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ON THE COVER

As was the case in the past when the country undertook various major infrastructure projects (such as the Gariiep Dam on the cover), infrastructure development will be a way to get South Africa's economy out of the depressed state in which it is. The South African construction industry goes into 2021 with the news that 29 of the country's contractor, professional, supplier (and other) bodies have united to form what is known as the Construction Alliance South Africa (CASA). Infrastructure development can only be achieved through innovation, being competitive and with a truly transformed industry.



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COMMENT

The South African construction industry goes into 2021 with the news that 29 of the country's contractor, professional, supplier (and other) bodies have united to form what is known as the Construction Alliance South Africa (CASA).

The origins of CASA can be traced back to the Construction COVID-19 Rapid Response Task Team that was established in the dark days of the hard lockdown – April 2020. John Matthews played a leading role with this initiative and it therefore comes as no surprise that he has been appointed as chairperson of CASA.

This task team provided a collective construction industry response to the pandemic's restrictions on construction activities. It was instrumental in developing a coordinated industry response and also the safe reactivation of construction sites as the lockdown restrictions were eased.

Importantly, the vital role it played in presenting just how the industry can form part of a national recovery plan post-pandemic led to the realisation that now, more than ever, the industry needs such an alliance that has as its main aim the

rebuilding of the construction sector.

Why CASA is essential

The task team that was established in April 2020 recognised the value of a collaborative and coordinated effort that included consultation and engagement with stakeholders to achieve the end goal: a sustainable construction industry. The Alliance that was recently formed aims to continue this with the aim of uniting the industry and facilitating smooth dialogue with government so as to unlock the vast potential the construction industry has to resurrect the country's economy. This, says Matthews, can only be achieved through innovation, being competitive and with a truly transformed industry.

20 years of Best Projects

Construction World's Best Projects is 20

years old this year. The competition will call for entries in April with the process culminating in an awards event in November. We aim to mark this occasion with the ultimate in excellence. Civil engineers, building contractors, specialist suppliers and contractors, consulting engineers and architects are invited to enter projects which will make this 20th instalment of Best Projects one to be remembered.

Stay safe

Wilhelm du Plessis

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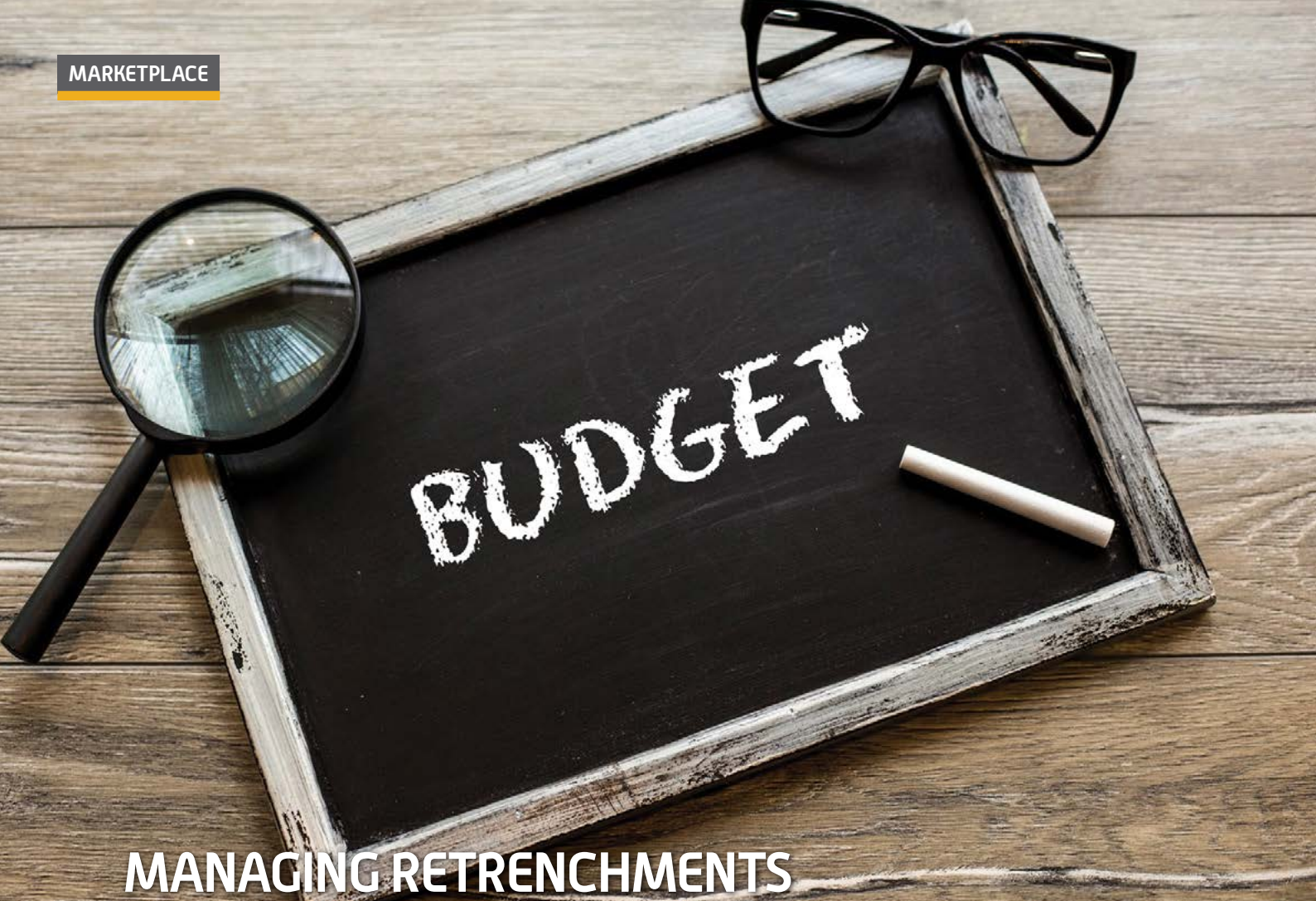
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MANAGING RETRENCHMENTS IN TOUGH ECONOMIC TIMES

