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ON THE COVER

In June 2023, M&D mobilised to South Deep Gold Mine in the Witwatersrand Basin to upgrade the operation's tailing-storage facilities' (TSFs) return-water dam (RWD) and cascade dams. This is in addition to providing the necessary stormwater-attenuation capacity to mitigate the risk of water spillage from the "dirty" water dams. The infrastructure that M&D delivers will enable South Deep Gold Mine to manage "dirty" water at its TSFs according to regulations that prevent pollution of water resources and mitigate the impact of mining on the environment.

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South Africa is no exception when it comes to an increase in government spending in an election year – especially infrastructure spending. This trend is likely to continue in 2024 as the ruling party would want to garner public support by initiating or accelerating infrastructure projects. This will no doubt lead to an increase in the demand for construction services and materials. But what if 2024 was not an election year? What is the forecast for construction in 2024, irrespective of it?

In 2022 the construction market was valued at USD25,5b and it is expected by various sources that the industry will grow up to 3% in the period 2024-2027. It is believed that the growth will be bolstered by transport, energy, industrial and housing projects.

The residential building sector, which buoyed the construction industry in times when government spending was lacking, has had its fair share of challenges, ranging from illegal land occupation to community projects to construction mafia demands. Despite setbacks, the indication is that this industry will rebound in 2024, not just with regards to the private sector housing, but in terms of the delivery of social housing units as part of government's social housing programme.

Treasury's budget indicates that South Africa's GDP is expected to grow from an increase of just 0,9% in 2023 to 1,5% in 2024. Growth in the

country's GDP normally implies growth in construction activities as residential and commercial demand for building grows.

The overall economic growth is, however, not expected to surpass 2% in the medium term, averaging below population growth. This implies that the average wealth per person will most likely decrease than increase – and this means that one has to be cautiously optimistic about real growth in the construction industry.

What this does mean for the construction industry is that growth may not be as robust as hoped for and that competition will increase and margin squeeze will persist.

Lower inflation's positive impact

Good news is that it is expected that inflation will decrease from its 5,5% in 2023 to about 4,9% in 2024. This will be a positive factor in financial planning as inflation has a direct effect on the

cost of materials, labour and project costs. The inflation forecast is a key factor in financial planning as it affects the cost of materials, labour, and overall project costs.

Still the rainmaker

Despite the private sector largely being responsible for keeping the construction industry in marginally positive territory in recent years, government policies and infrastructure plans play a crucial role in shaping the landscape of the construction industry. Government efforts will take the form of road construction, water projects and human settlements.

One can only hope that the election year does not play too big a role in the growth of the construction industry.

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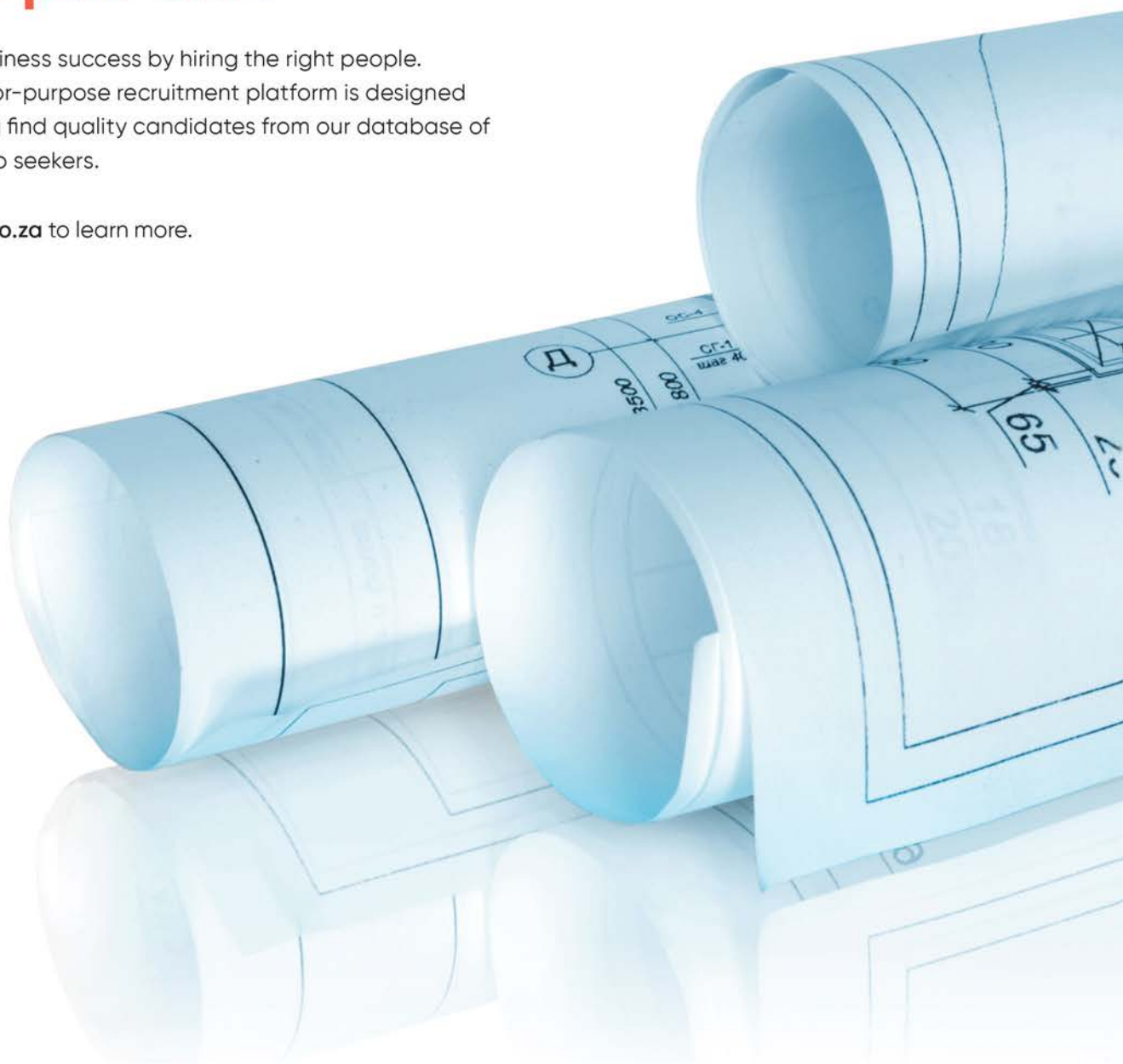
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Promoting STEM education to build a **PIPELINE OF FUTURE ENGINEERS**

In the dynamic landscape of consulting engineering, Zutari stands out not only for its innovative projects, but also for its unwavering commitment to socio-economic development, especially education. The company's focus on promoting STEM (Science, Technology, Engineering, and Mathematics) education, nurturing emerging talent, and achieving excellence in its Broad-Based Black Economic Empowerment (B-BBEE) status is testament to its values and social licence to operate.

At the heart of Zutari's commitment to education lies its Learner Excellence Programme and Maths & Science EduCate Programme, in partnership with Protec and Primestars, to cultivate success in STEM careers. These initiatives target underserved Grade 12 students in local communities, striving to enhance their academic performance and nurture a pipeline of skilled engineering professionals for Zutari and the broader industry.

"Our aspiration is to offer undergraduate scholarships post-Grade 12, nurturing a pipeline of much-needed engineering professionals for Zutari and South Africa. We believe in reducing educational disparities and contributing to poverty eradication," says Senzekile Mdluli (pictured), Head of Diversity, Equity, Inclusion & CSI at Zutari. The company's approach goes beyond financial support and includes in-person tutoring, holiday classes, and online learning opportunities.

"By investing in their education and providing essential resources and support, our aim is to empower them to achieve their full potential, becoming tomorrow's leaders and change-makers," adds Mdluli. The aim is to inspire and empower these students by showcasing the vast opportunities within engineering. "We firmly believe in the potential of STEM careers to shape a better future. Through engaging activities such as bridge-building competitions and motivational talks,

our intention is to ignite a passion for engineering in young individuals," says Mdluli.

As a responsible corporate citizen, Zutari engages actively in eradicating poverty within the communities surrounding its business. Its passion for education extends beyond academic improvement as it seeks to expand learners' career prospects, bridge educational gaps, and contribute to poverty alleviation efforts. Another priority is to reduce gender inequality and empower women, both within the business and the communities it serves. Its socio-economic development efforts are based on sustainable initiatives to ensure continuous empowerment beyond its immediate involvement.

As Zutari continues to strengthen relationships and build capacity, its commitment to education, diversity, and inclusion remains a driving force. The company not only pursues engineering excellence but also envisions an inclusive, diverse industry representative of the South African population. "Our dedication to education aims to enhance learners' performance and broaden their career horizons.

"Our collective aim is to enhance learner performance and enable them to realise their full potential," highlights Mdluli. With each learner supported, Zutari paves the way for a more inclusive and brighter future in the consulting engineering industry. ©

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**Hannes Meyer, AfriSam
Cementitious Executive.**



**Gavin Venter, AfriSam Manager
Saldanha & Strategic Projects.**



New limestone quarry **FOR AFRISAM AT ULCO**

As the important mineral component of its cement, limestone will soon be mined from a new deposit by AfriSam's Ulco cement plant in the Northern Cape.

The relocated quarry will be capable of providing security of supply for about 40 years, and will need to deliver around two million tons of limestone to Ulco each year. According to Gavin Venter, Manager Saldanha and Strategic Projects at AfriSam, the enabling infrastructure for this quarry has been significant.

“After conducting a number of wide-spaced prospecting campaigns – as well as close-spaced drilling across 100 hectares – we identified the best limestone reserves on our mining right on the opposite side of the R31 national road, which runs between the new site and the plant,” says Venter.

“This means it is necessary to construct tunnels under the road to facilitate safe access between the new quarry site and the existing plant. Adding to the complexity is that the large Gamagara water pipeline runs parallel to the road.”

The R31 road between Kimberley and Postmasburg carries high volumes of large ore trucks and abnormal load mining equipment. It will be diverted in early 2024 to accommodate this traffic for about six months while extensive excavation and civil engineering work is undertaken to construct the tunnel underpass system.

“In compliance with the road authority's requirements, the



AfriSam's Ulco cement factory is located in South Africa's Northern Cape province and has a production capacity of 4 000 tons of clinker per day.



Existing Ulco operation with new mining area outlined in red.



Ulco project area showing the development of the R31 bypass and drainage line diversion above it.

tunnels will traverse the full 32 metre width of the road reserve – to allow for future road widening, in addition to the pipeline servitude,” he says. “The two tunnels themselves will be over 50 metres in length, and will be separated to enhance safety as there will be counterflow traffic to and from the plant.”

The 5 metre high by 5 metre wide tunnels will be excavated to 12 metres below the R31 road level, and constructed as large culverts with steel reinforced in-situ cast concrete. The design work ensured a tunnel alignment to suit the future possibility of an in-pit crusher and conveyer belt. If such an option was financially justified in future, it would provide an alternative method to feed crushed material to the existing pre-blending stockpiles.

The civils works also has to accommodate the 700 mm diameter Gamagara pipeline, supplying the Northern Cape with water from the Vaal River. To avoid the risk of disrupting this water supply, a concrete bridge has been constructed parallel to the existing pipeline, inside which a new 100 metre stretch of pipeline was laid.

“This provided the necessary support for the pipeline so that excavation and controlled blasting can be conducted

underneath,” he explains. “As a further precaution, there is also a 100 mm per second vibration limit applied to any blasting activity around the pipeline bridge.”

Work on the pipe bridge began in late 2022 and excavation work began in the third quarter of 2023, creating the initial slot on the south side of the R31. Once the road is diverted, the excavation of the tunnels can begin and this is expected to be complete by end February 2024. This will be followed by the construction of the two tunnels. The supply of readymix – which will include AfriSam cement – will come from Kimberley, about 80 km south. With ambient daytime temperatures that can rise to 40 degrees, this will require careful use of admixtures to achieve the required slump by the time readymix trucks arrive on site.

“Mining is expected to begin in the second half of 2024, with an unusual topography in which the quarry will be mined into an escarpment,” says Hannes Meyer, Cementitious Executive at AfriSam. “Transportation of mined material is therefore mainly downhill. With the gradient of the haul road slopes limited to 5 degrees, AfriSam’s truck-trailer combinations have been designed to be much more energy efficient than conventional off-road dump trucks.”

AfriSam commissioned various specialist studies as part of its environmental impact assessment (EIA), to investigate the new quarry’s potential effects on wetlands, terrestrial life, hydrology, heritage and traffic. Authorisation was granted to mine in the vicinity of water features on the proposed mining area, with a seasonal drainage line that had to be diverted to avoid the exit slot of the new haul road. ©



SAPPMA launches project “SUPERIOR QUALITY 2024”

The Southern African Plastic Pipe Manufacturers Association (SAPPMA), a pivotal entity in the Southern African plastics pipe industry, is proud to announce the launch of Project “Superior Quality 2024” (SQ24). This initiative underscores SAPPMA's unwavering commitment to upholding the highest standards of product quality in the region.

Jan Venter, CEO of SAPPMA, emphasises the urgency of addressing long-standing challenges related to suspect quality, particularly concerning HDPE pipes. He explains that factors such as the use of third-party recycled material, price-cutting, and inadequate official certification have contributed to this persistent issue.

“Maintaining superior quality has always been the foundation of the SAPPMA brand. Project Superior Quality 2024 is our comprehensive response to the rising incidents of suspect quality, reaffirming our commitment to excellence in the plastics pipe industry,” Venter says.

Key measures under Project Superior Quality 2024 include:

- **Stricter standards:** Immediate adoption of the latest SANS ISO 4427:2023, with an increased OIT (Oxidation Induction Time) test value of 30 minutes at 210°C and a maximum 20% shift in OIT value from raw material to the final product.
- **Enhanced monitoring:** Increased frequency of sampling and testing through unannounced factory audits, ensuring compliance with the revised standards.
- **Code of conduct amendments:** Strengthening the existing Code of Conduct signed by member companies, aligning it with the updated quality standards.
- **Advisory committee restructuring:** The Advisory Committee is restructured into four different market sectors, allowing for more focused attention and expertise.
- **Disciplinary committee establishment:** A dedicated Disciplinary Committee, free from conflicts of interest,

is established to handle deviations from the Code of Conduct, ensuring accountability.

- **Industry collaboration:** Increased interaction with Consulting Engineers, Municipalities, and Contractors to promote awareness and understanding of product quality.
- **Public awareness campaign:** A focused promotional campaign in the media aimed at informing the public about the industry's commitment to superior quality.

Jan Venter expressed confidence in the success of the initiative, citing the full support of the Board of Directors and emphasizing the collective responsibility of all members to ensure the success of Project Superior Quality 2024.

“This initiative underscores SAPPMA's commitment to maintaining and enhancing the quality standards of plastic pipes in Southern Africa, fostering confidence in products, the market, and the association itself.

We invite all stakeholders to join hands with us in this crucial endeavour, which underscores the significance of maintaining high-quality standards for the benefit of the industry, market, and public,” he concludes. ☺

About SAPPMA

The Southern African Plastic Pipe Manufacturers Association (SAPPMA) is a leading entity in the plastics pipe industry, dedicated to promoting excellence, innovation, and sustainability in plastic pipe manufacturing across Southern Africa.

CONSTRUCTION & FORESTRY TECH EXCELLENCE

John Deere 2023 Awards



JOHN DEERE

In a ground breaking move that underscores its commitment to recognizing excellence in the field, John Deere recently launched its first-ever Construction and Forestry Technician of the Year competition. With a resounding success in its debut year, the competition saw Armand Botha clinching the coveted title, followed by Anton Lombard as the runner-up and Sabo Magqabi securing the third position.

The competition, akin to its agricultural counterpart – the AG Technician of the Year – is set to become a staple in the industry, growing in scope and influence with each passing year. The dedication of John Deere to fostering a culture of excellence within its technical workforce is evident in the meticulous process employed to identify and reward the best technicians in the field.

