include research into the potential for limestone calcined clay cement (LC3) to drastically reduce carbon dioxide emissions during the manufacturing process. ■



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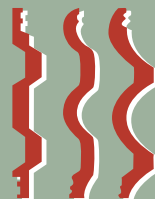
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Mixed messaging in specification documents leads to failed paving installations

By David Beer on behalf of the Concrete Manufacturers Association

The Concrete Manufacturers Association (CMA) often receives reports of precast concrete paving installations failing. In many instances, the cause stems right upfront from Bills of Materials (BOQs) which are not standardised and deliver mixed and confusing messages.

South Africa's paving standard was updated in 2010 to SANS 1058:2010 when tensile strength replaced compressive strength as the new performance measurement. The new standard was modified in 2012 to SANS 1058:2012, and despite having been in force for some 10 years, some specifiers are still referring to compressive strength in their BOQs, or in many instances, they refer to both compressive strength and the new tensile splitting standard in the same breath.

This leads to confusion, especially as there is usually little correlation between the two. Specifying two standards in the same BOQ leaves the door wide open for paving producers to plumb for the less costly option which, more often than not, is based on compressive strength and results in the specification of pavers which lack the requisite tensile strength.

A typical example of mixed messaging would be a BOQ which specifies an 80mm paver as Class 40/2.6 (tensile strength) with a compressive strength of 30MPa. This makes no sense because any paver complying with Class 40/2.6 will have a compressive strength rating equal to or above 40MPa. This type of mixed messaging is, unfortunately, not an exception and invariably leads to the wrong type of, and often inferior, paver winning the paving contract.

There are two tensile splitting standards in SANS 1058:2012, Class 30/2.0 which is rated at a 2.0MPa required tensile splitting strength, and is indicative of a compressive strength design of 30MPa, and Class 40/2.6, rated at a required 2.6MPa tensile splitting strength, and is indicative of a design compressive strength of 40MPa. The former generally applies to lightly trafficked areas such as driveways and parking areas, patios and paths in commercial and domestic settings, while the latter applies to heavily trafficked areas such as public roads, warehouse and container yards and other industrial settings.

"The tensile splitting test was introduced because most



The tensile splitting test.

pavers fail due to cracking or splitting caused by point load rather than being crushed due to a lack of compressive strength," says CMA general manager, Henry Cockcroft.

"Research has shown that paving blocks are hardly ever crushed under load whereas cracking and break-up are the main causes of paving failure. The tensile splitting test assesses shear strength and involves applying line loads to the top and bottom of the blocks using two steel bars, each with a diameter of 150mm. Plywood strips are inserted between the bars and the blocks to ensure an even load distribution. More importantly, the test takes the thickness of the block into account whereas thickness was not a factor in old compression test."

"Paving producers are aware that by increasing sand content in the concrete mix compressive strength will improve. This creates a false sense of security among those who still view compressive strength as the go-to performance measurement and use it in their BOQs. But owing to the homogeneous shape of sand particles and the way they bind with cement, an increase in sand

content reduces sheer/tensile strength and the performance of the paver. By contrast, the random shape of stone particles means that an increase in stone and a reduction in sand content increases tensile strength and load performance.

"Moreover, some paving producers increase the sand content in their pavers because it improves appearance. However, for the reason stated above, it is a practice which should be applied with great caution.

"The mixed messaging in paving BOQs is costing Rmillions in remedial work and impacts negatively on the good name of the precast concrete paving block industry. But, by sticking to the SANS 1058: 2012 tensile splitting standard and avoiding any additional reference to compressive strength in their designs and BOQs, engineers and specifiers can and should solve the problem with ease." concludes Cockcroft. ■

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Southern Africa's construction industry to connect in-person once again



The Big 5 Construct Southern Africa, previously known as the African Construction Expo, is Southern Africa's flagship construction exhibition and the 2022 in-person edition will return to Gallagher Convention Centre, Johannesburg from the 7 – 9 June 2022.

The Big 5 Construct Southern Africa and Totally Concrete Expo is a significant contributor to economic growth, recovery and transformation within Southern Africa's construction industry, placing a special focus on buyer and seller engagements, and showcasing the most innovative solutions for the region.

By attending the most influential event for Southern Africa's construction industry, attendees will have the opportunity to:

- Connect with Southern Africa's entire construction industry value chain, under one roof
- Discover the most innovative products and technologies available
- Engage with public and private sector stakeholders over the most critical issues
- Learn about the latest trends, best practice and upcoming construction projects

It's time to get back to business... and nothing beats face-to-face.



TOTALLY CONCRETE EXPO

TOTALLY CONCRETE EXPO

This is the 8th edition of the Totally Concrete Expo, and what an opportunity it is. This is where you can get your hands dirty with the technologies, admixtures, mixers, ready mixes... you name it.

If it makes, moves, places, set, finishes, maintains or repairs concrete, it is here.

Manufacturers, transporters and processors of concrete will be provided with access to Southern Africa's most influential project owners to build relationships, evaluate new technologies, overcome industry challenges and identify new and future commercial partners. To excel in a changing industry, you need the latest trends, the best-practices and a crystal-clear picture of where the industry is headed.

Readmix and pre-cast concrete producers, specifiers, contractors, engineers, architects – if you manufacture, sell, specify or work with concrete in any capacity, this is your show!





Free workshops, projects and funding

Empowering your success through knowledge

STAKEHOLDER ENGAGEMENT FORUM

STAKEHOLDERS ENGAGEMENT FORUM

With a growing emphasis on stakeholder centricity, the Stakeholder Engagement Forum provides a platform for open discussion on surrounding current challenges faced and current measures to expedite job creation and economic stability. Taking place on Tuesday, the 7th of June 2022 at the Gallagher Convention Centre, the theme for this year's Stakeholder Engagement Forum is "Job Creation for sustainable economic growth" – this theme positions the Construction Sector as a catalyst for job creation in South Africa and through the continent.

In partnership with NAFBI, the forum will serve as the opening session to their annual conference where professionals create an environment that is conducive to the growth and competitiveness of small and medium enterprises in the built environment.

Positioning this event in Youth Month is a strategic investment to the Youth of Southern Africa as we will be hosting over 25 free workshop sessions to address the issues of poor skills in the continent and ensuring that a transfer of these skills takes place from the giants of the industry to the owners of our tomorrow.



THE BIG 5 CONSTRUCT SOUTHERN AFRICA WORKSHOPS



The free-to-attend workshops will focus on five main areas of expertise in the sector, namely, Smart Talks that investigate the technology that has been introduced to the sector; Architecture Talks for maintainable best practices; Contractor Talks, with one of the sessions featured here is ‘An overview of PPPs by Engineers for Engineers’ – a must-attend for all engineers; and Concrete Talks to examine the quality and explore the 21st century solutions that exist in this space; and lastly, Green Construction, which will look at digital transformation in the Built Environment.

These free workshops are CPD accredited by industry associations and partners. They are produced to prepare and inspire the built environment. The lessons and case studies that will be examined will provide further insight and understanding to the challenges experienced in this sector.

Hear from the Construction Sector’s leaders such as Dr Kgosientsho Ramokgopa, who is currently the Head of the Investment and Infrastructure Office at The Presidency, in South Africa who will also be joined by PPC’s Njombo Lekula who is the Managing Director of RSA Cement and Materials Division as well as our colleague Aubrey Tshalata, the National President of NAFBI.

