Issue 3 2020

CONCRETE trends

The voice of the industry

AfriSam continues it long tradition of innovating composite cements

Innovations in concrete & construction

It's a precast world

Model houses

Innovations in the mix

www.concretetrends.co.za

dmg::events

CJCPrecast

CONCRETE IS OUR BUSINESS

Services

Precast Concrete Pump Stations

Water/Sewage Treatment Plants

Pipe Specials Manufacturing

Precast Concrete Reservoirs

In-situ Concrete Reservoirs

Visit:
www.cjcprecast.co.za

Call us:
061 532 4601
078 326 7034

Email us:
quotes@cjcprecast.co.za

CJC Concrete specializes in conventional and precast concrete products.
Our construction team can deliver projects on time and within budget and we are capable of handling any project.
Our team is highly experienced and able to offer creative solutions in both the design and execution of projects allowing the creation of outstanding products and structures which are secure and aesthetically pleasing.
Precast Concrete Reservoirs in collaboration with Corestruc (Pty) Ltd

Issue 3 2020

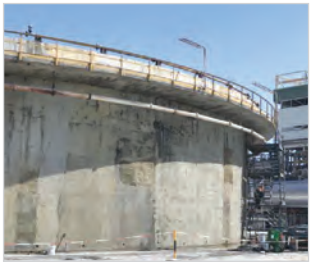
CONCRETE trends

The voice of the industry

COVER

AfriSam has been a pioneer in the evolution of composite cements for many years

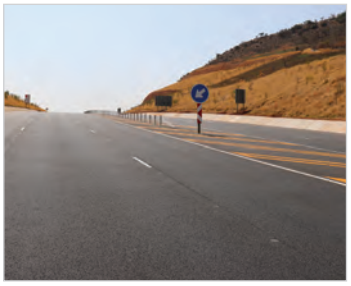
CONTENTS



6

18

20



34

VICE PRESIDENT:
Devi Paulsen-Abbott
e-mail: DeviPaulsen@dmgevents.com

PUBLISHING EDITOR:
Nicholas McDiarmid
e-mail: NicholasMcDiarmid@dmgevents.com
T: +27 21 700 5500 M: +27 78 551 9535

ADVERTISING:
Kenneth Masvikeni
e-mail: KennethMasvikeni@dmgevents.com
T: +27 21 7005509 M: +27 72 686 6998

MARKETING:
Cape Town office: Zara Eckles
e-mail: zaraeckles@dmgevents.com
T: +27 21 700 5511 M: +27 72 590 3207
Johannesburg office: Saki Magoxo
e-mail: sakimagoxo@dmgevents.com
T: +27 11 783 7250 M: +27 83 735 7213

DESIGN & LAYOUT:
Virgil Jacobs
e-mail: rykim@mweb.co.za
M: +27 83 524 5024

Sub Editor and Proof-reader:
Deidre Du Preez
e-mail: deidredupreez98@gmail.com
M: +27 73 469 2434

PRINT:
Shumani Printers, Cape Town

dmg::events

Published by **dmg**events: 31 Bell Crescent, Westlake Business Park, Tokai | PO Box 30875, Tokai, 7966, South Africa | Tel +27 (0)21 700 5500 | Fax +27 (0)21 700 5519
76 11th Street, Parkmore, South Africa, 2196 | PO Box 650302, Benmore 2010 | Tel + 27 (0)11 783 7250 | Fax: +27 (0)11 783 7269

ISSN 1560-2710

Nicholas McDiarmid,

The economy is projected to rebound by 3.5 percent in 2021 on the back of improving business activity and confidence as the authorities make progress in implementing policies to boost growth and stabilize public debt.

There have been a slew of announcements from the various entities in the public sector promising significant investments in infrastructure, housing and construction projects. Certainly, construction will be the at the centre of South Africa's economic recovery as the most effective means of revitalising economic activity across the socio-economic spectrum.

Human Settlements, Water and Sanitation Minister Lindiwe Sisulu announced that provinces and municipalities will be allocated over R20 billion to deliver subsidy housing for serviced stands, houses, and self-build options using "alternative building technologies".

For capital projects that deliver social rental housing, over R725 million would be allocated to the Social Housing Regulatory Authority, Sisulu told MPs. "Through the home building and land servicing programmes, the construction and home building industry will serve as a spring-board to jump-start our economy. …I have also instructed the department to review the procurement arrangements to enable swift uptake of alternative building technologies," Sisulu said.

The IMF approved US$4.3 billion in emergency financial assistance under the Rapid Financing Instrument to support the authorities' efforts in addressing the challenging health situation and severe economic impact of the COVID-19 shock.

More recently, we read this announcement: "South Africa's R100bn Infrastructure Fund is here, but there will no repeat of the large-scale corruption witnessed in 2010, says National Treasury director-general Dondo Mogajane. "We will ensure that [which] we had seen during the construction of the 2010 infrastructure roll-out does not happen. We've got lessons we've learnt from what we picked up when we rolled out the 2010 infrastructure," he continued.

In this edition of Concrete Trends, we see a far more active construction sector than we did only three short months ago. And as Publishing Editor, I have enjoyed far more engagement with the wonderful people who make up our sector, and although still cautious, there is an uncanny notion peppering many of their thoughts: perhaps this pandemic experience might end up doing some good?

We will know in time, but for now, I am highly encouraged and definitely welcome the onset of Spring with a renewed outlook for our future.

It's all by association

Industry associations play such a vital role in representing their members' interests to all spheres of government, the media, other industry bodies and each other, that imagining a world without them is a very quick wake-up call. Concrete Trends works very closely with our partner associations, to ensure that our perspective is directly informed by the facts and the actions of our stakeholders, and to plan and present content that is helpful, useful and practical. In preparing this edition, we have had the very generous assistance of ASPASA, the CMA, the NHBRC and the MBA North. Not only have we renewed our partnerships, we have explored better ways of assisting each other and I am excited by what is to come.

Like most industries, the concrete industry is fast becoming a global one. We need to learn as much as we can about those wanting to do business in Africa, maximising the benefits and being aware of how we manage the risks. The almost laissez faire trade practises existing between BRICS countries has led to some serious, and in some cases chronic problems, when it comes to the importing of cement, not to mention concrete. We need to be well-armed with information, support and access to the experiences of our global counterparts. For these reasons, **Concrete Trends'** new partnership with the World Cement Association is both exciting and extremely important; we now have direct contact and access to information that will help South Africa and Africa engage more fruitfully with the world at large.

Yours in grey matter,
Nicholas McDiarmid, Publishing Editor

Endorsing Associations

Concrete Trends' industry association partners endorse the publication and work with us to ensure that we continuously offer content of high value that directly contributes to the development of the industry we serve.

Concrete Trends is endorsed by these Industry associations:
ASPASA | The Concrete Manufacturers Association | The Concrete Institute | KPDA | Master Builders Association | Master Builders Association North | National home Builders Association Registration Council | The World Cement Association

SANIKA
WATERPROOFING SPECIALISTS

25 YEARS OF EXCELLENCE

WHY CHOOSE SANIKA WATERPROOFING?

Our history and our success lies in our 25 year history in the waterproofing industry. This gives us the insight, knowledge and experience needed to thrive in an exceedingly difficult and volatile market.

By developing, importing and installing only the most innovative and highest quality waterproofing products, and by providing an excellent service, we have entrenched ourselves as leaders in the waterproofing industry in Southern Africa.

SANIKA'S WATERPROOFING SOLUTIONS

Based on our solution driven philosophy, we understand that there is not only one waterproofing system that fits all waterproofing scenarios and therefore we provide tried and tested products and solutions for all types of waterproofing applications

Insulative Boarded Waterproofing systems:

- Shopping centers
- Warehouses
- Factories
- Concrete roofs
- IBR, Kliplock or Metal roofs

Crystalline Concrete Waterproofing:

- Parking basements
- Reservoirs
- Lift pits
- Sewarage plants
- Mine shafts

Custom precompressed expansion joints:

- Stadiums
- Bridges
- Parking decks
- Roofs
- Water containment structures

Prebagged waterproof barrier plaster:

- Exterior walls
- Foundation walls
- Showers
- Retaining walls
- Fountains

www.sanika.co.za
info@sanika.co.za
T | +27 (0) 11 425 3061
F | +27 (0) 11 425 6383
A | 7 Hills Street Rynfield, Benoni Gauteng, South Africa

Bubbling under the surface

ASPASA's priority issues, as shaped by the last year

It goes without saying that 2020 has been a challenging year. The Construction Industry – already facing severe challenges – has received more than its fair share of blows. This has influenced all parts of the industry and mining, building, and civil work particularly so.

Over the last few months, whilst under national lockdown, ASPASA have observed various issues that are "bubbling under". In this short article, we would like to mention but a few of these – by no means a full list, but a start:

- The way we do business in the future has dramatically changed, and will continue doing so. Traveling, attending conferences, attending training and meetings – all have been affected.
- Better productivity is already evident. Meetings are held and issues are resolved more quickly and effectively.
- As companies have had to resize, with many jobs lost, many people are battling with their own lives, their future, and their way of thinking. Depression and negativity are on the rise.

Examples of the many industry issues ASPASA is dealing with include:

- **Illegal Mining:** as lockdown drops below level three, it appears that the laws governing mining and mining rights have been forgotten by some. If Regulators (SAPS included), take the same tough stance against illegal mining as they did during the more severe levels of lockdown, the problem will be resolved.
- **Quality control:** ASPASA is currently tackling the issue of non-adherence to technical and quality standards. There have been cases of laboratories not testing properly, forcing aggregate and sand suppliers, amongst others, to spend huge sums of money defending against poor report tests. This is a very serious matter; if the engineering/ laboratory fraternity sees itself compromised, the ability to guarantee the quality of infrastructure being built is also compromised.
- **The Royalty Act:** This is a critical issue coming out of the South African Revenue Services (SARS) and could seriously harm the smaller mining industry.
- **Transport:** Issues with the Administrative Adjudication of Road Traffic Offences (AARTO) will affect the broader industry. Proximity Detection Systems in particular have the potential to seriously affect the mining sector.
- **POPIA:** The issues surrounding Protection of Personal Information Act (POPIA), dealing with personal protection legislation has become a reality. ASPASA's workshop on these matters was recorded and a copy can be obtained from ASPASA. This issue requires major attention and focus.
- **Corruption:** ASPASA has disseminated a lot of information about this, and supports the President of South Africa, as well as the Minerals Council, in calling for an end to corruption in South Africa's business sector. ■

ASPASA

Under the mask

by Nico Pienaar, Director, ASPASA

This is the first of a regular column for Concrete Trends by ASPASA Director, Nico Pienaar.