The competition kicked off with an exhaustive web-based training program, where technicians across the board were assessed based on their scores. The top 10 performers emerged from this phase, showcasing their knowledge and skills in the realm of construction and forestry machinery. These finalists then engaged in a closed assessment phase, where their practical skills and problem-solving abilities were put to the test.

Armand Botha emerged as the frontrunner, showcasing an exemplary understanding of the intricate workings of John Deere construction and forestry equipment. Anton Lombard and Sabo Magqabi, the worthy runners-up, demonstrated their prowess in the field, earning accolades for their dedication and technical proficiency.

Botha believes that listening to others and learning from one another as well as learning from your own mistakes is a big key to success. "My father always says that 'calmness can conquer any storm' and I believe by staying humble and by having an attitude of learning from others, we can achieve more."

What makes him excited in the industry is the constant innovation. Says Botha: "I love working with John Deere machinery and I love to see how they constantly improve their own product" With 13 years of experience in the field, he aspires to become head of a department where he can further live out his passion for fixing these machines.

The inception of this competition aligns with the multifaceted objectives of John Deere. Firstly, it serves as a rigorous test of the technicians' capacity, ensuring that they are well-equipped to handle the complexities of the machinery they service. Secondly, the competition aims to reward and celebrate excellence, acknowledging the hard work and dedication of technicians who go above and beyond in their roles.

Moreover, the competition serves as a powerful tool to boost employee morale and performance. By recognizing and valuing the contributions of its technicians, John Deere creates an environment where technical

and after sales teams feel motivated and appreciated, fostering a culture of continuous improvement.

Beyond the immediate benefits, the Construction and Forestry Technician of the Year competition is a strategic move by John Deere to drive training execution. By setting high standards and promoting healthy competition, the company encourages its technicians to invest in their professional development, ultimately raising the overall skill level of its workforce.

As John Deere looks ahead, the Construction and Forestry Technician of the Year competition is poised to become a cornerstone in the industry, setting new benchmarks for excellence and inspiring a new generation of technicians to strive for greatness in their craft. This inaugural event marks a significant milestone in the company's commitment to advancing the skills, capabilities, and recognition of those who play a crucial role in keeping the construction and forestry machinery in optimal condition.



C&F Technician of the Year-Armand Botha

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Spotlight on SME employment

TRENDS IN THE ARCHITECTURE & ENGINEERING SECTOR

SMEs play a crucial role in most economies, and South Africa is no exception. They are also important contributors to job creation and global economic development. According to the World Bank Group SMEs represent about 90% of businesses worldwide, while the International Finance Corporation revealed that roughly 50% to 60% of South Africa's workforce finds employment within SMEs.

A key challenge SMEs face is finding employees who are a good fit for their business and who have the skills required to increase efficiency and business growth. Although hiring is critical for SMEs, they are often vulnerable to hiring challenges, especially during economic downturns. This is because during times of uncertainty, high-quality candidates tend to opt for larger, more established firms which are perceived as being a “safer bet” or who “offer more”.

Salaries and wages across various sectors and roles differ greatly in South Africa. Pnet analysed jobs with the highest salary offers over a 12-month period (September 2022 to September 2023) and the findings revealed that Architecture & Engineering was the third-highest paying job sector in the country, after Business & Management and Information Technology.

When comparing hiring activity over September, October, November 2023 with the three months prior (June, July, August 2023), Pnet's findings indicated that hiring activity had increased by +6% in the Architecture & Engineering sector (Civil/Structural Engineering).

In terms of market-related monthly salary offerings for top in-demand skills, Mechanical Engineers are being offered between R42 648 and R57 018; Process Engineers are being offered between R43 363 and R54 330; and Draughtsmen can expect offers of between R23 452 and R31 097. Currently the most in-demand roles within the Architecture and Engineering sector are those of Industrial Engineer, Plant Engineer and Electrical Engineer.

Over and above the salary cost associated with employing skilled professionals in the Architecture & Engineering sector, there is also often a hefty price tag when it comes to sourcing suitable candidates. SMEs also require a quick turnaround time when it comes to filling their job vacancies, which can pose another recruitment challenge.

How SMEs can become more efficient in their recruiting processes

Specialised online recruitment platforms offer SMEs a range of benefits to help them save both time and money during the hiring process, and find the right candidates for their vacancies – ultimately driving business success.

Reducing time-to-hire

Sourcing candidates directly using smart-matching technology streamlines the hiring process so that SMEs can quickly and directly reach more jobseekers. SMEs can advertise their vacancies directly to active jobseekers, or tap into a database of professional candidates. Sophisticated platforms like Pnet's online recruitment portal offer a host of easy-to-use tools and features to easily filter and shortlist candidates with the required skills from their database of over six million jobseekers. What's more, recruiters' job ads get further reach from the 100 million Job Alerts that Pnet sends directly to jobseekers' inboxes every month.

Reducing recruitment costs

By going direct to the source of suitable candidates using specialised recruitment platforms like Pnet, SMEs can save up to 60% on their recruitment costs. Pnet's online recruitment platform uses advanced algorithms and analytics to target job advertisements to the most relevant candidates. This enables recruiters to find quality candidates using locally relevant filters, and even create a talent pool to access when they need to hire for similar roles in the future.

Built-for-purpose online recruitment platforms are emerging as powerful tools to help SMEs find the right candidates for their vacant roles, thereby boosting their competitiveness in the market. In fact, these platforms have become a gamechanger for companies of all sizes, allowing them to flourish by attracting and retaining their most important asset – people. ©



CESA welcomes new **PRESIDENT DAVID LEUKES**

Consulting Engineers South Africa (CESA), a voluntary association of approximately 600 consulting engineering member firms, has elected David Leukes (pictured) as its new President.



Leukes was elected at CESA's 70th Annual General Meeting held on Tuesday, 28 November in Kempton Park, Gauteng. He succeeds Olu Soluade in the position, with Knight Piésold Africa Regional Manager, Vishal Haripersad assuming the role of Vice-President of the organisation, a position which was held by his predecessor Leukes.

Leukes has served as a member of the CESA board for several years and is currently Managing Director of BVi Consulting Engineers, a CESA member company. He completed his National Diploma in Civil Engineering at the Cape Technikon and subsequently attained his BTech Degree at the Free State Technikon. Leukes also has an MBA Degree from the University of Stellenbosch Business School.

In his acceptance speech, he stated: "I am honoured to have served in the industry in my capacity as a CESA board member, where I have been contributing towards the growth and development of consulting engineering in South Africa."

Born in the Northern Cape town of Upington, Leukes' fascination with the world of infrastructure started at an early age, leading him on a professional journey through education and leadership roles within the profession. He received a bursary through BVi Consulting Engineers in 1992, which he believes was a major contributor in opening doors towards his civil engineering studies.

"I have over 25 years' experience in the industry, having risen through the ranks at BVi Consulting Engineers, and I am looking forward to using my skills and leadership attributes to contribute towards driving transformation and bringing positive change within our communities," said Leukes.

CESA CEO, Chris Campbell, congratulated Leukes on his new role within the organisation and reiterated his support: "We are looking forward to working with the new president and continuing to drive our focus on partnering with

industry stakeholders for sustainable, value for money infrastructure development. The president will be officially introduced to members of the media at our annual CESA Media Breakfast, scheduled for 1st February 2024 at the Radisson Blu in Sandton."

Leukes' presidency will run until the end of 2025 and will see him play an important role through advocacy in the organisation that is the custodian of the well-being of the industry supported by member firms who employ approximately 19 000 people. ©

"I have over 25 years' experience in the industry, having risen through the ranks at BVi Consulting Engineers, and I am looking forward to using my skills and leadership."

Six questions to ask before **HIRING AN ARCHITECT**

Taking on a new building project is no small task. Given the resources involved, whether constructing a home or a commercial development (or even renovating), it's important to partner with the right professionals.



This includes finding an architect who not only understands your brief and your budget, but who can bring the right expertise to your project to ensure it's a success. This includes the aesthetic components, but also knowledge of building regulations and codes, zoning schemes, and risk management principles.

However, choosing the best architect for your needs can be challenging. That's why it's important to ask the right questions before making a final selection. These six questions are designed to assist in this process.

Why would I be a good fit for your firm as a client?

"The best partnership between a client and architect is one where there is mutual respect and a shared objective," says Landseer Collen, Principal Director at BPAS Architects, a multidisciplinary architecture and design firm based in Cape Town. "When choosing an architect, you'll want to select someone who has expertise in your space and who can deliver on your brief with confidence. For example, if you're planning to build a luxury guest lodge or city apartment complex, you'll ideally want an architect with either a track record in these types of developments who understands the niche requirements or who is actively looking to enter the market and is willing to go the extra mile to ensure your project will be a success. You also want to work with someone whose ethics and philosophy match you well."

Can you execute my brief within my budget?

While clients often hesitate to share their budget with an architect, Collen says that doing so ensures you are not sold a design that cannot be built with the funds available. "This avoids frustration on both sides," he says. "Being upfront from the start also avoids wasting time that might be spent redesigning a building to cut costs later on."

Are there any challenges you foresee with my project?

This question can help you manage your expectations on a project and also make you aware of problems you might not have

thought about. "As a professional consultant, your architect is a bit like a medical specialist who can diagnose potential issues with your project and 'treat' them to ensure they are resolved as best as possible," says Collen. "But great architects go beyond problem-solving – they also look at how to proactively get the best results for you. Think of it as prescribing the right vitamins and minerals to ensure your project is in top health."

Why should I choose to work with you?

"It's important to understand what sets an architect apart from others and where they believe they can deliver value on your project," says Collen. "This question allows an architect to highlight other services, relationships and advantages they can offer you." For example, you might be able to streamline your project if your architectural firm can handle multiple aspects of it, such as master-planning, urban concepts and landscape architecture or interior design. The firm might also have strong relationships with other professionals who could assist you, such as engineering and construction firms, or they may be able to point you to specialised products and accomplished artisans.

How does your firm prioritise sustainability?

"Sustainability goes beyond green building principles – which should be standard practice today," says Collen. "It should incorporate financial robustness and economic contribution too. Find out what the philosophy is at the firm you're considering, how they ensure environmental care, and where they go beyond it."

How does your firm leverage new technologies to better serve clients?

With all the talk of generative AI in architecture and using digital tools to improve the client experience, it's important to know whether the firm you're considering is up-to-speed with making these a reality for clients.

"For example, at BPAS, we have a division called Archithera, that's focused on putting technology to the best use for our clients' benefits," says Collen. "We've used generative AI to streamline our design process and rapidly trial a range of designs, such as two- or three-bedroom apartments in various configurations, and parking lots for developments we're working on."

BPAS has also put technology to use to improve client experience in terms of visualising the end product. "During Covid lockdown, we hand-delivered VR headsets to clients, with a private video link to a 3D project walkthrough," Collen explains. "While they weren't able to physically visit their sites or our offices, they could do a 3D walkthrough at home to see what to expect. It was a popular intervention that we've since implemented into our regular practice processes."

He suggests asking prospective firms about their own technology and digital transformation initiatives. ©



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SA property market set for **BIG REBOUND IN 2024**

The local property market will see a resurgence in 2024 predicts Renier Kriek, Managing Director at Sentinel Homes.



year, and probably be led for the first time by a coalition government at national level. While this might concern South Africans, leading to uncertainty and hesitation prior to the election, it also promises to bring new impetus to solving the nation's dilemmas.

Kriek believes both these events will turn out well and will provide a release for the evident demand for property that is building in the background. "Then, we'll see a dramatic increase in market activity," he says.

Several lesser trends are also worth watching.

“There was a bit of a property boom after the country emerged from the COVID lockdown. Since then, people have been held back from buying and selling property by various factors, but that is about to change for the better," he says.

Factors impacting the local property market

In South Africa, property buying and selling have dropped steadily since 2021. In 2023, market volume was about 5% lower than 2019.

The factors driving this decline include negative consumer sentiment as a result of load shedding, the national logistical backlog, a stalling economy, high inflation, the rising cost of living, and a 475 basis point increase in the lending rate since the COVID lockdown ended.

However, people's life circumstances continue to change, suggesting pent up demand building below the surface.

The number of first-time buyers – a solid indicator of market demand – has also decreased significantly, again implying that unsatisfied demand exists, which is building up in the background.

Outlook for 2024

Two main events signal that things are about to change.

First, economists agree that, as inflation slows in South Africa and the world, SARB will likely reduce the interest rate at its May or July Monetary Policy Committee meeting, which is in line with the move expected from the US Federal Reserve.

Second, the country will hold general elections this

Smart money in the market

Right now, there's a lot of smart money in the market – people who are aware that it is a good time to buy and are hunting for value.

Interest rates on mortgage loans granted have decreased significantly, partly because banks are competing for a shrinking market, but also because current smart money buyers are generally richer, have better credit records or present a much lower credit risk.

They are also paying higher deposits on average despite banks being willing to lend up to 105% of the purchase price. In the same vein, wealthy buyers from abroad are snapping up luxury properties in Cape Town and other coastal areas in the price bracket above R20m. This trend is sure to continue into 2024 as that smart money looks to acquire more assets before the market turns on the two main positive signals expected for later in the year.

Semigration

Semigration remains a major trend in 2024 and smaller towns will continue to experience gentrification, no longer only in the popular Western Cape but across the country.

As more affluent buyers seek well-priced, quality stock in these locations, incumbents will see their property value rocket.

This may not be the only incentive for them to sell, though. Increases in rates and the cost of living may become unaffordable for them, pressuring them to move

elsewhere. But where will they go?

With more than 80% of all building plan approvals being in coastal areas currently, the answer is plain to see. Market actors who are the creators of housing stock are readying themselves for the turning market and are doing so with an emphasis on coastal areas.

Co-buying

There is a marked increase in co-buying, that is, people buying a property together with someone other than their spouse. This includes friends, unmarried couples, investors, and those with business intentions. About one in every four properties purchased is now co-bought.

This approach overcomes the gap between property prices and income and is a way for younger people to enter the market while spreading risk between them.

Banks have also changed their policies to accommodate co-buying, with some allowing up to 12 individuals to join in the application.

Buy-to-let boom

The buy-to-let market is booming, especially in the Western Cape. One reason is that, due to insufficient stock and higher property prices at the coast, many semigrants are electing to rent while waiting for the positive market signals, in the form of interest rates and election outcome.

Some are also renting while waiting for new builds, given that stock is restricted in the coastal areas that are semigration destinations.

This growing demand provides a good incentive for buy-to-let landlords to invest in new homes and

apartments, despite the high construction costs. Almost 11% of all bond applications are currently investment purchases, which is higher than the norm.

Smaller properties

Another continuing trend in 2024 will be smaller plots and smaller properties.

High construction costs make it very difficult to create new stock that competes with existing stock in the market, though this shortfall is being rapidly eroded in coastal areas, but specifically Cape Town and surrounds.

So, both tenants and buyers will have to adapt to reduced living space unless they can afford to build their own at a premium.

Relief for homeowners

The number of buyers may be low but owners are also holding onto their properties for dear life, in the face of crippling interest rates.

Unfortunately, foreclosure may force some to sell in the near future. Yet, the predicted drop in interest rates promises relief to those who managed to stay afloat until that signal rings in the market.

When will the change happen?

Kriek expects the dam of pent-up demand to break in the coming winter. This is not a prime time for property sales, however, especially in the Western Cape. During this season, people tend to buy fewer properties.

"With lower transaction volumes during the winter months, there is likely to be a slight buyer's market that will turn to a seller's market in spring," he says. ☺

Jet Demolition and Edifice Engineering AT THE 2023 WORLD DEMOLITION AWARDS

Representing global excellence in the demolition industry, Jet Demolition, in conjunction with Edifice Engineering of India, were declared runners-up in two categories for the World Demolition Awards (WDA) 2023. Currently in its 15th year and comprising 11 award categories, the WDA is part of the World Demolition Summit that took place from 17 to 18 October in Toronto, Canada.