Register at: www.thebig5constructsouthernafrica.com



Dr Kgosientsho Ramokgopa
Head of the Investment and Infrastructure Office, The Presidency South Africa



Njombo Lekula
Managing Director, RSA Cement and Materials Division, PPC



Mr Aubrey Tshalata
National President of the National African Federation for the Building Industry (NAFBI)



Henry Cockcroft
General Manager and CEO, Concrete Manufacturers Association (CMA) and CMA Certification Services



Sandor Dowling
Marketing Director, Sanika

CONCRETE TALKS PROGRAMME HIGHLIGHTS

7 – 9 JUNE 2022

CPD Accredited by:



Latest trends in concrete pumping

Carlo Garbini, Flowmaster, South Africa
Nabil Bejaoul, CIFA, Italy

Bringing 21st Century solutions to Africa

Sven Schutte, Managing Director, All States Africa Concrete Equipment, South Africa

Kryton Crystalline technology

Sandor Dowling, Marketing Manager, Sanika, South Africa

Lightweight concrete – explaining the options and applications

Victor Bouguenon – Director, CemteQ Building Solutions (Pty) Ltd

PRECAST CONCRETE: quality & standards, product certification & successful project deliverance

Henry Cockcroft – General Manager and CEO of CMA and CMA Certification Services

Polished concrete is not a Superfloor

Richard Hugh, Superb Flooring Systems, South Africa

Achieving crack-free, durable and cost-effective plaster

Brian Dillon – Director, Stanton Construction Chemicals

Concrete industrial floors on the ground

Senior Representative, PPC, South Africa

Register for your FREE visitor pass and see full programme: www.thebig5constructsouthernafrica.com



AFRICAN SMART CITIES SUMMIT



African Smart Cities Summit

The African Smart Cities Summit is in its 6th year and growing strong. The summit has grown from grassroots technology discussions, investigated the status of smart cities on the continent and in 2022 has taken the stance to rebuild African cities through smart discoveries. The pandemic saw African municipalities and local authorities succumb to more pressure and strain as the pandemic revealed the cracks that ran deep in the administration and management of services within utilities through to service delivery.

Urbanisation plays an integral role in economic and societal progress; however, it also strains a city's infrastructure. Challenges such as efficient and sustainable industrial devel-

opment, traffic congestion, energy usage, public safety, and inclusive communities are top of mind.

The main goal of a smart city is to optimise city functions and promote economic growth while also improving the quality of life for citizens by using smart technologies and data analysis. The value lies in how this technology is used rather than simply how much technology is available.

Taking place on Wednesday, 8 June 2022, the theme for this year's summit is 'Africa is ready' not just to position for the continent to start on working on smart cities, but as a realisation that Africa has been planning and preparing and positioning itself as an advancing continent.

Join us in discussion with our speakers:



Dr Ramakgopa
Head of Investment
and Infrastructure
Office at The
Presidency
South Africa



Chris Greensmith
Technology Director
Zutari



Francois Fouche
Research Associate:
Centre for
African Markets
& Management,
Gordon Institute of
Business Science,
University of Pretoria



Lee Perrin
DCE Business Lead
CBRE Data Centre
Solutions, Middle
East & Africa



Julie Wagstaff
Executive Director
Interfile
South Africa



Richard Matchett
Digital Lead
Zutari
South Africa



Nev Lalloo
Divisional Executive,
GRES, Liberty,
South Africa



Sean Bennet
Group Executive
NEXTEC
South Africa

Register for your delegate pass now at www.smart-summit.com

FEATURED CEMENT AND CONCRETE EXHIBITORS

The Big 5 Construct Southern Africa will see representation from across the globe on the exhibition floor as trade corridors and shipping lanes reopen – the world is eager to get back to business. Confirmed suppliers that will be showcasing their world-class products and services include:

**TOTALLY
CONCRETE
EXPO**



For full list of exhibitors and programme visit www.thebig5constructsouthernafrica.com





Innovative concrete solutions for mining

By Eamonn Ryan

With the mining industry being so immense, they have problems that require unique and cost-effective solutions.

Master Builders Construction Chemicals Solutions (MBCC) is the company that they trust to provide those solutions. This is because MBCC provides not only products but also expertise to ensure a positive outcome.

Jason Cooper is the UGC (Underground Construction and Tunnelling) Manager for Master Builders Construction Chemicals Solutions, explains: "We have a number of different solutions for sprayed concrete, such as admixtures, alkali free shotcrete accelerators and sprayed waterproof membranes."

"This has application in infrastructure developments like tunnel boring and basements, and not just conventional mining developments:

- Basements: to control water ingress to basements with a layer of shotcrete, Masterseal 345 over that and then another layer of shotcrete, which creates an impervious barrier which is flexible to ground movement, and not susceptible to damages during the application process as is the case with conventional installed PVC lining solutions.
- Tunnel boring: MBCC has various solutions for the expanding TBM sectors. With regards to concrete supply, we have innovative admixture systems which allow for the high production rates required with precast tunnel segment production for the post excavation segment installations. Along with the MasterSeal 345 sprayed waterproofing membrane, additional innovative products like our Masterlife CI 222, can provide the embedded reinforcing with class leading corrosion protection, to extend the life of the infrastructure in harsh environ-

ments and the waterproofing for corrosion protection with cementitious products, pumpable resin products and high-performance grout."

Cooper continues: "Shotcrete remains our core Underground Construction Supply solution. With our shotcrete solutions we manufacture our admixtures and Alkali Free Accelerators locally and supply both national and international markets. We supply into Africa for large projects where we are able to ensure supply to the tough site conditions and ensure a constant supply so that our project partners are always able to remain in production. Products like the MasterRoc SA160 Alkali Free Accelerator, MasterGlenium SKY 3610 High Range Super Plasticizers are leaders in their markets and are currently being supplied to mines all over Africa. We offer a full suite of





technical solutions, from initial materials analysis, mix design development and testing to on site test verifications, early strength development and Sprayed Concrete Systems Reviews. We are also excited about the introduction of our Virtual Reality based Shotcrete Training for both Robotic and Hand Sprayed Shotcrete applications. This system is developed to assist raising local standards to those of the European EFNARC Standards. In our developing markets it is important to help develop the skills of the shotcrete operators in line with world class standards."

"This allows us to ensure that our solutions are implemented correctly, and that the relationship built with our customers and project partners is built up on a solid foundation for long term relationships."

"Further to that, we assist with quality assurance through access to our RDP Panel test rig. This equipment allows us to confirm the Sprayed Concrete Toughness – Energy Absorption. This is becoming a more widely accepted form of QC analysis, and gives valuable feedback to the engineers specifying the shotcrete. We use this to test the energy absorption capacity of the shotcrete as well as the performance of our Polypropylene Fibers being supplied," explains Cooper.

"Shotcrete has been around a long time but with our innovations and continuous product development we try to raise shotcrete operations to new levels. The mining market is key to our business development plan, and expanding this



sector is a major part of my mandate. We are not taking our eye off Infrastructure Projects, as many of our solutions which have been adopted in the region for mining have very good application in proposed new infrastructure projects. Master Builders Solutions has a wide range of solutions for the mining and tunnelling sectors, and this makes us a valuable partner for projects within the African region."

"Building and establishing relationships with customers and key project partners is of highest importance. We form working partnerships. The depth of these relationships means when a client has a problem, they immediately take the initiative in bringing it to us knowing we will have a solution. As a result, we're busy and expanding rapidly. They know our solutions increase their efficiency. Mines understand that gains in efficiency go straight to their bottom line."

All of Africa is a market for Master Builder Solutions, and it's a big market. The challenge over the past two years of pandemic has been to keep adequate stock in the supply chain at a reasonable price considering fluctuating exchange rates. These challenges have been overcome through forward planning and interface with our global team."

DOING THINGS CORRECT THE FIRST TIME

As everyone knows getting the job done right in the first time not only saves time but also money. This is where innovation is required. Master Builders Solutions has been in the forefront when it comes to innovations in shotcrete and backfill in the last 15 years.

"The nature of innovation is that we open the way for our customers to improve their operations and projects." Cooper commented.