The CCMA is receiving record numbers of retrenchment referrals, thanks to the pandemic.

The Commission for Conciliation, Mediation and Arbitration (CCMA) received 28 000 retrenchment cases from May to June 2020 during the lockdown. In August it revealed that it had received 190 large-scale retrenchment referrals and 1 307 small-scale retrenchment referrals in that month alone. While the numbers may be slowly dropping as the lockdown eases, it is important that organisations have a clear understanding of the regulations that come with retrenchment and how to ensure that both employee and business are protected. According to Nicol Myburgh, Head: CRS Technologies HCM Business Unit, there are a lot of considerations that go with retrenchment and a Section 189 dismissal, and it is critical that these are carried out in accordance with the letter of the law.

“It is a very difficult time for business – the lockdown has exacerbated an already fragile economy and many companies are struggling and going into retrenchment procedures,” he explains. “However, retrenchment is complex and there are pitfalls that need to be avoided so as to not end up falling foul of the CCMA and the law.”

The role of the CCMA is to mediate the process of retrenchment and ensure it is done fairly and correctly. The role of the business is to ensure that the paperwork and regulations are adhered to so that employees are taken care of correctly. Companies have to know how to undertake this process properly, clearly outlining the financial reasons and issues that have brought them to this point.

“Companies need to know the ins and outs of retrenchment regulations and paperwork,” says Myburgh. “Retrenchments are 99% procedural, so if you miss a step or do something wrong, you are immediately procedurally unfair and the CCMA will grant an arbitration award to the employee.” The first step the business needs to take

is to issue a Section 189 letter that informs employees that you’re embarking on a retrenchment process. There are 21 items that have to be covered in this letter and if even one is missing, you’re putting your business at risk.

Once you’ve released the letter, you can then set a date for consultations and this is when you will need to discuss the retrenchment process with employees, and sometimes unions. Any discussions and negotiations have to be put in writing, otherwise you are opening yourself up to complications. Once these processes have been completed, you will need to make specific payments at a specific time, and you have to provide people with very clear deadlines and notice periods.

