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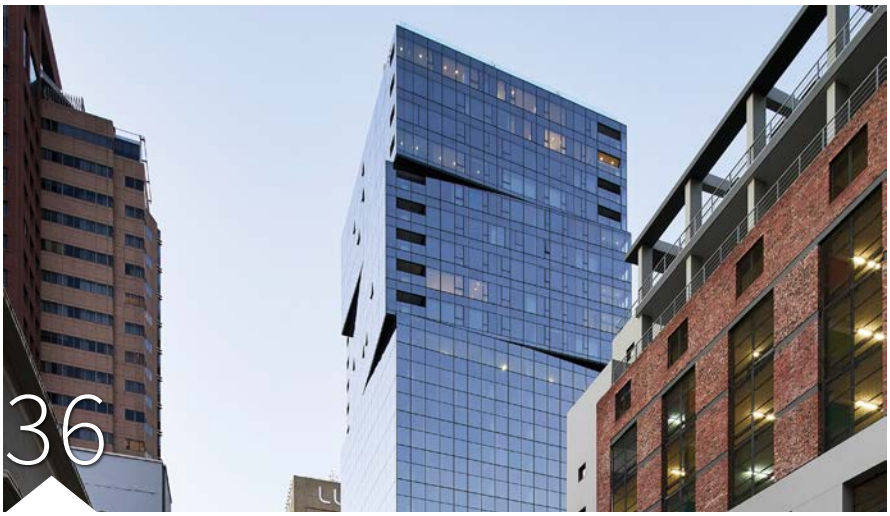

ON THE COVER

Throughout its 90 years, construction materials leader AfriSam has been an active champion of leading edge technology and global best practice in South Africa; from high performance materials and durability standards to advanced mixes and sustainable solutions, it has over the decades become a pillar of the construction sector.
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Over the last few years the construction landscape in South Africa has changed rapidly to now include technologies like Building Information Modelling (BIM). This technology is changing how projects are planned and executed – and can be applied to civils and building. BIM is by no means limited to building, but infrastructure projects have been slower in the uptake.

BIM streamlines processes and enhances collaboration in the delivery of projects. It is an IT "enabled approach that involves the application and maintenance of a fundamental digital representation of a building and all its information throughout the different stages of the project".

Simply put, BIM is a digital representation of a building or structure's physical and functional characteristics. Various aspects, which have up to now largely been worked on separately, are integrated. These include architectural design, structural engineering, MEP (mechanical, electrical, plumbing) systems, and construction sequencing. This technology enables stakeholders to visualise, simulate, and analyse the entire project lifecycle.

The process obviously fosters enhanced collaboration between all parties concerned – from stakeholders to engineers to contractors, and makes design and planning more efficient as architects, engineers and contractors can create 3D models to simulate the real conditions. This enables troubleshooting in the planning and execution of the project and leads to cost and time savings that will have a direct impact on the bottom line.

It seems like a win-win situation, but in the labour-intensive construction industry, BIM is often viewed as 'too much' of a winning technology against which there is a fair amount of resistance – especially in infrastructure projects where BIM is viewed as a threat to employment and traditional workflows.

However, the momentum to embrace BIM in South Africa is slowly growing, with the recent BIMHarambee 2024 that focused on preparing people and organisations to be 'Fit for BIM? - People + Business'. It addressed two critical aspects of mature BIM adoption and implementation: People (skills, roles and responsibilities) and Business (organisational changes necessary for digital transformation).

At this event it was highlighted that cities like Cape Town are leading the way by adopting BIM for managing their municipal infrastructure. Cape Town's Transport and Urban Development Authority is leveraging BIM to improve the planning, design, and maintenance of public infrastructure.

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Importance of engaging civil engineering companies AND CONTRACTORS REGISTERED WITH BCCEI

When it comes to infrastructure and civil engineering projects, the importance of selecting companies registered with the Bargaining Council for the Civil Engineering Industry (BCCEI) cannot be overstated.

This registration signifies a commitment to adhering to established wage agreements, fostering fair labour practices and ensuring a stable and ethical industry. Prioritising these companies that are in good standing is crucial for the economy for several compelling reasons.

All civil engineering companies and contractors, including many of those working within the surface mining sector, are bound by the wage agreements set forth by the BCCEI, and are furnished with a Letter of Good Standing by the Council. This ensures that employees receive fair compensation, aligned with the legislated minimum wage standards. By maintaining these standards, companies that are in good standing help ensure fair compensation, enhance worker morale and productivity, and reduce income inequality. "Fair wages contribute to higher job satisfaction, which in turn boosts productivity and overall project quality," says Lindie Fourie, Operations Manager at the BCCEI.

The adherence to wage agreements by registered and compliant companies ensures that contracts are not secured through unethical cost cutting measures, such as underpaying employees. This is critical for creating a level playing field where companies compete based on the quality of their work and efficiency rather than exploiting labour costs.

"Ethical labour practices lead to sustainable business models, which benefit the industry in the long run and help stabilise the market, ensuring that all players have an equal opportunity to succeed," she says.

When projects are awarded to companies that are in good standing with the BCCEI, it drives the entire industry towards higher standards. This encompasses not only fair wages but also compliance with safety regulations, investment in training and development and quality assurance.

These companies are more likely to adhere to safety standards, reducing workplace accidents and promoting a culture of safety, and such compliant companies significantly reduce the risk of job stoppages and unnecessary delays on a project.

Further, Fourie says, ensuring fair wages allows companies to invest in their workforce through training and development, leading to a more skilled labour force. Higher standards in labour practices often translate to higher quality in project execution, benefiting clients and the community at large.

The positive impact of engaging companies that are compliant extends beyond the industry itself. It contributes to broader economic growth by creating more job opportunities and reducing unemployment rates, especially at a time when South Africa needs this most. It also increases consumer spending as workers receiving fair wages have more disposable income, which stimulates demand for goods and services in the economy.

A stable, ethical industry is also more attractive to investors, leading to increased investment in infrastructure and development projects. "By prioritising companies that are registered with the BCCEI and adhere to BCCEI regulations, we not only support fair wages but also drive economic growth through job creation and increased consumer spending," Fourie emphasises.

"Lastly, choosing companies that adhere to BCCEI regulations reflects a commitment to corporate social responsibility, and demonstrates the industry values ethical practices, community engagement and long-term viability," she continues. "These companies are seen as responsible employers who value their workforce, strengthening the relationship between companies and the communities they operate in, and such ethical companies are more likely to be viewed as long-term partners in development, fostering ongoing economic collaboration." ⊙

JOHN DEERE

AFGRI EQUIPMENT

50 years of innovation AND EXCELLENCE

This year marks a significant milestone for Databuild as the company celebrates 50 years of continued commitment to innovation, excellence, and service in the construction industry. Founded in June 1974 by Peter and Matilda Burger in the garage of their Bryanston home, Databuild has evolved from its humble beginnings into a key player in the construction and allied industries.

The Burgers started Databuild as a lead tracking service, manually collecting and disseminating information on residential projects. Matilda reminisces, "I did the phoning during the day and the typing at night. We covered domestic and non-domestic projects, using whatever information we could obtain from the municipalities. If we couldn't find an address in the telephone directory, I would call local pharmacies to ask if they knew the homeowner. It was very antiquated, but it worked."

The company's dedication to providing reliable information quickly paid off. By 1992, Databuild had embraced new computer systems, allowing them to sort information according to clients' specific needs. Projects were automatically sorted and faxed to clients, marking the beginning of Databuild's journey into the digital age.

In 1996, as Peter and Matilda emigrated to America, Databuild was sold to BillCad, a newly listed company specialising in construction software. After a few years, the leadership torch was passed to Morag Evans, who became the Managing Director and later the CEO. Under her visionary leadership, Databuild joined the Centric Group in 2002, becoming the first of seven companies in the group.

Embracing technological advancements

The early 2000s were a period of significant transformation for Databuild. In 2005, the company launched Webleads, now known as Databuild Online, providing clients with access to specific project information from anywhere via the internet. This move revolutionised the way construction project information was accessed and used, laying the foundation for future innovations.

Today, Databuild offers a comprehensive suite of services designed to meet the evolving needs of the construction industry. From project lead generation and sales management systems to product promotion and market intelligence, Databuild is a key strategic partner for the construction and allied industries.

Looking ahead

As the company celebrates its 50th anniversary, Evans reflects on its journey from a small garage operation to a leading industry partner in construction. "Our mission has always been to provide our clients with the most accurate, real-time data to help them grow their businesses. Innovation is in our lifeblood, and we will continue to explore new technologies, opportunities, and approaches for the next 50 years.

"We would like to extend our deepest thanks to our loyal clients, dedicated employees, and supportive partners. Your trust and confidence in Databuild have been instrumental in our success. As we celebrate this golden milestone, we look forward to the next 50 years of shared success and continued partnership." ⊙

ABOUT DATABUILD

Databuild is a knowledge hub for the construction and related industries and acknowledged as the source of all intelligence required by all stakeholders in the industry. The company supports this expertise with a spectrum of services, including its flagship offering Databuild Online, a dynamic and detailed online database of contacts, projects and tender opportunities available in South Africa and other African countries. Clients have access to reliable and real-time information to proactively and timeously market products and services to the right industry players and thus increase business opportunities throughout the industry supply chain.

Prioritising the **NURTURING OF YOUNG TALENT**

Youth unemployment stands at a staggering 45,5% for individuals aged 15-34, significantly higher than the national average of 32,9% in the first quarter of 2024, as reported by Statistics South Africa. Furthermore, the annual panel data highlights that young people who have some work experience are much more likely to move from being unemployed or inactive to being employed between quarters.

GVK-Siya Zama is taking proactive steps to tackle the skills drain in South Africa's construction sector by fostering and retaining young talent. The company's strategic initiatives centred on professional development, innovation, and mentorship, address industry challenges and shape the sector's future.

Thabang Mathabathe, a 24-year-old Quantity Surveyor intern with a Diploma in Building Science from Tshwane University of Technology, reflects on his internship at the company: "Since joining as a Quantity Surveying intern, I've had the opportunity to learn from various industry professionals and take on significant responsibilities."

Mathabathe continues, "The day-to-day experiences have only strengthened my ambition and taught me the essential practical skills of a good quantity surveyor. Job satisfaction is a significant benefit and being part of a team that contributes to successful projects brings a sense of accomplishment. I am proud to be part of the construction industry and to say I am one in #BuildingStrength," quoting the company's slogan.

Fezeka Mpongwana, a 27-year-old Civil Engineering intern from the Mthatha campus of King Sabata Dalindyebo TVET College, says despite the challenges facing the South African construction industry, she remains passionate and optimistic about her role in it. "My journey in this industry has been good as I continue to learn and grow in my career. I enjoy collaborating with others and find great satisfaction in working with my hands."

Danielle Francis, a 22-year-old Junior Quantity Surveyor with a BSc in Quantity Surveying from the University of Pretoria, started at GVK-Siya Zama on a refurbishment project for the University of Pretoria, which she described as 'overwhelming'. She adds: "However, this opportunity offered insights beyond classroom learning. Under the guidance and tutoring of both a junior and senior quantity surveyor, I've learnt about client interactions and project complexities, enhancing both my professional skills and personal growth."

Unathi Mpayithethi, a Coega Development Corporation appointed Document Controller from KSD TVET College's Mthatha campus (Cicira), has navigated a challenging yet rewarding path into the construction industry. "The industry is opening up more opportunities for young women, and I'm driven to inspire others to consider it," she says.

Ricardo Hoffman, a 25-year-old Junior Quantity Surveyor, recounts his path: "My journey began at HTS Daniel Pienaar THS, South Africa's oldest technical high school, where I chose Civil Technology. This sparked my interest in construction, and studying Building Science at Nelson Mandela University provided clarity, offering career paths like Construction Management and Quantity Surveying.

"During my first year, amid the Covid-19 pandemic's challenges, I adapted to online learning. As the semester ended, a project assigned by our lecturer took me to construction sites for comparative analysis. At a GVK-Siya Zama site in Forest Hill, the late Mr. Crane, a Contracts Manager, generously assisted despite his busy schedule, leaving a lasting impression on me. The following year, the company hired me as a student under Simone Vermaak's mentorship, solidifying my path to becoming a quantity surveyor."