Cooper notes that there are a large number of "massive" mining projects in the pipeline where Trackless Mining and Automation are integral in the execution of these projects. This is part of an international drive to automate more. "Our various Underground Construction Solutions help with this trend to increase productivity through more mechanised mining practices"

"As a result, we have developed a reputation as the go-to experts among many mines for turnkey projects. ■





Precast built projects are on average 30% more cost effective than poured concrete

By Eamonn Ryan

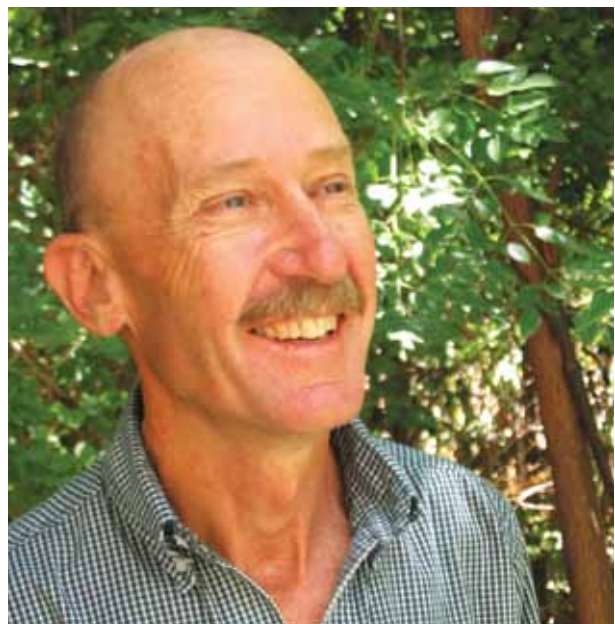
Concrete retaining walls do not have to look dull. A reputable walling contractor should be able to supply a design, or one endorsed by an engineer, for a concrete aesthetics retaining wall that is pleasing to look at, and complementary to the landscape it is placed in.

Holger Rust, owner of Terraforce, a Cape Town based concrete block business, has watched the industry change steadily over the last 35 years:

“It is encouraging that step by step, designers, developers and installers are moving toward a more aesthetically pleasing, living built environment. Many parties worldwide have been promoting these ideas and we at Terraforce are glad to have made our modest contribution.”

“Precast built projects are on average 30% more cost effective than poured concrete. Our experience. In terms of versatility, precast can easily match, if not surpass traditional,” says Rust.

He explains that precast concrete holds advantages across all sectors, from public infrastructure and construction projects to commercial property development, industrial structures and housing development. “In terms of cost effectiveness and versatility, precast products make many projects viable, projects that would otherwise not have seen the light of day or would have ended up as a complete disaster. In the face of free-loaders and reverse engineers in the construction industry, the precast sector like all other sectors, needs



Holger Rust, owner of Terraforce.

to provide the necessary quality control and design manuals coupled with a design service."

Production of blocks is automated to a large degree, cured under controlled conditions, stacked and stored with regular testing of blocks conducted. The fact that precast CRBs (concrete retaining blocks) have a much lower carbon footprint than conventional methods has been well documented.



CONCRETE AESTHETICS CAN BE PLEASING

Concrete retaining walls do not have to look dull. A reputable walling contractor should be able to supply a design, or one endorsed by an engineer, for a retaining wall that is pleasing to look at, and complementary to the landscape it is placed in. A good example for simple, yet good design is the featured family garden that was designed in a sustainable and attractive fashion.

Says Simon van Blerk of Decorton, a Terraforce approved contractor: "I was contacted by this family for some advice on enhancing the recreational appeal of their back garden. Proposal and quotation were accepted and weeks later the family had a significantly transformed garden to enjoy."

Apart from the meandering terrace walls in a rockface finish, two small sets of steps were installed. In this manner safe and easy access was provided to a raised area of the garden. Maintenance of level platforms is easy, compared to mowing on the slope, as any gardener will confirm."

Of particular interest, says Van Blerk, is the small curved set of stairs next to the pool, rounded to match the adjacent terrace walls that were packed in a circular shape: "Installed on a concrete foundation and filled from the side with a fairly dry concrete mix that was compacted with a pick handle, the blocks were fanned out only slightly, so that the gaps that opened up between the blocks towards the back were hardly noticeable."

No corking or grouting was deemed necessary, according to the client. This would be an important requirement on installations with a tight radius or where triangular wedges have to be cut from standard 4x4 Multi Step blocks to form sharp corners, curves or tricky details. In such instances, reinforcing becomes a necessity to avoid excessive cracking of the grouted joints.

Overlapping lengths of reinforcing steel – 4mm diameter minimum – would then be pushed into the moist concrete mix that is used for filling the blocks, and once the blocks are placed in their proper, level position. ■



L13, L18, L22



Terrafix



Terracrete



4x4 Multi



L11, L12, L15, L16

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Solving the tough jobs

By Eamonn Ryan

Twinstar Precast solves the difficult, once-off jobs as well as complicated sites that can make civil engineering and construction challenging.

Twinstar Precast has specifically geared itself to undertake this type of once-off job, which are typically avoided by many precasters due to their complexity, size and resource-intensive nature. Not all building contractors have the necessary expertise, manpower and facilities to manufacture such products on-site, explains Annemerie Coetzee, owner-operator of Twinstar Precast.

The company manufactures products ranging in weight from 2kg up to 6t, and as a result of the complexity of this type of work, Coetzee says it remains the only company in South Africa specialising exclusively in custom-made and one-off precast concrete products.

Among Twinstar Precast's major accomplishments have been to successfully close several old mineshafts with specially tailor-made mineshaft slabs – thereby preventing vandalism and illegal mining activities. Since the installation of mineshaft slabs manufactured by Twinstar Precast, the shafts remain closed and are still completely intact.

GROWING RELATIONSHIPS

"Twinstar Precast's success is owed to our strong relationships within the industry, ranging from civil engineering contractors – our direct customers – to architects and specifying engineers who conceptualise requirements. We have a unique relationship with mainstream precast concrete companies who pass on referrals and use Twinstar to supply certain non-standard products to keep their clients happy," Coetzee explains.

"With 26 years' experience in the precast concrete industry, I spotted a gap for custom-made products and once-off items. For example, in the concrete pipe and manhole market the emphasis is on high volumes so that the effort and time required to design and build once-off moulds for non-standard products disrupts any normal production line.

"Not all building contractors have the necessary expertise,

manpower and facilities to manufacture such products on site and as a result it has become our express aim to assist specifying civil engineers and civil engineering contractors with complicated sites and situations where currently available precast concrete products just won't work.

"We only keep a few fast-moving products in stock which are standard spec in tenders and drawings. Companies who previously made them have either stopped or have closed down. This has largely given rise to the unique relationship with the mainstream precast concrete companies who make use of certain non-standard products," says Coetzee.

Twinstar manufactures square concrete manholes and manhole slabs, as well as polymer manhole covers, stormwater channels and grids, kerb inlet slabs, v drains and chute channels.

The unusual dynamics in the market over the last two years has seen Twinstar filling the gaps left behind by the numerous company closures in the concrete precast market. "We now supply Randwater with their custom manhole covers," explains Coetzee, "and have become as comfortable manufacturing standard products as we are with non-standard products."

COMPLEX PROJECTS

One of Coetzee's more recent favourite projects was stepping in to manufacture bicycle stands for the Ekurhuleni municipality's recreational park in Springs. "It was a highly complex product, and certainly one of our most challenging," explains Coetzee. "We got a 3D drawing from an architect, and basically worked by trial and error."

The complexities of creating a mould that would allow for correct tapering of a design into which bicycles wheels must fit without breaking the concrete product was a challenge fit for Twinstar, and the skills and production management expertise it has perfected, she explains.



The company manufactures products ranging in weight from 2kg up to 6 tonnes.



There is a noticeable aesthetic quality to Twinstar's products that results from Coetzee's hands-on approach to everything manufactured.

While the company's manufacturing facility is situated in the heart of Gauteng, deliveries are made across the country wherever custom precast concrete products are required. The company also offers a service whereby crane mounted trucks can assist with placing of slabs during installation.