In August we all give credit to women in industry. This year, The Minerals Council launched a great initiative regarding Women in Mining, and whilst attending the launch function for this initiative, it dawned on me that we don't always understand the importance of women in our lives and our businesses. I soon found myself thinking back to some of the history I studied many years ago.

Nico Pienaar
Director ASPASA

Women powered the first industrial revolution

The First Industrial Revolution (we are now in the Fourth Industrial Revolution) saw coal mining dominate that sector in the United Kingdom. Women and children were used to "crawl" into the holes to dig out coal. The conditions were horrendous and it was not unusual for pregnant women and extremely young children to be forced into these chronically unsafe and toxic environments. Their treatment was despicable and inhumane – for the very people providing the fuel this revolution depended on. As time went by, these practices were outlawed.

Behind every law...

I always say that laws are brought in because of humans breaking laws. The multitude of laws in place today geared towards protecting employees from "unscrupulous employers" certainly tell some interesting stories. These stories are the reason why we have regulated hours of work, restricted conditions for employing minors and the complex conditions of employment which are now governed by legislation.

Many years ago – in the "old South Africa" – I worked in the Financial Industry as a Trade Unionist, and was involved in the union's negotiations for maternity leave for our members, which had yet to be written into law. Something that stood out for me in those days, was the tacit notion that in order to be considered for senior positions, women should sacrifice feminine energy for more masculine behaviours. This was a loss for all involved, and the real wisdom of equal opportunity is to embrace the feminine energy for its inherently powerful qualities. The lesson learnt is to embrace ones nature, there being no need to to change your behaviour to fall into stereotypical or other groups behavioural patterns.

Celebrating women and womenhood

Women in the business world, women as mothers, wives and just women are so important and we as men should cherish and treat women with respect and dignity, and encourage their development and success in their own right.

Let's make the whole year a woman's year, and not just for one month. We wish all women the very best for the remainder of 2020 and into 2021. ■

SANIKA take waterproofing the extra mile

Protect water resources and repair reservoirs from the negative side

Sanika's success lies in our 25 year history in the waterproofing industry; this gives us the accumulated insight, knowledge and experience needed to thrive in an exceedingly difficult and volatile market. "Our ultimate goal at SANIKA is to find the applications that work and last, and after so many years of doing this, we are confident that we supply the best solutions."

Smart concrete

Sustainable building practices are more important now than ever before. Providing a durable and environmentally-friendly solution to concrete leaks and deterioration can directly impact the long term environmental and financial viability of a structure. Most concrete crack repair methods are only temporary fixes, and contain harmful toxins. By using integral crystalline waterproofing technology, as well as decades of experience behind us, we are able to transform cracked and leaking concrete into a permanent, water-resistant barrier.

When Kryton's Krystol concrete waterproofing products are applied to the surface of damaged concrete, the Krystol proprietary chemicals react with water and un-hydrated cement particles to form insoluble needle-shaped crystals. These crystals fill capillary pores and micro-cracks in the concrete to block pathways for water and waterborne contaminates. Krystol will continue to give the concrete structure a self-sealing ability. If water is re-introduced through a rise in hydrostatic pressure or through hairline cracks, Krystol will initiate further crystallization to ensure permanent waterproof protection.

Krystol waterproofing systems create completely watertight concrete structures that are self-sealing and able to withstand hydrostatic pressure for the life of your structure. Since this waterproofing technology becomes an integral and permanent part of the concrete itself, its' effectiveness as a waterproofing barrier is not contingent on its ability to form and maintain a coating or membrane on the surface of the concrete. This means that, unlike surface-applied membranes, crystalline waterproofing technology can never be punctured, damaged or worn away, and will last the lifetime of the concrete.

SANIKA achieved excellent results as the sole distributor of Kryton's products, and has sustained this exclusivity for many years in southern Africa.

Before ▲
After ▶

"A key risk as a distributor is in the application of the product; a poor application can break a good product. We therefore choose our applicators with great discretion and provide top training to ensure the greatest quality in both method of application and product itself.

Joint covers and sealants

Sanika Waterproofing Specialists have partnered with Emseal to bring you waterproofing expansion joint covers and sealants for the built environment in Southern Africa. "As the sole distributor of Emseal in the Southern African region, we are proud to supply a product of such a high quality as well as an equally high quality service when installing Emseal products."

Sealing off the formwork holes

RiveStop is a patented elastic rivet with a mechanical 100% waterproofing system specifically designed to quickly and effectively seal tie holes formed by the removal of taper tie rods in concrete walls. Sandor explains that SANIKA first encountered Rivestop on a tradeshow trip to France. Rivestop is the first removable, reusable and recyclable formwork tube, designed to protect tie bars when they are inserted to form the wall. RiveOut is the extraction tool designed to effortlessly, quickly and easily remove RivePipe without damaging the wall. The result is a clean, empty, uniform hole perfectly prepared for an airtight seal with RIVESTOP. Sanika Waterproofing Specialists are the exclusive distributor of RiveStop products in Southern Africa.

Waterproof barrier with great finishes

AfriSam Plaster Pro is a single-step, pre-blended plaster solution that saves you time and money on every build while providing a spectacular finish and a waterproof barrier. AfriSam Plaster Pro is a water, mould & mildew resistant pre-blended mix of Portland cement, sand and Kryton Krystol Mortor Admixtures (KMA™). It requires only the addition of water to create a consistent, workable plaster mix with excellent adhesion and handling properties, extended board life, and resistance to shrinkage and cracking.

"Ultimately, one would all concrete to be treated this way," notes Dowling. "We really are the waterproof specialists, and as such we have maintained a solid business throughout even the COVID lockdown, as we are an essential service. All our staff were provided with the correct PPE and training, and we are now also providing training online – through webinar roadshows that are qualified as CPD presentations as well. ■

SANIKA can contacted country wide at the following numbers:
Head Office: +27 (0)11 425 3061 | e: info@sanika.co.za
Cape Town: +27 (0)82 928 5788 | e: colte@sanika.co.za

AFRICAN CONSTRUCTION EXPO BY THE BIG 5

TOTALLY CONCRETE EXPO BY THE BIG 5

29 JUNE - 1 JULY 2021 | Gallagher Convention Centre, Johannesburg

THE AFRICAN CONSTRUCTION HUB: CONNECTING THE WORLD WITH AFRICA

ANNUAL IMPORTS INTO SOUTHERN AFRICA:

Over US$4bn
Building Finishes and Interiors

Over US$33bn
Construction Tools and Equipment

Over US$16bn
Plant, Machinery and Vehicles

#AfricanConstructionExpo

CLAIM YOUR PLACE IN THE GLOBAL MARKET!
BOOK YOUR STAND TODAY: +27 21 700 5507

Host city: Joburg

Co-located with: AFRICAN CONSTRUCTION AWARDS, African Smart Cities Summit, WoodEX for Africa, DECK & FLOORING EXPO, pumps, valves & pipes AFRICA 2020

Host publication: CONCRETE trends

Organised by: dmg events

www.africanconstructionexpo.com

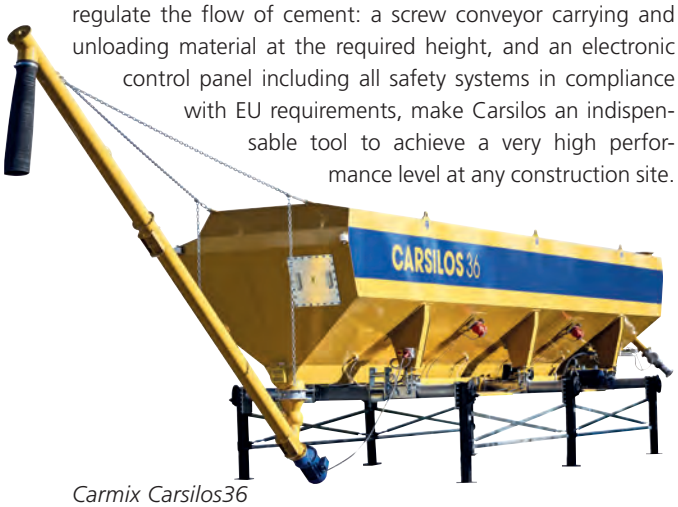
Innovative silos enhance construction site **productivity and performance**

Leader in the world of self-loading truck mixers and mobile concrete batching plants, Metalgalante S.p.a., an Italian company based in Noventa di Piave, Venice, offers an interesting range of silos that enhance the productivity and performance of any construction site. The range includes outstanding solutions such as Carsilos – an ideal horizontal cement silo equipped with a screw conveyor and electronic weighing system, and Carmix Bagger – a steel mini-silo of 3 m³ that facilitates cement loading ensuring an accurate Mix Design.

Cement silo with an electronic weighing system

Available in three versions of 16, 26 and 36 m3 respectively, Carsilos optimises on-site productivity through the interaction of three specific elements. Its main structure includes a positioning system that does not require the use of lifting machines. Its electronic load cell weighing system is particularly performing and easy to use, thanks to process control and management display.

Finally, its vibration system is indispensable to control and regulate the flow of cement: a screw conveyor carrying and unloading material at the required height, and an electronic control panel including all safety systems in compliance with EU requirements, make Carsilos an indispensable tool to achieve a very high performance level at any construction site.



Carmix Carsilos36

Efficient, transportable and green mini-silo

Carmix Bagger is composed of a container equipped with load cells that weigh the amount of raw material poured, ensuring speed and precision of use. Based on the use of cement big bags, the special construction of this machine achieves excellent performance in any situation, thanks among other things to a screw conveyor that carries raw material into the Carmix concrete mixer. The whole process is fully autonomous, as the hydraulic motor of Carmix Bagger can be used even at those sites where electricity is not available.

Carmix Bagger

An outstanding feature of Carmix Bagger is that its mini-silo combines with Carmix mobile concrete batching plants to achieve higher productivity and optimize on-site logistics. Designed to facilitate the work of operators, Carmix Bagger is easily transportable with a forklift truck and minimizes shipping costs thanks to its compact dimensions equal to half the size of a 20-box container.

Moreover, the use of cement big bags makes the work environment healthier, minimizes dust production and reduces the running costs for bag disposal. Finally, Carmix Bagger reduces the costs connected with raw materials, as cement bags can be loaded directly inside the machine. As a result, overall productivity increases owing to the machine's capacity of three big bags of 1 m³ each per cycle. ■

Giving back in a time of need

Thárros, the Greek word meaning courage, is the name given to the Child and Youth Care Centre situated in Hankey, Eastern Cape.