Cathy Strydom, HR Manager.

Cathy Strydom, an experienced HR Manager who has served at the construction company for over 25 years, provides an overview of the internship process and its objectives: "At GVK, we aim to bridge the gap between the theoretical training obtained at the tertiary institutions and the practical application of this knowledge on site."

Strydom, who is based in the Eastern Cape, says the objective is to ensure that the students are exposed to all facets of the business and experience the aspects of both commercial and production activities and how they integrate with each other. The company has a structured student programme whereby a seasoned mentor is assigned to the student, and together, they will navigate through the internship.

A key takeaway from the students is that GVK-Siya Zama offers opportunities for personal and professional growth through practical experience and mentorship. Each young professional highlighted how their hands-on experiences guided by experienced mentors have enhanced their technical skills and shaped their careers.

Group executive Amelia Keefer, comments that the company's student and mentorship programme not only builds careers for young construction professionals, it also makes a manifest contribution to a vibrant company culture and the reciprocity of learning. "It keeps us relevant and on our toes." ⊙

Dr. Nolwandle Mgoqi, CEO of Aon South Africa.

Strategic partnerships: key to advancing INFRASTRUCTURE DEVELOPMENT

In today's rapidly evolving infrastructure landscape, strategic partnerships have emerged as a cornerstone for advancing development across various sectors. Collaboration between government entities, private sector firms, and community stakeholders are not only essential for project delivery but also enhance efficiency and lead to superior quality outcomes.

Chris Campbell, CEO of Consulting Engineers South Africa (CESA), explains that strategic partnerships are instrumental in addressing the multifaceted challenges of infrastructure development. “By leveraging the strengths and resources of different stakeholders, collaboration fosters innovative solutions that can overcome financial constraints and streamline project execution. Public-private partnerships (PPPs), in particular, have proven effective in mobilising private investment, facilitating knowledge transfer, and ensuring long-term asset management. This collaborative approach enables the sharing of risks and rewards, ultimately leading to improved service delivery and enhanced community benefits.”

The CESA Aon Engineering Excellence Awards which took place on 14 August 2024, showcased several exemplary strategic partnerships that have made notable contributions to infrastructure development. “These collaborations involve various member firms, their partners and clients, each playing a vital role in contributing to excellence in infrastructure development. These collective efforts not only demonstrate the power of collaboration but also set a benchmark for future initiatives,” adds Campbell.

Dr. Nolwandle Mgoqi, CEO of Aon South Africa, reinforces this sentiment: “Aon understands and appreciates the pivotal role that strategic partnerships play in building a sector that consistently grows and delivers excellence. It is these collaborative partnerships that deliver much-needed infrastructure projects that lay the foundations for a more optimistic future for our communities, businesses, and economy. Infrastructure development significantly transforms societies in multiple ways, impacting economic growth, social development, quality of life, job creation, service delivery, social integration, sustainability and disaster preparedness. Infrastructure development is a cornerstone for societal transformation and at the heart of any and all progress and economic growth.

“At Aon, we see it as our role to facilitate an environment where all the role players in infrastructure projects - from contractors, owners, developers, engineers, architects, designers, financiers and investors - are able to successfully navigate the expanding construction and infrastructure risk environment.

“We do this by bringing our data and analytics, insights and tools to access the full extent of the risk capital value chain on every project, ensuring that every role player is able to make better decisions across their risk capital and human capital needs, to build a more resilient and sustainable future,” she concludes.⊙

Reforms to combat CLIMATE CHANGE IMPACTS

In an era marked by the escalating impacts of climate change, the importance of developing resilient infrastructure has never been more critical. Consulting Engineers South Africa (CESA) is at the forefront of advocating for robust infrastructural strategies to combat the increasing frequency and severity of extreme weather events.

Consulting Engineers South Africa CEO **Chris Campbell,** highlighted the necessity of revising infrastructure standards in response to more frequent and severe weather events. “For example, there have been revisions of standards regarding how close structures should be built to water courses. These standards are being updated to reflect the increased intensity and frequency of severe storms.” He further elaborated that traditional statistical models, which predict storm events every 100 years, are no longer sufficient. “These flood lines now have to move further back to ensure safety and resilience.”

Local authorities play a vital role in this transition. “It's not just developers at fault; local authorities must enforce compliance with updated bylaws and building regulations,” Campbell asserted. Failure to do so, he warned, would result in more human catastrophes and property losses.

One of the pressing issues is the construction of informal settlements near water courses, making them highly vulnerable to flooding. “People building informal settlements close to water courses do so out of necessity, but this makes them incredibly vulnerable,” Campbell said. He also pointed out that even high-value properties built close to water bodies for scenic views are at great risk, emphasising the importance of adherence to revised building regulations.

The call to action is clear: integrated efforts from government, developers, and the community are essential to create resilient infrastructure capable of withstanding the challenges posed by climate change. “Building resilient infrastructure is not just about new projects but maintaining and adapting our current systems to ensure they can cope with future demands,” Campbell concluded. ⊙

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Repair of critical infrastructure presents a good case FOR A LARGE-SCALE INDUSTRIALISATION PROGRAMME

Fresh off the Infrastructure Africa (IA) Conference hosted in Cape Town on the 16 and 17 July 2024, one is enthusiastic about the character of the discussion and the appreciation of the fact that infrastructure development is paramount to unlocking growth in South Africa and on the African continent. ***By Tafadzwa Chibanguza, is the Chief Operations Officer of the Steel and Engineering Industries Federation of Southern Africa***

Insights about financing, regulatory reform, policy coordination and co-operation to achieve this end will be the topics of discussion for weeks to come. Particularly important is the role that infrastructure investment can play in unlocking demand for the Metals and Engineering (M&E) Sector which enjoys markets in the mining, agriculture, construction, automotive, logistics, water and the energy supply industry.

However, what is critical to highlight is that while multi-billion and long-term infrastructure investments are critical for industrialisation, there is an intermediate discussion that needs to be had. That is, the massive scale industrialisation project that can be achieved through repairing the existing infrastructure which has continued to deteriorate due to under-investment and maintenance backlogs. This is a reality across most critical infrastructure areas namely: rail, energy, municipal services and increasingly worrying, water infrastructure. While it is obvious to mention that the country's poor economic growth outcome can be attributed to the bottlenecks in these respective areas, some of the immediate challenges faced by companies as a result of the infrastructure decay are as shocking as they are horrifying.

One recent example is of a multinational company operating in the East of Johannesburg that had to invest in a large-scale back-up fire suppression system at the staggering capital cost of R12 million. This 'investment' was necessitated by the company partially failing an ad hoc insurance inspection because there was no water coming out of the grid-based fire suppression system. This spend presents an opportunity cost for the company's capital allocation and by the same token the end consumer will regrettably bear this cost.

The South African Reserve Bank (SARB) has on numerous occasions highlighted its concern about the pace of

increases in administered prices and their impact on general inflation. The administered price trajectory is largely a function of these inefficiencies in infrastructure. Year-to-date 2024, administered price inflation was recorded at 8,02%, against a consumer price index (CPI) of 5,2% over the same period. It is noteworthy that approximately 35%-40% of costs for companies in the M&E Sector are attributable to administered prices in one form or another. This, in itself, should highlight the pressure that this line item contributes to input costs.

These are some cursory perspectives that highlight the need to fix the existing infrastructure. In this industrialisation framework the need to fix the infrastructure represents the demand-side of the equation. On the electricity side, while praiseworthy progress has been made on the load-shedding front, a slight increase in economic growth will put pressure on the available electricity capacity and either choke the growth or tip the country back into load-shedding. Hence, the urgent need to expand the transmission and distribution network while concurrently adding additional generation capacity.

On logistics, expanding the rail network and fixing port operations is required to enhance economic efficiency and connectivity.

Water infrastructure requires the most urgent attention on water treatment facilities and pipeline repairs. All of these investments amount to billions of rands and present an immediate off-take, demand-wise, for industry.

On the supply side of the equation, the M&E Sector comprises companies that supply products required in all these areas such as: transformers of all categories, transmissions lines, the supporting towers, equipment and instrumentation for substations, circuit breakers, capacitators and reactors for the electricity transmission network.

On logistics, rails (made of steel), locomotives, rail joints, signalling equipment, overhead wires and various pieces of port equipment, including tug boats, can all be supplied locally.

Lastly, for water infrastructure, valves of all types and sizes and steel pipes are manufactured and supplied from this sector.

Measured at an aggregated sectoral level, capacity in the sector is underutilised, recording 70% year-to-date 2024. The aggregate statistics, however, mask some crucial detail, for example a recent study of the electrical cable manufacturing industry (which is a sub-industry of the M&E Sector) revealed a volume adjusted capacity utilisation recording of 42%. This situation should not be allowed to persist because at these capacity levels, factories are just not sustainable.

The M&E Sectors production and employment trends which have contracted at a rate of 1,2% (CAGR) and 1,4% (CAGR), respectively, over the last 15 years are partly attributable to low demand and capacity utilisation levels. In this industrialisation framework companies in the M&E sector can quite easily increase production to meet demand with minimal investment required.

The last leg of this argument is the funding component. The extent of the historic under-investment and maintenance backlog, which runs into billions, coupled with the urgency to resolve bottlenecks, requires that an urgent

Tafadzwa Chibanguza, the Chief Operations Officer of the Steel and Engineering Industries Federation of Southern Africa.

solution be found. Regrettably, the current state of the public purse does not allow for this. Therefore, it is crucial that the state look to crowd-in private sector investment, capability and capacity.

The reforms being considered by National Treasury with regard to Public-Private-Partnerships (PPP) in the funding of public sector projects are commendable and must be fast-tracked. Particularly crucial, is the category of projects referred to as low value (below R2 billion) that will enjoy the exemption of certain Treasury obligations thereby fast tracking the projects through reducing the administrative burden. On a micro-level, the projects that would be considered under this proposed framework would typically fall into this category.

The recent signing into law of the Public Procurement Act also presents a crucial milestone with regard to the provisions that are made in the Act on preference for local production.

The intersection of these three crucial considerations, namely: the urgent demand that needs to be met, the under-utilised supply and the funding options under the PPP framework, present a sweet-spot for a large scale and immediate industrialisation program.

Ultimately, fixing the existing infrastructure base not only resolves the immediate pressing problems, but will make the country an attractive destination for even more long-term infrastructure investment, thereby creating a virtuous industrialisation cycle. ⊙

"The reforms being considered by National Treasury with regard to Public-Private-Partnerships (PPP) in the funding of public sector projects are commendable and must be fast-tracked."

‘Virtually getting **AWAY WITH MURDER’**

Anyone deemed to be an employer in the construction industry – including owners, developers, clients, designers such as architects, principal contractors, contractors and even supervisors – can be charged with culpable homicide or even murder in the event of a person being killed on a construction site due to non-compliance or negligence.

This is the statement from Ernst van Biljon, Director at Legislation Compliance Specialists – a law firm specialising in Occupational Health & Safety (OHS), who was a keynote speaker at the OHS compliance seminar on “Reputational Damage in the Construction Industry”, hosted by Master Builders Association (MBA) North recently.

“Many owners, managers and appointees in construction companies do not fully understand the gravity of their culpability,” he says. While none have been charged with murder as yet in South Africa, the common law makes it possible, he says.

MBA North executive director, Mohau Mphomela, says the seminar was hosted as part of MBA North’s ongoing efforts to educate its members on topical issues in the industry. “Because of how relevant culpability is in the industry, we believe it is important to have experts such as van Biljon address our members on responsibility, culpability and the far-reaching impacts of events such as the incident in George, where more than 30 workers lost their lives, and more recently, in Ballito where four workers were buried alive.” he says.

Van Biljon says in terms of the Construction Regulation 5.1, construction clients have to prepare a baseline risk assessment, health and safety specification, whereafter the principal contractor is to provide the health and safety plan. What many people are unaware of is that the regulations also apply to smaller projects and even double-storey private homes, and that a project as apparently simple as painting a roof for these projects is classified as a construction work.

If injuries occur on a construction site, an employer can be prosecuted in terms of section 38 of the OHS Act. “If the state can prove that the employer was negligent in not training the person, or not issuing PPE, or not supervising properly, and it caused an accident in which a person could have died, the employer could face a R100 000 fine or two years in prison,” he says.