Twinstar Precast is equipped and able to provide installation services on site, in the most challenging of environments. Coetzee lists another memorable project as being the work done on closing the Grootvlei mineshafts. The contractor was employed by the Department of Mineral Resources to ensure the safety of the communities around the defunct shafts.

"Whilst the shafts had been closed by other means on numerous occasions, they simply could not withstand the vandalism of continued illegal mining activities. Some of the shafts were extremely deep, posing safety risks to the township and the whole community. The slabs we manufactured to seal the shafts required considerable reinforcement so as to be impenetrable. It was extremely satisfying to deliver something so life-affirming to that community."

IF YOU'RE ON TIME, YOU'RE LATE!

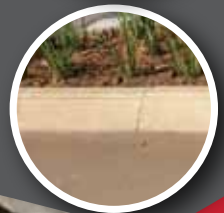
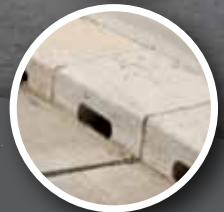
Coetzee has purposefully kept Twinstar to a modest size that facilitates precision work and the short lead times it typically commits to, without compromise. "We work in quite specific ways, whereby there is no such thing as a missed deadline."

There is a noticeable aesthetic quality to Twinstar's products that results from Coetzee's hands-on approach to everything manufactured. "One of the reasons Twinstar will not create other branches or franchises is because I insist on signing things off; I will not let something leave our doors without being perfect and aesthetically pleasing." Twinstar has expanded however, having tripled the size of its factory since 2015. ■

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TECHNICRETE

The difference precast makes to a precast concrete wingwall

By Eamonn Ryan

“There is sometimes a misunderstanding in the construction industry concerning the cost efficiency of precast concrete over in situ concrete, with people having assumptions in favour of one or the other. From my perspective precast is generally more cost effective when we – as the precast specialists – design something ourselves, from start to finish, as opposed to following publicly published drawing for a specific in situ designed product,” says Justin Kretzmar, Rocla Sales Engineer.

He illustrates this point with reference to the precast concrete wingwall, which is required at the beginning and end of any pipeline to prevent erosion of the soil where the water flows in and out of the pipeline. “There are many standard details in the industry for *in situ* concrete wingwalls, with a tendency to over design these in order to accommodate for *in situ* inefficiencies such as poor quality concrete or insufficient placement of steel reinforcement. When we looked at introducing precast wingwalls, we did our designs for similar structural installation, but where the *in situ* designs generally call for a 220mm wall thickness, ours range from 80mm to 120mm. This is where material cost efficiencies can be achieved with precast.

“We obviously use a much higher strength and hence more expensive concrete, coupled with very expensive moulds designed for 25+ years of service. A precast environment has large overheads including large sites, batch plants, cranes, a long term investment into staff, health and safety initiatives and quality management systems and hence relies on long term, large and consistent order volumes in order to be viable.”

But almost more importantly than material savings, precast also offers massive time savings for contractors that can assist

in achieving their deadlines. “Precast factories would be set up to produce high volumes, extremely efficiently, to a high quality, in a short period of time and even allowing for double shifts when necessary. This, in turn produces massive efficiencies on site, enabling the site project manager to pre-plan and prepare by ordering precast components well in advance to be ready according to a scheduled timetable to minimise delay. We can build up stock in our yard or manufacture to be ready to be delivered to that schedule to be installed almost immediately after arrival on site, minimising the requirement for on-site storage space,” explains Kretzmar. “With *in situ* manufacture, a two to three week lead-time for construction of these similar items would have to be factored into the project lead time prior to being able to move on.

“For example, when a wingwall is cast on site it is usually about a three-week process, including the shutterwork remaining on the structure for at least one week while the concrete is curing. In our factories we can strip the same product out of a mould, if needs be, within six hours. To do so we have to use a very special concrete mix that gets us almost to the same strength as the *in situ* material but within that six hour period as opposed to over 28 days. An *in situ* product might require

““ However, we generally find that the material and time savings more than offset the seemingly inefficient transport costs,” says Justin Kretzmar, Rocla Sales Engineer.





In some cases only 15 tons of product can fit on a 30-ton truck.

20 to 25 Mpa concrete at 28 days whilst precast will typically be 35 MPa at 7 days and extending to about 40 – 45 Mpa at 28 days. It is this far higher strength and more durable concrete that allows us (in our design) to perhaps reduce wall thickness and use a little less reinforcement,” says Kretzmar.

PROS AND CONS

“From a negative perspective, however, precast concrete products still have to be transported to site and due to bulk and mass, concrete products are generally not ideally suited to be transported. In some instances our truck bed is half empty because the items are large and heavy, utilising the full load capacity of a truck on only half the truck bed. In other cases our units are small, bulky and awkward to pack, using up the full truck bed but only half the load capacity. The latter is the case with our wingwalls, where we generally can only fit 15 tons of product on a 30-ton truck. However, we generally find that the material and time savings more than offset the seemingly inefficient transport costs.”



Rocla uses a much higher strength and hence more expensive concrete.

Furthermore, some products simply cannot be made on site, such as pipes which require large spinning machines to manufacture the reinforcing grids and the concrete itself, resulting in high quality, dense and well compacted concrete. In other cases a large portion of site resources might have to be allocated to manufacturing and curing concrete products such as culverts, “With precast they are assured of a quality product and save on those resources with products installed almost immediately, thereby saving weeks, if not months, on a construction programme. We invest massive amounts of expenditure in our factories which wouldn’t be viable on site for a single project.

“We cast thousands of items from a single mould, which in essence is the efficiency of precast, but on the other hand precast might not be viable for production of a special mould for a small run of custom items. The science of our moulds is an exact one – not only do they have to survive thousands of production cycles, without losing their design tolerances, but they also have to be designed to ensure a quick strip, clean, reassemble cycle or we lose many of the factory efficiencies included in our product costings. For this reason, our moulds cost a lot more than people would imagine,” he says. This creates a challenging barrier to entry for quality precast concrete products.

“We do see precast factories that don’t invest adequately in their moulds, and though their product may initially be good, within a few months or years they lose their tolerances due to the mould no longer being within specifications and thereby causing problems on site.” In this vein there is also a need for laboratories at each precast plant to consistently audit quality of both concrete mix and final product.

Kretzmar recommends that customers engage their precast suppliers and insist on seeing certification on internal practices and also to a relevant regulatory body such as CMACS or SABS for their products. Every one of Rocla’s factories has a quality department and concrete laboratory whereby cubes are taken, cured and crushed on a daily basis, from each batch plant as well as overseeing the relevant tests on finished products as per SANS requirements. ■



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As a BBF Safety Group product, Lemaitre Safety Footweares grounds itself in manufacturing high-quality products that keep those who continue to build South Africa safe. For over 30 years, Lemaitre is driven by passion, pride and has continued to cater to the construction and other closely related industries. Our hand-made safety shoes help the tough South African workforce to continue building a stronger nation step by step.



Made by workers for workers, the hardworking Lemaitre Raptor Range is made with the worker in mind. The footwear is manufactured with multiple benefits and features for hardworking South African feet. The range is fitted with torsion control, making it the perfect fit for environments with pothole-ridden roads, uncompleted concrete pavements and construction sites where a step on uneven terrain is a certainty. If doing it yourself requires a worker to be on the ground or traverse scaffolding and ladders, the TPU inserts and SRA-rated slip resistance in the range's footwear ensures additional support and control to keep you sure-footed in any situation.

The additional Ultra-Fresh technology in some of the Raptor range products guarantees added anti-bacterial properties that keeps your feet fresher and manageable over a lengthy period of constant wear and tear. Making the range ideal for workers seeking solid and odour free footwear.