It’s a little-known fact that the principle of Last In, First Out is not one that the business is forced to adhere to. Many companies believe that they’re locked in to this method and have to get rid of the last people they hired. This is not true. There are different methods for retrenchment that do not involve you having to dismiss your top performers. You can manage this process by working with a consultant who can help you identify the best route through the retrenchment process and help you manage morale, paperwork and procedure as carefully as possible.

“As much as it’s an extra cost at a time when costs are tight, it’s worth getting a consultant to help you go through retrenchment processes so you are completely aligned with the law,” concludes Myburgh. “If you’re not a specialist, it can be daunting to follow each employee case and ensure that every box is correctly ticked and that both business and employees are protected. A specialist will not only support you in getting the paperwork right, but will help you manage your people and processes correctly.” ■

STRUCTURED TRAINING FOR ZERO DEFECTS

Master Builders Association North and Tjeka Training Matters have partnered to provide structured training to the South African building industry.

Tjeka Training Matters is a registered private technical and vocational education and training college that is accredited by the Construction Education Training Authority. It has a 20-year-long track record providing high quality construction training throughout Southern Africa.

The partnership will initially offer short 20-day technical skills training courses in the building trades. They include bricklaying, plastering, carpentry, plumbing and painting.

"Tjeka Training Matters continues to build long working relationships with leading industry bodies to bolster training in the South African building and civil-engineering construction industries. Certainly, we are also looking forward to working with the Master Builders Association North, which has many reputable building contractors operating throughout Gauteng, North West, Mpumalanga, and Limpopo as members," Frans Toua, Chief Executive Officer of Tjeka Training Matters, says.

Led by a team of built-environment professionals, Tjeka Training Matters' training programmes have been designed to develop a competent workforce that is able to achieve performance goals safely and in a cost-effective manner.

The training provided by the partnership is geared towards achieving zero defects by enabling learners to perform their jobs correctly the first-time round. This is in response to the demands of the members of Master Builders Association North for structured training that addresses the limitations of conventional skills interventions in the industry.

Tjeka Training Matters customises its learnerships, skills programmes and short courses to adequately address company-specific needs. In so doing, clients' processes and procedures are incorporated into training programmes to align them with unit standards. This approach ensures consistent standards, a better experience, higher quality, and greater safety. Notably, learners



Frans Toua, CEO of Tjeka Training Matters.

receive support throughout the practical component of their training from competent site managers and mentors, as well as coaches. This, together with the theoretical component, makes up an integrated and comprehensive learning programme. The partnership between Master Builders Association North and Tjeka Training Matters comes at a time when infrastructure construction has been placed high on government's agenda as a means of stimulating economic recovery following the severe impact of the COVID-19 outbreak. The focus on social infrastructure, including housing, presents immense opportunity for the South African building industry.

Toua says that companies should now focus on developing a robust pipeline of skills to strengthen the South African building industry.

"Training is more than just enabling employees to perform their jobs well. This is a short-sighted approach that has not helped solve the dire skills shortage that the industry has grappled with for many years. Companies that continue to invest in high quality training improve their competitive edge. Equipped with the correct skills, their workers can solve challenges and are more efficient, boosting productivity and reducing the amount of rework on civil-engineering construction and building contracts. Importantly, it also drives up standards in the industry, while both public and private-sector client bodies gain from higher quality and improved safety performance of the professional teams working on their projects," he concludes.

Importantly, training also has a marked positive impact on the morale of a company's workforce by providing employees an important opportunity to hone their skills and, in so doing, developing long and vibrant careers in the civil-engineering construction and building sectors. "This is a significant benefit of quality training that transcends a focus on merely contributing to the scorecard," Toua concludes. ■

Chaly Mah appointed Chairman of Surbana Jurong Group

Surbana Jurong Group recently announced the appointment of Chaly MAH Chee Kheong as its Chairman, with effect from 1 January 2021. Mah succeeds LIEW Mun Leong, Surbana Jurong's founding Chairman, who retired in September 2020. The appointment follows the Board's approval of a recommendation by the company's Executive Resource & Compensation Committee.