“If a person dies on the construction site, any role player from designer/architect all the way down to the supervisor can be investigated, and if non-compliance or negligence are proven, they can be charged with culpable homicide. Alternative charges could include prosecution under various provisions of the OHS Act as well as regulations which include the Construction Regulations. However, if it could be argued it was foreseeable that non-compliance or negligent actions or omissions lead to people’s death, employers could also be prosecuted for murder, through *dolus eventualis*,” van Biljon says. “Employers have a duty of care to look after employees as well as people other than their employees such as visitors etc., and if they fail to do so, they are deemed to be negligent.”

He explains: “The reasonable person test – which courts use to determine if a person was negligent – looks at whether a reasonable person could have foreseen the possibility of the incident happening, and taken action to prevent it.” Van Biljon says the legislation is highly prescriptive around the duties of every stakeholder in a bid to avoid negligence.

Potential penalties

The penalties if convicted in a Regional Court could be a fine of up to R600 000 or 15 years in prison. However, in the High Court, fines could amount to millions of Rands, with prison sentences up to 25 years.

Van Biljon notes employers could also face civil suits if found negligent.

In addition, because employers in South Africa are legally required to provide a safe working environment, non-compliance can result in severe legal penalties and fines should a prosecution be recommended by the

Department of Employment and Labour. Accidents on site can also lead to substantial financial losses such as medical costs, workers' compensation claims, increased insurance premiums and legal fees. Additionally, downtime due to number of Prohibition Notices issued by the Department of Employment and Labour has notably increased. An area often overlooked is the cost of reputational damage: a company known for poor safety practices can negatively affect its ability to win new contracts, retain clients and could affect the organisation's share price.

Improving OHS on site

Van Biljon believes the number of construction accidents, injuries and fatalities is on the increase in South Africa. "In my opinion, many people are oblivious to what could go wrong and there is a lack of proper risk assessment processes," he says. Notably, he says that since the Specialist Court for occupational health and safety matters was disbanded, the success rate in prosecutions has decreased. We must protect workers and provide them with decent, dignified healthy and safe working environments.

According to The Federated Employers Mutual Assurance Company (FEM) statistics, the construction sector had 2383 reported accidents in 2022, with 18 fatal accidents while 2023 saw 2612 reported accidents with 13 fatalities.

"Things can very easily go wrong on a construction site. We have to be compliant, and make sure all parties are trained and competent," he said. To reduce risk and improve health and safety on site, Legislation Compliance Specialists offer proactive legal auditing and OHS training, and MBA North offers members construction health and safety services, training and workshops.

Mphomela notes: "MBA North offers training workshops and seminars on all aspects of health and safety compliance to help contractors mitigate these kinds of risks. Education and ongoing awareness go a long way to preventing accidents and fatalities on site."

"Focusing on workplace safety is essential for South African construction companies to avoid legal and financial risks, protect their reputation and prevent litigation, all of which are crucial for maintaining a successful and sustainable business.

"Supporting this, it is crucial that organisations such as the MBA and FEM ensure that contractors are accredited and reputable and that safety is prioritized," concludes Mphomela. ⊙

How can the construction sector achieve its TRANSFORMATION AGENDA?

In the South African context, transformation refers to the comprehensive and ongoing efforts to address and redress the inequalities from the past, including their impacts on various sectors and the economy. ***By Nosiyabonga Mongane, President, South African Council for the Quantity Surveying Profession***

For South Africa, true transformation involves fostering inclusivity, economic growth, and development. Achieving growth without transformation will perpetuate the unbalanced pattern of wealth inherited from the past, while transformation without growth would be unsustainable and limited in scope. Therefore, focusing on transformation that enhances and expands economic benefits and participation is crucial for advancing South Africa's growth and development.

The construction sector has experienced a slower transformation compared to other industries. Implementing skills development programs can significantly help in achieving broader industry transformation goals by equipping previously disadvantaged individuals with the skills and experience necessary for success and advancement within the industry. This includes promoting diversity and inclusion by targeting underrepresented groups, such as young people and women.

Infrastructure, as a driver of economic growth, requires a well-trained workforce to meet its demands. Currently, the construction industry faces a shortage of skilled labour, with demand continually surpassing supply. To address this skills gap, prioritising skill development is essential for economic growth and development. One effective approach to mitigating this shortage is by prioritising Built Environment Professional Registration.

These professionals are crucial for the successful execution of construction projects. The lack of experienced professionals has significantly hampered the industry's growth. Therefore, advancing professional registration for previously disadvantaged individuals is a key aspect of achieving transformation and fostering economic growth in the construction sector. The various statutory bodies, depending on the specific profession within the construction industry, oversee the process of professional registration.

To achieve their professional registration goals, graduates need to be encouraged to complete their registration with the relevant statutory council. The implementation of skills development programmes by the private and public sectors is also crucial for supporting graduates and fulfilling the transformation agenda. This will ensure a steady flow of skilled individuals who can meet the evolving demands of the construction industry. ⊙

Public structures need to be protected by using durable construction materials.

THROUGH NINE DECADES, AFRISAM serves each phase of SA's growth

Throughout its 90 years, construction materials leader AfriSam has been an active champion of leading edge technology and global best practice in South Africa; from high performance materials and durability standards to advanced mixes and sustainable solutions, it has over the decades become a pillar of the construction sector.

"Our evolution as a business has mirrored the changing needs and opportunities of our markets," says Amit Dawneerangen, AfriSam's Executive Construction Materials: Sales and Product Technical. "As South Africa has grown, we have built our expertise and technology base to take the lead in applying world class standards, so that our construction industry could make the best possible contribution to the country's infrastructure."

Each era of South Africa's economic development has been able to benefit from AfriSam's presence. In the early days after its inception in 1934, the then-Anglovaal Portland Cement Company supported reconstruction efforts after World War II. In the 1950s and 1960s, the country's urban areas grew quickly, demanding construction materials for residential housing and other projects. The decades of the 1970s and 1980s saw the pace of infrastructure projects ramp up further, with highways, dams and bridges needing a new generation of high performance construction materials.

"The pressure to complete larger and more projects meant contractors increasingly wanted to fast track their work," says Dawneerangen. "The performance of construction materials had to evolve, and AfriSam was proactive in developing solutions that would give customers flexibility to work more productively."

The vital factor of quality and durability now also came under the spotlight, as this determined the expected lifespan

AfriSam is also an important contributor to environmental sustainability.

of large high investment projects on which the economy relied. He points out that it was no longer enough to satisfy only a structure's strength requirements during and after construction. It was also vital to optimise longevity, and ensure maintenance costs were kept to a minimum.

"Especially with public structures like bridges and roads, large investments were being made in the country's future, and these investments needed to be protected, *inter alia*, through more durable construction materials," he explains. "Apart from the cost of maintaining public assets like these, there are also severe disruptions caused when structures have to be repaired."

In the 1990s, therefore, durability in construction became a strong theme of international best practice, which South Africa embraced enthusiastically. AfriSam, he says, took a leading role in producing the materials that would allow projects to meet the exacting durability specifications being developed and applied.

"We also took a keen interest in understanding how the relevant tests needed to be conducted, so concrete could comply with new durability standards," he says. "This became very important in the 2000s, during the build-up to the hosting of the Soccer World Cup in 2010. During this time, many of these specifications were applied in the construction of stadiums, the Gautrain, airport upgrades and other mega-projects."

Dawneerangen pays tribute to two academics in particular – Professor Mark Alexander at the University of Cape Town and Professor Yunus Ballim at the University of the Witwatersrand – who pioneered South Africa's Durability Index tests. The durability standards and the related testing were adopted by key government agencies responsible for infrastructure – and from there were embraced by ever wider circles within the construction industry.

"Durability is a particular concern for any concrete structures which are permanently exposed to the elements," he highlights. "To make the most of the substantial investments they require, these structures need to withstand aggressive environments without needing any undue attention before the end of their design lives."

Applying these new durability standards, however, was initially no simple matter – requiring key players like AfriSam to participate actively in an industry-based Durability Committee to standardise the necessary testing equipment and methods.

"Indeed, we took a leading role in the process by establishing a dedicated Durability Laboratory at our Centre of Product Excellence in Roodepoort," he explains. "Apart from the universities, we were one of the first to install the correct test equipment – allowing us to assess various concrete mixes in terms of their compliance with durability specifications."

AfriSam was able to conduct these tests for contractors nationwide – even for projects in which the company was not directly involved. Importantly, this work coincided with progress AfriSam had already made in its understanding of supplementary cementitious materials. Until this time, it was widely accepted that the quality of a concrete was primarily a function of the volume of cement it contained. Alternative materials – like pulverised fly ash or granulated blast furnace

slag – were considered as just extenders to reduce the portion of the cement component.

"With the experience and technical expertise we had developed, we could research this field scientifically, and had identified that cementitious material like fly ash and slag could, in fact, enhance the durability properties of concrete," says Dawneerangen.

In addition to making valuable advances in concrete durability, these innovations from AfriSam were also an important contribution to another emerging theme in South Africa's economic life: environmental sustainability. As climate change took centre stage in the global narrative, all sectors began to embrace the need to respond in the most responsible ways to safeguard the future of the planet.

"We were able to become more energy efficient in our production of cement, and also in the production of concrete through strategies including the use of supplementary cementitious materials," he says. "Our research and innovation allowed us to pass these benefits onto our customers and their end-clients, who were also looking for ways to reduce their carbon footprints."

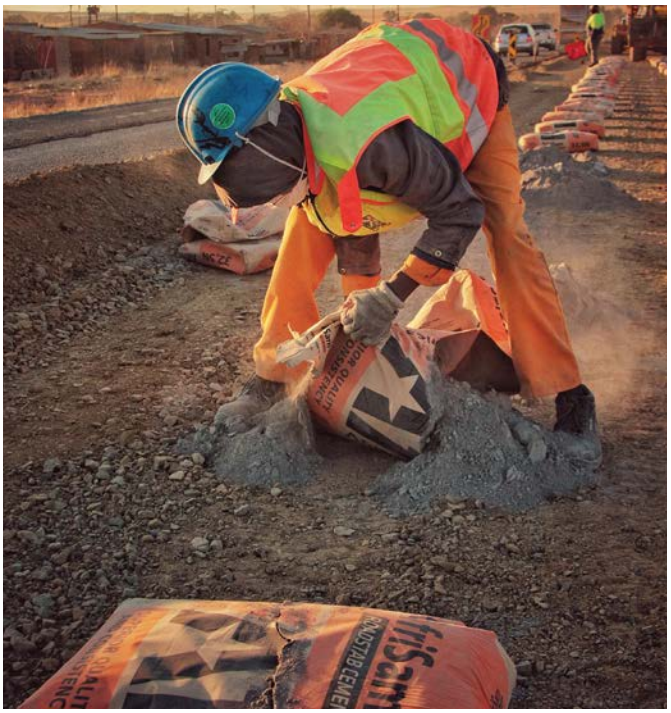
Moving with the times, AfriSam embraced automation and digital technologies to ensure it delivers services that are cost effective. The latest batching systems in its readymix concrete business, for instance, impact directly on efficiency, which holds down costs and ensures minimal wastage.

"Our measuring and tracking systems are now so advanced that there is very little space for human error," he says. "This means quantities are always exact, giving customers peace of mind and ensuring that our concrete gives structures the longevity which is expected."

Today, highlights Dawneerangen, a key industry focus is on developing and retaining the skills the construction sector demands – to maintain and grow a modern infrastructure. He acknowledges that the country has lost vital skills, but AfriSam has stepped up to the plate, supporting customers in specialised duties like concrete mix designs and best practice in terms of application. Its 90 year legacy has given it a depth of expertise across the range of construction materials – which it still readily shares with new entrants.

"We are committed to exposing engineering students to the world of concrete, cement and other construction materials, and regularly engage with universities," he says. "Where possible, we encourage and support university-level research, to foster technology development in our fields."

After 90 years, he says, AfriSam continues as it began: with a passion to create concrete possibilities through quality service and products, scientific excellence and a commitment to meet customers' most challenging demands on site. ⊙



AfriSam will continue with its commitment to meet customer's challenging demands on site.

A key focus for AfriSam is developing and retaining the skills the construction sector demands.