In partnership with Edifice Engineering, Jet Demolition entered the category of explosive demolition for the controlled implosion of the Supertech Twin Towers in Noida, Uttar Pradesh near the capital New Delhi on 28 August 2022. It marked Jet Demolition's second collaboration with Edifice Engineering, a leading demolition company based in Mumbai.

Citing the project as one of the most challenging ever undertaken by Jet Demolition, Director Joe Brinkmann (pictured) says: "Edifice Engineering and India have joined the 100 m implosion club under extremely demanding conditions."

In the projects under USD1m category, the highly successful collaboration of Jet Demolition and Edifice Engineering entered the precision brownfield demolition of large coke oven infrastructure at the Tata Steel Jamshedpur Works (TSJW) in India. The main challenge

was achieving fully assured, precise control of the toppling direction of the chimneys to prevent damage to operational plant assets from direct impact.

Jet Demolition is no stranger to international accolades, being crowned 'Best of the Best' at WDA 2020 and winning the explosive demolition category for the controlled implosion of the Bank of Lisbon building in Johannesburg.

In 2019, Jet Demolition won in the recycling and environmental category for the safe decontamination and demolition of three redundant gold and uranium complexes.

In 2018, it won in the industrial demolition category for the demolition of a coal-fired boiler and ancillary equipment at Duvha Power Station in Mpumalanga. In 2017, it won for its innovative implosion of the 14-storey HG de Witt Building in Pretoria. ☺



From left: Melisa Gagu, Cindy Hector, Tarrin Lynch, Nazette Bost, Lydia Hendricks, Akhona Mabongo, Devlyn Henry, Riziah Ganief and Nonduduzo 'Melody' Zindela (absent – Zola Mabanga).

FM Solutions Technical's all-women **TEAM REVOLUTIONISES FACILITIES MANAGEMENT**

In the world of Facilities Management (FM), where technical expertise and reliability are paramount, FM Solutions Technical is once again emerging as a trailblazing player, setting a new standard for diversity and competence in the industry. With an exciting new offering that boasts an all-women team in FM maintenance, FM Solutions is challenging stereotypes and redefining what it means to excel in the realm of facilities management.

“Facilities Management comprises a wide range of services and duties that are critical to the smooth and efficient operation of any business or organisation. It includes everything from physical asset maintenance and repair, such as HVAC systems, plumbing and drainage, and electrical reticulation, to administrative activities such as project management, space allocation, and health and safety compliance. In essence, FM guarantees that an organisation's physical environment is conducive to its aims and objectives. Facilities Management is concerned with making assets and infrastructure perform efficiently and cost-effectively, as well as creating a safe and comfortable environment for everyone who visit the area. In this context, FM Solutions Technical is establishing a reputation as a leader in the industry by forming an all-women maintenance team, challenging the historically male-dominated FM space,” says Lydia Hendricks, Director at FM Solutions.

Zaahir Forbes, Director at FM Solutions Technical confirms this statement, saying: “FM Solutions Technical has a well-earned reputation for being a results-driven organisation, with a commitment to performance excellence with every job at hand, and the ability to think creatively whenever obstacles are encountered. This ground-breaking move further emphasises our company's commitment to performance excellence, creative problem-solving, and diversity”.

Although the use of technology has in recent years greatly impacted the field of Facilities Management, Zaahir emphasizes the enduring importance of a personal touch.

“The consolidation of FM services offered by a team of sensitive, caring, and highly trained women is a game-changer which provides clients with a unique skill set combined with a warm and personal approach. This all-women technical team is not merely breaking barriers; they are proving that competence and excellence know no gender. Their technical expertise, coupled with their ability to multitask and address sensitive areas, has enriched FM Solutions Technical and empowered a

new generation of women in technical roles,” Zaahir says.

Brendon Nortjé, Key Account Manager at FM Solutions Technical, underscores the exceptional qualifications and performance of the female technicians, stating that the decision to hire each one of the female team members was solely based on merit.

“Each member of this diverse and skilled team has been hand-picked for their unique talents, expertise and ability to handle various technical maintenance tasks. From initial call logging to plumbing, HVAC, and electrical maintenance and procurement, these women know how to tackle every problem that comes their way. Their presence has positively influenced their areas of work and responsibility, but also provides us with a competitive edge, especially in sensitive areas like female dormitories and restrooms,” Brendon says.

FM Solutions Technical's all-women team is not just fixing facilities; they are shattering prejudices and inspiring a transformation in the facilities management industry. Their story is a testament to the power of diversity, competence, and relentless pursuit of excellence, setting a shining example for the industry and beyond.

“I think the facilities management sector is at a turning point right now. In addition to changing the dynamics of our workplace, these women's diversity of abilities and dedication to excellence have empowered more women to assume technical roles that have historically been associated with the appointment of a male counterpart. They have also single-handedly challenged and changed the industry for the better. As they continue to excel and deliver superior results, our “girl power” team is proving that diversity and competence go hand in hand. In a world where gender should never be a barrier to achievement, they are setting a shining example for the facilities management industry and beyond. This is true empowerment and a long overdue transformation that can inspire us all to break down barriers, challenge norms, and pursue excellence relentlessly,” Hendricks concludes. ☺



TUHF announces ambitious **EXPANSION PLANS**

As TUHF marks its 20-year milestone of fostering urban regeneration, the company has announced an ambitious expansion strategy aimed at addressing the evolving demands for affordable housing across South Africa – and plans to expand into the rest of the continent.

Under the stewardship of CEO Paul Jackson (pictured), TUHF champions the ethos of ‘making a difference one neighbourhood, one city block, one community at a time’. This principle has driven significant social and economic impacts in the urban landscapes across the country.

“The essence of well-located housing goes beyond shelter. It is an engine of economic growth and social wellbeing for the communities in those precincts. Our approach has always been about nurturing micro-economies within city blocks and neighbourhoods, thereby creating a ripple effect of inclusivity and wealth mobility,” explains Jackson. “This high-touch approach, distinguishing TUHF as an in-city financier, has been instrumental in stimulating business and employment opportunities, fostering mixed-use economies, and promoting mixed-income communities.”

Expanding demand in inner city and in-city areas

While TUHF began as an inner-city financier in Johannesburg, it has progressively broadened its geographical footprint to align with the shifting demands for affordable housing.

“Our journey began with urban regeneration within the Johannesburg inner-city, focusing on affordable housing and black economic empowerment. As the landscape evolved, so did our strategy, leading us to extend our services beyond traditional inner-city areas to include in-city areas,” shares Jackson.

“The expansion follows a well-defined in-city strategy. These areas, adjacent to the inner-city and near key urban nodes, align with our market expansion strategy. For instance, in Johannesburg it would be to move with the market to areas like Linden, Randburg, Buccleuch, and Kew, among others.”

The nationwide expansion has seen TUHF establishing a presence in 11 of South Africa’s metros, with a vision to extend its reach into the Southern African Development Community (SADC) in the next two years. The strategic growth is backed by an extensive branch network, ensuring a local presence to better understand and meet the market demands.

An example of this is through its uMaStandi township programme it launched in 2015.

“There is enormous demand in South Africa for people to live in well located townships – and we are delighted to have found significant interest from property entrepreneurs looking to develop in those communities,” Jackson says.

As a specialised commercial property financier, TUHF has

found that there is large market niche in townships where it is difficult to get commercial property finance at the scale (up to R5m) in those communities.

Working with clients

“We are not a long-distance financier. Our branches across the nation not only symbolise our growing footprint but also underline our commitment to being hands-on with our clients, ensuring the success of each project we finance,” says Jackson.

Going beyond financing, TUHF actively nurtures a collaborative and supportive ecosystem for budding property entrepreneurs.

“We encourage interested parties to immerse themselves in the neighbourhood they wish to invest in, to walk the streets, absorb the atmosphere, and identify potential investment buildings. Before developing a business plan, we invite entrepreneurs to engage with us, to share their thoughts and price points, and to benefit from our intimate knowledge of the areas and the lessons we have learnt over the years,” Jackson explains.

He emphasises the importance of leveraging TUHF’s experiential knowledge and the willingness of its community of property entrepreneurs to share their journeys with newcomers. “Our approval process, though thorough, can be quick, and completed within 21 days or less once all information is received. We walk with our clients throughout the entire process, ensuring a robust, sustainable, and commercially viable solution that forms a solid foundation for future growth,” Jackson adds.

As TUHF embarks on its next chapter, the focus is to consolidate its brand, enhance market reach, and continue being a catalyst for urban transformation.

“TUHF’s continued growth reflects the sheer size of the prospering rental accommodation market and the opportunities this market represents in our ‘perfect niche’. With a track record spanning 20-years of financing over 50 000 units and investing over R8,3b into urban housing, we are keen on extending our impact further across South Africa and, beyond the country’s borders by partnering with property entrepreneurs,” concludes Jackson.

The legacy of TUHF over the last two decades sets a solid foundation for its ambitious journey ahead, reaffirming its commitment to shaping vibrant urban communities in every city and town it invests in. ©

The critical role of digitalisation to fast-track INDUSTRIAL DECARBONISATION

AVEVA, a global leader in industrial software, driving digital transformation and sustainability, demonstrated at COP28 how leveraging data in a connected industrial economy can accelerate the path towards a sustainable future.



The AVEVA delegation at COP28.

AVEVA was a gold sponsor of the International Chamber of Commerce pavilion within the Blue Zone of the United Nations Conference of the Parties, in Dubai, UAE, with the aspiration of building bridges between developed economies and the global south.

AVEVA's leaders highlighted how digital solutions can minimize CO₂ emissions of existing industrial infrastructure while maximising efficiency across the value chain and delivering measurable cost savings that can be reinvested in clean technologies.

AVEVA's delegation at COP28 was led by CEO Caspar Herzberg along with Lisa Wee, Head of Global Sustainability; Harpreet Gulati, Senior Vice President, Head of PI System Business; Evgeny Fedotov, Senior Vice President, EMEA; and Nayef Bou Chaaya, Vice President MEA.

Caspar Herzberg, CEO of AVEVA, said: "The world must dramatically cut waste. The industrial sector accounts for a quarter of global emissions. Every day, our customers prove that digitalisation enables industrial companies to drive measurable carbon reductions, including for traditionally energy-intensive industries. At AVEVA, our ambition is to accelerate low-carbon innovation, and to drive circularity and efficiency across the value chain. We want the software we create to transform how industries are designed and how they operate, to accelerate climate action and reduce inequalities. Forging partnerships with businesses, governments and civil society leaders here at COP is critical to build forward-thinking, collective solutions that accelerate climate action, worldwide."

Evgeny Fedotov, Senior Vice President, EMEA, at AVEVA, added: "Collaboration is essential to driving efficient global value chains – collective action is also

essential to drive decarbonization. This is why we want to be part of the conversation at COP28 to advance necessary and inclusive climate progress by building bridges across international communities.

"As a driving force toward a more sustainable world, COP28 is a milestone moment for the world to take stock of its progress on the Paris Agreement. We are eager to engage with world leaders, governments, and our technology peers, to drive insightful discussions on how together, we can accelerate the transition to a sustainable future."

Nayef Bou Chaaya, Vice President MEA at AVEVA, said: "While AVEVA helps industrial customers optimize their existing processes and operations, we drive innovation, opening up new industry frontiers, that leverage emerging green technologies. Our software empowers teams with connected insights so that they can make the best decisions at speed, ensuring the resilience

and efficiency that in turn drive sustainable success. The positive impact our solutions bring to customers is our single biggest opportunity to make a difference in the world." Lisa Wee, Head of Global Sustainability at AVEVA said: "At AVEVA we want to lead by example in the fight against climate change. We have already cut our scope 1 and 2 GHG emissions by 93% and we are actively working to reduce the environmental impacts of our value chain. We have made significant progress in delivering solutions that are low carbon by design and have in-built capabilities to enable industries to decarbonize, drive circularity and adapt to the impacts of global warming.

"Exchanging insights and forging partnerships with forward-thinking businesses, governments and civil society leaders is critical to finding solutions that increase the scale and scope of climate action across the globe. COP28 is an ideal forum to have these discussions, given the breadth of stakeholders convened alongside key national and international policymakers capable of actively contributing to our collective endeavor for decarbonisation."

Harpreet Gulati, Senior Vice President, and Head of PI System Business at AVEVA, said: "Harnessing the potential of green hydrogen could avoid up to 80 gigatons of cumulative CO₂ emissions by 2050, contributing to as much as 20% of total abatement required to drive the net-zero economy.

The hydrogen sector will require a new transportation, distribution, and regulatory approach to operate successfully as an alternative fuel. Combining this with the latest digital twin and AI-enhanced capabilities, industries can discover new paths to drive efficiency and decarbonise." ©

Saint-Gobain signs a major renewable **ELECTRICITY SUPPLY AGREEMENT IN SOUTH AFRICA**

Saint-Gobain Africa has signed a renewable electricity supply agreement (Power Purchase Agreement or PPA) with CVE, an independent French renewable energy producer, to secure about 140 GWH of solar electricity over a 20-year period.

This PPA is expected to cover around 40% of the electrical needs of Saint-Gobain's major production sites in South Africa, namely, Brakpan, Alrode and Germiston in the Gauteng region, as well as the factory in Parrow, Western Cape.

This will offset Saint-Gobain South Africa's CO₂ emissions from electricity by more than 6 800 tons per annum.

"CVE is proud to support Saint-Gobain's renewable energy commitment in South Africa and looks forward to seeing all four projects generating renewable energy," said René Laks, General Manager, CVE South Africa.

Commenting on this PPA, Othman Benjelloun-Touimi, CEO of Saint-Gobain Africa, said: "With this PPA, Saint-

Gobain Africa will further reduce its CO₂ emissions, demonstrating its commitment towards sustainable manufacturing. This renewable energy project is a new milestone on the way to meeting Saint-Gobain's commitment to reduce CO₂ emissions and to reach carbon neutrality by 2050." ☺

ABOUT SAINT-GOBAIN

Worldwide leader in light and sustainable construction, Saint-Gobain designs, manufactures and distributes materials and services for the construction and industrial markets. Its integrated solutions for the renovation of public and private buildings, light construction and the decarbonisation of construction and industry are developed through a continuous innovation process and provide sustainability and performance. The Group's commitment is guided by its purpose, 'MAKING THE WORLD A BETTER HOME'.

Green energy milestone: **GHANA'S LARGEST ROOFTOP SOLAR INSTALLATION EARNS MINISTERIAL APPROVAL**

Powered by Sungrow, Africa's largest rooftop solar installation has received the seal of approval from Ghana's Minister of Energy, Dr Matthew Prempeh-Opoku during his recent visit to the project site located in the Tema Freezone, Ghana.

Owned by Helios Solar Company (part of LMI Holdings), the 16,82 megawatt project utilises Sungrow's cutting-edge SG350HX PV inverter alongside the MV Station MVS4480-LV, Sungrow's technology. Selected by the project's PV EPC and O&M Contractor, Dutch & Co., both components will play a pivotal role in delivering reliable and efficient solar energy solutions, and helping Ghana reduce its carbon dioxide emissions by approximately 11 000 tonnes annually. Sungrow



emphasises the company's dedication to accelerating the development of clean energy power generation system integration.

"The Sungrow team is proud to have been selected by Dutch & Co to provide technical solutions for this project which will be Africa's largest rooftop solar installation. This work aligns with our mission, 'clean power for all' and reinforces our commitment to accelerating the adoption of clean energy solutions and driving innovation in power conversion technology for a sustainable future," states a representative of Sungrow.