The range includes the Eagle, Hawk, Falcon shoe and two fresh-out-the-box additions with the Osprey Hiker and the Falcon boot. The Eagle is designed with an aggressive TPU grip in the arch area of the sole for extra support and further incorporates an anti-toe and heel scuff for increased durability. The go-to partner shoe for the Eagle is the Hawk which features punch detail for breathability and comfortability.

The latest addition, the Osprey Hiker, is the only safety footwear in the Raptor range featuring a Footology Elastopan Climate Control Insole. The insole enables fast and complete absorption of humidity inside the shoe, meaning the Osprey Hiker has 300% higher absorption than a standard PU insole. The ergonomic design allowing wears to feel superior cushioning, confident and comfortable in varying and uneven terrains.

With a special focus on the durable Falcon boot and shoe, the Falcon footwear is constructed for the construction industry particularly. The durable Falcon shoe is the same trusted Falcon footwear made in a boot form for those seeking extra grip. However, not to be stepped by the brand-new Lemaitre

Raptor Range Falcon Boot, the improved Falcon shoe has updated its features with a padded collar and padded bellows tongue for increased comfort.

Both the Falcon shoe and boot are made with genuine leather uppers with additional padding on the collar for consistent comfort and unwavering reliability in any environment or weather. The padded bellows tongue prevents particles and water from entering the boot and keeps your feet protected and dry at all times. The Raptor sole unit features cleats that are good for traction, with TPU inserts designed for a secure grip to keep Lemaitre wearers balanced and protected on ladders, scaffoldings and any situation on construction sites. Both boots and shoes have dual-density PU sole units crafted for stability, comfort and ankle support, and with an additional lacing system that makes lacing easy, the only remaining uncertainty will be if you prefer to wear a boot or a shoe.

So, whether it's the Falcon or any of the other footwear from the Raptor range, Lemaitre's mission is to keep hard-working feet safe and secure on construction sites. Ensuring that when it comes to safety, our footwear is not only reinforced with durable material that keeps you safe but is also reinforced with pride, attention-to-detail and a hands-on approach for South African wearers.

As a proudly South African brand made from one worker to another, Lemaitre Safety Footwear supports South Africans through safety footwear and supports South African workers by manufacturing and sourcing safety footwear locally. Supporting one worker to another by boosting the economy, getting South Africa back on its feet and paving the way to a better future for workers from the southern tip of Africa.

Our local support is netted into our four-stage process involving local procurement, local manufacturing, local distribution and keeping workers safe across construction sites and various industry terrains. Ensuring we are proudly manufactured by workers, for workers. ■

Drug testing in the workplace – keep it as consistent as alcohol testing

By Rhys Evans, Managing Director at ALCO-safe

As much as alcohol testing has become an expected legal requirement for road safety and workplace safety, the impact of drugs is still largely overlooked. It is important to remember that the effect of drugs in the workplace is just as dangerous as alcohol.

The need for workplace drug testing is therefore equally critical as drugs impair an individual's ability to perform tasks by affecting depth perception and reaction time. This could result in a serious work-related injury (or even death) if the use of drugs goes unnoticed in the workplace. Simply including a random drug testing policy and procedure to ensure health and safety protocols are covered, is not enough. Businesses need to implement drug testing on a consistent and regular basis in order for it to be truly effective, and it should be treated as equally important as an organisation's alcohol testing schedule.

As the country's vaccination levels rise and more people return to the workplace, health and safety measures that focus on intoxicating substance use for employees are going to become increasingly important. Drugs are just as intoxicating as alcohol and can have a massive effect on workplace performance, with the biggest noticeable impact being on the individual's reliability. Absenteeism becomes increasingly common, along with decreased performance and a lack of motivation when the individual does come to work, often due to a hangover or drug come down. In the workplace itself, there is an increased risk of accidents due to impaired concentration. Depending on the drug that person uses, it might make them drowsy, or it might affect their depth perception and decision-making ability.

KEEPING SUBSTANCES OUT OF THE WORKPLACE

Overall, intoxicating substances lead to a decrease in performance which in turn has a negative impact on production, along with an increased risk of accidents. An increase in accidents means more downtime, which again affects productivity and creates a vicious cycle. Failure to notice a culture of substance abuse in the workplace is not a situation for management to apply plausible deniability. If there are people in a workplace using substances, that kind of behaviour has a tendency to spread unchecked. To keep intoxicating substances out of the workplace, it is essential to have a company policy that communicates clearly that there will be zero tolerance to drugs and alcohol, while detailing the procedures and grounds on which employees will be tested for the presence of substances.

Along with this foundational policy that clearly states the consequences of being caught out by means of a breathalyser or saliva test, it is necessary to have mechanisms whereby employees can voluntarily seek assistance, for substance abuse problems without fear of punitive disciplinary measures being taken against them. Even if it's just providing sick leave and referring the individual to a treatment centre, it's important that businesses handle such situations carefully and with empathy.

PREVENTATIVE, NOT PUNITIVE

Breath alcohol testing and saliva testing needs to happen regularly and visibly if it's to have a deterrent effect in the workplace. People are more likely to be deterred from partaking in intoxicating substances if they know there is a strong chance they will get caught out at work. In addition to a clear workplace policy, consistent and visible substance testing procedures and consequences for testing positive, alongside awareness training on the dangers of alcohol and substance abuse, is important. Educating employees on the health and occupational risks associated with alcohol and drugs in the workplace is critical to the effectiveness of any safety policy. It's essential that people understand that the rules are there to keep everyone safe, they're not there to catch people out and get them fired. ■



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Emergency lighting: one-size does not fit all

By Dean Gopal, Product Manager of Eaton's Life and Safety Division for Africa

Emergency lighting is perhaps one of the most complex topics that building owners and facility managers deal with. A wrong decision at any point in the design process can mean putting the lives of building occupants at risk in emergencies.



Dean Gopal

According to Eaton's new emergency lighting fundamentals guide, there are several factors that need to be taken into consideration with regards to specification, placement, maintenance and regulation. An effective emergency lighting solution plays a critical role in crises but so many in the industry continue to ignore the basics.

times and this may require maintained (always on) emergency lighting to ensure that escape routes and exits are clearly lit at all times, not only when a crisis breaks out. This is also critical to aid safe evacuations in the case of a power failure.

TYPE AND PURPOSE OF THE BUILDING

A key influence on emergency lighting system design is how safely tasks can be stopped by the occupants of a building hit by reduced visibility. There are three risk levels which define how easily a task can be safely stopped and how this influences the most appropriate emergency lighting approach:

- **Low-risk tasks:** These are typically conducted in offices, retail and the services sector and can be safely stopped under reduction of illuminance to very low levels (typically 0.5Lux from 300-500 depending on the task).

They usually require escape and anti-panic illumination.

- **High-risk tasks:** Activities in warehouses, cafés, and swimming pools, can be safely stopped at practically any time by interacting with a control panel. Illumination is typically required on both the control panel and task to safely stop and evacuate.

- **High risk (+) environments:** Theatres and airport control towers where tasks cannot be immediately stopped or take a long time to do so. They need full illumination over a whole area.

USER PROFILE OF THE BUILDING

There are various decisions that need to be made around the occupants of the building. While some buildings have a broadly homogenous user profile, for example student residences, others may be more mixed. Age, health, well-being, lifestyle and familiarity with the environment are all design considerations that play a key role in dictating the best emergency lighting solution.



“For hospitals, theatres or other public buildings that people don't visit regularly, panic or herd mentality can set in and cause crush scenarios during an emergency.”

The lighting placement as well as higher illumination are key for various demographics. For instance, older occupants whose eyesight may not be as strong require higher and more uniform illumination with extra-thought to hazards like stairs. Buildings with higher levels of occupants experiencing physical and cognitive impairment should also implement high illuminations to support with more complex evacuations, for instance students in halls (who would frequently host parties in a time without COVID).