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The P-Tier Dump Trucks elevate productivity through cutting-edge technology and intelligent design. These ADTs automatically adjust engine torque curves, differential locks, and select the optimum gear ratio, ensuring seamless operation and enhanced productivity.

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John Deere places a high priority on operator comfort and safety in the design of the P-Tier Dump Trucks. The spacious, ergonomically designed cabin offers a comfortable working environment with features such as adjustable seating, intuitive controls, and excellent visibility. The lowered hood design improves forward visibility, enabling operators to navigate with confidence. Additionally, the optional LED light package and rear-view camera enhance visibility in low-light conditions, ensuring a safer and more efficient work environment.

The quiet, pressurised cab features an easy-to-read monitor and rear-camera display, plus an optional automatic temperature control (ATC) system that allows operators to

maintain a comfortable temperature. The standard high-back air suspension seat offers multiple adjustments for all-day support.

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The John Deere P-Tier Dump Trucks signify a new era of power, productivity, and performance in the coal and quarrying industries. With their robust engines and advanced technology features, these ADTs provide a comprehensive solution to meet the evolving needs of industry professionals. Whether it's hauling heavy loads, manoeuvring challenging terrains, or optimising productivity, the 410P and 460P Dump Trucks are reliable partners that deliver exceptional results, reinforcing John Deere's reputation as an industry leader.

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Voices of Lusikisiki **A MAJOR WINNER**

The Voices of Lusikisiki Asset Based Community Development (ABCD) and Legacy Programme linked to the N2 Wild Coast Toll Road emerged as significant achievers at the 2024 Impact Awards organised by Zutari.

From left: ***Tashna Margo, Nwabisa Gxumisa from SANRAL, Amelia Visagie, Wim van Schalkwyk and Andile Maphumulo.***

These awards are an annual event where the leading consulting engineering and infrastructure advisory firm celebrates its collaboration and co-creation with key clients. "The projects celebrated captures what Zutari is all about," remarked CEO Teddy Daka during the gala event held at the Pretoria Country Club in April.

The project won the Shaping Radically Collaborative Networks category, which recognises a project that combines technical engineering and strategic advisory service across traditional boundaries. Exemplary collaboration with partners, clients, and end users resulted in improved outcomes. The project also received a commendation in the Delivering Resilient Spaces and Accelerating Equitable Quality of Life categories.

The South African National Roads Agency (SANRAL) appointed the Zutari Consortium to oversee the design and construction of the national route and associated local access roads in Package 4 of the N2 Wild Coast Road development. In partnership with Africa! Ignite, the consortium will implement the SANRAL Legacy Programme, which aims to engage with, and develop projects in the communities along the new road, explains Amelia Visagie, Associate Design Director at Zutari.

The scalable project offers the opportunity to expand the ABCD and Legacy Programme aspects to encompass even more villages in the region, thereby extending the community outreach and involvement of the project even further. "We have established a meaningful partnership with the client that has delivered exemplary results. It has been exciting to see people's lives changed as a result." shares Visagie. The project is situated within the Ingquza Hill Local Municipal area of the OR Tambo Municipal District in the Eastern Cape. It includes villages along Package 4 of the N2, adjacent to Lusikisiki, between the Lingeni Intersection and the Msikaba Bridge.

The N2 Wild Coast Road (N2WCTR) is a multibillion-rand infrastructure project significant for the Eastern Cape economy. As a Strategic Infrastructure Project (SIP), it aims to stimulate development in the Southeast Node and Corridor (SIP3) and aligns with the National Development Plan.

Construction is creating thousands of direct and indirect jobs, though unemployment remains a critical issue driving community action against projects on the Wild Coast. "Therefore, SANRAL's Legacy Programme maximises the benefits of the new road for adjacent communities, creating broad buy-in for the N2 construction project," explains Visagie.

The Zutari Consortium, Zutari's Social and Stakeholder Engagement Team, and Africa!Ignite used an Asset-Based Community Development (ABCD) approach. A method that empowers communities to identify and develop their skills, knowledge, and talents, focusing on strengths rather than deficits. It promotes active citizenship, community accountability, and sustainable development.

"Investing in proactive community engagement and development resulted in well-informed and committed stakeholders, broad buy-in, and endorsement of both the N2 road construction project and the associated Legacy Programme," comments Visagie. ⊙

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AECOM's rising stars

Celebrated yearly on 15 July, World Youth Skills Day was established by the United Nations General Assembly in 2014 to emphasise the importance of equipping young people with skills for employment, decent work, and entrepreneurship. The 2024 theme, 'Empowering Youth for a Sustainable Future', focuses on preparing youth to tackle global challenges like climate change, economic inequality, and social justice. It underscores the significance of sustainable development and the pivotal role of youth in building a more equitable and resilient world.

Kaveel Jugdiswar Building Infrastructure and Social Impact at AECOM.

AECOM Africa is dedicated to developing the skills of its young professionals, including engineers, quantity surveyors, project managers, and architects. Through its comprehensive Candidacy Mentoring Programme, AECOM ensures these professionals are well-equipped for successful and fulfilling careers. The programme pairs candidates with experienced mentors who provide invaluable insights, advice, and encouragement, helping them navigate the complexities of their professional development.

In addition to mentorship, AECOM offers extensive on-the-job training, allowing young professionals to apply their knowledge in real-world scenarios and gain hands-on experience crucial for their growth. Continuous learning is supported through external training opportunities and access to the AECOM University training portal, with over 5 000 training modules. This comprehensive approach ensures that AECOM's young professionals stay updated with the latest tools and techniques in their field.

By combining mentorship, practical training, and global project involvement, AECOM nurtures the next generation of engineering talent, empowering them to reach their full potential and contribute meaningfully to the company and the industry at large. In celebration of World Youth Skills Day, we profile three outstanding young professionals from the AECOM Candidacy Mentoring Programme.

Kaveel Jugdiswar: building infrastructure and social impact

A candidate engineer for the Building Services team under Buildings + Places, Kaveel has been with AECOM since June 2022. Specialising in bulk earthworks design for major infrastructure projects, he is currently focused on data centres, working predominantly on international projects. He also has experience in stormwater, sewer line, and water design.

Jugdiswar appreciates the mentorship opportunities at AECOM, citing how the program has helped him prioritise his professional registration and manage his responsibilities more effectively. "In terms of engineering's impact on society, I think the biggest thing for me, and that is also why I gravitated toward construction before entering consulting, is I like to see the difference it makes to work in developing areas and provide solutions to issues for people on a daily basis.

"Apart from the civil engineering aspect, there is a social engineering aspect. It is great to do technical things on paper, but it is completely different to actually go see it on-site, how it is working and how it is improving people's lives. That really makes a tangible change and is what appealed to me most," says Jugdiswar.

Jugdiswar's future plans include becoming a mentor to guide and inspire the next generation of engineers, stressing the importance of continuous learning and perseverance in the STEM field. "The learning does not stop once you complete your education. You must always have an open mind. It does get difficult at times, but just concentrate on the end goal. If you encounter problems, remember there are solutions and resources to use to your benefit."

Jugdiswar concludes: "The programme has made me what I am today, and I truly appreciate that. If you know how to use the resources that AECOM gives you, along with throwing you in the deep end, you can make a really good opportunity out of it."

Hakeem Adams: modelling the future of transport

A BIM modeller in the Highways and Bridges Department, Adams focuses on geometric modelling for various road projects, including non-motorised transport (NMT) infrastructure such as sidewalks and bicycle trails. With a background in traffic engineering, Adams transitioned to geometric modelling to leverage his understanding from the traffic side.

"Before I started at AECOM I was involved in the traffic engineering side," Adams explains. "I fell in love with how the geometric aspect is derived from the traffic side. That was the reason I felt I needed to get into modelling because of my understanding derived from the traffic side. That was really what pushed me towards this specialisation."

At AECOM, Adams values access to the latest digital tools and software, enhancing his proficiency and efficiency. He is optimistic about the impact of AI on streamlining engineering processes. "Given how coding has improved over the years, certain tedious tasks now just require a plug-in code and can run in the background while we focus on much more complex information. That is really where AI is heading towards."

All the projects that Adams has worked on so far at AECOM

have been international projects. “You learn a lot in regard to the different standards and guidelines used globally. It is different, but the basics stay the same, which is the beauty of engineering. On-site exposure is a challenge, but I enjoy the design aspect.”

Adams is focused on achieving his professional registration through the AECOM Candidacy Mentoring Programme by 2026. “The programme engages you to be much more focused on achieving the smart goals that you have set yourself. It is a peer-to-peer, supportive environment. We are working in a group-driven industry. It is not individual based. Your success is never just your success. It is a collaboration that adds up to the final product. It is motivational atmosphere and helps everybody achieve their goals at the end of the day.”

His advice to youngsters contemplating going a STEM career like engineering is to remember that small things add to the bigger picture. “Have patience learning the small things. At the majority of tertiary institutions, once you obtain your degree, you think you are just going to walk in and carry out complex these complex tasks. Instead end up working on much more mundane tasks than you anticipated. What you do not realise is that one day this will have equipped you to take on more complex tasks with much more responsibility,” says Adams.

Sinky Thobejane: engineering water solutions for communities

Thobejane joined AECOM in July 2022 and works closely with the water team. With a BTech in Civil Engineering Water, she has contributed to significant projects, including upgrading pipelines and working on large-scale international irrigation schemes. Her passion for water engineering was ignited by witnessing the impact of water projects in her rural community.

“I was fascinated at how it worked and wanted to understand more, which sparked my interest in water engineering, especially as it has just a tangible impact on local lives and communities. How to improve these systems and continue to make a local impact?” Thobejane adds that this is an important part of AECOM’s Sustainable Legacies commitment that underpins all its projects.

Working at AECOM has been her first experience of being part of a Candidacy Mentoring Programme. Since joining, she registered as a Candidate Technologist in August 2023. “I have learned additional skills like how to structure an engineering report. We have quarterly presentations whereby your progress is assessed. It motivates us to gain more experience, manage our time and it gives us confidence in our own capabilities, which is very important being part of a larger team.”

Thobejane adds that the programme has also boosted her confidence in her presentation and communication skills, which is integral as engineers are required to communicate with a range of stakeholders, from contractors to clients.

“If you are entering the engineering field, know that there are a lot of qualified people in this industry with a lot of experience who can mentor you as a junior engineer or a technician. Then doors will open for you, doors that you did not even think you can open with your knowledge. Also, do not be afraid to ask questions or ask for advice. If you are tasked with a project and encounter an engineering problem, just reach out. You will be empowered and continue to learn at the same time,” concludes Thobejane. ⊙

Ethiopian-Sudan rail project on track
FOLLOWING A FEASIBILITY STUDY

At Africa Rail, which took place from 25 to 26 June at the Sandton Convention Centre in Johannesburg, globally trusted infrastructure consulting firm AECOM showcased its significant experience and expertise in the rail sector in Africa. Globally, it is currently ranked #1 in terms of transit rail, taking part in major projects such as the feasibility study for the Ethiopia-Sudan Standard Gauge Railway (SGR) project.

The SGR project will link Addis Ababa in Ethiopia to Port Sudan on Sudan's Red Sea coast. The transport sector goal is to contribute towards socioeconomic development by providing an efficient and effective transport system in Ethiopia and Sudan. The generally accepted route is Addis Ababa-Awash-Kombolcha-Weldiya, on to Wereta, Gonder, Metema, Galabat to Gadarif, Kassala, Haiya and to the port at Port Sudan, a total estimated distance of a staggering 1 522 km.

"This ambitious SGR project has significant implications for regional connectivity and trade," comments James Anafi, Market Sector Lead: Rail, Africa at AECOM. "The main aim is to enhance transportation links between Ethiopia and Sudan to facilitate efficient movement of goods, people and services."

The feasibility study that AECOM played a major part in assessed whether the railway line is technically, financially, economically, socially and environmentally viable. It considered factors such as terrain, engineering challenges, economic benefits and environmental impact.

It provides a sound basis for decision-making regarding the investment project. In addition, due diligence from the study can attract funding from various sources, including development partners and the private sector. The African Development Bank (AfDB) approved a USD1,2 million grant to finance the feasibility study, which was completed in December 2022.