Funded by the International Finance Corporation as part of an all-encompassing USD30m clean power and water deal with LMI Holdings, the installation will comprise of 29 261 solar panels using the latest N-type technology across a rooftop area of 92 000 m² of LMI Holdings' IWC Mega-warehouse. Once operational, the solar system is projected to produce 24 750 MWh of clean, stable, and sustainable electricity annually, further solidifying Sungrow's position at the forefront of innovative and environmentally conscious endeavours in the energy sector. ☺



M&D teams shine at top **GOLD MINING OPERATION**

South Africa's top miners entrust M&D Group, a leading multi-disciplinary construction company, with their mining and water infrastructure requirements. Among the group's many mining clients is Gold Fields, one of the world's largest mining companies with eight operating mines in Australia, Peru, Ghana and South Africa, home to South Deep, a world-class mechanised mining operation.

In June 2023, M&D mobilised to South Deep Gold Mine in the Witwatersrand Basin to upgrade the operation's tailing-storage facilities' (TSFs) return-water dam (RWD) and cascade dams. This is in addition to providing the necessary stormwater-attenuation capacity to mitigate the risk of water spillage from the "dirty" water dams. The infrastructure that M&D delivers will enable South Deep Gold Mine to manage "dirty" water at its TSFs according to regulations that prevent pollution of water resources and mitigate the impact of mining on the environment.

The project is being managed by seasoned Contracts Director, Martijn Groot, who has successfully completed a number of projects for M&D.

Notably, his entire team, except for one other individual, comprises new M&D employees. This project has, therefore, also been an ideal opportunity to familiarise the new staff with the company's unique processes, underpinned by important core values that always ensures a successful outcome. These commitments that M&D makes to its clients include:

- To Be Safe
- To Do it Right
- To Find the Best Way
- To Do what we Say
- To Grow Together, or Khula Nathi

"Undergoing a tremendous growth phase, we are bolstering our ranks with highly skilled and experienced construction professionals. As committed members of our team, they will help us to continue achieving our vision of 'growing a Great company with Great People and Great Partnerships'. With 20% of the project already completed, they have demonstrated that they are more than up to the task at hand. Ahead of mobilising to site, members of my team underwent extensive preparation at head-office to ensure that they were closely aligned to our core values so that we again deliver exceptional service to our clients. They now have the opportunity to live them on this worksite," Groot says.

The contract harnesses three group core operational

disciplines, namely Civil Structures, Pipelines and Structural, Mechanical, Piping and Platework.

These M&D Divisions are being supported on this contract by M&D Plant which brings a large fleet of mainly new construction equipment. This sizeable investment in critical plant by M&D Group helps to keep projects on track by mitigating breakdowns. Certainly, it also demonstrates the group's commitment to the success of its clients' capital projects.

Moreover, M&D's pipe fabrication workshop, which was one of the first to have its processes certified to ISO 3834 quality standards, is manufacturing all piping required for the new pumpstations. This state-of-the-art facility also helps to reduce delays by ensuring the timely delivery of quality pipes and components.

Having made a solid start on the contract, M&D anticipates achieving practical completion by the end of September 2024.

Constructed within the footprint of the upper compartment of the existing RWD of TSF 1 and 2, the new RWD will have a capacity of 150 000 m³. It will be lined with a 2 mm-thick high-density polyethylene (HDPE) liner. An underdrainage system will be installed below to limit hydrostatic uplift of the liner. It will drain to a single sump, which will be emptied into the RWD by a duty and standby pump. A concrete-filled geocell will be installed above the liner as a ballast to further reduce uplift.

A concrete-lined silt trap will be installed at the inlet of the new lined RWD. The provision of vehicle access will enable silt to be removed from the silt trap mechanically. Meanwhile, a bypass pipe will divert flow around the silt trap during de-silting operations.

The capacity of the upper compartment of the existing RWD of TSF 1 and 2 will also be raised by M&D. This will be achieved by excavating the upper compartment of the RWD basin to a depth of about 3m below the current spillway level. The existing upper compartment drain inlet structure will be removed and the outlet pipe sealed.

Collector drains will be installed to convey water that

decants from the TSF solution trenches; penstocks; and the South Shaft stormwater channel to the new lined RWD.

The new pumpstation will transfer water to either the gold plant or the reclamation project, via an existing pipeline. There is also the option to transfer the water to the Doornpoort RWD by using the Doornpoort return-water pipeline in reverse up until the “Y-junction” and then via an existing 450 mm-diameter pipeline. Two variable-speed drive centrifugal pumps will be installed inside the pumpstation to efficiently match the inflows to the RWD on demand. Each pump will have the necessary capacity to supply the expected peak demand on their own and, in this way, provide the required redundancy in the system. The delivery pipework will be reconfigured so that one pump can supply the gold plant and the other can transfer excess water to the Doornpoort RWD independently. Featuring electrically actuated control valves and pumps that automatically prime after shutdown, the system will be fully automated. The pumpstation will feature a reinforced roof and walls to safeguard the mechanical and electrical equipment housed inside against theft.

A pipeline will also be constructed to connect the new pumpstation to the existing pipe infrastructure. This is after the existing DN350 gold plant return-water pipeline is first temporarily and then permanently diverted to the west of the new pumpstation.

M&D’s work scope also entails diverting the existing stormwater channel around the pumpstation.

Moreover, the contract includes de-silting, excavating and constructing a foundation for the existing cascade dams, which collect water draining from the TSF 3 and TSF 4 solution trenches from where an existing pumpstation transfers water to the TSF 1 and 2 RWD system. A 2 mm-thick HDPE liner will be installed in both compartments, with an underdrainage system below and a geocell ballast on top that matches that at the new TSF 1 and 2 RWD compartment.

Groot and his team will also demolish the two existing pumpstation suction pipes and inlet structures.

A concrete silt trap similar to the one at the new TSF 1 and 2 RWD will be installed at the inlet to the cascade dams, and it will also feature a mechanical desilting system.

As an example of how Groot and his team are “finding the best way” for Gold Fields, drones fitted with cameras are being used to capture high-resolution aerial images of the construction site. “Our aerial surveys are providing us with an accurate and comprehensive overview of project progress. In this way, we can make more informed decisions and adjustments to the programme that will improve our overall efficiency and quality of workmanship. As opposed to using a third party, we have our own drones and pilots, who also have an intricate understanding of our projects and the expected outcomes. Importantly, they are also closely aligned to our core values,” he says.

At the cutting-edge of technology and innovation, M&D has always been able to easily navigate obstacles, and it continues to develop this capability.

Certainly, this project has

also had its fair share of challenges that have required quick solutions. These include large quantities of silt and unsuitable material on site and hard rock inside the basin that need to be removed. Due to the redesign of the RWD wall layout, additional cut-to-spoil is also required, while Groot and his team have encountered extensive hard rock in the areas where subsoil drainage is being installed.

Therefore, the project is an ideal starting point for the company’s new employees, who have already displayed the necessary grit and an ability to think on their feet, two key traits of typical M&D construction leaders.

Rukesh Raghbir, CEO of M&D Group, says that the mining infrastructure market will remain a key growth driver for M&D. “Miners have continued to invest in projects in the country, with capital spending on assets increasing year on year. In 2023, investment in local mining operations increased to 37% from 18% the previous year. This trend bodes well for the group, which has earned a solid reputation for the very high quality of its civil, mechanical and pipeline infrastructure,” Raghbir concludes. ☺



Pepkor distribution centre (Keystone Park) – SOIL IMPROVEMENT WORKS

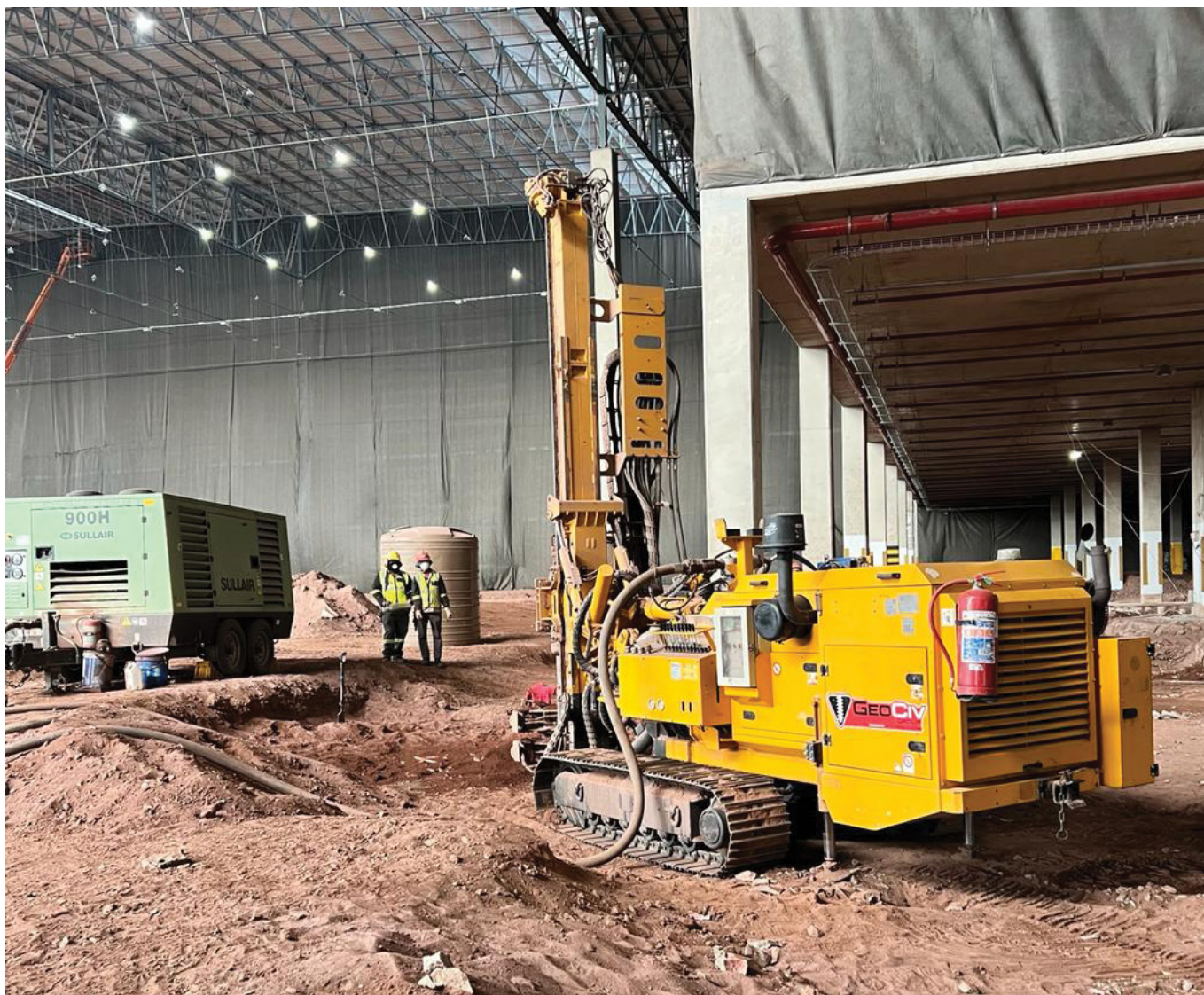
*The new main distribution warehouse for Pepkor is located in the Keystone Park Light Industrial, Warehousing and Logistics Precinct in Hammersdale KZN. The immense 110 000 m² warehouse was constructed as the main, fully automated distribution warehouse for the Pepkor Group. **This project was the winner in the ‘Specialist Contractors or Suppliers’ category in the 2023 Best Projects awards.***

During construction, the structural engineers noticed an issue with differential settlement of the earth platform. Due to the strict tolerances for the automation of the warehouse, the settlement would cause the robotics operating on the warehouse floor to lose track of position and render a large part of the warehouse unusable.

The size of the warehouse meant a large cut-to-fill exercise was undertaken initially to create the platform (+500 m x 350 m) for the warehouse. Three fifths of the warehouse

footprint was situated on sandstone or shallow fills following the in-situ rock profiles. The remaining two fifths of the warehouse was situated on an outer shell of choked rockfill and a wedge of fill that in some instances was constructed up to a depth of 25 m. This was the area that suffered from large settlements, and SOIL IMPROVEMENT was required.

The client went to tender to acquire a turnkey geotechnical solution to stabilise the platform from further settlement. GEOCIV Group submitted an offer that was not only suitable as



NEXT LEVEL

GEOTECHNICAL SOLUTIONS...

GEOCIV GROUP has been a leading specialist in Geotechnical Works, Piling and Lateral Support in Gauteng, South Africa and other SADC nations since 1996. Services and products are on a full design and construct, or construct-only, basis. GeoCiv Group's ability to project manage entirely in-house has enabled us to secure major government and private contracts in the Commercial, Industrial and Residential spheres. It is GeoCiv Group's objective to further develop our experience, growing in a sustainable, controlled manner, and expanding in terms of both geographical coverage and product offerings.

GeoCiv Group management have a combined sectorial experience of more than 100 years in the piling & geotechnical works field. GeoCiv Group operates in a highly specialised market with a vision of being the most efficient **GEOTECHNICAL** company in the Southern Africa region. The business consists of an excellent team of motivated, experienced and highly skilled professionals.

- ▼ **PILING** ▼ **LATERAL SUPPORT**
- ▼ **CONCRETE REPAIRS**
- ▼ **GROUTING** ▼ **MINING WORKS**
- ▼ **ROCKFALL MITIGATION**



a solution but was vastly superior regarding cost, programme, and effectiveness than competitors. Another “Innovative Geotechnical Solution,” says Managing Director Greg Whittaker.

The design for the structure was based on large conventional pad footings as the foundation. The foundations and majority of the superstructure had already been constructed at the time of tender.

Based on further geotechnical studies, it was concluded that the fill consisted of coarse granular material, mainly obtained from the sandstone in the cut area on site. As a result, the bulk fill has numerous sandstone rock fragments up to 400 mm in diameter, making conventional piling problematic. The expected settlement for a well-constructed fill platform on incompressible founding can be in the order of 0,25% of the depth of the fill under its own weight alone. GEOCIV calculated that this would result in settlements in the order of 40 mm to 65 mm in the deepest fill areas. In addition, the floor slab carries a surcharge load of 75 kPa, and the columns a structural load of 150 kPa. Further calculations indicated additional settlements under the floor slab of between 50 mm and 75 mm, and under the columns of 60 mm to 90 mm with the assumption that the fills were constructed correctly as specified.

The tender required a solution to reduce the variable settlement in the fill zone to guarantee a maximum settlement of no more than 25 mm over 20 years. Most solutions are not viable due to the nature of the structure, the depth of the fill, the nature of the fill, and the limited access within the partially completed warehouse. **Rigid inclusions** – a thin slab was designed to transfer the load to the soil, and a piled solution would therefore not work, as the slab could not span between fixed pile positions. GEOCIV therefore proposed the installation of rigid inclusions into the incompressible rock below the fill and in-situ soil.

“In addition, this would require the construction of a 1 m thick soil transfer ‘mattress’ to transfer the load to the rigid inclusions, evenly spreading the support across the surface bed. Where rigid inclusions overlapped the column bases, reinforced underpinning rigid inclusions would have to be installed through the column bases.

Because of the nature of the fill, GeoCiv Group reverted to the installation of rigid inclusions by means of percussion drilling techniques. The nature of the fill and the grouting process would result in a very high friction value on the rigid inclusions, resulting in the full weight of the soil column being transferred to each inclusion. Furthermore, the rigid inclusions would be socketed into an incompressible stratum, which allowed higher loads at each position.

The final design required installation of a total of 6 960 No rigid inclusions installed, and a total of 750 No underpinning piles extending up to 8 m past the footprint of the warehouse externally, to meet the settlement criteria of the fill. This included the engineered soil raft to transfer the load evenly across the total area of the treatment zone.

This system was designed in collaboration with Fisheagle Geotechnique and Eco Elementum Engineering. The design was reviewed by Soilmechanics GmbH in Germany as an independent consultant and finally by Jones and Wagener on behalf of the client. It was ultimately approved in all instances.

After the design process and review was completed, the execution of works was like any construction project, but GEOCIV Group was under an immense time constraint. The client, Pepkor, was at this stage unable to occupy the warehouse as its main distribution centre.