It is a temporary haven for babies and children under the age of 12. These children have experienced some form of abuse, trauma, abandonment, and neglect. In this home, where they have been placed as a ward of State, they will assuredly find warmth and care during their 3 to 6 month stay.

Finding the best outcomes

The primary goal of this care centre is to reunite these children with their biological family. In situations where this is not

possible, permanent foster care is sought. During this period of waiting, partnerships are made with external social workers to ensure the best outcome for these children.

Like most non-profit organisations, Thárros relies predominantly on donations and support from the community and business, to keep the care centre running. Usually, regular fundraising is done in the form of jumble sales and quiz nights, but unfortunately none of this has been possible due to Covid-19. This 'spanner in the works' adds an extra weight of concern to the selfless team of carers at the centre, who already have enough on their shoulders.

It takes a community

It was in July 2020 that Therese Sampson, the Project Director at Thárros, contacted Sika with a request for assistance. The roof of the Thárros building was leaking in various places, resulting in damage to the ceilings. Urgent assistance was required to nip this leak in the bud before further damage ensued.

To repair the damaged roof area, 100 litres of waterproofing paint was required.

With this being one of Sika's specialities, it was without question that Sika was readily willing to donate towards such a worthy cause. Twenty Sika® RainTite® Kits were happily donated, with Ros Bosch, one of Sika's sales representatives in the Eastern Cape, facilitating the handover.

The Sika® RainTite® Kit provides a waterproofing system that can be used to seal joints on various kinds of roofs, as well as parapet and external walls. The kit consists of the Sika® RainTite® Kit Waterproofing Compound which comes in a 5-litre bucket, as well as the Sika® RainTite® Kit Membrane, which is 200mm x 10m roll of membrane.

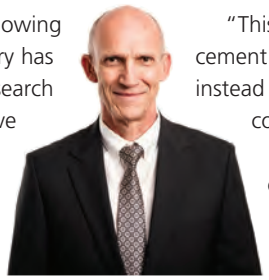
This kit is an easy to use single component acrylic and is vapour permeable. It is UV resistant, has excellent adhesion, and is flexible and durable. These are the exact components needed to keep the roof of this building in good condition for years to come.

The Thárros team were extremely grateful for this donation. Their initial request had been for a discount on the required products; however, Sika went above and beyond by donating all the products at no charge. Donating in a time such as this is something that Sika is proud of! ■

More innovation greets latest cement sector challenges

South Africa's cement industry has, for many years, been a pioneer in the evolution of composite cement, using locally sourced granulated blast furnace slag (GGBFS) and fly ash as valuable contributors to the quality and versatility of cements. Current shortages of both these extender materials are now leading to further innovations in composite cements, according to AfriSam cementitious executive Hannes Meyer.

"Having long endured the headwinds of a slowing construction sector, the cement industry has nonetheless sustained its extensive research and development capability," says Meyer. Times have certainly not been easy for cement producers, and he points out that additional factors – of both a global and local nature – are now adding to its woes. The shortage of slag – a by-product of the steel-making process – has stemmed from the poor state of the local steel industry, impacted by factors like declining global demand, rising electricity prices and cheap imports.



Hannes Meyer, AfriSam cementitious executive

"The steel sector has been hard hit, including the recent closure of Saldanha Steel in the Western Cape," Meyer says. "This has removed a vital source of slag, with the lack of availability placing pressure on cement producers in that province. This does not bode well for the future, as slag is an important part of cements used in coastal areas."

In addition, there has also been the closure of some steel-making facilities in one of Gauteng's heavy industrial centres, Vanderbijlpark, due to the poor market. Similarly, the steel works in the KwaZulu-Natal town of Newcastle has also cut back its production – meaning less slag available.

"This has led to a nationwide shortage of slag, causing cement producers to look at ways of using more fly ash instead of slag," he says. Fly ash is a by-product of burning coal to power in most of the country's power stations.

"The problem, of course, is that fly ash on its own cannot be used to the same extent as the slag-fly ash combination," says Meyer. "A maximum of 48 to 50% fly ash can be used in composite cement."

Just as the demand for fly ash was rising, however, the established supply chain has also been disrupted. There have been challenges on this front for some time, with power-station production being stalled by frequent breakdowns. The supply of fly ash is directly affected when these stoppages occur.

More recently, a further obstacle has emerged – with fly ash contracts being renegotiated. This transitional period in between contract renewals – and the award of contracts to some new entrants with limited experience of the sector – is adding to the challenge of securing sufficient supply.

"This is hopefully just a temporary issue which can be resolved within 12 to 18 months as relationships are formed between established players and those new contract holders

AfriSam is constantly learning more about the cementitious material that it uses in its production processes, thanks to the company's ongoing research and testing

AfriSam has a slagment operation in Vanderbijlpark, Gauteng with the capacity to produce 800 000 tons of slagment annually

who may not have industry experience," says Meyer. "Until the market can stabilise, though, the result is that the cement industry is selling even less than it could if all other things were equal."

Building on its firm foundation of technical expertise and R&D capacity, AfriSam is forced to convert back to the use of limestone as an important extender in composite cements, to maintain supply security to its own customers.

"This is not an ideal route to take, as it does mean that carbon emissions are affected in a negative direction," he says. "Indeed, part of our technology development in using more slag and fly ash has been precisely to reduce the carbon footprint of our plants."

Meyer notes that the recycling of slag and fly ash also has a positive environmental impact ensuring that much of this material does not need to be stored on large dumps which carry their own risks of environmental contamination.

"We have to make use of limestone-extended cement because the South African industry has very few options to use other extenders as substitutes," he says. "For instance, we have limited availability of pozzolana in the country, in contrast to our east African operations which have ready access to greater volumes."

He notes, however, that there might in future be some alternative extenders in the form of other types of slag that are

Amidst the shortage of slag and fly ash, AfriSam has converted back to the use of limestone as an important extender in composite cements

The company has the capability to push the performance of the its composite cement beyond the parameters of current standards

generated locally in mineral processing activities. The obstacle here is that current ISO standards and other international benchmarks which govern AfriSam's operational framework do not allow most of these products to be used.

"It would have to be a long-term research project to find acceptable ways of utilising these kinds of slag materials," he says.

In the meantime, Meyer remains optimistic about the power of scientific endeavour at AfriSam.

"We are constantly learning more about the cementitious materials that we use in our production processes, thanks to our ongoing research and testing," he says. "We are pushing the boundaries further and further, and as we do this we must contribute to evolving and improving the standards to which we comply."

He says the company has the capability to push the performance of its composite cement beyond the parameters of current standards. It is a matter under discussion with the South African Bureau of Standards (SABS) technical committee, in which AfriSam actively participates.

"This is not a short-term matter, but in the medium term we look forward to being able to use more of the mineral additives that we are currently testing," he says. "Composite cement is continuously evolving, as it responds to market demands, constraints and opportunities."

With a focus on the better control of the various constituents of cement, AfriSam has been conducting ongoing research to achieve high levels of product performance with lower carbon emissions from cement plants.

"Our current plant trials have been very successful, and we are poised for a breakthrough quite soon," Meyer says. "Better control over constituents basically makes for superior products, especially regarding the customised design of specialised concrete mixes to make them fit-for-purpose."

He concludes that the inclusion of suitable cementitious material in composite cements remains one of the most important levers that the global cement industry can use in reducing its carbon footprint.

"While many European companies are still reluctant when it comes to composite cements, it must be recognised the use of Portland-type cements does come with a more detrimental environmental impact," he says. ■

www.afrisam.com

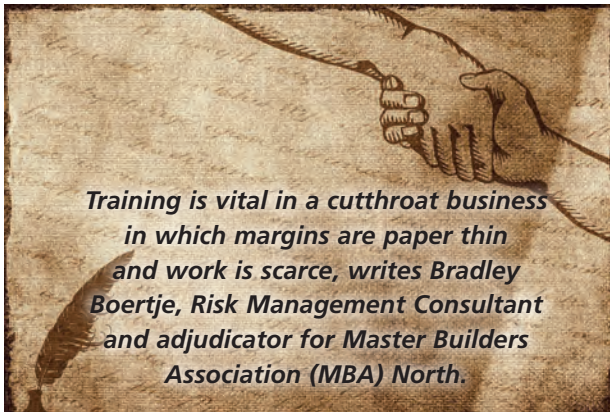
▼ *AfriSam has been conducting ongoing research to achieve high levels of product performance with lower carbon emissions from cement plants.*

IF YOU THINK PRECAST CONCRETE,
THINK CMA PRODUCER MEMBERS.

CONCRETE MANUFACTURERS ASSOCIATION
Quality cast in concrete

Address: Office 0400, Standard Plaza Building, 440 Hilda Street, Hatfield, Pretoria, 0083
Tel: (011) 805 6742 • Email: admin@cma.org.za • Website: www.cma.org.za

Training = survival
for contractors in a post-COVID world



As the name suggests, contractors work under the terms of the contract they have signed with the client or, more usually, with the principal contractor. One of the key reasons that contractors find themselves in difficulties is that they simply do not understand the implications of the contracts that they have signed, and the risks to which it exposes them.

Short-term thinking vs complex contracts

Contractors face a multitude of issues, some of which – like a shortage of work, delay in awarding public works tenders, and a restless and aggressive labour force – are beyond their control. Other issues stem from a poor understanding the contracts and a tendency to sign any document simply to get work. This kind of short-term thinking ultimately sees many contractors finding themselves in a lengthy and expensive disputes and often not getting the payments they expect.

Building contracts are highly specialised documents and one needs specialised knowledge to understand what they entail. I am involved in a lot of dispute work, either as an adjudicator or helping contractors to prepare claims going to adjudication, and I can testify to the fact that claimants who have made sure they understand the contract and have all the details at their fingertips get quick – and often favourable – results.

All too often, though, I find that contractors have entered into contracts that they don't fully understand, with the result that they miss out on lucrative opportunities and miss crucial deadlines, in turn making them liable for penalties.

Entitlements, risks and deadlines

It is vital that contractors understand the contracts they sign, what their entitlements are and what risks they face. The best advice for contractors is to consult a reputable risk consultant before they enter into a contract, just to make sure they are doing the right thing.

If they do find themselves in a contract which looks like it is going sour, MBA North offers initial contractual and commercial advice free to its members. This will provide a quick review of the contractor's circumstances, and an executive summary of their position and a suggested strategy.

Knowledge wins the day

While specialist advice is critical at certain stages, it cannot substitute for a solid understanding of contractual issues and strategies on the part of the contractor. Nobody is a better steward of your wellbeing, commercial and otherwise, than you are. To equip contractors with the information they need, MBA North will offer a three-part series of three-hour webinars designed to provide contractors with the basics they need to keep their contractual affairs in order. Any contractors working under JBCC and MBSA contracts should attend.