For hospitals, theatres or other public buildings that people don't visit regularly, panic or herd mentality can set in and cause crush scenarios during an emergency. The lack of familiarity with the environment could result in longer evacuation

BUILDING SCALE AND COMPLEXITY

The scale and complexity of a building can make evacuation difficult. In high rise buildings, despite no inherently dangerous tasks, longer durations may be necessary to provide ample time for a safe evacuation. Fully enclosed staircases in most applications could be a reason to consider higher illumination levels, as could the fatigue of people leaving the building.

In older buildings, there may not be enough escape routes or the routes may be too narrow (according to newer building regulations). It's also possible that flammable construction materials could have been used. To mitigate these risks, higher illumination levels for a longer duration may be needed to reduce panic and ensure the safe exit of all occupants. Adaptive evacuation signage and techniques could be used to direct people to safety as well as control the flow of people using escape routes.

LIFECYCLE COSTS

Lifecycle total cost of ownership (TCO) can make a real difference to any building owner or operator installing an emergency lighting system. Just like any other commercial investments, there is a balancing act between how much the system will initially cost to design and build (CAPEX) and the operating costs (OPEX) involved over its lifetime. Nevertheless, safety should always be at the forefront of any emergency lighting design.



MAINTENANCE AND SERVICING

While testing an emergency lighting system is extremely important it does not encompass a maintenance programme sufficient to ensure people can evacuate safely, as well as meet regulatory standards. Robust processes must be in place so that faulty equipment can be quickly repaired or replaced, and that any new products or components needed deliver the required performance and satisfy all regulations.

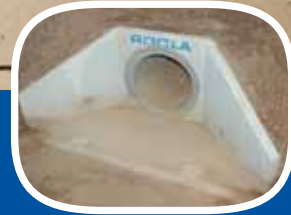
While some building owners may choose to take on testing, maintenance responsibilities and arranging a simple repair or replacement themselves. However most – especially when it comes to larger systems – will choose an annual service contract with their emergency lighting supplier company. This ensures that fully trained engineers manage all aspects of testing and maintenance and arrange any repairs using OEM components to high compliance standards.

Facilities managers must consider all these factors and be confident in their efficacy to class their emergency lighting system as suitable for the building they manage, but also its occupants at any given time. ■

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Key factors for concrete durability

Supplied by Cement & Concrete SA's School of Concrete Technology

The two main reasons why concrete is the most abundantly used construction material are its durability and competitive pricing compared to other construction materials. Concrete's durability also leads to significant reductions in maintenance costs over its service life, says John Roxburgh, senior lecturer at Cement & Concrete SA's School of Concrete Technology.



John Roxburgh, senior lecturer at Cement & Concrete SA's School of Concrete Technology.

"But there is still alarming ignorance about the fact that increased durability of concrete – and lower life-cycle costs – can often be achieved by following some simple rules," Roxburgh advises.

He says although most concrete is inherently very durable, it can nevertheless be susceptible to chemical or mechanical attack or degradation. The mechanical and physical processes of deterioration could include abrasion, erosion, cavitation and freezing. "The more common chemical processes

that can cause deterioration in concrete are soft or pure water attack, acid attack, carbonation (along with the associated corrosion of steel reinforcement), sulphate attack, alkali silica reaction and the ingress of crystal forming or corrosive salts. The corrosion of steel, and subsequent cracking and spalling of concrete caused by it, is the most common durability problem."

But Roxburgh feels these concrete deterioration issues can be prevented, or at least greatly reduced, by following three simple principles:

- Firstly, the concrete mix design should be designed for the specific environment the concrete will be used in. If the concrete is going to be placed in sulphate bearing soil, the concrete mix design should be one that will mitigate sulphate attack. Another precaution would be the use of heavily extended cements in the mix to reduce the risk of alkali silica reaction.
- Secondly, good on-site practice will optimise the durability of concrete. Good site practice in transporting, placing, compacting, curing correctly and using concrete with the right plastic properties will reduce the formation of cracks and voids, and enhance the concrete strength, finish and durability. Good site practice also involves the correct depth of concrete cover to protect the steel re-bars.
- The final, and probably most important principle to making concrete durable, is to make it waterproof. Almost all durability problems associated with chemical deterioration of the concrete or steel, as well as mechanical deterioration such as freeze-thaw and salt-crystal jacking, can be prevented – or considerably slowed down – by making the concrete impermeable to water, and to a lesser extent, gas. "Water both transports chemicals into the concrete and facilitates chemical reactions in the concrete. By stopping or minimising water ingress, potential deterioration is either stopped or reduced. Gases can contain chemicals with adverse effects. Of course, the first two of the above principles are intrinsically linked to making concrete waterproof," Roxburgh adds. ■

CCSA has pointed out that cracking of concrete can be prevented - or substantially reduced - by following simple preventative principles.

Source: Justus Menke/Unsplash

RDP housing project built with precast concrete

By David Beer on behalf of the Concrete Manufacturers Association

Precast concrete masonry blocks and hollow-core slabs were used for the construction of Lourensa Park, a City of Cape Town RDP housing project situated in Somerset West. Comprising 86 double-storey 40m² units and 62 single storey 40m² units, Lourensa Park was designed and built by housing specialist, ASLA Construction.



Some of the single-storey houses at Lourensa Park.



Partially completed double-storey houses at Lourensa Park.



A double-storey unit under construction.

Concrete blocks were supplied by precast concrete manufacturer, BluBlok, in three sizes: 190 x 190 x 190mm, 390 x 190 x 140mm and 390 x 190 x 90mm. In addition BluBlok supplied its 140mm U block which was used in place of lintels and it supplied the kerbing for Lourensa Park's roads which were built as part of the civil works by ASLA in 2019.

BluBlok's 140mm block was used for the exterior walls of the double-storey units and the 190mm block for the inner walls. The exterior walls of the single units were built with the 190mm block and the interior walls with the 90mm block.

ASLA site manager, Wayne Nieuwoudt, says BluBlok blocks were chosen for this project because of their high quality.

"It is vital to use a good quality building materials to ensure there are no comebacks and we know we can rely on BluBlok. We've never had any problems with their output."

Both the single-storey and double-storey units were built in four-unit structures and prestressed hollow-core slabs, manufactured by CMA member, Cape Concrete, were used for the upper level flooring of the double-storey units.

Nieuwoudt said that using precast slabs made for considerable time savings.

"No propping or shuttering was required and the slabs can be installed in a matter of hours as opposed to the weeks it would take to build the upper flooring with in-situ concrete. Moreover, we were able to start building the upper-level walls as soon as the slab installation had been inspected."

One of the contract conditions was that local labour be used for the construction work and at least 60 local labourers were used on the project by the time the project had been completed.

Each house comprises a living area, a bathroom and two bedrooms and the ceilings are insulated with 135ml Isotherm. Window frames are in aluminium and roofing is IRB sheeting. ■



The interior of a single-storey unit.



Portland's precast products prior to offloading.

CMA member supplies hollow-core slabs for Balwin Lifestyle Centre

By David Beer on behalf of the Concrete Manufacturers Association

Concrete Manufacturers Association producer member, Portland Hollowcore, is supplying prestressed hollow-core slabs, precast staircases and precast beams for the construction of the upper-level floors of De Aan Zicht, a new lifestyle estate being built by Balwin Properties at Atlantic Hills in Cape Town. When completed in 2027, the estate will comprise 95 four-storey building blocks housing 1 354 apartments in one, two and three-bedroom layouts.



One of the steel beams being offloaded.

Installed with a 55 tonne crane, Portland Hollowcore's slabs are being supplied in several lengths, widths and depths. Once in place, the slabs are covered in screeds in various depths and then tiled.

According to Portland Hollowcore manager, Petrus Theart, the precast staircases were specifically designed and manufactured for the project.

"The slabs' smooth soffit surfaces are being used as ceilings and downstand beams were eliminated in the design through the use of steel beams.

"In addition to being the proud supplier of hollow-core, we are supplying a substantial amount of readymix concrete to the De Aan Zicht project. The bulk of the concrete is being used for the raft foundations and is placed with a concrete boom pump. We are also supplying the balance of the projects' concrete requirements for its other applications."