The construction programme was based on completion of the 7 710 No inclusions within a 7-month duration; total metres drilled accumulating to 125 000 metres of percussion drilling



and grouting through the variable fill stratum.

This, including the soil raft and final floor slab was to be completed in record time to mitigate large financial losses for the client. All critical path milestones were met without fault, even with large quantities of redrilled and re-grouted positions due to localised collapse within the fill.

Record keeping to this scale required a team of site engineers, skilled management, and staff, including the management of an independent third-party testing service to confirm the correct installation and reporting.

Rigorous integrity testing of grouted inclusions as well as static load testing were conducted to prove the system with great results. The difficult execution of this project and soil conditions was further complicated by the limited access nature of the existing structure.

In certain areas the contractor experienced headroom constraints, the lowest of which did not exceed 4,5 m, by using our fleet of specialist limited access drilling rigs and custom engineered drilling equipment and grout pumps made the execution of the proposed design possible.

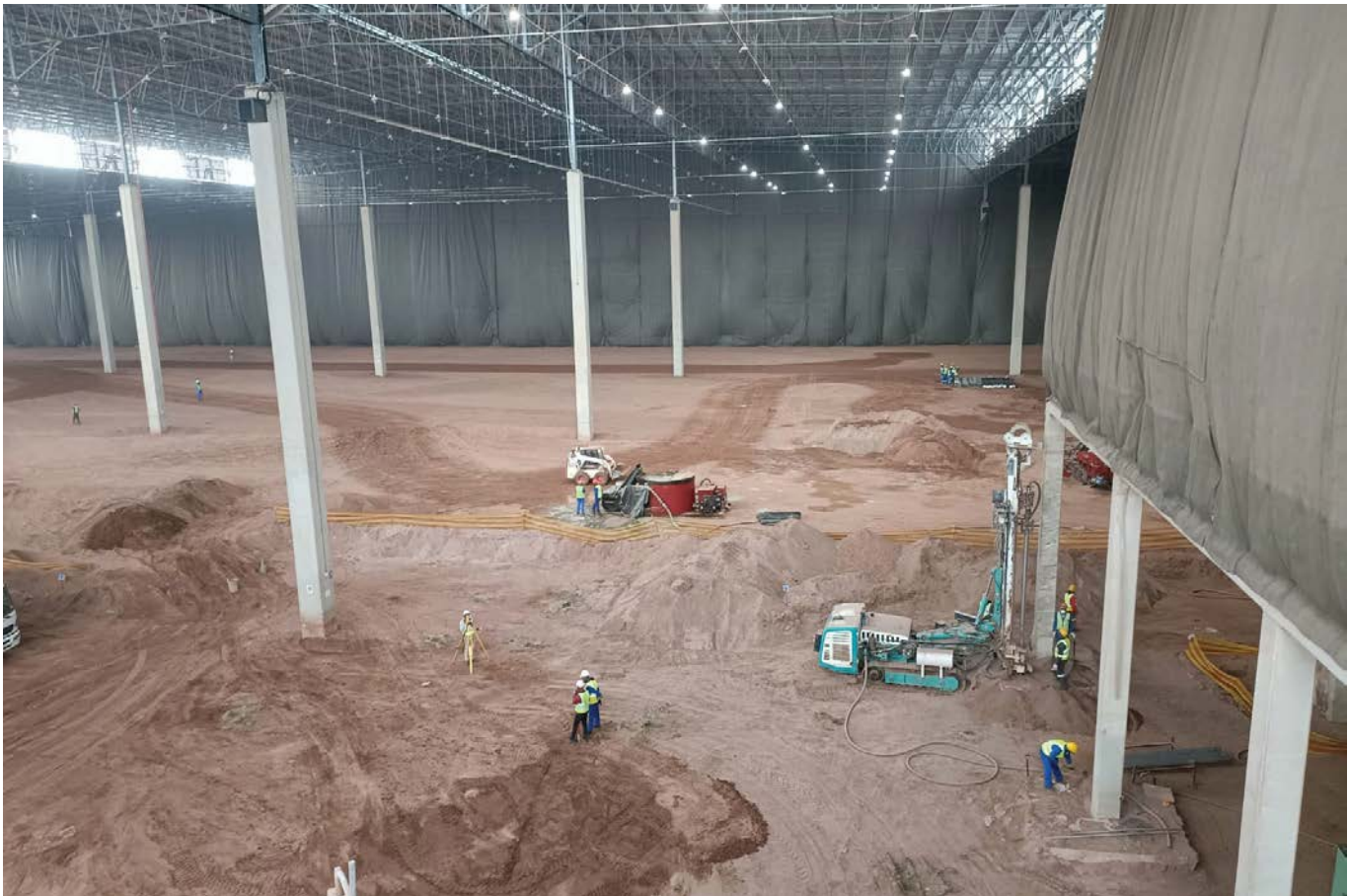
As with most modern construction projects, it is any contractor's duty to get involved in giving back to the community. With the specialist nature of our company's field, it is not always possible to employ large quantities of general labour from localised community wards.

To complete the team for the monitoring and quality control to this scale, the contractor required a team of site engineers. The company took it upon themselves to employ five graduate engineers from the KZN region, who under supervision and design training by Fisheagle Geotechnique, kept accurate records of each borehole and multiple tests completed during the project.

"Coming across a project like this is certainly a once in a

lifetime opportunity," says Jean Breedt, Operations Director – "not only to test the limits of an 'innovative design', but mostly the successful execution of the works with specialist geotechnical rigs and plant, and something that has not previously been done." It also allowed GEOCIV Group to showcase what a team of professionals in their field can achieve if put to the test, to help resolve a very sensitive and urgent problem.

A total of 125 000 metres were drilled and 7 710 No Rigid Inclusions drilled and successfully grouted and tested. The Pepkor Distribution Centre in Hammersdale is currently operating to its full extent and is certainly a masterpiece of engineering prowess and determination, not only with regards to its scope of works, but the majesty of its sheer scale and complexity as a mega structure completed in South Africa. ©



Protecting an **ISLAND PARADISE**

Mauritius is one of the smallest countries in Africa. It has a coastline of 177 km. The island is known for its beaches, lagoons and reefs. It is (or rather was) also the place where the extinct dodo bird once roamed. Much effort is put into conservation of other endemic animals on the island such as the pink pigeon. Not only do we need to protect the fauna and flora of the area, the infrastructure on this small island that spans 2 040 square kilometres also needs to be protected.

Over the last four years, Geobrugg, a Swiss company with an office in Johannesburg, South Africa, has provided protection solutions for various projects on the island. All Geobrugg systems are developed in Romanshorn, Switzerland. The systems are tested under the supervision and in cooperation with research institutes and certification bodies. Geobrugg is available as a full-service provider along the entire process chain on finding solutions to protect people and infrastructure from natural hazard conditions. Geobrugg has been producing systems made of high-tensile steel wire for more than 65 years. The systems provide reliable protection for vulnerable areas and objects in the environment.

Geobrugg aim to achieve the ideal solution by making the best possible use of all components based on our many years of experience and track record of countless successful projects. When it comes to safety, we leave nothing to chance.

Maconde

On the south coast of Mauritius, is the Baie du Cap. The region is known for its natural beauty and its wild, rugged coastlines. The winding road along the basalt cliffs of Maconde was first built in the 1920s. Today the Black River Savanne Coast Road (B9) at Maconde is a popular tourist route that provides breathtaking views of the Indian Ocean.

During the past few years, several rockfalls had occurred during heavy rainfall, endangering road users at the base of the cliff. This had become a recurring problem and, on several occasions, the road had to be closed and traffic diverted through Baie du Cap Chamarel Case Noyale Road (B104). The aim of the Maconde Cliffs project was to stabilise the Maconde cliff over a length of 500 m and to make the B9 road at Maconde safe for road users. The contractor, Sotravic Limitee, had been appointed in 2023. In order to carry out the safe purging of rocks and stabilisation of cut slopes, full road closure of the B9 road was required for a duration of three months. During that time the traffic was diverted through the B104 road. The road closure took place from May 2023.

TECCO Stainless

Geobrugg's TECCO System is an engineered slope protection and stabilisation system which is used to stabilise steep slopes of unconsolidated soils and/or rocky material. It also prevents stones and blocks in disintegrated, loose or weathered rock faces from breaking out. In general, the corrosion protection of the TECCO System must be in accordance with the project-specific requirements. Geobrugg high-tensile wire comes with Zinc-Aluminium (SUPERCOATING) galvanising as standard providing three





Close to Maconde cliffs is another iconic attraction on the island of Mauritius, Chamarel 7-coloured earth. Geobrug's Tecco mesh was used along a section of the B104 road, close to this tourist attraction.



The aim of the Maconde Cliffs project was to stabilise the Maconde cliff over a length of 500 m and to make the B9 road at Maconde safe for road users.



During 2018, the Road Development Authority launched the A1M1 link as part of the Road Decongestion Programme. This 1 km dual carriageway was designed to improve the distribution of traffic within the network of the A1 Road and the M1 Motorway.

times better corrosion protection than zinc galvanised wires. The improved SUPERCOATING A can also be offered as a finish to the mesh. However, where projects are in close proximity to the coast in C4 or C5 environments, a better solution is possible. Geobruigg have undertaken research and development into the use of Stainless steel in the TECCO System and now also provide TECCO STAINLESS. For Maconde, the consulting engineer on the project, Marie Basson (ARQ Mauritius) advised that a stainless steel solution should be used. The TECCO G65/3 STAINLESS is constructed from 1,4462 (AISI 318) marine grade stainless steel. It has a tensile strength ≥ 140 kN/m and weighs only 1,65 kg/m². The TECCO G65/3 STAINLESS is a fully compliant system complete with stainless steel spike plates, connection clips, boundary ropes and wire rope clips all of 1,4401 (AISI 316).

Geobruigg systems can provide the same level of protection as a conventional protective covering but uses less nails. This significantly reduces the installation time and total project costs. The stainless option was designed for use in extremely salty and moist conditions. The increased material costs of TECCO G65/3 STAINLESS is only a small percentage of the total package costs compared with that of a standard galvanised or plastic coated mesh product.

Elsewhere on the island

Close to Maconde cliffs is another iconic attraction on the island of Mauritius, Chamarel 7-coloured earth. Geobruigg's Tecco mesh was used along a section of the B104 road, close

to this tourist attraction. Chinese contractor Sinohydro used a combination of TECCO G65/3 and TECCO G45/2 on this project. To allow for revegetation, a section was protected with an erosion protection mat, TECMAT. The TECMAT stabilises the topsoil layer and prevents plant seeds from washing away. The project was commissioned by the Road Development Authority. This project spanning 7 605 m² was completed in 2022.

In the Moka District, a small section (1 287 m²) was also covered with a TECCO G 65/3 System during 2021. The Road Development Authority (RDA) appointed Keller Geotechnics Mauritius to do the installation at Souillac Bridge almost three years ago.

During 2018, the RDA launched the A1M1 link as part of the Road Decongestion Programme. This 1 km dual carriageway was designed to improve the distribution of traffic within the network of the A1 Road and the M1 Motorway. The design and final layout of the GBE1000 A-R catch fence was completed by ARQ Mauritius, with some input from Melis & du Plessis. The 5m high catch fence was installed by Transinvest-GCC-Bouygues (TGBV) in 2019.

The Geobruigg office in South Africa serves the whole of Africa with custom made solutions. During 2023, the company changed its logo. Those of you who are familiar with Geobruigg, will have noticed the change in our branding since the middle of last year. The previous logo design for Geobruigg was adapted to be in line with the appearance of the logo for the greater BRUGG Group. ©



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Safety is our nature

Gabion Baskets starts second **PHASE AT SILVERSTAR CASINO**

When Gabion Baskets was started in 2006 by Managing Director Louis Cheyne, its products and services were geared towards civil engineering and mining. However, gabion structures are increasingly being used in the architectural segment as their geometric shapes and stone composition lend them to architectural building industries. The company is increasingly involved in the installation of the projects for which it manufactures products and does planning for.



As 2024 commences, Gabion Baskets started on Phase Two at Silverstar Casino. This project builds on the success of the first phase of the project and is testament to Gabion Baskets' commitment to excellence and innovation in construction. *Construction World* spoke to Clinton Cheyne, Operations Manager at Gabion Baskets about how this project builds on the legacy of the company.

Building on a successful phase one

Gabions are best suited for use in civil engineering where it assists with erosion control. It can be used against the sides of river embankments, for retaining collapsible embankments and for the prevention of rock falls next to roads.

Cheyne says that to fully appreciate the scope of Phase Two, it's important to reflect on the achievements of Phase One in 2023. The project set a high standard for quality and innovation, overcoming numerous challenges to create a functional and visually striking gabion retaining wall.

The challenging first phase of the retaining wall for Silverstar Casino was successfully completed in two months (October to December). This venture saw 20 local staff members working tirelessly to overcome significant obstacles.

"The heart of this project lay in the creation of a strong foundation," says Cheyne. "Our task was to replace a failed concrete block retaining wall, standing nine metres high and spanning approximately 40 metres in length. To ensure the stability of this new retaining wall, we began by excavating into the bank, creating a foundation that was three to four metres wide. This base was constructed with meticulous precision, stepping

back half a metre for every metre in height."

Starting from the existing gabion wall on the right-hand side, Gabion Baskets gradually excavated further into the ground, pushing through and creating a sturdy gabion foundation. "We laid geotextile below and behind the baskets after which we could fill, pack, and compact the soil behind the baskets, stepping up and repeating this process all the way to the top," says Cheyne.

A significant challenge that was encountered during this project was the need to move between 300 to 500 cubic metres of fill, equivalent to around 600 to 800 tons of material. "This task impacted our timeline, pushing us slightly beyond our anticipated completion date. The fill served multiple purposes, including backfilling behind the baskets and creating ramps to allow our machinery to access the gabions for filling and compacting," explains Cheyne.

Starting on Phase Two

Despite these challenges, the project was successfully completed

in December. The second phase commenced on 8 January 2024, with the Gabion Baskets team moving in to dismantle the existing concrete block retaining wall.

Phase Two aims to enhance and expand upon the foundations laid in 2023. "It involves constructing a gabion retaining wall with precise engineering and aesthetic design, ensuring both stability and visual appeal," says Cheyne.

Phase Two is a gravity wall, measuring 30 metres in length and six metres in height. Phase Two has now stepped down to six metres but it gradually slopes down.

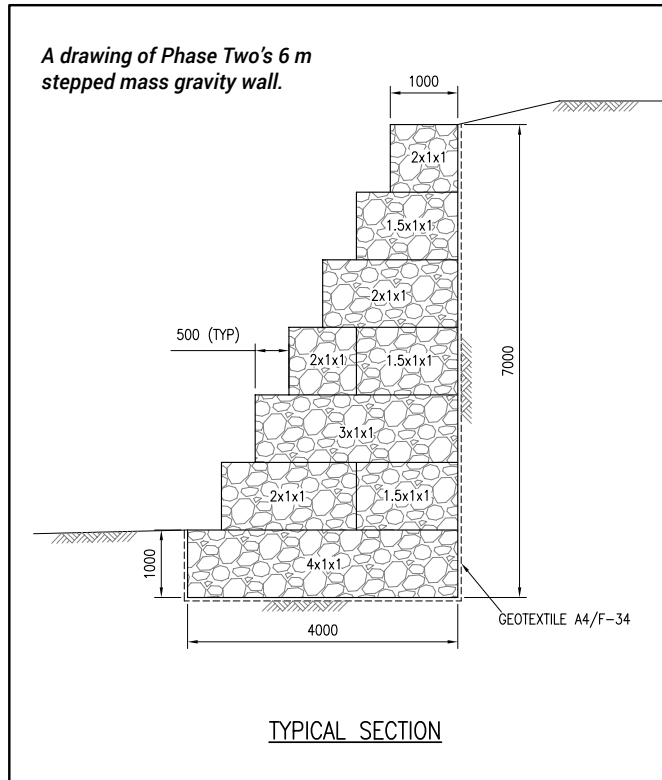
The construction process for Phase Two includes meticulous planning and execution. "Our team is creating a foundation that is three metres deep, with a mass gravity wall standing six metres high. This approach guarantees the long-term durability and effectiveness of the structure," explains Cheyne.