What contractors can expect

- An introduction to law in South Africa and what options are available to contractors in respect of securities, guarantees and so on. We will cover the important topic of retention and the importance of insurance
- An overview of how to manage time and time extensions. Most contracts experience delays, and it is vital that contractors understand exactly how to keep on the right side of time clauses
- All aspects of payment, including loss and expense claims. It also looks at the contractor's exposure to penalties and damages, and what the difference is between the two
- All the various dispute resolution processes that can be used – and how to choose the one that best suits each case. Too often, contractors' claims do not succeed because they opted for the wrong process.

These training sessions offer an affordable way to acquire important information and skills – especially when compared to the costs of litigation when a contract goes wrong.

The next webinar series on contracts and contract management will take place in November. For more information, contact MBA North on 011 805 6611 or e-mail sheila@mbanorth.co.za to hear more details.

About the Master Builders Association North

The Master Builders Association North is the amalgamation of the former Master Builders Associations of Johannesburg (founded in 1894) and Pretoria (founded in 1903). The organisations merged to form the Gauteng Master Builders Association in 1996, and was renamed Master Builders Association North, representing four regions: Gauteng, North West, Mpumalanga and Limpopo. It is a chapter of the Master Builders Association South Africa.

Based in Halfway House, the Master Builders Association North represents the interests of employers in the building and allied trade industries in the abovementioned four regions. It aims to serve its members by facilitating best practice within its membership and the building industry as a whole. ■

Contact: MBA North
Boitumelo Thipe, Marketing & Business Development Manager
Tel: 011 805 6611, Email: boitumelo@mbanorth.co.za

SHAKING UP THE PRECAST INDUSTRY

AGGREGATE BATCHERS

From 2m³ to 12m³ Bins

CONCRETE MIXERS

From 350 - 2000L Pan, Twin-Shaft and Planetary Mixers with water & cement scale

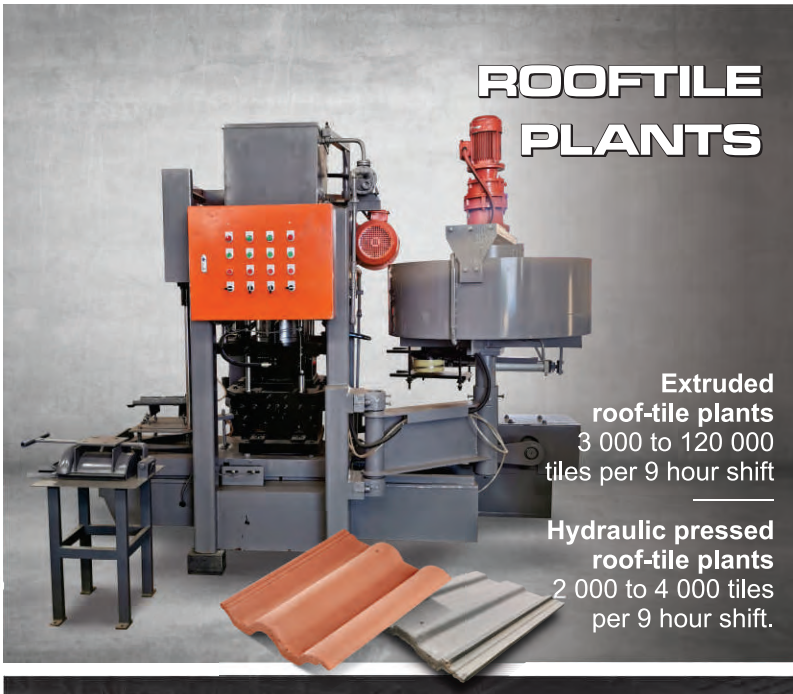
BRICK, BLOCK, AND PAVER PLANTS

Various Models

Daily production output (9Hr shift):

Stock Bricks:	7 000 - 250 000
6" Hollow Blocks:	1 440 - 40 000
Pavers:	5 400 - 162 000
Maxi Bricks:	4 000 - 140 000

ROOFTILE PLANTS



Extruded roof-tile plants
3 000 to 120 000 tiles per 9 hour shift

Hydraulic pressed roof-tile plants
2 000 to 4 000 tiles per 9 hour shift.

LINTEL AND HOLLOW CORE PLANTS

Large production rate

Various Models Available
Of all machines depicted

KERB PLANTS

Single Head 500 kerbs per 9 hour shift

Three Station 1 080 kerbs per 9 hour shift

We advise, finance, deliver, install and train. Back-up parts and on-site service available

WEB: www.revaro.co.za
TEL: +27 11 794 8271 • +27 65 178 3117 *(All hours)*
E-MAIL: sales@revaro.co.za
ADDRESS: 125 R114, C.O. Beyers Naude Drive
Muldersdrift, Krugersdorp, Gauteng

Revaro Concrete Equipment (Pty) Ltd is a member of the Revaro Group of Companies

REVARO®
AFFORDABLE INNOVATION™

*Productions depicted are not to scale - E&OE

PARTNERSHIP AND EMPOWERMENT

Driving PPC's contribution to the South African construction sector

Keeping our ear to the ground, PPC has spent the last 128 years empowering communities to build a better quality of life. Through PPC's Enterprise Supplier Development (ESD) programme, we have seen Small, Medium and Micro Enterprises (SMME's) across South Africa grow and make a positive contribution towards the economy.

Each of our SMME partners is an example of why partnership and empowerment drive South Africa's construction sector.

Thomas infront of Zonke Bonke store

Thriving partnerships for mutual development

The thriving Cape Town brick maker and founder of Zonke Bonke Hardware and Steel, Thomas Khumalo, is a wonderful example of this empowerment through partnership. Thomas' vision to improve his community's access to building supplies, and his community's desire for just such a trusted partner in their journey to home development has given rise to the seven-year partnership between PPC and Thomas Khumalo. With customers willing to pay for quality building materials from the hardware store, this partnership continues to be an example of how PPC customers offer a collective building solution to the community that has provided visible employment prospects.

This knowledge and experience is what drives PPC's SMME development as South Africans have more confidence in the competence of our 100% local, 100% quality products that drive the economy and the construction sector forward.

Empowerment – at the core of PPCs Enterprise Supplier Development

Empowerment at PPC is our daily living because we strive for excellence in all we do. We remain a trusted partner in business and community activities because we understand the challenges and needs of local entrepreneurship.

We remain committed to the development and growth of the country to celebrate all of our SMME partners who afford us the opportunity to do so. This is why we upskill each partner that comes through our ESD programme. By providing them with the critical education, skills and the technical knowledge required to support, grow and manage their businesses effectively, in doing so, they are changing their community's socio-economic status as well.

R1 800 000 machinery delivered to bolster the construction industry's SMME sector

PPC's commitment to ensuring that SMMEs are well placed to meet the anticipated demand for quality local bricks in South Africa's construction industry has allowed them to contribute to the sector in Gauteng, Limpopo and Mpumalanga.

Having worked closely with the industry to realise modest changes in how its operational choices impact sustainable growth, PPC has handed over six machines to six of its long-standing SMMEs in Gauteng, Limpopo and Mpumalanga collectively valued at R1.8 million.

These machines will play an integral part in ensuring 100% local and 100% quality products remain accessible to the sector and will assist in making a difference in the beneficiaries' lives and expand their business.

Rising to the quality-of-life challenge

PPC's ongoing engagement with the SMME sector has propelled the business to empower the community to experience a better quality of life. Taking the lessons that have come from

Making bricks

operating in South Africa over the past 128 years, PPC remains optimistic about the opportunities that exist in the sector. The business' decision to make this investment into SMME's, as part of its ESD fund during a post-pandemic environment, has proven to be an example of PPC's ongoing investment in the community.

"The global pandemic has challenged us to add sustainable value and convenience to the SMME sector. We understand that the challenge for local entrepreneurs is to remain competitive while ensuring they put into practice the education on producing quality bricks, we have provided over the past few years. Each brick making and paving machine provided will serve as a visual representation of our commitment to provide a better quality of life so they can take advantage of the niche opportunities available to them," explains Njombo Lekula, MD at RSA Cement.

Real benefits down the line

"The sponsorship of the machinery came at the right time; we are facing a different and unprecedented challenge as SMMEs. Receiving the machinery means a lot to my business as this will assist in growing the business, creating more employment and most importantly, being competitive. We appreciate PPC for choosing us as one of their Enterprise Development beneficiaries and giving us the courage to continue improving and building our township/local economy. I see these machines as being a tool that will leave me in a position to strengthen what they have been teaching me for so long," says Rachel Msiza, founder of Style Africa Paving and Cladding (Pty) Ltd in Soshanguve the north of Pretoria.

Access to market

Forming part of PPC's commitment to go beyond, efforts to improve access to the market with each brick making and paving machine increases the capacity to grow the business. PPC's long-standing relationship with the SMME's in the community has resulted in the identification of individuals who would be best placed to grow their local township economy.

Highlighting the long-term business impact of the machinery JX115 Trading's, founder, Joel Msipha, says, "As a customer of PPC, this machinery shows me that they are really focused on investing in the community. We are honoured to be one of the beneficiaries who have received the brick making machine. I am excited to see where this partnership will take me and other SMME's like me who have been given the opportunity to excel in their business over the past 3 years. The machinery will help us with our business's economic structure, growing the business and increasing employment in our communities; as we do our part in assisting in closing the unemployment gap."

Trusted partners

As a trusted partner of business and communities, PPC understands the challenges and needs for local entrepreneurship that is often seen through the ambitions of brick makers. More than 1000 brick makers from across South Africa have benefited from PPC's brick-making workshops. PPC's efforts to upskill each brick maker continues to provide them with the critical education, skills and technical knowledge required to support, grow and manage their businesses effectively in this changing economy.

"The continued participation of our people into the township economy has remained a motivator for us to reinvest into the entrepreneurial efforts we encounter daily. Today we have taken another positive step towards promoting manufacturing and production efforts in the township. Our work thus far has improved the social and economic value of brick makers. For this reason, we see the work we do as being key to creating an enabling environment for us all. In recognition of this, PPC is focused on ensuring that together we are stronger," concludes Lekula. ■

www.ppc.africa

The evolution of innovations – mixers that deliver

Fig. 1: Eirich mixer for facing concrete at a concrete product manufacturer in Norway

Just as in all other areas of technology, fundamental changes and innovations have also made their way into the world of mixing technology over the last 150 years. Herbert Cullum, head of sales and marketing for the Birkenmayer Group, looks at the bigger picture.