Several other precast concrete products are being used in the construction of De Aan Zicht. They include: Klompie Brick



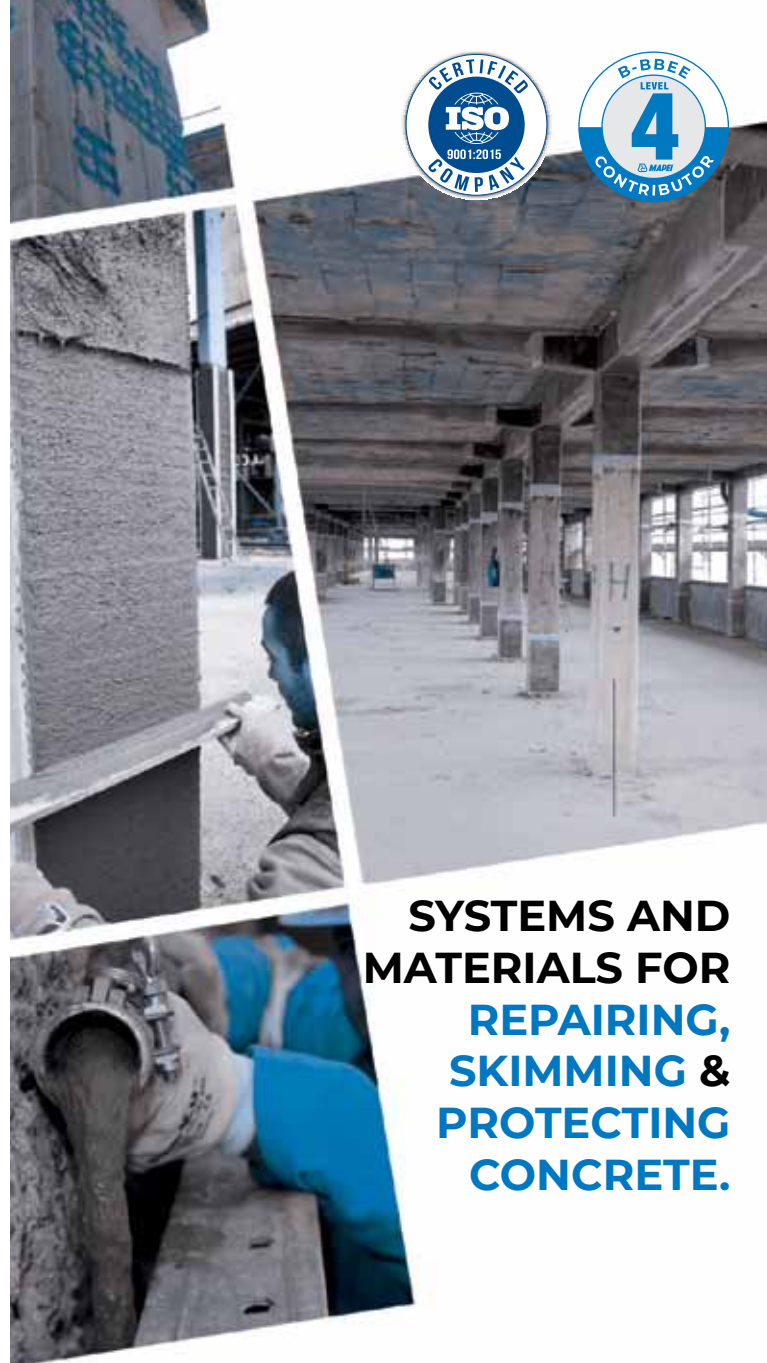
cladding (Revelstone); lintels and coping (Lintels for Africa); exposed aggregate pavers (Inca); parking and walkway paving (N1 Paving); and kerbing (Blueblok).

De Aan Zicht is Balwin's most iconic lifestyle centre in the Western Cape and its location gives it a cutting edge. Perched on top of a hill, it affords uninterrupted and panoramic views of Table Mountain, Robben Island, Lions Head and the Atlantic Ocean.



A hollow-core slab is lowered into position.

Only a 20 minute drive from the centre of Cape Town and close to the Durbanville Hills Wine Route, De Aan Zicht offers a host of lifestyle features including: a Montessori school; fibre and DSTV ready; 24 hour security with biometric access; a swimming pool; a spa; training science gym with trainer; function and conference rooms; a mini soccer field; and several other features. ■



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Revelstone's Klompie Cladding embellishes Balwin Lifestyle Estate

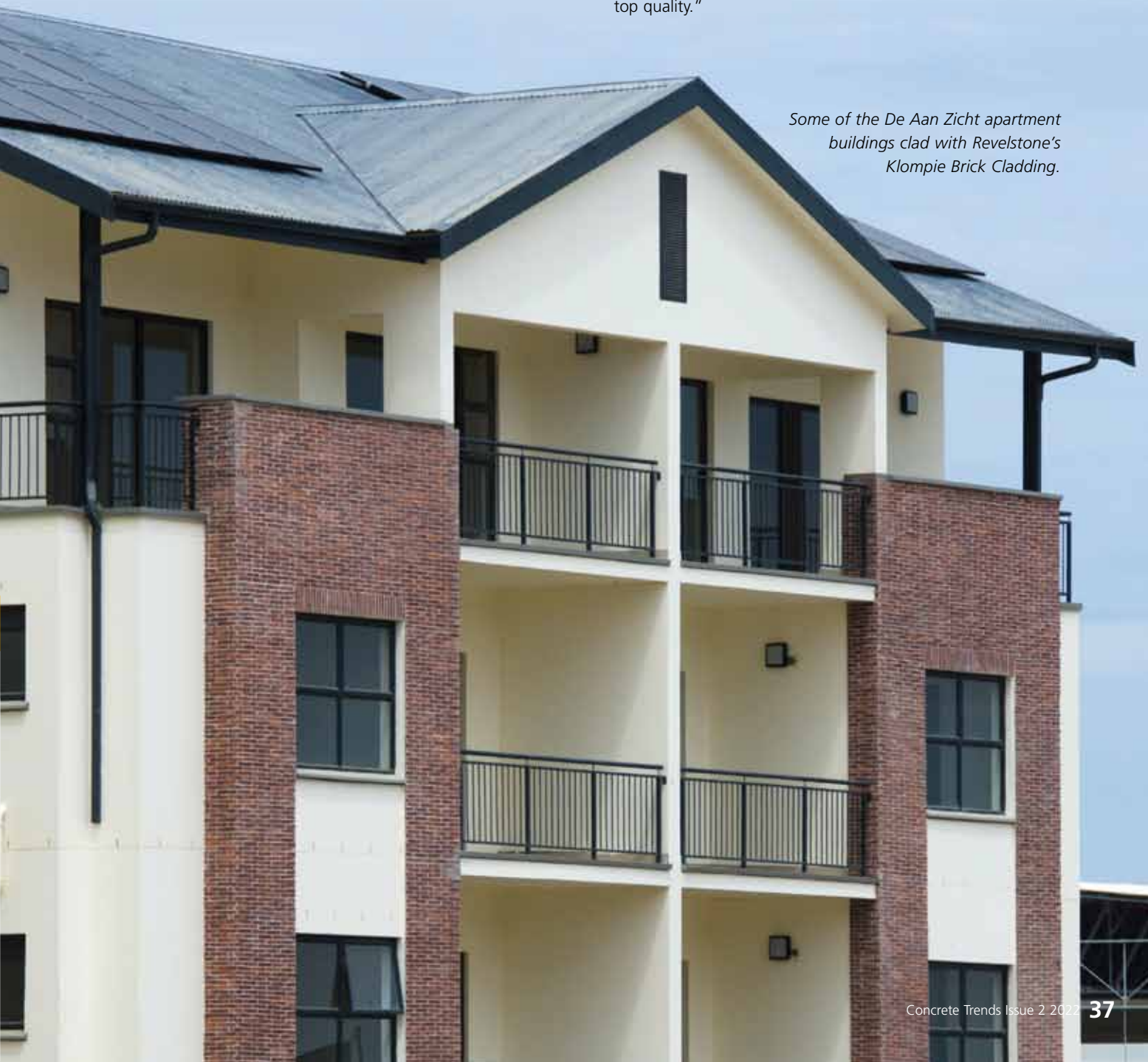
By David Beer on behalf of the Concrete Manufacturers Association

Concrete Manufacturers Association (CMA) producer member, Revelstone, has supplied its Klompie Brick Cladding for wall sections of a new lifestyle estate being built by Balwin Properties at Atlantic Hills in Cape Town. When completed in 2027, the estate will comprise 95 four-storey building blocks housing 1 354 apartments in one, two and three-bedroom layouts.