Anafi says the feasibility study became necessary due to Ethiopia experiencing rapid economic growth. "The challenge is that Ethiopia is landlocked and is quite a vast country. To obtain accesses to seaports, which are important for economic growth, requires extensive railway infrastructure."

A major challenge is that the route extends across Ethiopia and Sudan to reach Port Sudan. "That was the aim of the feasibility study," confirms Anafi. "The vast scope of the project required a lot of resources and ingenuity to have the feasibility study completed successfully."

A challenge was balancing the strategic interests of the two different countries, which were not always aligned. While the project was driven mainly by Ethiopia, the bulk of the route is actually through Sudan. "It starts from the middle of Ethiopia but has to cross Sudan to reach the port. Hence, Sudan was a significant stakeholder and there were different requirements that had to be balanced."

AECOM's strategy was predicated on being as collaborative, fair and inclusive as possible to all stakeholders. "Everyone had

AECOM has significant experience and expertise in the rail sector in Africa.

to feel they were adequately catered for in the project to ensure its ultimate success or there would be pushback." This major consideration had to be balanced against various technical and situational challenges.

The fact that the feasibility study commenced during the COVID-19 pandemic imposed immediate travel restrictions. "We had to come up with innovative ways to still obtain site information from the required project location to be able to carry out the feasibility study," says Anafi.

Part of AECOM's strategy was to ensure its client expanded its own rail capability and skills base as the project proceeded. The consultancy's technical capabilities are complemented by advisory services during the design and planning stages and incorporates important aspects like Environmental, Social and Governance (ESG) considerations. It is a critical focus of the planning and design stage as it is where AECOM stands to make the biggest impact on projects.

"We have quite a big global footprint. We act and think globally to bring world-class solutions to bear, based on our experience and expertise from all over the world. Typically, problems encountered on such projects usually have been encountered elsewhere and were resolved. We bring that experience and expertise to any project, so we do not really have to start from scratch," says Anafi.

AECOM typically already has a viable solution in mind, even at such a preliminary stage. "We reference the local conditions to ensure it is fit-for-purpose and suitable for the local environment," says Anafi. "We try to maintain a low carbon footprint on all projects, even to the point of curtailing our own travel where it can be avoided," adds Anafi.

"For example, on this project we achieved a lot of the requirements without having to travel to the country and the site itself. That allowed us to maintain a small carbon footprint for the project. We take this into account in the designs we carry out and the solutions we provide to ensure they are sustainable."

For instance, AECOM deploys remote site reconnaissance technology for remote project site monitoring. It combines mobile app data acquisition, real-time reporting and data access globally using cloud storage to enhance safety, efficiency and decision-making in design and construction of infrastructure projects. "That made it very effective for us to work with our local partners. We could still collaborate with them closely enough to achieve a successful outcome," says Anafi.

Environmental considerations were key, as Ethiopia is mountainous and forested whereas Sudan is mainly desert and flat. "We had to come up with ways to deal with the particular conditions encountered on both sides of the border. We looked at less resource-intensive solutions in terms of sustainability," says Anafi.

For example, AECOM made use of a track design solution that operates effectively in a desert environment without having to put in additional infrastructure to control sand blowing onto the track. In the mountainous sections of Ethiopia that had to be traversed, AECOM also had to consider the ecological impact of any proposed solution.

This meant the size and extent of embankments had to be carefully considered in order not to unduly impede the natural migration patterns of animal species in the region. Instead, bridges or even tunnels that would have much less of an environmental impact in this regard were proposed with due regard to cost implications. This meant the infrastructure that would be put in place would not have too much of an impact on local fauna and flora.

The social impact of any project is another critical consideration, especially in terms of AECOM's Sustainable Legacies strategy. Apart from engaging the main stakeholders, it includes active engagement with the local communities to ensure the project benefits the entire region in the most sustainable manner possible.

Local companies from both Ethiopia and Sudan were also included in the project and afforded the opportunity to contribute and build up their own skills base. "A defining capability of AECOM's global footprint is that we have access to global expertise and knowledge. That gives us good exposure to typical problems encountered in railway projects."

"Wherever we resolve these in the world, we have access to that knowledge, which enhances our own capability and efficiency," says Anafi. AECOM's global footprint also means it makes extensive use of digital tools to collaborate on projects across the world and engage seamlessly with clients and partners.

AECOM is a globally integrated firm. Even though based in South Africa, the Africa team works collaboratively on projects throughout the world. "We are very much involved in many projects going on in the Middle East, which has some of the biggest railway infrastructure projects globally at present," highlights Anafi.

"The benefit of AECOM Africa being part of a global multinational is that we can always bring in expertise and capacity from our colleagues throughout the world. There is some very specialised expertise sometimes required on rail projects with respect to things such as signalling, telecoms, electrification and so on," says Chris Britz, Director: Transportation and Leader of the Transportation Business Line in Africa at AECOM.

"We can draw on the best expertise for a specific project as and when required. It does not matter where the project is, who the client is and what capacity that needs to be delivered, whether it is just planning and design or all the way to infrastructure development and project supervision. We can also provide any related civil, architectural or specialised technical services that may be required," concludes Britz. ⊙

Zimile was appointed by SANRAL to manage a crucial road project.

Teamwork overcomes multiple challenges to reopen HIGHWAY AHEAD OF SCHEDULE

Zimile Consulting Engineers is proud to announce the successful reopening of the main N2 highway between Durban and Cape Town, a month ahead of the anticipated three-month construction schedule. This achievement, despite several challenges, underscores the power of dedication and teamwork.

The project, led by Zimile's Routine Road Maintenance Manager Amit Bhoora, faced significant obstacles, including localised flooding and disruptive site conditions between Port Shepstone and Kokstad. The collapse of an aging drainage culvert, triggered by extraordinarily heavy rains in mid-January, resulted in the complete closure of the highway. The deluge caused a nearby farm dam to overflow, which washed away the culvert and led to dangerous subsidence of the road surface.

"Zimile was appointed by the South African National Roads Agency (SANRAL) to manage this crucial project as part of their 246 km Routine Road Maintenance contract, with a target to reopen the N2 within two months – one month ahead of the usual project timeline," Bhoora said. "Achieving SANRAL's target date required an all-hands-on-deck approach, as we navigated significant technical, environmental, and political challenges."

Initially considering various innovative techniques, Zimile settled on a traditional solution due to time and material constraints, and continuous rain. The chosen approach involved a dump rock foundation and the installation of four 1,5 m diameter concrete pipes encased in a concrete shell to manage future overflow events.

"The volume of water from the overflowed farm dam was immense. It took five days for the water to subside after we excavated a drainage channel across the embankment," Bhoora explained.

The project's contractor, VEA Road Maintenance, also faced numerous challenges, both practical and political. Multiple local and district municipalities claimed the project, leading to demands from local business forums for work opportunities. This issue was resolved by splitting the work among different communities. Continuous heavy rain further complicated the project, turning the site into a quagmire and causing vehicles to get stuck. "Additionally, the nearest quarry supplying dump rock was 45 km away, and other road projects had priority on materials. Through negotiations, the quarry worked overtime, and a convoy of 25 dump trucks transported the G7 material for the foundation," Bhoora noted. "We also had to construct a secondary road to allow the heavy trucks to reach the site without getting stuck."

Thanks to the tireless efforts of everyone involved, the N2 was reopened to traffic on March 27, just in time for the Easter holidays. Final ancillary work, including the completion of culvert headwalls, guard rails, and road markings, continued after the roadway was opened.

"This project is a testament to the dedication and teamwork of all parties involved," concluded Bhoora. "We are proud to have delivered this essential infrastructure ahead of schedule, ensuring the safety and convenience of road users." ⊙

Achieving SANRAL's target date required an all-hands-on-deck approach.

New N2 Belstone **INTERCHANGE OPENED**

The South African National Roads Agency SOC Limited (SANRAL) has announced the opening of the N2 Belstone Interchange and route MR0688 linking Bhisho to Zwelitsha to traffic.

This follows a 33-month construction period, which commenced in September 2021. Valued at R438 million, the project was critical to address the high accident rate at the old Breidbach intersection and the traffic congestion at the intersection of the MR0690 and MR0688. Safety and flow of traffic were thus central in its design and construction.

"The upgrades to this section of the N2 will result in improved management of traffic flow from Bhisho, Breidbach, Zwelitsha and East London, and improved safety for pedestrians and other non-motorised road users. The one loop and off-ramp will present safer access to the N2 and improve safety for both motorists and pedestrians," said Mbulelo Peterson, SANRAL's Regional Manager for its Southern Region.

The upgrades included construction of new interchanges at the Belstone and the Breidbach intersections, construction of a link road from Breidbach towards Sweetwaters outside Zwelitsha, free-flowing interchange at Belstone Bridge, dualling of the MR0688 road Bhisho and reinforcement of the concrete structures with the necessary road works.

"The benefit to the community goes beyond the new and safer road infrastructure. Through this project, SANRAL was able to create job opportunities for 376 general workers from the local community, with about R106 million spent on wages of targeted labour."

"Over R194 million was spent on 100 targeted enterprises (SMMEs) which were subcontracted on the project. Furthermore, SANRAL invested over R4,6 million towards formal training of 614 locals by accredited training service providers to contribute to the skills development and capacitation of targeted enterprises.

This was done to ensure that they can be self-sufficient beyond the SANRAL project," said Peterson. ⊙

SANRAL empowers SMMEs through information SESSION IN THE EASTERN CAPE

The South African National Roads Agency SOC Limited (SANRAL) will be upgrading the R61 near Ngcobo in the Eastern Cape, which will improve road safety while also providing opportunities for small businesses and local workers.

This was shared at an information session at the Engcobo Indoor Sports Centre in the Eastern Cape, which aimed to empower small, medium and micro enterprises (SMMEs) by providing comprehensive insights into SANRAL's procurement processes and support mechanisms.

Dr AB Xuma Local Municipality Acting Mayor, Councillor Sandiso Ngxangu, welcomed SANRAL's drive to ensure safe infrastructure.

"The R61 on both sides of Ngcobo town has always recorded crashes that claim human lives every month. The projects SANRAL is set to bring will therefore make a big difference in people's lives and households while attempting to reduce road accidents. It's about the safety of road users and access to essential services in town using safer roads. We want Ngcobo to change in terms of infrastructure," said Ngxangu.

Participants were enlightened on various aspects critical to their participation in SANRAL projects. The discussions covered the mobilisation period, the tender process and the criteria for participation in SANRAL's initiatives. Thandile Makwabe, SANRAL's Regional Transformation Officer, emphasised the processes prescribed to main contractors for appointing subcontractors to meet SANRAL's contract participation goals.

"SANRAL ensures that there's a percentage set aside for SMMEs while empowering them to participate in construction projects in their local communities and elsewhere. We provide information and training to enable businesses to be ready when projects come. Also, to assist them in having compliance documents valid and ready," Makwabe noted.

Makwabe delved into the tender processes tailored for targeted enterprises, highlighting the essential steps required for tender preparation. He stressed the importance of adhering to these processes to ensure successful participation.

The tender evaluation process, as explained by Makwabe, comprises four stages: eligibility assessment, functionality analysis, price and preference consideration as well as a compliance check.

He remarked on the critical nature of realistic bidding, cautioning against unviable low bids that could jeopardise profitability and lead to misplaced claims of exploitation by SANRAL.

Lusanda Kali, from the Indyebo Fund, provided an overview of the funding tools available for SMMEs. She elaborated on the various short-, medium- and long-term funding options, offering valuable guidance to businesses on how to access and use these financial resources effectively.

The session also featured a presentation from the Construction Industry Development Board (CIDB) Assessment Officer, Lusindiso Nocha, who discussed the grading criteria, contractor competence, contractor performance, grading requirements and registration fees. "It's important to pay your annual registration fees because failure to do so for two years will lead to the deregistration of your company," noted Nocha.

SANRAL's Regional Transformation Officer, Thandile Makwabe.

This provided participants with crucial information on maintaining and improving their standing within the industry.

"We have now assigned transformation officers across all our projects in an effort to enhance our monitoring and evaluation and to ensure that our transformation efforts are being implemented thoroughly on the ground. This will help us ensure that the targeted enterprises (TEs) receive supervision and mentorship from the dedicated TE Mentors on site. This will greatly contribute to their development and safeguard them from any threat of exploitation," added Makwabe.