The operating principle of the single and twin-shaft mixer (19th century) was followed by ring trough mixers (around 1900), planetary mixers (EIRICH 1906), mixers with a rotating pan (EIRICH 1924), mixers with an additional rotor (EIRICH 1960), and mixers featuring just a single moving mixing tool, the rotor (EIRICH 1972).

For a number of years, manufacturers of ring trough mixers and planetary mixers have been offering mixers with additional rotors. Concrete manufacturers regularly approach EIRICH with requests to replace this type of mixer with an EIRICH mixer.

Back to the future

Many manufacturers offer mixers for concrete, but almost all of them did not start manufacturing mixers until after 1950. This is because this is when the patents for the mixing systems "single and twin-shaft mixer", "ring trough mixer" and "planetary mixer" expired (as did the patents for mixers with funnel-shaped mixing pans, which were built around 1908). For simple types of concrete, mixers with simple mixing systems were sufficient.

Overburdening the mixing tool

In recent decades, however, expectations and demands in the industry have changed. High-performance concrete and increasing requirements in terms of the surface quality of concrete products have placed increasing demands on the mixing technology. Due to the nature of the system used, on all simple mixers the mixing quality is limited by low tool speeds. The mixing tool is responsible not only for the actual mixing tasks, but also for transporting the material in the container. This requires tools that run close to the bottom and

to the walls. The speed of these tools is limited in order to keep friction and wear within limits.

The better way

By contrast, on an Eirich mixer the mixing and transport of the material are kept separate from each other. The transport is performed via a rotating mixing pan, while mixing is performed by a tool that has been adapted to the particular mixing task and is referred to as the rotor.

This separation of tasks offers degrees of freedom that are unique and distinctive characteristics of the design. The rotor now needs practically no contact to the bottom or walls, which means that it can run as fast as is needed. Not only does this help to deliver perfect mix qualities, but it also keeps the mixing times short.

Another benefit: compared to other mixing systems, the mixing pan experiences significantly less wear. While simple concrete mixers often feature ceramic linings, Eirich mixers do not require any such ceramic protection against wear. For the customer, this means significant cost savings and reduced downtime and repairs.

Scientific investigations carried out in 1980 on simple mixers showed that tool speeds of around 1.5 m/s delivered the best mixing results. Increasing this figure to just 2 m/s results in centrifugal forces strong enough to cause clear separation and demixing. The Eirich mixing system does not display these limitations. Thanks to the rotating container – known as the disk – the mix is completely turned over in a single revolution. The mixer subsequently mixes with no demixing at all – even at higher tool speeds.

Optimal results

Today, many manufacturers of concrete products depend on producing the highest quality products with flawless surfaces. Certainly, when it comes to facing concrete, they have opted for the best mixing technology available – technology that, thanks to its inherent design, is able to optimally solubilize and mix in all types of pigments and fibers.

Because the rotor in the Eirich mixer allows the best possible mixing effects, in recent years manufacturers of ring trough/ring pan mixers and planetary mixers have started to retrofit their mixers with "rotors". The effect is completely different – these are closer to stirrers, and improvements to the quality of the mix are modest at best. As a result, in recent years several nearly-new ring trough mixers, planetary mixers and conical mixers used for facing concrete have been replaced with Eirich mixers.

Today, Eirich mixers are frequently found in plants built by other suppliers of mixers (Fig. 1). The goal is to provide manufacturers of concrete products with the best and most cost-effective solution for their needs. For manufacturers of concrete products who want to reduce the amount of rejected product due to the mixer, investment in improved mixing technology will quickly pay off and is easy to justify. EIRICH also offer a range of attractive plant concepts for expansions and new plants.

This is why Eirich's list of customers also includes a number of companies who build mixers themselves. ■

Further information: Herbert Cullum
email: sales@birkenmayer.co.za

Trucking for **equality**

It is early morning in a busy commercial vehicle stockyard and Dorah Lungile Mabaso is meticulously completing a walkaround safety check of a new multi-million Rand truck that is about to be delivered to a local transport fleet.

Dorah Lungile Mabaso

Not everybody in the yard is used to seeing a female truck driver, so they shout a few comments as Mabaso enters the cab to start her workday. This is the first of four truck deliveries on her schedule today, so Mabaso gets going and easily manoeuvres the big machine into the busy Gauteng traffic.

"I have a big responsibility to ensure the safety of all the other road users around me, and to deliver this new truck safely," said Mabaso. "I must say I still get all excited with every delivery I do, especially when the recipient is happy with their new truck. Customer satisfaction is the ultimate goal!"

Commercial driver training programme

Mabaso is one of few female truck drivers in the local transport industry. She graduated from the Volvo Trucks Iron Woman heavy commercial driver training programme and was subsequently employed by Trucklogix, a company that specialises in commercial vehicle logistics.

"When the opportunity to become a truck driver first arose, I was simultaneously excited and scared! With nothing to lose, I decided to just go for it, and I know now that I could not have chosen a better career," explained Mabaso.

"My dad, who used to be a truck driver and naturally knew all the challenges you come across in this profession, was initially very reluctant to encourage my new career path. But now, he is my biggest supporter and brags everywhere about 'his little girl driving these big trucks!'"

Skills without limitation

Mabaso believes that she and her fellow graduates have broken a lot of gender barriers in the industry and that more women should come aboard.

"I believe that we can affect real change in the industry and challenge the norms. This includes creating dedicated facilities for women drivers at truck stops and safer operating conditions on long-haul routes," said Mabaso.

A critical shortage of skilled commercial vehicle drivers is one of the contributing factors to the country's high accident rate. Volvo Trucks, therefore, believes that training remains instrumental in efforts to improve road safety.

"During the COVID-19 pandemic it once again became clear that truck drivers form the backbone

of our economy," said Marcus Hörberg, vice-president of Volvo Group Southern Africa. "With women severely underrepresented in the industry, it is hoped that Iron Women will continue to help increase the pool of skilled women drivers in the country."

Statistically safer

Statistically, women drivers are more risk averse and defensive drivers. Providing more drivers with the necessary skills will not only benefit the industry, but also the economy and the community at large.

"At the beginning of my journey as a trucker I was intimidated by men saying, 'this is a man's job', and openly criticising us at truck stops. Now, my skills speak for me. I greet male drivers confidently knowing that I am a well-trained and experienced trucker with one goal in mind: doing my job efficiently, safely and professionally," said Mabaso.

Hörberg also said that truck driving is no longer a job only for the physically strong, that it is often thought to be, and this message needs to be communicated more.

Nicci Scott, founder of the Commercial Transport Academy where the Iron Women receive their training, said that it has been calculated that the commercial driving sector in SA is short of about 15 000 drivers.

"With truck driving today a gender-neutral task, we believe this programme is addressing gender parity in the sector through the employment of highly determined, well-trained female drivers, while creating job opportunities for SA women in economic plight," explained Scott.

After the delivery of the last truck of the day, Mabaso has a satisfied smile on her face.

"Driving a truck is wonderful. I have the privilege to travel this beautiful country of ours and the views that fill the cab windows are simply spectacular. The people you meet along the way are just so diverse and fascinating," said Mabaso. "It is a job filled with responsibility and risk, but when you complete another delivery, it fills you with immense satisfaction. That is what drives me every day."

Volvo Trucks' Iron Women Programme

The training programme, sponsored by Volvo Trucks, is conducted at the Commercial Transport Academy (CTA) in Kempton Park. In 2019, 40 women trained as professional commercial vehicle drivers, with 30 more added to the programme this year. The training is, unfortunately, on hold for the time being due to the Covid-19 pandemic.

Iron Women is aimed at enhancing the capacity of professional drivers and to ultimately enable them to contribute to their future employers' fleet safety, profitability, and efficiency. This qualification, which is approved by the Transport Education Training Authority, is based on both theoretical and practical modules. ■

Mixing technology
for the preparation of fibre concretes

For many applications, fibres are added to concretes, especially to improve the cracking and fracture behavior. The brittleness of the concrete matrix decreases when fibres are added, making the concrete more ductile and better able to resist bending stresses.

Soccer City Stadium Johannesburg

Depending on the application, steel fibres, glass fibres or synthetic fibres are used, the latter also for fire protection, especially in tunnel construction. If a fire occurs, the fibres burn and leave channels through which water vapour can escape. This prevents the edge layer of the concrete component from chipping off; the steel reinforcement behind it remains protected. It is important that the fibres are homogeneously distributed in the concrete. This places high demands on the mixing technology used to mix the concrete. Not all mixers are equally suitable for this purpose.

High speeds; low wear

In the Eirich mixer, a rotating container transports the material to be mixed. This material is fed to the mixing tool, called a agitator. In sizes from 1 litre to 3000 litres, only one single agitator tool is required. Only in larger mixers,several agitators are installed – at a typical ratio of 4 agitators per 12 m³ net capacity.

A characteristic feature of this mixing system is that the agitator only needs two small, non-contact floor cleaning knives to keep the bottom of the mixing pan free of deposits. The power dissipation via friction and thus also the wear of the bottom is therefore very low (which is why Eirich mixers do not need ceramic linings). This also allows high tool speeds, with correspondingly high power input. The agitator can run at tool speeds of up to 30 m/s, are required for the task at hand. It goes without saying that added fibres can be separated and distributed more easily at higher tool speeds, and lump formation – known in technical jargon as "hedgehog" – can be prevented.

In search of optimal mix quality

In addition: Each mixing process is superimposed by a segregation process, essentially caused by centrifugal forces, especially when the components of the mixed material have different densities and grain sizes – as is the case with concrete. Investigations on concrete mixers were carried out as early as 1980, and found that it is not possible to mix for an arbitrary length of time because the mixing quality then decreases. This is also the reason why concrete standards do not specify that concrete should be mixed "well", but only until the mixture appears uniform. It is therefore often not possible to achieve the optimum mix quality.

With the Eirich mixer, on the other hand, complete mixing is achieved during a single rotation of the container. The product, which is locally segregated by the agitator during the throwing process, is back-mixed by the permanent circulation movement, so the mixer mixes without segregation. This means that the product can subsequently be mixed for as long as the respective task requires it.

Many manufacturers of precast concrete elements today use the best available technology – mixing technology from Eirich. It should be noted that the term "concrete" is also used for fibre concrete when the maximum grain size is less than 4 mm. Such fibre concretes are particularly demanding in terms of mixing technology. The glass fibre concrete panels for the façade of the Johannesburg Stadium, which was built for the 2010 World Cup, were also produced using Eirich mixing technology. The design of the façade was to be reminiscent of a traditional African drinking vessel. The 40,000 glass fibre concrete panels in various African colours were supplied by the Austrian company Rieder Smart Elements with production facilities in Kolbermoor, near Rosenheim, Upper Bavaria, Germany.