De Aan Zicht will be Balwin's most iconic lifestyle centre in the Western Cape and its location gives it a cutting edge. Perched on top of a hill, it affords uninterrupted and panoramic views of Table Mountain, Robben Island, Lions Head and the Atlantic Ocean.

"We wanted to create a signature trademark in the Western Cape and Klompie Brick Cladding was a perfect fit. We have used it on another development and the result was stunning," according to a Balwin representative. "Similarly, the interior finishes at De Aan Zicht are unrivalled and are of top quality."

Some of the De Aan Zicht apartment buildings clad with Revelstone's Klompie Brick Cladding.



Klompie Brick Cladding is one of 15 Revelstone cast-stone cladding options. Cast in concrete, it looks like an original clay Klompie brick and is ideal for cladding feature walls.

“It is a high performance and low maintenance product which costs considerably less than the clay Klompie. It can be used for external or internal wall cladding, and is produced in a variety of colours and two thicknesses, 30mm or 75mm, ” says Revelstone managing director, Alex Cyprianos.

Several other precast concrete products are being used in the construction of De Aan Zicht. They include: hollow-core floor slabs and precast staircases (Portland Hollowcore); lintels and coping (Lintels for Africa); exposed aggregate pavers (Inca); parking and walkway paving (N1 Paving); and kerbing (Blueblok).

Only 20 minute drive from the centre of Cape Town and close to the Durbanville Hills Wine Route, De Aan Zicht offers a host of lifestyle features including: a Montessori school; fibre and DSTV ready; 24 hour security with biometric access; a swimming pool; a spa; training science gym with trainer; function and conference rooms; a mini soccer field; and several other features. ■





The attractive paving layout integrates with the recently completed High St pergola.

Revamped Hermanus High Street beckons shoppers and tourists

By David Beer on behalf of the Concrete Manufacturers Association

Now that the transformation of Hermanus' High St from a busy traffic-dominated thoroughfare into a paved sanctuary has been completed, High St business owners have cause for celebration. Its magnificent coastline aside, Hermanus now has an additional tourist drawcard, providing visitors and locals alike with a tree-lined pedestrian mall paved with an attractive mix of precast concrete pavers supplied by CMA producer member, C.E.L. Paving Products.

The revamped thoroughfare is fronted with an inviting mix of outdoor eating venues and bespoke retail outlets and the paving links High Street's varied architecture in an integrated living space for pedestrians, cyclists and cars.

The final phase of the revamp involved the construction of a pergola on the corner of High St and Dirkie Uys St. Completed in June 2021, it will house market stalls and be used to support events such as the annual whale festival.

Executed on behalf of the Overstrand Municipality, the

makeover was conceived and designed by Gapp Architects and Urban Designers under the auspices of Element Consulting Engineers. The civil work and paving was done by Meyer Beton Siviele en Boukontraakteurs.

High Street's upgrade forms part of an overall framework plan commissioned by the Overstrand Municipality in 2016. Developed by Gapp Architects, the framework focuses on revamping the CBD, the treatment of public spaces and traffic flows. As one of several development opportunities, the framework identified High Street as an important historic route, and



Some of the paving layouts and newly planted trees.

as such, recommended its transformation from a traditional shop-and-go precinct into a recreational space.

Hedwig Crooijmans-Iemmer of Gapp Architects and Urban Designers commented: "By providing more leisure space we wanted to encourage shops and restaurants to spill out onto the sidewalks.

"We took our cue from other sections of Hermanus which

have been redeveloped over the past five-to-ten years, including some of the earlier paving projects. We looked at Gearing's Point and Market Square where the paving was well received by the local community and has held up well, and we decided to create a sense of place in High Street using the same visual language. This is why we chose C.E.L.'s concrete pavers which had been used on the earlier projects." ■



Massive Mossel Bay housing project nears completion

By David Beer on behalf of the Concrete Manufacturers Association

Mountain View, a Department of Human Settlements housing project in Mossel Bay is close to completion. Built almost exclusively with precast concrete products supplied by Concrete Manufacturers Association member, Mobicast, the 1 003 housing unit development is scheduled for completion in June this year.

Ruwacon is the project's main contractor and Royal Haskoning DHV its consulting engineers. Mobicast has supplied concrete masonry blocks, suspended rib & block flooring, concrete staircases, paving blocks, kerbing, parapet coping, stock bricks, manhole covers and concrete tree rings for the project.

Two housing models have been constructed at Mountain View, Breaking New Ground units and Finance Link Individual Subsidy Programme units. Both are built to the same 45m² structural design, however, the FLISP units come with additional finishes and a pitched roof.

Mobicast's 140mm cement blocks have been used for the outer walls and its 90mm blocks for the internal walls. The fire walls between units were constructed with 190mm blocks.

Ruwacon Southern Cape area manager, Theo Wessels, notes that building the floors with Mobicast's suspended rib and block system worked well.

"Besides being cost-effective it required on-site labour in teams of six and created jobs for the local community.

"We have used Mobicast's precast staircases inside all the units. In addition, special tailor-made precast concrete stair-

cases were produced for external attachment to give disabled occupants access to the upper floors," says Wessels.

Mobicast has also supplied 60mm coloured and textured interlocking pavers for some of Mountain View's internal roads, and the spaces between buildings were paved with Mobicast's cobble and stretcher bond pavers.

Operating out of four factories located in George, Groot Brak Rivier, Mossel Bay and Wellington, Mobicast manufactures a wide range of precast concrete products in both dry and wet cast formats. Its Garden Route plants deliver as far-a-field as Beaufort West, as well as to Swellendam and Plettenberg Bay. The Wellington factory supplies the greater Cape Peninsula area.

“We are an extremely versatile and solution driven company.**”**

The company produces almost every type of precast concrete paver, and in addition to the products itemised above, it also produces the Smartstone range of simulated stone



An aerial perspective of Mountain View.



Mobicast's rib & block flooring and concrete building blocks.



A fully completed precast concrete staircase.

cobbles and pavers under license for the Western and Southern Cape. Other products made under license include Terraforce and Loffelstein retaining wall blocks.

Founded in 1981, the company's three Southern Cape plants and extensive product range make it the Southern Cape's precast concrete building products market leader.

"We are an extremely versatile and solution driven company," says CEO Chris van Zyl. "We operate to a philosophy of always ensuring that customers don't leave without being helped even if it means referring them to another company.

"Mountain View is an excellent example of this policy. We made bespoke tree rings and staircases based on the client's size and spec requirements.

"Moreover, our staircases highlight the advantages of precast construction. They are delivered in kit form and don't require cranes for off-loading and installation. Manual labour suffices and subbies are easily trained to do the assembly and installation work. Precast staircases also save time and unlike in-situ staircases, don't require skilled carpenters to construct timber frames," concludes van Zyl. ■



Apart from its precast staircases, this picture shows the entire range of products delivered by Mobicast to Mountain View.



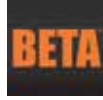
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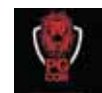
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