> *"SANRAL ensures that there's a percentage set aside for SMMEs while empowering them to participate in construction projects in their local communities and elsewhere."*

Paving the **WAY AHEAD**

Fibertex South Africa's solutions for road pavement maintenance include the manufacture and supply of Fibertex AM-2, which is a flexible nonwoven paving fabric, specifically developed for road engineering conditions in Africa.

"Reflective cracking and water intrusion are significant contributors to pavement deterioration in both rigid and flexible road constructions. Existing cracks in old asphalt layers allow water ingress when overlaid with new asphalt, compromising the overall lifespan and driving quality of the road," explains Brian Potgieter, Technical Sales Engineer, Fibertex South Africa - specialists in a wide range of nonwovens, geosynthetics and performance-based materials. "Fibertex has developed a nonwoven paving fabric - Fibertex AM-2 - that specifically addresses these issues through a two-fold mechanism: as a waterproofing membrane and as a Stress Absorbing Membrane Interlayer (SAMI). The company also supplies F34 and F 46 – which function as a separator layer within the road base.

"As a waterproofing membrane, Fibertex AM-2 acts as a barrier, substantially reducing water permeation through the asphalt overlay and into the underlying pavement structure. This mitigates the detrimental effects of water ingress. The fabric also functions as a SAMI, absorbing stress caused by differential loads on the road surface. This material helps prevent the propagation of existing cracks from the lower pavement layers to the newly installed overlay, delaying the onset of reflective cracking.

Benefits of this system include reduced maintenance cycles and costs. By extending pavement life and minimising reflective cracking, Fibertex AM-2 allows for extended intervals between road maintenance projects, leading to significant cost savings. The use of Fibertex AM-2 may allow for a reduction in the overlay thickness required, further contributing to cost efficiency.

In addition, this material can be applied mechanically for large-scale projects or manually for narrow installations, offering flexibility in application methods.

Comparison with traditional asphalt overlays

While traditional asphalt overlays offer some mitigation of reflective cracking, Fibertex AM-2 provides a more comprehensive solution by addressing both water intrusion and stress absorption. This two-pronged approach demonstrably extends pavement lifespan and reduces overall maintenance costs.

The established benefits of asphalt overlay geotextiles in general, align with the technical aspects of Fibertex AM-2. These features include-reduced reflective cracking, greater flexibility and enhanced pavement performance.

Fibertex AM-2 offers a technically sound solution for road pavement maintenance by addressing water intrusion and stress absorption. This innovative approach translates to extended pavement life, reduced maintenance cycles and significant cost savings.

Basal stabilisation and load capacity

Fibertex F-range nonwoven geotextiles – including F34 and F46 – function as a separator layer within the road base (prism). This separation layer allows for optimised road design by reducing the load-bearing layer thickness and enhancing load distribution, as well as improving durability and minimising environmental impact.

The geotextile effectively separates the engineered fill from the subgrade, preventing intermixing. This allows for a thinner load-bearing layer design while maintaining its load capacity. The geotextile transmits and distributes traffic loads more efficiently across the entire road structure, further contributing to an optimised design and cost savings.

In weak subgrade conditions, without a separation Fibertex fabric, two issues arise - engineered aggregates can punch through the weak subgrade, compromising stability or a weak subgrade material can migrate into the engineered fill, reducing the overall base course strength and potentially leading to rutting.

Virgin PP geotextiles, with high chemical stability across a wide pH range, are suitable for most civil engineering environments. This ensures long-term product performance, minimising project cost impacts and potential environmental issues from product failure.

Fibertex offers UV-stabilised virgin PP geotextiles – the only nonwoven geotextiles in Africa certified for over 100 years of durability, according to the latest EN standards.

Fibertex South Africa's geosynthetic portfolio goes beyond basal stabilisation. The company offers a comprehensive range of products to address various civil engineering challenges, including basal stabilisation, where Fibertex F-grade geotextiles have been developed for optimised road design and load capacity improvement. Geotextiles are also used for soil reinforcement and stabilisation, where geogrids and geocells enhance soil strength and stability in applications like embankments, slopes, and retaining walls.

Fluid barrier systems include Geosynthetic Clay Liners (GCLs) which are designed for low permeability barriers in landfill and containment applications. Geomembranes (GMBs) are suitable for high impermeability applications and are often used in composite lining systems with GCLs for enhanced containment security.

This diverse range of geosynthetics caters to diverse civil engineering and environmental needs. Fibertex specialists offer a technical advisory and support service throughout Africa. ⊙

Graham Dean, CHRYSO Business Development Director - Eastern Africa.

Growing role for CHRYSO admixtures in EAST AFRICA'S CONSTRUCTION BOOM

With the construction sector in East Africa seeing an upswing, CHRYSO East Africa has grown its offerings to the market while ensuring its admixture solutions are targeted at local conditions.

According to Graham Dean, CHRYSO's Business Development Director Eastern Africa, the region's growing investment in construction projects is evident in countries like Kenya, Tanzania and Uganda. While infrastructure development such as roads and railways are mainly driving this growth in Kenya, it is Tanzania's mining industry and Uganda's oil sector which are becoming more significant.

"As a key construction product, concrete uses natural materials which are locally sourced," says Dean. "This might include cement produced from limestone quarried around Nairobi, pozzolana to modify different cement types or quarried aggregates and crushed sands. To achieve the best results in concrete, it is important to understand the variations in what Mother Nature provides to us as raw materials."

He highlights that concrete admixtures which have been well proven with materials in South Africa, for instance, may not necessarily perform to the same levels with concrete materials from Kenya. Accommodating these variations has required considerable investment in research and technical facilities in East Africa, to ensure customised admixture solutions.

"To resolve the performance differences between regions, CHRYSO set up a concrete laboratory in Nairobi where we can modify existing formulations," he explains. "This allows us to design bespoke admixtures for customers, based on their specific requirements and the local materials going into their concrete."

With its Nairobi office established almost 10 years ago, CHRYSO has developed the locally based experience and infrastructure to become a trusted partner in the concrete space. The company supplies its admixture solutions not only to large construction companies, specifiers and developers, but also to readymix plants, manufacturers of precast products and specialist applicators of decorative concrete.

As the negative environmental impact of sand mining falls under the spotlight in certain East African countries, CHRYSO is also contributing to more responsible practices in the concrete segment.

"The uncontrolled mining of river sand for concrete in many areas has led to concerns at government level, and an expectation that this practice might be banned in future to prevent further damage to the natural environment," says Dean. "We have promoted our Quad range to raise awareness in the construction industry about alternatives to river sand."

CHRYSO uses its in-house polymers in the Quad range of products to accommodate the use of challenging sands, including too little or too much fines, swelling clays or irregular shapes. Being able to use lower quality sands can drive down procurement

The CHRYSO Quad Range is an alternative to river sand and addresses environmental concerns.

CHRYSO cement additives boost compressive strength and reduce production costs with enhanced cement performance.

The CHRYSO Quad Range enables the use of challenging sands, lowering costs and carbon footprint.

CHRYSO's state-of-the-art concrete laboratory in Nairobi.

costs and can also reduce the carbon footprint of a given concrete where these alternative materials are closer to site.

"We have also taken a leading role in the supply of additives to cement producers, with our in-depth understanding of cement production technologies," says Dean. CHRYSO has been supporting cement producers to reach their sustainability goals, as cement manufacture is a leading contributor to carbon dioxide emissions. The company's innovations allow more efficient clinker grinding, reducing power consumption in this energy intensive process.

The additives permit increases in the compressive strength at the initial, mid-term and later ages. The resulting enhanced performance can meet specific market needs such as reducing cement fineness or lowering unit production costs. The clinker factor can also be reduced by using increased levels of supplementary cementitious material (SCMs) while retaining cement performance. CHRYSO additives can be used for the grinding of most cements in all types of grinding systems, including those with ball mills, roll presses, and open and closed circuits, as well as horizontal roller and vertical roller mills.

CHRYSO is able to develop specialised products for customers, to suit their applications. A customer in Mombasa, for instance, needed a solution for the use of coral limestone as a bulking agent in cement production.

"Coral limestone is a notoriously difficult material to blend effectively into cement," he notes. "Through extensive trials for the customer, CHRYSO East Africa was able to formulate a solution by finetuning one of our products; the result was a solution which overcame the customer's challenge and is now being regularly used." ⊙

Babcock committed to **A GREENER FUTURE**

Babcock is demonstrating its commitment to a greener future through initiatives that align with South Africa's environmental objectives, while also operating within Babcock International's goal of environmental sustainability.

"We seek out opportunities where we can make a difference within our working environment to be more eco-friendly, and reduce our carbon footprint," says SHE Manager at Babcock, DJ Marais.

Two such examples are supporting the Carbon Trust's 'Zero Waste to Landfill' goal, and exploring the use of renewable electricity.

Dedicated waste transfer facility at Bartlett

According to the Department of Environmental Affairs, the average South African produces a staggering one tonne of waste per year. Up to 65% of waste in the country is recyclable, yet only 10% is being recycled annually. Landfills across South Africa are reaching capacity, particularly in metropolitan areas. As Mpendulo Ginindza, President of the Institute of Waste Management of South Africa, says, "This situation requires everyone's involvement – from households to business."

Babcock already recycles waste but has recently taken it a step further by creating a centralised waste transfer facility at its Bartlett site for all recyclable waste. An under-utilised space covering an area of 46 m^2 within the warehouse yard was repurposed into a secure waste transfer facility where the waste will be sorted according to different categories before it is collected by a permitted waste management service provider. This includes oil cans and containers, different types of plastics, packaging for parts, and recyclable office and warehouse waste. "We have gone to great lengths to find a suitable permitted waste management service provider that operates beyond compliancy and is fully committed to the 'Zero Waste to Landfill' goal, while also having the resources to responsibly manage recyclable hazardous waste such as industrial oil," says Marais. What makes this facility unique is that it was built almost entirely with recycled materials. "Even the locks are repurposed wheel spanners" says Marais. Another unique aspect of the facility is that Babcock is encouraging its employees to bring their personal industrial waste to this facility instead of disposing of it with general waste.

The facility is expected to be fully operational by the last quarter of 2024.

Replacement of generator with solar panels at Middelburg

Babcock's state-of-the-art sales, parts and service dealership in Middelburg was constructed in 2015 to offer responsive regional support and service across its entire construction equipment product range. The building was equipped with a 500 kVA generator as a back-up power supply so that customers could access service support 24-hours a day from Babcock regardless of national power outages. While this was sufficient for some time, the diesel used in the generator impacted negatively on the air.

A solar solution was identified to replace the generator which would meet with the branch's energy requirements, while also adhering to Babcock's sustainable procurement policies. Following a load study to assess the energy consumption, the supplier proposed a solution that would guarantee power during loadshedding and meet Babcock's target on climate change commitments of ensuring the use of 100% renewable energy by 2030.

The new solar installation, which has been fully functional since April 2024, comprises a 150-kilowatt hybrid inverter system driven by 198 x 550-watt solar panels installed on the roof, making it one of the largest solar installations in the region. The 30 000 m^2 building, with a roof large enough to accommodate all the panels, was constructed facing north to maximise natural light entering the building, so it was ideally positioned for this installation, and can accommodate additional panels if required in the future.

Babcock is examining other environmental initiatives across its operations, such as capturing rainwater to utilise on site, and extended recycling programmes at its larger branches. In Middelburg, the yellow-metal facility has a purpose-built waste recycling area, as well as an oil drainage system that filters wastewater to allow it to safely enter the municipal sewer system. ⊙

De Beers Group's sorting building in Johannesburg awarded **PRESTIGIOUS GREEN RATINGS**

De Beers Group is proud to announce that its new rough diamond sorting, valuation, and sales building, Sky Park, located in Johannesburg, has received the prestigious 5-star interior green rating and two 4-star green building ratings from the Green Building Council of South Africa (GBCSA).

The accolades were awarded for the innovative and sustainable design elements proposed and approved by the GBCSA, as well as the "As-Build" rating that evaluates the use of green and sustainable materials during the construction phase. The comprehensive waste, water, and power management strategies implemented during construction were also recognised as part of these awards.