Gabion Baskets is negating the challenges of managing excavation and material displacement with innovative solutions such as the creation of a ramp for backfilling and the strategic placement of fill material.

Cheyne maintains that environmental sustainability remains a key focus in Phase Two. "The use of gabions supports eco-friendly practices, promoting natural drainage and reducing soil erosion, making it a responsible choice for construction.

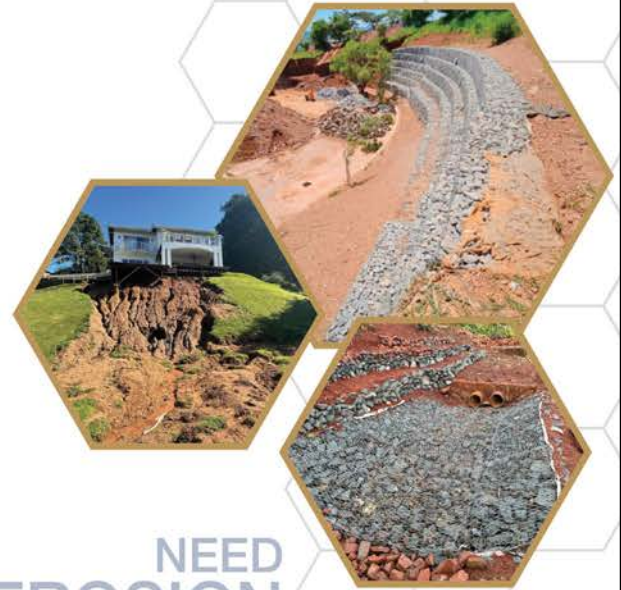
Building on a legacy

"Our legacy has grown dramatically over the past couple of years. We've now diversified into installation, rather than just supplying products to projects. This is one of the biggest installation projects we have undertaken and it is a big achievement for us to be able to handle a project of this size," concludes Cheyne. ☺



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Gauteng Piling paves the way forward for **IMPROVED UNIVERSITY ACCESS**

Gauteng Piling, a leading piling contractor, successfully completed the supply and installation of piling for a river bridge that will be constructed as part of the upgrade of road infrastructure between the University of Venda's (Univen) New Punda Maria gate and Punda Maria Road (R524).

Part of Univen's ongoing investment into upgrading infrastructure to attract more students, the new 1,6km road and river bridge will improve access to the university.

Subcontracted to principal contractor, Tainama Civils, Gauteng Piling mobilised to site on 25 October 2023 to start supplying and installing the 750mm auger piles. On 4 December, the contractor's state-of-the-art piling machine on site was converted to install the sheet piling, which was

completed at the end of January 2024. The project again provided Gauteng Piling the opportunity to demonstrate the extent of its capabilities. This is considering the challenging nature of the contract with its unpredictable soil conditions, consisting of very soft and very hard clayey material; a perched water table; extensive hard rock; and unforeseen boulders.

Lethabo Mashala, Contracts Manager of Gauteng Piling, and her team successfully navigated all obstacles to finalise the



geotechnical work by the contractual completion date.

Mashala attributes much of the project success to interdisciplinary collaboration which facilitates innovative and creative thinking. This is in addition to Gauteng Piling's extensive skills and experience which enable the company to deploy sophisticated techniques.

"A case in point was the use of 10 m temporary casings to mitigate the risk of collapses and the flow of water into the holes, a technique that can only be undertaken by a proficient and seasoned piling contractor. Temporary casings are used to retain the sides of boreholes long enough for concrete to be placed. Once it has reached a level sufficient to withstand ground and groundwater pressures, the temporary casings are removed while additional concrete is placed to maintain the pressure balance," Mashala says. Certainly, rigorous monitoring throughout the duration of the contract also ensured that potential problems were identified and resolved quickly so that the project progressed according to schedule.

A total of 12 auger piles were installed. Reinforcing cages, comprising 10y25 longitudinal bars, each 12 m in length with a y10 outer spiral at a 150 mm pitch, were placed over the full length of the piles and the four 65 mm-diameter ID steel tubes inside the augered holes. These ducts were used to undertake integrity testing of the 30 Mpa concrete placed in the piles.

As is the case with all its contracts, Gauteng Piling adhered to strict health and safety specifications and requirements

throughout the project duration. Mashala is also proud of the jobs that the project created for general and unskilled workers who reside in Thohoyandou.

"We have again demonstrated the importance of dealing with an experienced piling contractor with a comprehensive profile of completed projects. Our workmanship will play a critical role in the construction of a robust bridge that continues to add value over its lifecycle," Mashala concludes. ©



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Fuchs Lubricants South Africa PURSUES ZERO HARM

For FUCHS LUBRICANTS SOUTH AFRICA, maintaining the highest standards of health, safety, and environmental (HSE) responsibility is not just a corporate obligation, it is a way of life. Technical Director Dr. Siphilisiwe Ndlovu (pictured) says the company has embedded these values into its operations and corporate culture.



“We take health and safety very seriously, with an ongoing commitment to monitoring and improvement,” says Dr. Ndlovu. FUCHS’ comprehensive approach is encapsulated in a robust SHEQ (Safety, Health, Environment, and Quality) policy that outlines its goals and objectives. The policy is the guiding document underpinning its health and safety drive.

FUCHS is committed to the overarching goal of Zero Harm to ensure no harm comes to employees, stakeholders, the environment, or the local communities where the company operates. Dr. Ndlovu stresses the importance of employees coming to work and returning home healthy and safe, a philosophy that underpins the entire operation.

“Our health and safety objectives are central to our business strategy, as they guide our operations and decision-making processes,” says Dr. Ndlovu. Health and safety are top of mind at various company meetings, including those with the Managing Director and Executive Committee. FUCHS’ open communication

culture is underscored by Visible Felt Leadership (VFL) sessions whereby management engages directly with employees to understand their experiences and challenges. FUCHS has introduced numerous channels for employee engagement and communication. “We have a Health and Safety Committee with employee representation, regular shopfloor safety meetings, management-level meetings, and monthly safety meetings as key platforms to exchange feedback and discuss safety-related topics,” highlights Dr. Ndlovu.

The VFL programme has proven particularly successful, with both management and executive teams engaging directly with employees, observing practices, and gathering feedback. Dr. Ndlovu points out that the transparency of these sessions demonstrates the effectiveness of the company’s entire health and safety framework.

In addition to direct employee engagement, FUCHS uses various communication tools such as television campaigns, SMS messaging, and memos. The company is also subject to third-party audits and holds ISO certifications for health, safety, and environmental standards.

Reflecting on the company’s proactive response to the Covid-19 pandemic, Dr. Ndlovu explains it acted swiftly to implement necessary measures, including creating a shift system, adopting a work-from-home policy, and enhancing cleaning and sanitisation procedures. “Our highly effective approach allowed us to continue operating without compromising employee safety,” notes Dr. Ndlovu.

Furthermore, the company conducts regular drills and training to prepare for any major incidents. These drills simulate emergency scenarios and are designed to ensure that the company can respond effectively in real-world scenarios.

“Our commitment to health and safety extends beyond the workplace,” adds Dr. Ndlovu. FUCHS considers it a broader responsibility to look after its employees as people and ensure that no harm comes to anyone associated with the company. “Health, safety, and environmental responsibility are not simply corporate policies, but a way of life that begins at home and extends to the workplace,” she concludes. ☺

FUCHS is committed to the overarching goal of Zero Harm to ensure no harm comes to employees, stakeholders, the environment, or the local communities where the company operates.

Khula Nathi "Grow With Us"



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Think Tanks Think TROTECH

ISO-Reliability Partners announces **STRATEGIC PARTNERSHIPS FOR 2024**

A leading provider of reliability and lubrication solutions, ISO-Reliability Partners capped off a highly successful 2023 with a landmark five-year tender to supply Royal Purple premium lubricants to Transnet Engineering for lubrication of high-speed traction motor bearings.



“In the mining industry, we add considerable value to milling and processing plants. We have grown our market share in the open gear lubrication field by onboarding new customers looking to improve production output while lowering operating costs,” notes Craig FitzGerald.

In addition, the company showcased its expertise by demonstrating the enhanced compressor performance achieved by Sasol Synfuels by it adopting Royal Purple Synfilm GT, resulting in improved protection and reduced energy consumption.

“Our success has come with challenges,” adds FitzGerald. The company had to address attempts by unscrupulous competitors to replicate its pioneering Filter Focus branded micro fine filtration technology.

Despite copied products resembling the original, these underperform significantly. ISO-Reliability’s strategy for 2024 involves continued education efforts to inform customers about these imitations and emphasise the superior performance of authentic Filter Focus products.

Another milestone goal for next year is establishing a predictive maintenance platform powered by Artificial Intelligence (AI), in partnership with a leading German AI technology firm. FitzGerald anticipates announcing these partnerships early next year, with the aim to deliver substantial cost-saving initiatives to its client base.

In order to extend its offering and break into the consumer and retail markets for premium motor vehicle lubricants, ISO-Reliability Partners has acquired 100% of Power Performance Lubricants (Pty) Ltd. As a result of this acquisition, the

company now controls distribution of both the industrial and consumer range of Royal Purple’s energy-saving premium lubricants.

In terms of latest trends, FitzGerald says AI “is undoubtedly one of the biggest trends that our industry will see for many decades to come.” The company anticipates leveraging AI for real-time equipment monitoring, providing early insights into potential issues and enhancing safety through reduced human interactions with equipment.

Condition monitoring requires regular analysis performed at predetermined intervals to evaluate changes in machine vibration, wear particle analysis of lubricating oils, and temperature increases through thermographic inspections. Most importantly, it requires human interaction and the use of off-site laboratories, with results often only available up to three days after a site visit.

AI, on the other hand, has the ability to continuously monitor equipment in real-time at a fraction of the cost. It can provide early insights into potential machine issues months before the techniques used at present.

“AI will dramatically reduce the costs associated with condition monitoring, with the added value of safety by eliminating human interactions with equipment. Our solutions provide automated fault reporting with root cause identification and recommendations for fault repair,” notes FitzGerald.

He highlights the industry’s concern about the availability and security of electricity in South Africa. The company aims to address this by offering innovative technologies to improve efficiency and reduce electricity wastage. Its collaboration with Royal Purple of the US, which has developed energy-saving lubricants capable of significantly lowering electricity consumption, is testament to this commitment.

“Dynamometer tests reveal an increase in engine output by around 12% gained by reduced frictional losses through the engine and drive-train,” points out FitzGerald. Friction accounts for 15% of all energy usage worldwide.

Therefore, Royal Purple has developed energy-saving lubricants for a range of industrial equipment. It is capable of lowering electricity consumption by 4% to 18%, while achieving the same production output. “A commonsense approach to friction reduction results in considerable cost reductions,” argues FitzGerald.

Looking to 2024, FitzGerald says his outlook remains positive. ISO-Reliability Partners fosters an environment of inclusion and positivity, with focus-driven goals to grow its valued client base and range of cost-reducing technologies.

“Our employees are the heart of the business. As such, a large effort is made in terms of technical and managerial training to raise the skill level of our employees and add value to the service we offer our clients,” he concludes. ©

The company anticipates leveraging AI for real-time equipment monitoring, providing early insights.

Johannesburg Development Agency BREAKS GROUND ON KLIPFONTEIN WELLNESS CENTRE

A transformative state-of-the-art facility designed to combat drug and alcohol abuse is on the cards in the Klipfontein View community of Ward 32.



The Johannesburg Development Agency (JDA), the City of Johannesburg's infrastructure arm, has commenced with the construction for the Klipfontein Wellness Centre in Midrand, Region A.

This state-of-the-art facility will include a 2175 m² clinic and a 2247 m² Social Development Drug Treatment Centre. The facility aims to provide critical support and services to individuals and families impacted by substance abuse.

The primary objective is to create a haven for young people at risk of drug misuse and those experimenting with drugs.

The Klipfontein Wellness Centre will offer a comprehensive range of services, including advice, counseling, treatment, rehabilitation, and aftercare.

Moreover, it will serve as a hub for community engagement and awareness campaigns aimed at educating our youth about the harmful consequences of substance abuse.

Key Features of the Klipfontein Wellness Centre will include:

- **Comprehensive care:** The facility will house a 2175 m² clinic, offering accessible healthcare services for those affected by substance abuse. Additionally, a 2247 m² treatment center will provide specialized treatment and support for individuals on their journey to recovery.
- **Outdoor Sports Facilities:** As part of the scope of works, the JDA will incorporate outdoor

sports facilities within the center. This will include a soccer field, an outdoor playground, running track and an outdoor gym to promote physical fitness and recreation.

- **Safety and compliance:** The Klipfontein Wellness Centre will adhere to the highest occupational health and safety standards to ensure the well-being of all patients, staff, and visitors.
- **Community engagement:** Beyond clinical services, the center will actively engage with the community to raise awareness about the negative effects of drug abuse, especially among our youth.

"The Klipfontein Wellness Centre represents a significant step toward dealing with socio / economic ills such as drugs abuse, alcohol abuse and unemployment amongst young generation in Joburg," JDA acting CEO Siyabonga Genu said.

"Once completed, the JDA will hand over the Klipfontein Wellness Centre to the City of Johannesburg's Social Development Department," he noted. ☺

The primary objective is to create a haven for young people at risk of drug misuse and those experimenting with drugs.

Cape Town's most iconic building STARTS TO TAKE ROOT AND GROW

Construction has begun on Cape Town's – and Africa's – first-ever biophilic building – The Fynbos. Biophilic buildings blur the lines between nature and the built environment - incorporating elements inspired by our natural surroundings into their design to create spaces that mimic nature, and help to improve the quality of life for inhabitants and users. They also embrace sustainable building practices to the highest degree, meaning reduced energy consumption and carbon emissions.

Once completed, The Fynbos promises to stand as a poster child for biophilic building design and will become an icon in Cape Town's skyline. This truly unique and innovative mixed-use building will stand 24 storeys high on Upper Bree Street in the heart of Cape Town's CBD, and will feature 689 apartments, a rooftop sunset terrace with a lap pool and co-working space, a rooftop fitness centre, as well as a ground-floor plant-based restaurant, a tearoom, and a botanical bar.

Added to this, The Fynbos will also boast a waterfall at the front reception of the building, which will be the starting point of a unique water feature which will run from Buitengracht to Bree Street.

Undoubtedly, one of the most exceptional biophilic design features at The Fynbos will be its exterior, which will be draped in a 1200 m² vertical garden made up of 30 species of indigenous trees and 20 species of indigenous shrubs. The pioneering garden system at The Fynbos was designed by a specialist team of botanists and will be monitored by a highly technical water and nutrient system with automated root scanners, monitored water content and drainage, as well as "flying" gardeners who will manage maintenance externally.

Biophilic buildings set to become the future of inner city living

The announcement made by the developers of The Fynbos, Lurra Capital, that they would be constructing this vanguard building in Cape Town has been met with great excitement and enthusiasm as it heralds the beginning of a new era for South African and African building design, and the future of inner city living.

According to Lurra Capital biophilic buildings are considered the way forward for modern living as they offer a host of benefits, and have the potential to transform concrete jungles into vibrant

and sustainable spaces that prioritize the well-being of residents.

"Included in these benefits is connecting people to nature in an urban environment – which has been shown to improve mental health, reduce stress, enhance productivity and creativity, and increase overall well-being."

"Air quality is also improved through the abundant vegetation, which helps filter pollutants, and reduces carbon dioxide levels. Biophilic buildings often include communal areas such as rooftop gardens or courtyard areas, and these spaced allow residents to connect, fostering a sense of belonging and improving social well-being."