For precast manufacturers who produce high-quality and uniform (fibre) concrete, the properties of the Eirich mixing technology prove to be advantageous. ■

Email: sales@birkenmayer.co.za

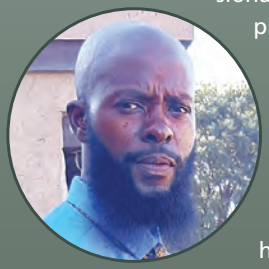
umcebowethu supplies – Treasuring Slag

When Victor Sikhosana launched Umcebowethu Suppliers, the idea of coming full circle was on his mind. In many ways, the very core of Umcebowethu Supplies is founded in the wisdom of circular sustainability.

Accounting for over 8% of global greenhouse emissions, the benefits of converting value from waste are profound for cement and concrete producers. Umcebowethu Supplies is a supplier of Silico Manganese Slag (SiMn Slag), a by-product of steel manufacturing with valuable properties in the manufacturing of cement and concrete

A vision for the future

Umcebowethu Supplies is the embodiment of Victor's vision for success, informed by the richness of his professional experiences, and founded on the very principles that have always driven him: a passion for excellence, an appetite for opportunity, a deep commitment to value-creation and a very evident pioneering spirit.



Victor Sikhosana

Victor's career began down a coalmine shaft, when at 18 he became his family's primary breadwinner. The career he forged by curiosity, tenacity and dedication is filled with a series of achievements, promotions and milestones normally accumulated over several decades. In a few short years, Victor had completed an electrician's apprenticeship, applied his skills at all levels of the mine, and earned the position of Plant Maintenance Manager at one South Africa's biggest coal producers.

A vision for the future

The potential of SIMn Slag caught Victor's eye as the ideal opportunity: a versatile product adding value beyond its intrinsic uses. Slag doubles the lifespan of buildings, producing highly durable concrete, with self-cementing properties. It is a latent hydraulic binder commonly used in concrete and also serves as a partial cement replacement material in construction, and is a direct replacement for ordinary Portland cement, by weight. ■

Slag + Fly ash = 3D Concrete Printing

Researchers from Nanyang Technological University in Singapore created a new concrete-like material to 3D print, made from two waste materials: fly ash and steel slag.

3D printing concrete has made the material a bit more sustainable, as less material is necessary to create objects and even buildings. However, making concrete still generates a lot of CO_2. Fly ash consists of fine particles of fuel that are driven out of coal-fired boilers, while steel slag is a by-product of the steel industry, left over after a metal is separated from its raw ore. Both materials have been used as additive to cement before, but are now used together with only the addition of some chemicals to make a concrete-like material that can be 3D printed.

3D printing concrete made from fly ash and steel slag

The current material is as strong as normal concrete, but the researchers are looking at how it can be strengthened to make it a suitable substitute for reinforced concrete. The geopolymer mortar is 3D printable using concrete printing equipment to fabricate large, solid structures.

The 3D printable concrete could help the construction industry, which generates about 5 per cent of the world's carbon emissions with the production of concrete, to drastically reduce its carbon footprint.

Victor Sikhosana (Director)
UMCEBOWETHU SUPPLIES PTY LTD
T: +27 (0)79 037 0809 | (0)72 697 5542
email: umcebowethusupplies@yahoo.com
Fax: 086 275 7113

"WE FIND SOLUTIONS FOR YOU"

Registration Nr: 2015/149897/07

Global flooring trends

drive development of new products

Recently launched new adhesive products are a reflection of both current trends in flooring, as well as feedback from contractors on what they need from an adhesive product.

Gela Ohl, TAL Marketing Manager explains, "Property owners and developers are renovating their commercial properties to accommodate the changing needs of tenants, particularly in a post-COVID marketplace. This has led to a renewed interest in alternate floor coverings and TAL is pleased to offer a range of multi-level solutions which are quick-setting and deliver long-lasting results."

Double buttering, open windows

The first new innovation is a new tile adhesive, specially designed for fixing large format tiles on both floors and walls. The new adhesive, TAL Goldstar XL, is a quick-setting, high-strength product which has been developed in response to the global trend towards larger tiles. "Our customers indicated that they needed a product with a longer open time in order to allow for the 'double-buttering' technique, where the adhesive is applied on both the substrate and the backs of the tiles, so we developed TAL Goldstar XL to have an extended open time of 30 minutes" says Ohl. The product is also more workable to help make the

installation process seamless and the extended open time helps to prevent the adhesive from 'skinning', ensuring a wet-to-wet installation where the two layers 'kiss together'.

A concrete vapour barrier, primer, leveller and adhesive

With the increasing popularity of luxury vinyl tiles (LVTs) and PVC-backed vinyl tiles in both domestic and commercial applications, TAL have also developed a new acrylic flooring adhesive for these types of floor coverings. The result is TAL Profix Plus LVT, an anti-fungal, solvent free, modified acrylic based adhesive. Designed as part of a multi-level installation system required to successfully install LVTs and PVC-backed vinyl tiles which comprises a vapour barrier, primer, levelling compound and adhesive. It is also suitable for application onto concrete, screed, toppings, underlayment compounds, render and wood.

> "TAL Profix Plus LVT is an anti-fungal, solvent free, modified acrylic based adhesive"

"Our goal is to provide complete solutions to our customers, with products that are designed to be compatible with one another and deliver a superior end-result" confirms Ohl.

TAL products are manufactured and tested to TAL procedures which are maintained in accordance with Quality System Standard ISO 9001, Environmental Management System ISO 14001and Occupational Health and Safety Management System OHSAS 18001. The TAL laboratory is an ISO 17025:2017 accredited testing facility for 1348:2007 (Tensile Adhesive Strength of Cementitious Adhesives).

As a member of the Green Building Council of South Africa, TAL is committed to designing and manufacturing their products in an environmentally responsible manner. By recognising the importance of energy efficiency, reduced water use, upcycling building materials and implementing appropriate waste disposal, TAL believes they are aiding the fight against climate change. All TAL adhesives and ancillary products tested to date are well within the limits stipulated by the Green Building Council of South Africa. ■

◀ *TAL Goldstar XL installation system*

▼ *TAL Profix Plus LVT installation system*

A Quantum Leap for Mixer Trucks in SA

It's a story residents of Gauteng know all too well: just as the congested traffic starts to ease, and it looks like you might not be late for work this morning, you find yourself stuck behind four mixer trucks, making their way to Sandton Central to deliver the endless supply of concrete required by the hungry business hub.

Familiar, at least, when construction levels are strong and before anyone had heard of Covid-19! The transport of concrete is essential to a thriving economy, and we all know the buzz of construction as a symptom of positive economic growth. The state of mixer trucks – their performance on our roads; emissions contributions, maintenance records – is not well reported on. We know that the trade in second-hand mixer trucks is strong, and that the country's conditions tend to tolerate less sophisticated machinery on the roads. But it is safe to say that new demands in emissions standards and road performance will soon see demand for more sophisticated trucks increase, as we catch up with our European counterparts.

A new acquisition

Quantum Readymix – a leading South African readymix supply company – seems somewhat ahead of the pack, and their new acquisition of 12 mixer trucks is described by company director, Calvin Billett, as an experiment for South Africa's construction industry and roads agencies. "The trucks incorporate numerous cutting edge technologies that have actually been familiar in European markets for some time now, but are a first for South Africa," he explains.

The top-line benefits of these new mixer trucks include the greater volume of concrete each truck can deliver in a single journey, greater manoeuvrability on site, highly significant reductions in greenhouse emissions, and a reduction in number of mixer trucks needed on the road at one time, per project. All-in-all, it sounds like a very attractive proposition, and it has been made possible by the contributions from Volvo Trucks, Liebherr and – of course – Quantum Readymix. Concrete Trends spoke to all contributors to discover what the new generation of mixer trucks might look like for the South African concrete industry.

The Volvo FMX460 10X4 Truck

Alexander Van Strijland is Volvo Trucks (South Africa) Sales and Marketing Director, who explains that the significance of the additional 5th axle allows the truck to carry a higher payload without exceeding the legal axle loads. The main difference between this and a traditional 8X4 twin steer chassis is the addition of a hydraulically steerable tag axle. This gives the additional carrying capacity without compromising manoeuvring ability.

The Euro 5 Engine

Van Strijland explains that another key difference between Volvo's standard Euro 3 engine and the Euro 5 is the addition of a Selective Catalytic Reduction (SCR) exhaust after treatment system. This uses AdBlue (a urea solution) which is injected into to the exhaust system to remove the NOx emissions. "The primary reason this truck is equipped with this engine is that this particular model is not available with a Euro 3 engine. The Euro 5 is an excellent alternative as it can handle our diesel quality in South Africa, and AdBlue is easily available," he continues.

The enormous contribution of the cement and concrete industry to global CO_2 emissions makes Volvo's commitment to the environment very attractive to the sector as a whole: "Environmental care has been one of our core values since the 70s. Since then, we've reduced emission of air pollutants from new Volvo trucks by 90%, and decreased fuel consumption and climate impact by 40%. We believe in a sustainable future for the transport industry," he emphasizes.

Fuel management and alternative fuels have also been high on Volvo's priority list: "Our trucks are fuel-efficient. Our smart fuel management systems and driver training help you get the most from them," notes Van Strijland. "We were the first truck manufacturer to comprehensively test Bio-DME fuel and present a diesel engine that runs on methane gas."

Volvo is investing in the use of recycled materials, with around a third of new Volvo trucks comprised from them. "Up to 90% of new Volvo trucks can be recycled at the end of their lifespans," he points out.

Under the hood

The D13C420 is a 420 hp 12.8-litre in-line, six-cylinder diesel engine equipped with an overhead camshaft, four valves per cylinder and unit injectors. The engine meets the EU exhaust emissions requirements according to the Euro 5 standards.

The D13C420 is designed for heavy long-haul and construction operations. It is based on a robust and dependable design with an overhead camshaft, four valves per cylinder and precisely controlled electronic fuel injection. The engine is designed for low fuel consumption, good driving properties and high availability.

The timing mechanism is located at the rear of the engine, which results in less vibration and permits the fitting of a rear-mounted power take-off. The D13C420 is a low-emission engine regarding both exhaust gases and noise level. Owing to after-treatment of exhaust emissions with SCR (Selective Catalytic Reduction) technology, the engine is approved to the EU's Euro 5 standards.

The D13C420 is available with VEB+ (Volvo Engine Brake) as an option. This system provides extremely high braking effect, further improving safety and reducing wear on the wheel brakes.