The 5-star interior green rating reflects the sustainable choices made for the building's interiors, including the selection of eco-friendly materials for furniture and furnishings, advanced water consumption systems, and the integration of internal gardens. The assessment also considered the building's energy efficiency, highlighted by the installation of a solar plant and comprehensive water management systems.

DBSSSA Senior Sales and Office Manager, Richard Steenkamp, said: "De Beers is a steward of sustainability, and achieving the Green Star Building ratings for the Sky Park building affirms our commitment to creating spaces that harmonizes environmental responsibility with innovation and excellence."

In January 2023 De Beers announced that it was relocating its Sightholder Sales activities in South Africa from Kimberley, where it has been operating since 1974, to Johannesburg following a review of its sorting activities in South Africa. De Beers Sightholder Sales South Africa (DBSSSA) is part of the Global Sightholder Sales network that sells rough diamonds for beneficiation purposes in South Africa, Botswana, Namibia and Canada. It is also responsible for the distribution of De Beers rough diamonds in South Africa and seeks to support the industry at large in maintaining a sustainable diamond manufacturing industry through its beneficiation strategy. The relocation supports the government's strategy to consolidate the country's mineral beneficiation sector into one area at the Gauteng Industrial Development Zone, close to the OR Tambo International Airport.

SA architects rally to tackle HOUSING SHORTAGE

Industry professionals will discuss solutions to shape cities and communities for a sustainable future at AZA24 from 4-7 September in Johannesburg, South Africa.

South Africa is currently experiencing rapid urbanisation, with 63% of the population already residing in urban areas, a figure projected to rise to 71% by 2030. By 2050, it is estimated that eight out of every 10 people in the country will live in urban areas. As a consequence, the demand for basic infrastructure and essential services will significantly increase.

While urbanisation is a worldwide development, the growth rate is the fastest in Africa. By 2035, half of its population will be living in cities and urban areas. But so far, it has largely translated into rising informal establishments, especially in sub-Saharan Africa, increasing poverty and inequality.

One of the most pressing issues is the dire state of the architectural profession in the region with too few skills on hand.

"As the demand for proper urban planning and development escalates, so does the need for skilled and competent architects who can contribute to sustainable and inclusive cities. However, the current state of the profession is cause for concern, with various obstacles hindering its progress. One of the most significant challenges is the housing crisis, which creates complex issues for architects," says Devi Paulsen-Abbott at Energy Capital & Power.

The ever-growing urban population has put immense pressure on the limited housing options available, resulting in a dire need for affordable and sustainable solutions. Architects have a crucial role to play in developing innovative and sustainable housing options for all citizens.

"These are the professionals who possess the skills, knowledge, and creativity to design and build the spaces we live and work in.

Claire McCusker, President 2024/25 of SA Institute of Architects (SAIA).

AZA Convener, Daniel van der Merwe.

They have the potential to transform our cities and shape them into liveable, inclusive, and sustainable environments. However, the current state of the architectural profession in Southern Africa is hindering its ability to fulfil this critical role," she Paulsen-Abbott.

Another big challenge facing the local architectural profession is the lack of collaboration between the public and private sectors, she says. "The development of our cities requires a joint effort from both these sectors, but there is a significant disconnect between them. As a result, many projects are abandoned, delayed, or poorly executed, leading to subpar living conditions for citizens. Paulsen-Abbott explains that this disconnect also stems from the inadequate recognition and support for the architectural profession. "Despite its crucial role in shaping our built environment, architecture is often undervalued and underfunded by the public sector," she says. "This results in a lack of resources and opportunities for architects to develop their skills and push the boundaries of innovation in design."

To address these pressing issues, the Architecture South Africa Conference (AZA24) was a much-needed event. Bringing together over 50 experts under the theme, "Where Architecture Meets ... US/ Planet/Future ...", the conference was a insightful and thought-provoking exploration of the dynamic relationship between architecture, humanity, and sustainability.

This highly anticipated event, hosted by the SA Institute of Architects (SAIA), Gauteng Institute for Architecture (GIFA), and University of Johannesburg (UJ), will take place from 4-7 September 2024 on the UJ campus.

AZA Convener, Daniel van der Merwe, says: "This conference is a vital opportunity for the architectural profession to come together, collaborate, and find solutions to the challenges facing our cities. By bridging the gap between the public and private sectors, architects can work towards creating more liveable and sustainable cities for all."

AZA will also serve as a platform for architects to showcase their innovative designs and ideas, encouraging further growth and development within the profession.

"As citizens, we must also realize the importance of the architectural profession in creating a better future for us all. We must demand that our governments prioritise urban planning and development, and allocate sufficient resources and support for the architectural profession," Van der Merwe concludes.

"The Architecture South Africa Conference AZA 2024 was a call for united action. We know the challenges South Africa faces, lack of sufficient housing, spatial inequality and ailing infrastructure. As architects our ultimate goal is to improve the lives of the end users of the spaces we design, inclusive of everyone in our beautiful country. AZA looks to open the discourse on how we can achieve this. Bringing together thought leaders to empower us all for a bright future," Says Claire McCusker, President 2024/25 of SA Institute of Architecture (SAIA). ⊙

ABOUT SAIA

The South African Institute of Architects (SAIA) is a voluntary association for Professional Architects. SAIA's mission is to act as the collective voice serving the interests of its members in pursuit of excellence and responsible design. It aims to uphold the dignity of the architectural profession and contribute meaningfully to the enhancement of society and the environment. The fundamental principles of equality and justice are implicit in our Constitution.

SAIA incorporates the nine existing regional institutes: Border-Kei (Eastern Cape), CIfA (Western Cape), Eastern Cape, Free State, GIfA (Gauteng), KZNIA (KwaZulu-Natal), Limpopo, Mpumalanga and PIA (Gauteng).

ABOUT GIFA

The Gauteng Institute for Architecture (GIfA) boasts a rich legacy, tracing its roots back to 1900 as the Transvaal Institute of Architects. It is dedicated to nurturing architectural excellence and raising awareness of the built environment. Its focused committees explore specific topics, addressing both current and historical issues. Moreover, it offers extensive training and development opportunities to members, ensuring continuous professional growth.

dhk Architects COMPLETES THE RUBIK

dhk Architects has completed The Rubik, an elegant 27-storey tower located in the heart of the Cape Town CBD, for Abland Property Developers. The building comprises retail, commercial and residential accommodation on an 821 m² site which straddles the city's financial and heritage districts.

The design features distinctive angled cubes that break up the volumetric mass. The parking base features varied vertical and horizontal elements and planes to directly reference the lower-rise heritage buildings on the southern boundary. The Rubik is a true mixed-use development that densifies the city and offers walkable access to local amenities, adding a significant contemporary architectural insertion to the city centre.

Site background and challenges

The Rubik is situated in the heart of the Cape Town CBD, on the corners of Loop, Riebeek and Sea Streets. The site straddles the financial district, where city planners encourage taller buildings; and the heritage district, characterised by smaller two- and three-storey heritage buildings. This juxtaposition presented a notable design and developmental challenge. The site is located in a Heritage Overlay Zone, and so the design required approval from Heritage Western Cape and the City of Cape Town's Land Use Management authority. The site also had an existing height restriction of 60 m above base level, with a zero-metre street setback up to 38 m and a diagonal setback for higher than 38 m.

Client brief

The initial design brief was for a 12-storey building on the southern portion of the site. Abland subsequently acquired the northern part, consolidating four erven into a single square site. Two existing buildings of no significant architectural or heritage merit were proposed for demolition.

The second design brief called for a much higher mixed-use scheme. dhk developed several proposals of various masses, heights and façade articulations, eventually finalising the design for a 91-metre tower. The resulting form is an elegant, aesthetically striking design that enhances the city skyline, rather than imposing a conventional monolithic tower. The design required a major departure from the zoning height and setback restriction.

Design concept

Retail uses are accommodated at ground and first floor level. The parking podium rises 10 floors above, bucking the common development typology of landing an inactive parking mass at ground level. Above the parking plinth, from floors 11 to 26, the office and residential portion is broken into three stacked orthogonal twisting cubes rotated around a central axis. This fragments the building into smaller volumetric masses, creating a dynamic sculptural form. The glazing on these levels forms smooth, differently angled planes that capture different reflections of the sky and surrounding buildings, further fragmenting the mass and creating visual interest across the skyline.

With typical mullion and generous 1,6 m centres, the flush glazing offers a consistent visual appearance for the office and residential components, and conceals the slab edges, fire break spandrel panels and walls behind. The façade on the second and third cubes – the residential floors – feature discreet incisions, forming recessed balconies small enough not to detract from the cuboid form.

Façade description

The façade that wraps around the parking podium has been designed to reference the scale, vertical rhythm and massing of the surrounding lower-scale heritage buildings, reflecting their more detailed urban grain. This façade combines primary elements of pre-cast concrete in vertical and horizontal bands, secondary vertical elements of extruded aluminium in between, and a combination of glazed panels, aluminium louvres and plastered masonry walls as the infill façade. The intentionally irregular pattern, geometry and varying scales add visual interest. Cladding is articulated into various panel sizes to break down the scale of the parking levels base relative to the scale of the lower buildings in Loop Street. Glazing effectively 'stitches in'

elements of the tower above into the parking podium.

This approach responds to Heritage Western Cape concerns that the early design iterations of flatter translucent screens at the parking levels might negatively impact the surrounding context.

Building access

Access to the residential entrance is off Loop Street. Access to the commercial accommodation is off the busier Riebeek Street. Both are flanked by retail units, accessed from the corner of Riebeek and Loop. This strategy maximises street activation on the small site. Vehicle entry points are on the southern edge of the Loop Street boundary, adjacent to the heritage buildings, set as far from the Loop/Riebeek intersection as possible. The Sea Street entrance is also positioned away from the street corners on the southern boundary. To maximise street-level activity, the only services at ground floor are the municipality's non-negotiable requirements of an electric sub-station, firefighting equipment and a small meeting room.

Internal planning

At only 28 m x 29 m, the constricted site area presented challenges to resolve the internal layout. The building was configured to accommodate five lifts, two escape stairs, active street level entrances, municipal services, internal vehicle circulation and parking, office floor layouts and residential units above..

The centralised lift core and scissor stair positioned on the common southern boundary accommodates the parking and spiral vehicle ramp circulation below. The WC core and lift lobby is positioned between the lift and stair core. Full height glazing flanking the scissor stair core on the common boundary maximises views of Table Mountain and the CBD.

An additional challenge in the tight site area was how to provide efficient parking spaces and compliant vehicle which required careful positioning of large columns to secure City planning approval.

Residential layout

The challenge of using the full extent of a square site is having sufficient frontage for bedrooms and living spaces, while also accommodating usable space in the deeper zones inside the perimeter.

On the typical floors, larger two-bedroom apartments are positioned on the two northern corners, and one-bedroom units on the southern corners. Longer bedrooms in the narrower one-bedroom flats are positioned at the rear to maximise use of the deeper spaces for the areas between corner units.

Larger units are on the top three floors, with five duplex and four triplex configurations. Bedrooms not adjacent to the outer façade are lit and ventilated from small courtyards open to the roof. The triplexes have roof terraces with partial pergola covering and glazed balustrades to maximise views. Terraces are inboard, behind strategic openings in the glazed façade to provide weather protection, and to enable residents to open their sliding doors onto the terraces.

Mixed uses

The Rubik introduces retail uses at ground- and first-floor levels, creating a more dynamic and active street frontage with natural surveillance. The retail space on the first floor on the northern portion of the building connects to the ground floor retail area. This activates the first-floor façade, as required by the Tall Building policy of Cape Town.

Colour palette and materials

Natural-looking materials and a muted colour palette throughout the building create a more natural, warm feel.