"Basically, biophilic buildings offer a promising future for inner city living by creating healthier, more sustainable, and community-focused urban environments that prioritize human well-being and allow individuals to maintain a vital connection with nature," says Lurra Capital.

According to development managers Gardner Property Solutions, who are working with Lurra Capital in the development of the Fynbos building, some of the sustainable building solutions that will be incorporated into the building include water efficiency through low-flow fittings, well-point filtration, and a sophisticated rainwater harvesting system which will be integrated into the unique cantilevered and staggered balcony design. Integrated PV solar panels will generate double the electricity quota needed to power the common areas, minimising fossil fuel consumption, and a central heated water system allows for economies of scale and avoids individual geysers. Expansive windows and glass sliding doors utilising specialised double glazing will allow in abundant natural light. And the double glazing reduces the amount of energy spent on heating in winter and acts as a sound softener.

"The Fynbos stands as a pioneering testament to sustainable architecture," says Keagan James of DG Properties, sales agent for The Fynbos. "This innovative project has garnered much local and international attention for its groundbreaking approach. The incorporation of green spaces, natural light, and eco-friendly materials not only contributes to the local environment but also serves as a magnet for local and foreign investors eager to support and be part of a project that epitomizes the harmonious coexistence of modern living and nature in the heart of Cape Town."

"We are seeing robust interest in The Fynbos," explains Keith Anderson of DG Properties. "In the last six months, we have enjoyed a steady flow of sales from buyers who are wholeheartedly embracing the arrival of biophilic design to our shores."

"Demand at The Fynbos is strong - despite Cape Town having gone through a particularly bleak winter, coupled with the 11,75% interest rate hike - and we anticipate sales to soar now that construction has begun and the building starts to take shape. The Fynbos will become a destination building of the future and a must-see for visitors to Cape Town." ©



Spun concrete electrification poles offer greater **LONGEVITY AND REDUCE VANDALISM**

There are estimates that over R22b in revenue has been lost due to illegal electricity connections, with over a R7b loss in Gauteng alone. It is not just the loss of revenue that is of concern to suppliers of power or municipalities, there are safety issues as well. Illegal electricity connections are a major cause of electrical fires and electrocutions in addition to the impact on traffic and medical facilities management due to more frequent loadshedding.

In order to install electricity carrying equipment that significantly reduces vandalism while offering an increased lifespan, Lyon and Partners Consultants for the Sicelo Informal Settlement, near Vereeniging, turned to Rocla for the supply of precast concrete spun electrification poles due to their design and manufacturing expertise which would not only safeguard the power installations but also the Sicelo community.

Rocla Sales Consultant, Kevin West said “The implementation of electricity supply to Sicelo was a project that needed a customised electrification concrete pole solution. Our technical team met with the consultants and the engineers for the Sicelo Informal Settlement project and undertook the manufacture and supply of their final design specifications required for this five-phase project.”

“Our ability to customise, manufacture and deliver over 105 concrete spun electrification poles within the required timeframes was a key factor to our successful partnership. We were manufacturing two poles per day for Phases One, Two and Three. We are now in production for Phases Four and Five. A safe electricity supply to informal settlements is a priority. It uplifts the community, and we are a proud partner to Lyon and Partners in the supply of infrastructure that will meet their objectives,” commented West.

Rocla has manufactured and supplied 11 metre/160 mmtp/8.5 kN spun poles and 9 metre/160 mmtp/8.5 kN spun poles. The company is currently manufacturing 9 metre and 11 metre spun poles for Phase Five of the project.

Transmission and distribution power lines in suburban and rural areas need poles that can withstand not only vandalism, but harsh environments and inclement weather in order to ensure the continuous supply of electricity. Rocla’s Spun concrete transmission and distribution poles are well suited to meet the stringent requirements of electrical distribution line construction.

The durability of precast concrete makes it a far superior and sustainable alternative to other options that were presented. Wooden poles had previously been utilised, but were prone to vandalism, fire



and termite attack as well as being an easy target for illegal power installations.

The maintenance free Spun concrete poles are exceptionally strong through 360 degrees, whereas normal cast concrete poles have a major and minor load axis. The unique centrifugal manufacturing process gives a uniform densely compacted concrete along the whole length of the pole. This gives the Rocla Spun concrete pole superior strength properties, not found in cast concrete poles.

Spun concrete transmission and distribution poles offer a cost-effective solution due to small servitude requirements, simple and economic funding methods and a quicker installation turnaround time. They offer a durable, long-term solution with minimal maintenance. Rocla Spun concrete poles systems are ESKOM approved and have been tested at Eskom’s Rosherville Testing Station. “Rocla offers a variety of pole lengths in single, jointed and double pole solutions, and Rocla’s engineering technical team offers technical assistance in the design and customisation of Spun concrete pole solutions to meet specific customer sizing requirements as well as design and manufacture products for non- standard applications,” said West.

“We have supplied Spun concrete electrical distribution poles to windfarms in the Northern Cape. Rocla concrete poles erected many years ago are still standing and structurally sound such as the Rocla poles erected in Harrismith over 30 years ago for Eskom. We are therefore very confident in the efficacy of our product to deliver a cost efficient and sturdy solution for electrical supply applications,” concluded West.

The Rocla Spun concrete poles offer a lifespan of over 50 years. Rocla manufactures a range of concrete pole solutions for electrification, reticulation, telecom masts, lighting, security monitoring and stadium use. Rocla is part of the IS Group which also includes Technicrete. ©

“Our ability to customise, manufacture and deliver over 105 concrete spun electrification poles within the required timeframes was a key factor to our successful partnership.”

Azmet **REACTOR PROJECT**

Fabricating six massive reactors that are over three storeys high in Gauteng and then transporting these more than 2 500 kilometres to a mine in the Democratic Republic of Congo (DRC) - where all 3265 parts fitted perfectly, with not even one of the 26 900 bolts out of place - is a massive achievement.

This is according to Southern African Institute for Steel Construction (SAISC) CEO Amanuel Gebremeskel, commenting on the Azmet Reactor project, a collaborative effort led by Viva Engineering, an innovative and deserving 2023 Steel Awards Mining and Industrial category winner.

“The project entailed the detailed design of complex geometry with finite element (FEM) modelling, and integrated support frame and platform. As such, it exemplifies precision engineering, showcasing intricate design and fabrication processes. To appreciate the complexity thereof, one has to consider how to plan, design and fabricate such huge modular structures ahead of time, in such a way that they can be moved through four or five different countries by road to install on site at the mine,” Gebremeskel says. He goes on to explain that the more conventional approach would be to use heavy concrete tanks; or set up a substantial design office and fabrication works with a highly skilled team, both of which are not readily available locally in the DRC. Using an established South African fabricator based in Gauteng therefore provided a viable alternative - allowing for a

controlled environment and close monitoring to ensure that all construction materials and structures met the required quality and safety standards.

Pouring over the project

The Azmet Reactor project not only involved creating six huge reactors - but also, several other complex tanks, as well as platework and plant buildings.

From a technical point of view, engineers had to consider the design of the vessel in relation to permanent, material, equipment and wind loads. Due to the nature of the spliced connections, these had to be modelled in detail, including all the bolts. Furthermore, as the vessels had to be transported and erected piece by large piece, a lifting study first had to be performed. This focused on the selection of the most appropriate lifting methodology, considering that the reactor components would need to be loaded onto conventional heavy-duty transport vehicles.

On the opposite end, at the mine in the DRC, careful consideration was given to the constructability of the project.



Shaping up and shipping out

Gebremeskel says that the aspect of this project that stood out the most during the judging process was the logistics: “They designed each large structure in a modular fashion, for ease of transport and installation. However, bear in mind that these structures have a diameter of 9,9 metres and a height of 11,6 metres - which is almost the size of a 3-story building!”

The road transportation therefore necessitated exacting tolerances to ensure safe and timely delivery to site in the DRC.

Transport jigs were designed and built to brace the components and reduce vibration during transportation, while meticulous load packing optimised weight distribution for the lengthy trip.

All the components of each reactor were packed so that upon arrival on site, it could be assembled from the designated package. The components also had to be carefully packed in specially designed cradles to optimise each load and minimise the number of loads to site

“The essential brilliance of this project lies in the smooth coordination and orchestration of design, fabrication and erection. This process was perfectly choreographed by the project managers who oversaw the planning down to the finest detail,” Gebremeskel observes.

Reactors are essentially large tanks that are custom-made to remove precious metals from mined ore, and must tolerate a variety of different temperatures and chemicals. A rubber bladder required to protect the steel from these compounds therefore also had to be installed prior to leaving the Viva Engineering workshop in Gauteng.

Here too, Gebremeskel says, adjectives such as ‘innovative’ and ‘ingenious’ come to mind.

“The lining is put on the inside to protect the steel from whatever solvent is being used. As one can imagine, it is necessary to do some fairly detailed mockups and even trial assemblies to test this. The reactors were eventually bolted together. This meant that the lining had to work in a bolted tank rather than a conventionally welded one,” he points out.

Maintaining the continuity of the rubber lining between the bolted faces of each component was successfully addressed, as the project brief explains: ‘The first reactor was trial assembled to prove that the jigs and manufacturing was correct. All six rubber-lined reactors were installed without a single flange hole out of place. Rubber lining is continuous on the bolted faces. This required that the fabrication details incorporated the lining thickness. During fabrication, spacer plates were also inserted in the connections to simulate the lining. Corrosion protection was furthermore applied to the external surfaces of the component’.

Joining quality with manufacturing excellence

Yet another innovative aspect of the Azmet Reactor project is the precision welding required to join the panels during the fabrication process, so they could be bolted together once on site. The level of welding precision and accuracy had to be very high, as the structures could not distort during the transportation process. “A lot of the design had to cover exactly how to lift and maneuver

these large and very heavy modular structures. The most significant load is during the lifting process - as opposed to when they are in use - entailing a very different kind of engineering. The entire design is driven by how one plans to construct and then transport each structure - as opposed to its ultimate application,” Gebremeskel continues.

The benefits of steel in this project were numerous, as detailed in the project brief: ‘The complexity of the reactor geometry is best suited to fabrication in steel. Construction of the reactor in concrete would not be viable due to the complexity of formwork and deployment of plant onto a site of limited size. The benefit of steel for this application is a relatively lightweight structure (compared to concrete), which can be preassembled and trial-erected before being transported to site. This allows for fast and accurate erection in the final location’.

A precise and praiseworthy precedent

One of the chief challenges, according to Gebremeskel, was completing the project on time - as late delivery would have resulted in substantial penalties. Needless to say, timeous delivery was achieved against all odds.

“The Azmet Reactors project represents a veritable feat of engineering – showcasing brilliance of design, logistics and installation – and demonstrating the South African steel sector’s capability to execute structurally and logistically complex projects with praiseworthy precision.

This is indeed a victory for our industry, which could certainly not have been achieved elsewhere on the continent. Considering the number of mines being constructed throughout Africa, the good news is that similar projects will no doubt be required, which our local steel supply chain can certainly deliver,” he concludes. ☺

The road transportation therefore necessitated exacting tolerances to ensure safe and timely delivery to site in the DRC.



The expansion of the Kendal Ash Disposal Facility is more than 80% complete.



Pierre van Vuuren, Concor Project Manager.

Kendal Ash Disposal facility **NEARS COMPLETION**

The Kendal Ash Disposal Facility expansion project, responsible for the storage of ash produced by Kendal Power Station until 2023, has successfully reached over 80% completion. With a projected completion date set for March 2024, this intricate venture is rapidly approaching its final stages.

The Kendal Ash Disposal Facility expansion project, responsible for the storage of ash produced by Kendal Power Station until 2023, has successfully reached over 80% completion. With a projected completion date set for March 2024, this intricate venture is rapidly approaching its final stages.

Led by joint venture partners Concor and Lubocon Civils, the project accelerated its construction schedule over the winter, capitalising on the dry conditions. Concor's Project Manager, Pierre Jansen van Vuuren, highlights the stellar productivity in June and July when the teams committed to continuous 24-hour shifts to gain momentum before the onset of the rainy season.

Spanning a massive area of 2,5 km by 3 km, the project's components comprise the new 65 hectare Ash Disposal Facility (ADF), two dams each for both clean and polluted water storage, silt traps, an expansive 16 km V-drain system, a significant stream diversion and access road construction.

While the stream diversion and majority of the 14 km access roads have been completed, the principal focus now revolves around the ADF and the basins.

The in-situ material is clay soils which calls for a specific construction methodology. Selected stockpiled excavated materials are being used in a double-layered low permeability clay for base protection, topped with carefully selected river sand to prevent liner damage. Cutting-edge drainage and leachate collection systems are incorporated to manage water flow efficiently, emphasising sustainability with dirty water reuse for dust suppression and other ADF activities.

Concor's innovative approach in basin construction employs a

patented PVC concrete formwork system, boosting efficiency by accelerating the casting panel process. This technique is not only time saving but also labour efficient.

Jansen van Vuuren accentuates the rigorous quality control measures in place. Leak prevention is paramount, with electronic leak detection ensuring construction integrity. "Our teams maintain open communication, emphasising the importance of the quality and structural integrity of the project," he adds.

Challenges notwithstanding, the project is gearing up to finalise the liner system installation before the rainy season, with subcontractor Aquatan managing the basins and the ADF concurrently.

Highlighting the human element, Jansen van Vuuren praises the skilled workforce, noting that 852 locals have received training, and the project's local procurement achievement stands at a remarkable 55%.

He says this involvement extends beyond labour, and is aligned with Eskom and the Joint Venture's CSI strategies, which are aimed at giving back to the local communities. By identifying local community recipients and working together with the contractors on its projects, Eskom ensures that the upliftment is extended beyond just employment opportunities.

A good example associated with the Kendal Ash Dump Facility project was the adding of modular classrooms using containers and the fitting out of a kitchen at a local primary school, by the Joint Venture in conjunction with Eskom. This opportunity to give back addresses other needs within the community such as education and nutrition. ☺

The road to tackling South Africa's **HIGH FATALITY RATES**

*Regardless of the season one pressing issue continues to dampen our holiday cheer: the country's infamously high road fatality rate. In the six week-period during 2022/23 festive season alone, a staggering average of 40 people lost their lives every day on South Africa's roads, of whom 41% were pedestrians – nearly double the global average. **By Roelof van den Berg, Chief Executive Officer of Gap Infrastructure Corporation (GIC)***

South Africa is home to the tenth-largest road network in the world, which stretches approximately 750,000 kilometres. Given the extensive reach of this network, ensuring road safety remains a significant challenge. But, while the overwhelming majority of accidents remain the result of human error, the design and construction of roads are also key to improving road safety and eliminating all traffic fatalities.

Safeguarding pedestrians and cyclists

Notably, according to the Road Traffic Management Corporation (RTMC), jaywalking remains the single greatest contributory factor in accidents involving pedestrians, accounting for around one in three of all road-related fatalities. So, to address the critical issue of pedestrian deaths, infrastructure developers must incorporate formal footpaths and pedestrian crossings into designs. Likewise, designs should be carefully analysed and stress-tested to avoid errors that could aggravate the risk of accidents, such as guard rails and poles placed on narrow pavements that may force pedestrians and cyclists into the road.

Additionally, leading infrastructure developers such as Gap Infrastructure Corporation (GIC) actively encourage public participation in all road projects, as these provide vital insights into the needs of local communities and how they will use the road network. Through this participation process, developers can play a role in educating communities on road safety and improving pedestrian behaviour, while ensuring that all designs are fit for purpose, working collaboratively to positively impact and even save lives.

Safer road design and construction

Another major contributor to accidents in South Africa is speeding. But, through meticulous planning and best design practices, professional infrastructure developers such as GIC can reduce risky behaviour and encourage sensible driving with speed-calming measures. These could include narrowing lanes by extending the size of sidewalks or creating pedestrian refuges, or introducing measures such as chicanes, speed bumps or roundabouts. However, these measures must be balanced with an eye to traffic flow and distribution so that they do not create unnecessary bottlenecks. Through employing advanced engineering techniques and materials, developers can further

help to manage dangers such as wet or slippery road surfaces, which remain the greatest environmental risk to local road users. For instance, developers like GIC can implement robust stormwater management and drainage systems with hardwearing materials that are resistant to water damage, reducing long-term maintenance costs while lowering the threat of flooding. Stormwater drainage is also essential to reducing hazardous potholes, creating gaps in pavements that allow water to seep through rather than pooling and corroding the roadway.