Volvo has also invested in creating a completely sustainable production process: "Our plants in Ghent, Belgium, and Tuve, Sweden, were the world's first climate neutral vehicle factories. Our paint facility In Umeå, Sweden, has the lowest solvent

emissions in the industry. And an increasing number of our dealerships are going CO_2 neutral, too. It doesn't stop there. This work is expanding rapidly, and globally, to cover as many of our manufacturing methods, factories, transportation and dealerships as possible," notes Van Strijland.

Coming back to the reasons behind the particular configuration chosen for this project, Van Strijland points out: "This type of chassis has long been in use in Europe, so is not a new development. It is new for South Africa, as we have a customer who is willing to invest in an alternative vehicle configuration to optimise their operation. The reason it was developed was simply to get more payload on a single truck and reduce the number of trips needed for a specific operation, simple as that."

Liebherr's new generation truck mixer

Riaan Lotter, General Manager – Concrete Technology at Liebherr-Africa, is equally enthusiastic about Quantum Readymix's willingness to invest in a truck chassis capable of handling the enhanced capacity of Liebherr's new truck mixers. "We make the mixers from a patented steal that is tried and tested all over Europe, the Middle East, Central and North Africa, as well as Asia," explains Lotter. This newly developed special steel has extremely hard components (titanium carbonitrides) and an optimised chromium content ensure a long drum service life – and thus low maintenance and repair costs. It was specially developed for applications in the truck mixer, exclusively for Liebherr.

"The advantages derive from the quality and supported drive train components used on the mixer, as well a much easier and faster loading time and reduced truck-idling time – this saves significant fuel," continues Lotter. "Very significantly, the mixing blade design allows for effective mixing that consistently delivers quality concrete", Lotter explains enthusiastically. "Because it is a bigger payload, the centre of gravity is lower, and this makes for safer driving and operating conditions," he continues. "This all using a mixer twice the size of what we have been using up to now!"

Some of the features of the new generation truck mixer include:

- LICRO 500 drum steel quality for a long service life
- Higher payload thanks to lower unladen weight
- New oil cooler unit with capacity reserves
- Flexibility due to new platform concept
- Different stowage options upon request.

In the development of the new generation of truck mixer from Liebherr, emphasis was placed on safety, ergonomics and cost effectiveness. The greater benefits are primarily realised in a higher payload, lower cost of cleaning and superb handling. ■

Top-level features

Safety Greater safety during operation due to:

- Litronic-EMC (option)
- Placement of items in stowage boxes (option)
- Excellent driving stability

Ergonomics

- Especially user-friendly design of the ascent and all control units
- Smooth surfaces without projecting edges for ease of cleaning

Cost-effectiveness

- Lower weight for a higher payload
- Durable components and short cleaning times increase cost effectiveness

Electronic mixer control

The optional Litronic-EMC mixer control allows demand-based control of the diesel engine speed and torque. This ensures significant savings in fuel and less wear on the drive train. Thanks to the "Constant Speed Drive" function, the service life of the drum is extended due to reduction of the drum revolutions during each tour.

Advantages of the Litronic-EMC

- Lower fuel consumption
- Longer service life of the drive train
- Less wear of the drum
- Better driving behaviour when the drum is loaded
- Intuitive and convenient one-hand operation

Increased water capacity

Due to the increased water capacity, even better safety and reserves when transporting liquid consistencies.

Greater payload

Weight of the basic unit reduced by approx. 250 kg, taking service life and reliability into account.

Innovative accessories concept

The innovative platform solution allows flexible and safe installation of accessories and attachment parts. All requirements are met in the positioning of toolboxes, holders, chutes, etc.

Advantages of the platform concept

- Simple and flexible installation of stowage boxes
- Easier handling of the extension chutes
- Protected cable routing in the profile of the platform
- Water filler pipes conveniently and ergonomically positioned
- Subsequent attachment of options also possible

The LTB conveyor

Whilst these units are not fitted with the The Liebherr LTB conveyor, they are ideal for them, and can be attached to or removed from the truck mixer in a matter of minutes. This too makes its operation even more cost effective. Its closed structural elements and panels make the conveyor easy to clean quickly too. It is ready for use in a matter of minutes and cuts cost by speeding up the discharge process. You can use the LTB conveyor to deliver all kinds of construction materials to precisely the required point. Its mechanical, hydraulic and control-system components have been designed for reliable operation and long life.

PORTS | RAIL | ROAD

TRANSPORT EVOLUTION

Infrastructure is at the core of re-stimulating the South African economy, with

R294bn investment across 65 transport projects

on the cards to aid a sustainable recovery.

Join us at the Transport Evolution series of events to meet with key authorities responsible for driving the region's transport infrastructure projects.

13 – 15 April 2021	30 May – 1 June 2021	21 – 22 September 2021
Maputo, Mozambique	Accra, Ghana	Durban, South Africa

Engage with African authorities first-hand and understand what their construction requirements are. In 2020, you can still connect with regional stakeholders leading the port, rail and road sector in our Transport Evolution World digital series - to find out more, please contact:

Steve Lee **T:** +27 21 700 5507 **E:** SteveLee@dmgevents.com

www.transportevolution.com

dmg::events

Precast concrete empowers emerging contractors

Recent construction using precast components and empowering emerging contractors saw this reservoir construction project demonstrating how some precast-concrete systems can complement labour-based construction methods.

Corestruc, a leading South African precast-concrete specialist, collaborated with Pamsensive Projects, who they appointed to undertake parts of the in-situ concrete work on a new 30ML reservoir that is being built in Selcourt in Springs.

The company was appointed to undertake parts of the in-situ concrete work on a new 30Ml reservoir in Selcourt

Water supply project

Pamsensive Projects – small, medium and micro enterprises owned by both black men and women – was introduced to Corestruc by Selby Construction, the principal contractor on this Water and Sanitation Department of the Ekurhuleni Metropolitan Municipality project that will bolster water supply in a rapidly expanding area of Gauteng. Corestruc is manufacturing and installing the reservoir roof and wall on behalf of Selby Construction as a specialist sub-contractor.

Precision undertakings

Pamsensive Projects' scope of works included the accurate construction of the concrete bases for the precast-concrete columns that support the modular roof structure, and the company is now working on the ring-beam upon which the various prefabricated concrete wall panels will be placed.

Gift Mohwaduba Moroe, a Director of Pamsensive Projects, says that the construction of both the concrete column bases and the ring-beam are extremely precise undertakings.

"The various precast-concrete elements were manufactured during the earthworks and construction of the concrete bases and ring-beam to fast-track the project. Once our work is completed, Corestruc immediately dispatches components of the reservoir system to site for installation. Impressively, it maintained tolerances of 20mm at height when erecting the inside portion of the roof of the structure" notes Mohwaduba Moroe.

Little margin for error

There is less scope for error in the construction of the wall where this specialist contractor must achieve tolerances of as little as 5mm. The holes at the bottom of the wall panels must perfectly align with the bolts grouted into the ring beam. At the same time, the steel plates at the top of each wall panel have to line up with the voids in the adjacent slabs and those that traverse the full width of the panels through which the post-tensioning strands are threaded," Mohwaduba Moroe says.

Tango's Consultants, the design engineer and the firm of consulting engineers that have been appointed to supervise the construction works, specified Corestruc's precast-concrete system for the construction of two reservoir projects in the Ekurhuleni Metropolitan Municipality areas to significantly accelerate the construction programmes and to ensure a high-quality final structure.

Constant contact, training and support

To eliminate errors, the Pamsensive Projects team, which comprises about five people who were employed from the local community, maintains constant contact with Corestruc's factory, the heart of the operation where the precast-concrete elements are being manufactured. It has also received training from the principal contractor and Corestruc as part of the socio-economic targets on this Expanded Public Works Programme project.

A further seven people will be employed from the surrounding community by Pamsensive Projects when it starts constructing the in-situ concrete floor slab, while Corestruc completes the installation of the wall panels and precast-concrete buttresses that reinforce the structure.

The precast-concrete specialist will then commence with the post-tensioning of the wall and finalising the outer portion of the roof to complete the project.

Willie de Jager, Managing Director of Corestruc, says that he remains impressed by the high-quality workmanship of the Pamsensive Projects team.

"The company has an impressive portfolio of completed projects and has demonstrated its unwavering commitment to its clients and other members of professional team on this contract. We look forward to successfully completing this project with the company by the end of this year," De Jager says. ■

1. *To eliminate errors, the company maintains constant contact with Corestruc's factory*

2. *The company has also received training from the principal contractor, Selby Construction, and Corestruc as the specialist sub-contractor*

From eyesore to urban asset

New urban living

Despite its potential, Irene Court was a run-down apartment building in the central business district of Bloemfontein. The apartments had no doors, there were very few walls due to a lack of maintenance with tenants having to use curtains as dividers. Despite this, Ntombi Sithole saw an opportunity to revitalise the building and transform it into the prime location it is today.

Financing in a new world of development

With the assistance of Trust for Urban Housing Finance (TUHF), Ntombi purchased the property in 2017 and began a refurbishment project that was completed a year later.

"Being so strategically located in downtown Bloemfontein at the heart of the Urban Development Zone, this property was a gem at an incredibly attractive price. Situated at the corner of Charles and Hanger Street opposite the Department of Health and next to Sanlam Plaza and China Mall, the opportunity to turn this into beautiful real estate was just too good to pass up on," says Ntombi.

Additionally, given its location the property provided a great tax incentive and attracted a lot of tenants despite the condition it was in previously.

Above and below: Irene Court – street view

From scratch – the truth about brownfields

"To be honest, before we started the refurbishment, the place looked like a dumpster. The previous owner did not perform any upkeep or maintenance. We literally had to start from scratch and put in new tiles, doors, brick walls inside the apartments, burglar proofing, and new bathrooms. The scale of the project was significant," she adds.

Considering this was the first project TUHF would undertake in Bloemfontein, Ntombi was motivated to prove the potential of Irene Court. "As this was a brownfield initiative in the city, we had to establish relationships with builders and

Irene Court, Ntombi Sithole and Chané Beckmann, TUHF Operations Administrator for Bloemfontein

other stakeholders to ensure its success. The scope of the refurbishment presented us with many challenges and the first contractor really did not provide any assistance. I had to take over and invested R200 000 from my own funds to supplement the R4.6-million funding from TUHF and the Intuthukho Fund."

Funding dignity

However, Ntombi says that TUHF really came to the rescue and was more than a funding partner on the project. "They helped me re-finance the property to be able to finish it and walked with us throughout the process and provided invaluable assistance. Paul Jackson in particular was an incredible mentor and it has been amazing to work with TUHF throughout the project." Today, she says it is an honour and a privilege to know that people are living in a decent place.