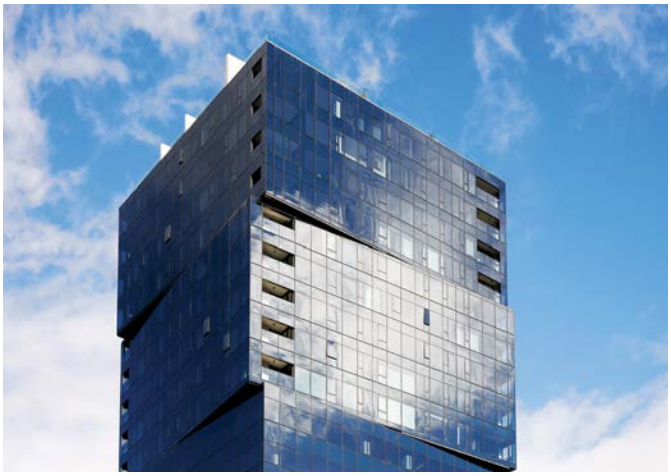
Sustainable elements

The Rubik incorporates several sustainable design features. It is a true mixed-use development that maximises the site area and helps densify and animate the city within walking distance to workplaces, local amenities and public transport.

Environmentally friendly and sustainable construction materials and techniques were used, including sustainably sourced timber and durable composite materials to ensure longevity, paints with low volatile organic compound (VOC), limiting plastering on masonry walls in the service and escape areas or on exposed reinforced concrete walls, soffits and columns.

High-performance double glazing throughout, with desk-height opaque spandrels in offices to reduce solar gain and improve space efficiency. Recessed, semi-enclosed balconies promote natural ventilation and reduce wind loads. Above-ground parking facilitates natural ventilation and smoke extraction. Energy-saving electrical devices and efficient mechanical, electrical, and wet services are installed throughout. The building optimises lift usage with just five elevators, using careful destination control and dual-purpose fire-fighting lifts to maintain efficiency without compromising on waiting times or safety. ⊙

Photos: Sean Gibson



Building Africa's first precast-concrete WATER TOWER

The City of Ekurhuleni's Water & Sanitation Department is at the cutting-edge of precast-concrete technology. This water-services provider has already successfully completed the construction of four prefabricated reservoirs. With another precast concrete water-retaining structure nearing completion, it was just a matter of time before the Water & Sanitation Department would take its concept even further.

A new water tower is being constructed alongside one of these precast-concrete reservoirs. It too, when completed later this year, will have been almost entirely prefabricated in a state-of-the-art factory and skilfully integrated on site. The only in-situ components include the tank floor slab and the foundation.

When finalised later this year, this will be the first precast-concrete water tower in Africa. It will have a final height of 36 m and a capacity of 2,5 ML. The municipality opted for a precast-concrete water tower because it was faster and more cost-effective to build. This while also providing a final structure of an exceptionally high quality which, in turn, will provide operating cost savings through reduced maintenance requirements.

The efficacy of prefabrication had proven itself time and again on each of the projects the Water & Sanitation Department completed. Meanwhile, its professional team had also become more proficient in executing the works, refining and honing the sophisticated method from one project to the next.

The water services provider is again being supported by Tangos Consulting Engineers, the design engineer and project manager, and Infinite Consulting Engineers, a structural engineer with an extensive pedigree in the design and supervision of precast-concrete structures. This is in addition to RSMM Construction, the principal contractor, and Corestruc, a precast-concrete turnkey contractor. Partnering Corestruc with its extensive precast-concrete know-how, which includes manufacture, transport and rigging, RSMM Construction has earned a reputation for the exceptionally high quality of its water-retaining structures. This while building them in fraction of the time that it would have taken using conventional cast-in-place methods.

The construction of the precast-concrete water tower will be completed in only 14 months compared to between the two and three years that it would take using traditional methods. Considering that this is the first precast-concrete water tower to be built by the team, it is taking slightly longer to construct. The other water-retaining structures will be completed in only nine months, bearing in mind that the tower constructed above the footing took only six months to build.

It will also have a design life of 100 years if maintained appropriately, considering the high-performance concrete used to manufacture each individual component.

Corestruc's quality control technicians precisely calculate the moisture content of aggregates and factor in water from admixtures to make the necessary modifications to maintain the optimum water-to-cement ratio. The company is also judicious in its selection of aggregates to ensure that they are as impermeable as possible. Furthermore, admixtures are used to modify fresh or hardened concrete. All of these produce an almost impermeable concrete element that can withstand damaging chloride and sulphate ions, as well as aggressive chemicals.

The water tower design is the outcome of years of research and development by Corestruc and Infinite Consulting Engineers, followed by a sizeable investment into the new formwork required to manufacture the various concrete elements that make up the structure. These are already being used to fabricate the precast-concrete elements for another precast-concrete water tower that is also being built in the municipal

jurisdiction. Further structures are also being planned by other municipalities as they explore more efficient and cost-effective ways of augmenting water supply, a critical challenge in the country.

They include the forms used to manufacture the 12 columns and spiral beam elements for each of the three sections or "rotations" that comprise the outer portion of the tower. These 30 interconnected semi-circular prefabricated elements wrap around the structure providing the necessary support, while also offering a striking aesthetic effect. The two columns are fixed via the protruding dowels that pass through the underside and topside of the spiral beam which is then filled with in-situ concrete. This process was repeated until the columns reached their final height.

Then there are the 15 prefabricated elements that make up the 3,6m-diameter shaft, which is constructed at the same time as the outer portion of the structure. Equipped with precast-concrete stairwells with balustrades, it leads to the underside of the prefabricated tank. Thereafter, the shaft connects with stacked precast concrete pipes equipped with a cat ladder. Cast into the reservoir floor slab, this top portion of the shaft will traverse through the water-retaining structure to a manhole on the roof.

The superstructure consists of 12 tapered beams connected to the columns of the last rotation. Resting on bearing pads, they will carry and distribute the load of the precast concrete tank and its contents.

Installed in the triangular-shaped junctions between the tapered beams, cut-to-size and shape hollow-core slabs serve as the shutter for the in-situ foundation for the water-retaining structure. Coping panels have been installed along the perimeter providing an aesthetically pleasing finish.

To ensure the very high levels of accuracy required for this precast-concrete structure, Corestruc has also invested in a robotic total station. It is also fast and highly efficient, which is precast concrete's ultimate value proposition. This technology is making the company even more efficient at what it does so well.

Meyer van Rooyen, a seasoned Corestruc Project Manager, who has supervised all precast-concrete work thus far, says that there is very little scope for error on this project. "We have achieved tight 15 mm tolerances throughout the construction of the three rotations of the substructure, starting with the placement of the first-rotation columns on the in-situ foundation. Among other factors, this is also facilitated by our precise manufacturing processes. Each element undergoes extensive quality assurance before it is dispatched and again once it has arrived on site. Once the elements have been safely transported to site and as the last component in Corestruc's precast-concrete value chain, the responsibility rests with my team of riggers to maintain the highest levels of productivity, efficiency and accuracy," Van Rooyen says.

His team is supported by a state-of-the-art 150 t mobile crane, which has the capacity to lift the heavy precast-concrete elements and reach to efficiently place them. The 12 tapered beams, for example, each weigh a staggering 18,5 t and the columns for the second and third rotations slightly less.

While the tank is significantly smaller than the reservoirs that Van Rooyen and his team have already built, constructing it many metres above ground poses unique challenges.

Safety of employees is on top of mind for RSMM Construction and Corestruc. Therefore, the companies have contracted the services of a specialist work at height safety consultant to assist with occupational health and safety protocol. It will also provide specialist training to the team.

Four sub-contractors who have been sourced from communities located within the construction footprint will work alongside Corestruc's team to construct the floor slab.

A total of 104 m^3 of concrete will be placed to construct the 350 mm-thick floor slab. One of the challenges is the heavy reinforcement in the beam junctions. Therefore, the placement of concrete will have to be carefully managed to ensure that the correct compaction is achieved. This while also ensuring that the top portion of the cast-in-place shaft is water-tight.

An articulated boom lift has already been placed on top of the superstructure to assist with the installation, as well as the grouting of the 34 tank wall panels. This is in addition to the two buttress panels for post-tensioning, which will be undertaken in the same way as all of Corestruc's other reservoirs. All of the wall panels will be propped during their installation, considering the wind speeds at this height. Conventionally, only the first wall panel is propped to free up space.

Meanwhile, the roof structure consists of four columns and beams, as well as 150 hollow-core slabs. The centre portion or "core" will be constructed first, and the outer section completed as part of the among the final aspects of the programme.

While the structure, itself, demonstrates excellence in precast-concrete design and implementation, Van Rooyen says that RSMM Construction and Corestruc have also had an opportunity to show off their extensive expertise in cast-in place concrete methods.

"Supporting this water tower is a 1 m-thick and 25 m diameter foundation consisting of 500 m^2 of 30 MPa cast-in-place reinforced concrete. It is underpinned by 200 m^2 of mass concrete blinding. This took 10 hours to place, starting at 5h00 and using two concrete pumps, while also isolating an entire ready-mix concrete plant just for this purpose," he says.

Van Rooyen has all the reason to be proud, considering how well the project is progressing. He will soon be able to boast that he has again played his part in yet another project that has demonstrated the efficacy of precast concrete. ⊙

Cutting-edge hybrid power system takes HEIDELBERG MALL 100% OFF-GRID

Energy Partners, a pioneer in South Africa's energy solutions sector, has successfully delivered a 3.2 MWp, 3.1 MWh hybrid power project for the Futuregrowth Community Property Fund owned Heidelberg Mall in Heidelberg, Gauteng.

The project ensures 24/7 uninterrupted power, significantly reducing total electricity expenditure and offering a compelling value proposition for retail tenants.

EP designed a hybrid system that guarantees peak demand reduction, increases self-consumption from excess solar generation, saves on diesel, and achieves arbitrage savings, better known as load shifting.

Manie de Waal, EP's Chief Executive Officer.

A proven partnership

Manie de Waal, EP's Chief Executive Officer, notes that the project is but another step in an already proven partnership with Comprop, which began in 2018: "Our ongoing collaboration with Comprop has been instrumental in driving substantial energy savings and lowering operational costs across their property portfolio. Over the past seven years, we've successfully implemented more than 13 MWp across 11 properties."

The Comprop portfolio, he confirms, has experienced consistent on-target generation performance thanks to EP's maintenance and real-time monitoring.

Advanced engineering and technology

The Heidelberg Mall project is unique in that it provides an uninterrupted power supply to the entire mall, handling loads up to 2,5 MVA.

EP's proprietary Battery Energy Storage System (BESS) control philosophy and engineering design integrate three power generation sources, creating a robust off-grid solution. The grid serves as a back-up, while the primary sources are solar and diesel generation.

Charl du Plessis, General Manager, EP Power, says, "The rooftop solar system can carry the mall's full load during the day, and the BESS is sized to ensure autonomy during loadshedding and even unexpected grid failures by means of smart load management and diesel generation.

"The design guarantees zero interruption on full mall load when the grid fails including unexpected grid failures. Additionally, the design protects the entire mall load from voltage fluctuations and other grid power quality issues." The control philosophy is fully integrated with various external systems to optimise electricity usage and expenditure. This includes smart load management in the mall on HVAC, weather prediction integration for solar generation forecasting, and loadshedding schedule planning.

The entire system is remotely monitored via real-time dashboards and continuous support from EP's plant monitoring hub in Bellville, Cape Town.

EPs asset management team oversees a spectrum of energy solutions including steam boilers, hybrid generation power plants and refrigeration systems.

"Exciting stuff"

With the rapid deployment of embedded generation in almost every industry in South Africa, EP's partnership with Comprop has proven key to the success in its energy asset portfolio.

Smital Rambhai, the Fund Manager of the Futuregrowth Community Property Fund, says, "The ability to continuously trade and reduce energy costs over the long term will result in better long-term value in our properties relative to our competitors.

Not only is Energy Partners assisting us in delivering a cutting-edge hybrid power system that will enhance returns for our investors, but it will reduce our carbon footprint at the same time."

Successful deployment, confirms de Waal, hinges on the level of support after commissioning.

"We're proud of what we've been able to achieve for Comprop so far," he concludes. "But the Heidelberg Mall hybrid generation project is truly groundbreaking, and it unlocks the possibility of securing energy supply across their entire portfolio. That's exciting stuff." ⊙

"The Comprop portfolio has experienced on-target generation and performance thanks to EP's maintenance."

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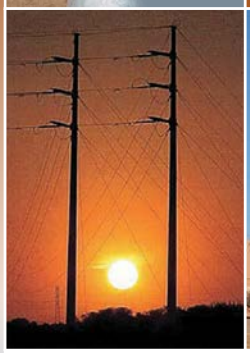

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