The design of the road itself is also critical to its durability and ability to resist wear and tear. When the elevation of a road's crown is excessively high, the impact of concentrated traffic can lead to the creation of longitudinal indentations, resulting in the accumulation of water. Conversely, if the crown is too low, it causes small hollows where water can gather and potentially weaken the roadbed.

Supporting commuters

Among the other top 10 contributing factors to road fatalities in South Africa listed by the RTMC are head-on collisions, poor road visibility, and substandard road surfaces. However, the risk of accidents diminishes significantly where infrastructure developers work to manage roadside hazards like trees or fixed objects, physically separate opposing traffic, and promote adequate visibility for all motorists and road users.

For example, developers can employ high-quality illuminated paint for lane separation and directional signs, along with durable road studs and textured speed humps that are specifically designed for nighttime travel. These measures serve to regulate traffic flow and reduce the likelihood of single-vehicle accidents and collisions. Furthermore, as the government works diligently to roll-out new roads and upgrade gravel roads in South Africa's informal settlements and rural communities, GIC has been fortunate to work with many public sector partners on projects.

These enhancements bolster local infrastructure, mobility, and access to basic necessities. Ultimately, a multi-faceted approach is imperative to curbing persistently high road fatality rates.

Through the proactive efforts of infrastructure developers in collaboration with public partners, we can realise the dream of a zero road-fatality future, ensuring the safety and well-being of all road-users. ©



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CHRYSO plasticisers allow a mix design to be optimised, giving more open time to the fresh concrete.



Right admixtures ensure quality **CONCRETE IN ALL WEATHER**

For the contractor, extremely high or low temperatures are two of the biggest challenges when trying to achieve a quality concrete with the required strength and sufficient setting time.

The good news, according to Patrick Flannigan, Technical Manager at CHRYSO Southern Africa, is that admixtures are available to help concrete to perform in these conditions. Flannigan also addresses the need to optimise of the open time of concrete to allow for transporting, placing and finishing.

“Generally, the higher the temperatures of the concrete when placing, the higher the initial strength development – but the lower the long term strength,” he explains. The hot weather will also reduce the open time of the concrete; this means it must be placed more quickly, which can create problems if it is being transported over long distances.

“The opposite is true in cold weather concrete, although only limited to small areas in Southern Africa,” he continues. “When initial concrete temperatures are low, the initial strength gain will

be reduced but the later strength will show high gain.”

He points out that when temperatures drop below 5°C, the hydration process slows down and this could cause the prolonged extended bleeding. When temperatures drop even lower, there is a risk that the water in the concrete will freeze.

“When water freezes, it expands by approximately 9%,” he says. “If concrete has not reached sufficient strength, there is a strong possibility that the freezing water will cause the concrete to crack.”

Faced with these kinds of challenges, contractors and other concrete users can turn to CHRYSO’s range of purpose-designed admixture solutions. When ambient temperatures are very high, there are a number of strategies that contractors employ, from cooling the construction materials to using ice to chill the water. However, these can be costly and difficult to apply, especially



CHRYSO high performance water reducing plasticisers reduce water content, ensuring workability and strength while increasing the slump.



CHRYSO plasticisers deliver a flowable concrete that is easily pumpable with a long workability retention despite temperatures up to 40 degrees Celsius.

on remote sites. “An easier solution is to use the CHRYSO® Tard range of plasticisers, which is well developed and used to ensure enough open time when increased temperatures start becoming a problem,” he says. “As a retarder, it slows down the hydration of cement by momentarily blocking the surface of the cement particles and delaying the time of initial setting.”

At the other end of the scale – where temperatures are low – the CHRYSO® XEL range of chloride and non-chloride accelerators can help with early strength gain of concrete. When there is risk of water freezing, CHRYSO® Air can help by adding extra voids to the concrete; when water freezes, it will expand in the capillary openings that the air entrainer has created, preventing the concrete from cracking.

Heavy rainfall is another common aspect of extreme weather conditions, and often brings flooding. Concrete that is in contact with standing or flowing water needs to be protected, especially in terms of its finishing process. Although no admixture can help with damage that rain may cause on the surface of the concrete, CHRYSO® Aquabeton can be used for underwater concrete.

Flannigan highlights that solving the challenges of heat, cold and water must be accomplished while addressing other pressing industry priorities – such as the concrete’s carbon footprint.

“With the growing focus on sustainability, there is actually more than just one priority to focus on,” he explains. “As CHRYSO, we focus on helping customers to reduce the CO2 emissions related to their concrete.” An important way that admixtures do

this is by allowing for less water in concrete. Conserving water is a sustainability benefit on its own, but reduced water in cement means a reduced cement content – and therefore less associated carbon emissions. A further contribution to sustainability is by using local aggregates whose clay content and unfavourable grading would previously have disqualified them from use.

“We can now use locally sourced aggregate that was previously deemed not suitable for concrete due to the high clay content, for instance,” he says. “To prevent materials having to be transported from far away, admixtures can be specially designed and adapted to cater for all the needs for specific project or customer.”

He describes the shift in the admixture industry from using older generation products towards using polycarboxylates. This trend has changed not only what admixtures can achieve, but also how they can be put to use.

“Admixtures can now be specially developed for a certain type of cement and construction material,” he says. “With the global drive toward sustainability and the reduction of carbon emissions, admixtures now play an important role in allowing locally sourced material to be used; this cuts transport distances and therefore keeps vehicle emissions to a minimum. In doing so, the focus can be placed on Scope 1, Scope 2 and Scope 3 of CO₂ emissions.”

In a recent solar energy project in the Northern Cape, for example, the contractor had to deal with extreme conditions where temperatures reached below zero in winter and 30 to 40° in summer. Alongside this challenge, the area was known for its difficult aggregate.

“The project needed a special mix for extended retardation in concrete slide operations,” says Flannigan. “The progression of the slide also coincided with a change in seasons, and big difference in temperatures; to cater for all these factors, a CHRYSO® product was adapted and successfully applied on this project.” ☉

Doka sets standards in European **BRIDGE CONSTRUCTION**

Doka has made a name for itself with formwork solutions for exceptional bridge constructions. Recent projects such as the Aurach, Jaruga and Aftetal bridge in the heart of Europe show that thanks to Doka's expertise, the infrastructure projects of tomorrow are already being built today. They are being developed in Doka's in-house competence centre at the company's headquarters in Amstetten by a team of highly qualified engineers, who are involved in the largest bridge projects with the most diverse construction methods.



Building a bridge is a long-term project that requires professional planning if it is to be completed efficiently, quickly and economically. For this reason, Doka set up its own competence centre “Global Expertise Centre Infrastructure” in 2006, dedicated to comprehensive project management in bridge construction. The key to strategic success in the realisation of numerous megaprojects in over 60 countries is the competence centre’s highly qualified team. These experts work with regional representatives to plan the implementation of major bridge projects – from composite bridges to prestressed concrete bridges. The team is constantly looking for new ways to develop even more efficient and sustainable solutions for construction customers worldwide. These include the Doka cantilever formwork traveller and the Doka UniKit universal engineering kit for heavy loads, with which even the most challenging bridge projects can be mastered successfully.

Innovation leads to success

Modern formwork systems are adaptable, versatile and can be easily combined. For instance, they can be used initially to form retaining walls or pier foundations and then to form pier shafts. Furthermore, the extensive Doka product range offers the best formwork solution for different bridge construction methods. The Doka Cantilever Forming Traveller is particularly suitable

for large-span superstructures, as it constructs bridge sections symmetrically on both sides. For a safe and fast construction of composite bridges, where the deck consists of both concrete and steel structures, Doka applies the Composite Forming Carriage. Doka’s universal engineering kit UniKit is ideal for handling high loads across any span. A clear advantage of these formwork systems is that they are made up of standardised rental components that can be reused on other construction sites.

The following international projects show how expertise and sophisticated solutions can make an impact:

Aurach Bridge: exemplary bridge refurbishment

A team from Doka’s Austrian national organisation and engineers from the Doka Global Expertise Centre Infrastructure collaborated to develop a tailor-made project solution for the extensive renovation of the 50 metre high and 420 metre long Aurach Bridge in Regau. As the highest bridge on Austria’s A1 motorway, it carries around 50 000 vehicles at peak times. So, despite the ongoing construction work, traffic must continue to flow across the Aurach valley. In order to ensure this, a new structure will be built parallel to the existing bridge, to divert traffic temporarily. Ultimately, the new bridge will be constructed to withstand significantly higher loads and to provide a functional and reliable traffic link across the Aurach Valley for the next hundred years. The Cantilever Forming

Traveller will act as support structure and formwork during the construction of the new bridge, ensuring fast – and safe – progress.

Jaruga Bridge: focus on 3D digital planning

The total length of the Dumanja Jaruga Bridge is 500 metres, with a maximum span width of 120 metres. Most of the viaduct was formed using four Cantilever Forming Travellers. The adjustments that had to be made to support the transverse inclination were a challenge for the formwork, as the highway had to be adapted to the S-shaped curve. Various components from the UniKit engineering kit were used to form the foreland zone. In addition to the Doka UniKit tower 480, both UniKit primary and secondary beams were used, as well as customised SL-1 towers. Doka added significant value through digital formwork planning in 3D design, checking for potential collisions and promoting smooth collaboration. This resulted in shorter planning times, cost savings and increased site safety.

Aftetal Bridge: mastering complex bridge geometry

The Aftetal Bridge is a composite bridge between Brilon and Paderborn. Due to its height, pier geometry and massive pier heads, as well as its length and span, it is one of the more challenging structures. The complexity of the bridge geometry also increases the demands on the formwork. The German flagship structure was planned in collaboration with Doka's German national organisation. Due to the demanding construction requirements, Doka developed individual solutions to ensure process reliability, schedule adherence and cost management. The use of Doka formwork solutions resulted in a

40% reduction in material consumption and a 30% reduction in construction time. A perfect example of minimising the ecological footprint whilst maintaining quality.

Rotterdam: Supported by Doka UniKit

The universal UniKit engineering kit for heavy loads was used throughout the construction of the new 1.1 km link between the A16 and A13 motorways in Rotterdam. By applying formwork solutions consisting of UniKit secondary beams and a tailor-made reinforcement area, all of which can be reused despite the different geometries, bridge segments were cast, lifted and moved over the ongoing motorway traffic with the incremental launching method. Doka's expertise was also instrumental in creating the fair-faced concrete formwork that is now part of Rotterdam's cityscape.

Västlänken: Pioneering transportation

The Västlänken project in Gothenburg, Sweden, involves an underground rail network that will carry commuter and regional trains through the city and connect three new train stations. Part of the project is the construction of the Olskroken bridge. To form the composite bridge with ParaTop, Doka developed a special formwork shoe that ensured optimum load distribution on the steel structure when pouring concrete.

A combination of UniKit primary and secondary beams, supported by an SL-1 construction, made it possible to form bridge sections with spans of up to 22 metres. The finished bridge consists of two parallel highways, each approximately 100 metres long and 6 metres wide. ©

Aurex Constructors ADDS A 70-TON LIEBHERR CRANE

Aurex Constructors, a leader in Construction, Turnaround and Maintenance services in South Africa's energy sector, is proud to announce the acquisition of a 70-ton Liebherr all terrain crane to bolster its asset fleet.

The strategic acquisition of this crane marks a significant milestone in the company's ongoing efforts to provide cost-effective and reliable solutions to its range of customers. The crane is a cutting-edge heavy-duty lifting solution designed to meet the demands of complex and diverse projects.

Aurex Regional Director of South Africa, Delvin Bühler says, "One of the key advantages of this acquisition is the potential of guaranteeing equipment availability when it is needed most. Owning this crane allows Aurex to maintain tighter control over scheduling, ensuring ready access for projects without the dependence on external factors." Aurex remains dedicated to innovation, customer satisfaction, and the continued growth of its capabilities. The company looks forward to the positive impact this addition will have on both current, and future projects, with its first project already lined up in January 2024. ©



ABOUT AUREX CONSTRUCTORS

Aurex Constructors is a leading player in South Africa's construction, turnaround and maintenance industry with more than 40 years' experience serving blue-chip customers in the oil & gas, mining & metallurgy, infrastructure, petrochemical, conventional power, and renewable power sectors. The company offers a comprehensive range of services, including civils, structural, mechanical, electrical, instrumentation, piping, platework (SMEIPP), fabrication and management services, catering to projects of any scale and complexity.

Ctrack's role in transforming mining OPERATIONS WITH EDGE TECHNOLOGY

In the dynamic and challenging world of mining, Ctrack is pioneering change with its advanced edge technology and data insights. Specialising in asset management, Ctrack is redefining mining operations, turning them into paragons of efficiency and productivity. Central to this revolution is the strategic use of data, now considered the new gold in the mining sector.

Mining environments, known for their harshness and unpredictability, demand robust and adaptable solutions. Ctrack's integration of advanced edge computing and data technologies is pivotal in this context. Edge technology, in particular, involves processing data directly on mining vehicles and equipment. This on-site data processing capability enables real-time analysis, offering immediate operational insights. For mining companies, this translates into more efficient monitoring of vehicle and equipment performance, improved predictive maintenance, heightened safety measures, and enhanced overall operational efficiency. The role of edge technology is transformative, empowering faster decision-making and reducing dependence on remote data centres, a significant advantage in remote or challenging mining environments.

The essence of mining success lies in the meticulous monitoring of a broad spectrum of assets. Ctrack's technology provides real-time monitoring capabilities extending from regular vehicles used for transportation and administrative purposes to large, heavy-duty machinery like excavators, drills, and bulldozers. This comprehensive monitoring includes essential safety equipment and critical infrastructure elements such as conveyors and pipelines. Such diverse and detailed asset tracking is fundamental for proactive maintenance and ensuring safety across the varied terrains of mining operations. Immediate access to data and performance metrics across all these assets enables quick responses to emerging issues, thereby enhancing strategic planning and bolstering safety protocols throughout

the mining site. Moreover, the integration of edge technology in mining heralds a new era of productivity, with implications far beyond mere economic gains. For mines employing advanced edge processing solutions, increased productivity equates to more efficient extraction processes, better resource management, and reduced operational costs. This aspect is particularly vital in a sector where profitability fluctuates with market and regulatory changes. Higher productivity not only speeds up project timelines but also fosters a safer work environment and contributes to broader economic development through job creation and community involvement.

Ctrack's solutions also extend to optimising key operational parameters, including fuel consumption, machine utilisation, and overall productivity. By meticulously recording and analysing data such as machine speed, and driver performance, Ctrack aids in resource management and cost reduction, maintaining competitiveness in the mining sector.

In addition to its wide-ranging asset-tracking capabilities, a key strength of Ctrack's technology is its bespoke nature, allowing it to be tailored to the specific needs of different clients. Recognising that each mining operation has its unique challenges and requirements, Ctrack offers customisable solutions designed to meet these diverse needs. Whether it's adapting to different types of vehicles and machinery, varying operational scales, or specific environmental conditions, the technology can be fine-tuned to ensure optimal performance. This flexibility ensures that every client can benefit from a solution that not only addresses

their current demands but is also scalable and adaptable to future changes and challenges in their operations.

Ctrack's role in mining transcends traditional tracking; it embodies a strategic approach to utilising data for operational excellence, safety, and sustainability. As mining operations delve deeper and confront increasing challenges, the importance of data and technology in driving innovation and efficiency has become more pronounced. Ctrack's solutions stand as a testament to the transformative power of data and edge technology in revolutionising the mining industry, marking a significant step not just toward operational efficiency but also towards economic resilience and societal progress. ©



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