"From what it was to what the building is today required a major leap of faith. Fortunately, the equity growth has been marvellous and the support we received from TUHF throughout means we were never alone in this project. Yes, it was hard work and we went through difficult times, but the continued 100% tenancy rate of Irene Court makes it all worthwhile in the end," concludes Ntombi. ■

Facts

- Location: Corner of Charles and Hammer Streets, CBD, Bloemfontein, 9301
- TUHF Product: Irene Court
- Original configuration: Dilapidated apartment building
- Configuration upon completion: Rejuvenated apartment building featuring 11 one-bedroom flatlets and four two-bedroom units

NATIONAL HOME BUILDERS
NHBRC
REGISTRATION COUNCIL

Assuring Quality Homes Since 1998

The NHBRC is here to protect your rights as a new homeowner, by ensuring that our registered builders deliver a quality home that you can enjoy for generations to come.

1. Use a registered builder and sub-contractors.
2. Register your new home 15 days before you start building.
3. Demand that a minimum of four inspections are done during construction.
4. Before signing your “happy letter”, make sure you are satisfied with the quality of your new home.
5. Address any construction related issues with your builder in the first three months of moving into your new home, to take advantage of your Warranty Cover.

ASSURING QUALITY HOMES

An Agency of the National Department of Human Settlements

Toll Free: 0800 200 824 *www.nhbrc.org.za* @NHBRC National Home Builders Registration Council

SANRAL's Horizon 2030

delivers complex road project in North West Province

Engineering consultant Zutari has celebrated its involvement as part of the professional team on the R512-PWV3 Pampoennek Road in Brits in the North West Province. Built at a cost of R377 million on behalf of the South African National Roads Agency SOC Limited (SANRAL), the road stretches from the R512 to the west of the dam, and connects directly to the N4 to Rustenburg through Pampoennek.

The project was officially opened by Transport Minister Fikile Mbalula, in partnership with SANRAL and Madibeng Local Municipality, on Thursday 3 September 2020. Zutari, responsible for the Design and Construction Supervision (Project Management and Quality Control), was represented at the official opening by Engineer's Representative Hendrik Louw, Client Director for Transport Phil Hendrik and CFO Joe Ndala. Louw has been working on SANRAL and SANRAL-related projects for the past 12 years.

A challenging project brief

Motorists will now enjoy a free flow of traffic, as well as there now being a better link between the North West Province from the west of Pretoria and Johannesburg. The completion of this 30-month project demonstrates the ongoing commitment by SANRAL in investing in road infrastructure as part of its Horizon 2030 proactive response to improve the national road transport system.

Hendrik Louw, Phil Hendrik and Zutari CFO Joe Ndala with Transport Minister Fikile Mbalula

The project brief was construction of National Route 4 Section 12 (PWV3) from km 69.985 at the interchange with Road 980 to the interchange between the project road and Road P123-1 and to km 76.170. The road traverses a moun-

There is now a link between the North West Province from the west of Pretoria and Johannesburg

tainous terrain in a north-westerly to a south-easterly direction. This resulted in a vertical alignment with a sub-section in deep cut and other sub-sections on high fills.

The new construction was 6 km of undivided dual carriageway, with interchanges at P123-1 and 980, and resurfacing of Ramp A, De Rust. There were three soil-nailed and Titan anchor retaining walls at the Magaliesberg Neck, with a portion of contiguous piled retaining wall. The culverts were installed at the De Rust interchange, along with various gabion structures and erosion protection.

The road stretches from the R512 to the west of the dam and connects directly to the N4 to Rustenburg

Additional structures

Zutari's design scope was the vertical and horizontal alignment of the road and the design of various structures. This included a bridge on the southern end, 75.8 m long and 26.6 m wide, and the design and optimisation of the geotechnical aspects in the cutting, such as three soil-nailed and Titan anchored retaining walls finished in a Rockscape finish to mimic the natural environment.

The mountainous terrain and the limited width in the cutting through Pampoennek made the optimal vertical alignment through the cutting quite a challenge, notes Louw. "In an endeavour to supply a superior product while keeping the client's interests and budget at heart, we optimised the vertical alignment to ensure a balance between the cut and fill materials, while taking the natural topography and on-site soil conditions into account," he elaborates.

Environmental complexity and care

A full-time Designated Environmental Officer and Environmental Control Officer oversaw the rescue and reinstatement of indigenous vegetation. The installation of the corrugated iron game underpass connects the nature reserves on either side of the freeway. Any blasting and associated activities that could potentially have disturbed the breeding processes at the Skeerpoort endangered Krantz vulture breeding colony had to be concluded during the small window between the last nestlings leaving the nests and the next year's copulation rituals.

Job creation and training

Local labour and sub-contractors received both on-site and accredited training. The training provided was for NQF levels 3 and 4. Additional Contractor development training was also provided to 15 identified local SMME contractors. A total of 209 full-time local labourers were employed on-site. A certain percentage of the expenditure for local SMME contractors was allocated to women-owned enterprises.

Commenting on the successful outcome of this project, Louw concludes: "This is just a confirmation that Zutari is the leading consultant on our continent. We pride ourselves in delivering products of superior quality and value our relationships with our clients. This was an awesome project delivered by an awesome team." The team included Grinaker-LTA and Lubocon Civils on the contracting side. ■

The future of concrete reinforcement

Fibre scores key advantages over steel in large-scale rollout

An operations site commissioned for use in the transport and logistics sector came with project specifications for especially heavy loads. The 1 800 m² of reinforced concrete required by the project design utilized an oxymodified fibre product never before used at large-scale. The advantages were numerous, and impressed engineers, operators and contractors alike.

Oxymodification

Oxymodification is a process of atom exchange on the polymer surface in which hydrogen atoms are permanently replaced by oxygen and fluorine atoms. The fibres are oxymodified to increase surface wettability. This process ensures excellent fibre dispersion during mixing and placing, enhances interfacial bonding between fibre and cementitious matrix and prevents the balling of fibres.

Oxyfibre arrests the propagation of macro-cracks due to the dramatic reduction in the length and width of initial cracks. With the addition of these fibres, the cause of weakness is removed, making concrete a reliable and durable material with its optimal intrinsic properties intact.

AfriSam leveraged its expertise to create yet another concrete possibility the moment the lockdown ban was lifted on construction activity for essential services

A project with a heavy load

Appointed to undertake a project relating to the transport and distribution logistics for the client, DM Bodenstein Projects & Construction brought its experience on similar and, in fact, larger projects to the contract. The company is owner driven with a solid track record in delivering quality projects on time.

Phase 1 of the project was completed last year and comprised access and security structures. Phase 2, 3 and 4 comprise the construction of three surface beds in the storage yard to carry the static and dynamic loads of containers and heavy delivery vehicles, as well as the installation of fire hydrant lines and sleeving for all services and all paved walkways.

With heavily loaded forklifts with up to 98.17 tons on the front axle, the challenge was to design and construct concrete slabs to carry these loads. The surface beds are only 300 mm thick.

"We believe we secured this contract based not only on our experience and ability to offer a competitive price, but also because we were able, through our relationship with AfriSam, to offer technical solutions that would meet the specific application requirement," Dewet Bodenstein, director of Bodenstein Projects & Construction says.

A team-driven solution

This solution was found in a modified AfriSam Surfacebed mix with the addition of Oxyfibre, supplied by CHRYSO Southern Africa. In consultation with the AfriSam Centre of Product Excellence and the technical team from CHRYSO Southern Africa, a high dosage rate of 3 kg Oxyfibre per cubic metre of concrete was determined as the optimum application for these surface beds.

Mixing, monitoring, pumping – advantage: fibre

The project specification called for a 40 MPa concrete, 125 mm slump, with a 22.4 mm aggregate. The addition of the Oxyfibre, with a strand length of 40 mm, required careful monitoring of the slump at all times," Bodenstein says.

The high density of fibre in the mix necessitated very thorough mixing of the concrete to ensure that the fibres were evenly dispersed. As AfriSam's readymix plant in Spartan is less than 2 km from the construction site the concrete trucks arriving on site had to stand for another 10 minutes to complete the required mixing time.

Some 1 800 m² of fibre reinforced concrete was placed using an AfriSam pump, and Bodenstein says that placing the pumped concrete is much easier and faster when the operator does not have to navigate steel reinforcing. In total all four phases will equate to about 7 000 m².

"Another major advantage of using fibre instead of steel mesh is that the fibre disperses throughout the concrete matrix, facilitating a multi-directional plastic shrinkage cracking reduction matrix," he explains.

Seven-day cube results achieved 29 MPa, and with appropriate curing the required 40 MPA specified strength at 28 days was achieved. While the cold weather and windy conditions have slowed down the curing process somewhat, it has had no detrimental effect on the placing of the concrete.

"The AfriSam readymix plant's proximity to the site, coupled with AfriSam's track record of excellent support service, made the company an easy choice," Bodenstein says. "And their readiness to supply material at short notice once the lockdown was eased, and the support received from their Centre of Product Excellence and sales representative on site ensured that the project could proceed without a hitch."

"This is our first experience using Oxyfibre at this scale, and having experienced the advantages and ease of use, we are confident that this is the way of the future for reinforcement."

Queen Mabunda, territory sales manager at AfriSam concludes: "We pride ourselves on giving excellent service and building lasting relationships to ensure the successful execution of a project. Working with DM Bodenstein Projects & Construction on this project proved once again that supplying appropriate materials, supported by dedicated service is the AfriSam way." ■

HBA

Hans Brink & Associates

Civil Engineering Consultants CC

A Passion for Solutions

Innovative | Effective | Functional

ULTRA THIN REINFORCED CONCRETE I THE PATENTED STORMWATER HALF-PIPE

Specialised Engineering Solutions

Township developments | Industrial developments | Storm water management
Water reticulation | Sewer reticulation | Road & transport systems | Civil services reports
Engineering reports | Engineering drawings | Project management | Project estimation
Site supervision | Complex layer work solutions | Roads auditing

Contact Hans Brink: 083 399 9093 I hans@hbaconsulting.co.za

LOESCHE CCG

LET'S ENTER A NEW DIMENSION

Globally recognized technology in its most compact and modular form

The extensively proven LOESCHE VRM is the core of the Compact Cement Grinding plant (CCG). LOESCHE's CCG provides its technological features in a most compact and modular form thus making them available in small but growing markets and remote areas with a demand for locally produced cement.

A LOESCHE CCG in Tarfaya, Morocco

For more information, please contact:
Jonathan Smith, LOESCHE South Africa
mail: jsmith@loeschesa.co.za
phone: +27 82 653 4274

LOESCHE®

INNOVATIVE ENGINEERING