Mah will bring extensive board and leadership experience to the role of Chairman of the Surbana Jurong Group. TAN Gee Paw, one of the Board's longest serving directors, commented: "The Board was pleased that Chaly agreed to join us and serve as Chairman, because we see his experience and vision as critical to continuing the journey that Surbana Jurong started under Liew Mun Leong's leadership. Chaly's leadership credentials and his desire to see Surbana Jurong continue its growth journey, delivering sustainable social and economic impact for our clients, appeal to us all."

Mah said of his appointment as Chairman, Surbana Jurong Group: "I am deeply honoured and humbled to be entrusted with this responsibility. Five years after its formation, Surbana Jurong Group

continues to fulfil its essential purpose of building cities and shaping lives. It has grown from strength to strength, expanding its influence and presence globally.

"For this, I would like to thank Mun Leong who, with the SJ leadership team, was the driving force behind Surbana Jurong's growth strategy. I look forward to working with the board and management to leverage on this strong platform to advance the Group into a leading global player."

WONG Heang Fine, Group Chief Executive Officer, Surbana Jurong Group said: "On behalf of the leadership team and all colleagues, I warmly welcome Chaly and look forward to working with him to take Surbana Jurong to its next phase of growth. In the face of unprecedented challenge, the over 16 000 colleagues in the Group have continued to deliver on our commitments to create value for all our stakeholders. Chaly's deep experience and insights will benefit us greatly as we continue to grow our portfolio of specialty consulting skills and expand our capabilities for the built environment, anchored on sustainability and technology for the future." ■

M&D CONSTRUCTION GROUP GIVES PENSIONER A HOUSE

M&D Construction Group, a leading multi-disciplinary construction company, continues to invest in many communities where the company operates as part of its ongoing corporate-social investment drive.



Chris Porter, Group Commercial Director, handed over the house to Marriam Mokgotho.

A case in point is the complimentary house that the company recently built for Marriam Mokgotho, a pensioner residing in Vosloorus.

Mokgotho used to stay in a makeshift dwelling with her three unemployed sons on a small plot of land located close to one of the contractor's social housing development projects. It provided less than adequate shelter for the family, which also did not have access to electricity and a convenient supply of water.

The house was completed in 2018, and Mokgotho agreed to allow M&D to use it for site offices and administration, and to hand it to her once the contractor had completed the social housing project.

As part of the arrangement, the family was temporarily relocated to an apartment in the area and for which M&D paid rent. Mokgotho also earned rent from the contractor for use of her land throughout the duration of the project.

The 13,5 m x 24 m house has a tiled roof and tiled floors, and five bedrooms, as well as fully functioning bathrooms, a kitchen and garages. It received a fresh coat of paint to ensure that it was in tip-top condition to be handed over to the family.

Notably, Mokgotho's old dwelling was also preserved for sentimental value considering that it was built by her late husband, Johannes Mokgotho, many years ago. Located at the back of the new house, it serves as a reminder of her husband's love and unwavering

dedication to his family. "It was an absolute pleasure seeing the look on Marriam's face when we told her about our plans to build her a house. Now well into her 60s, she has struggled throughout her life, never having lived in a formal house, while continuing to support her three sons with a modest grant. As such, the M&D team is very proud to have built her a house that she can call her home, and we hope that this will provide her with some relief," Dinesh Rampersad, Civil Engineer at M&D, says.

The house was handed over to Mokgotho on 8 December 2020 by Group Commercial Director, Chris Porter, who said it was a privilege for M&D to assist and support local communities wherever it can. Marriam accepted the keys and thanked God, M&D and the site team for providing her with her new home.

Rukesh Raghubir, CEO of M&D, says that this is just one example of the company's ongoing commitment to communities located within its project footprint.

"M&D continues to build strong relationships with communities as critical participants in our projects. This focus on developing partnerships is enshrined in our Khula Nathi motto that has been so instrumental to our success and rapid growth over the years. It transcends serving as a 'bigger brother' to smaller construction companies by also helping those in need wherever and whenever we can," Raghubir concludes. ■

LOCAL MANAGEMENT TEAM buy-out SNC-Lavalin SA

Led by Vice President Stuart Kent, the South African management team of SNC-Lavalin SA successfully completed a management buy-out of the local entity on 10 December 2020. Building on the success of SNC-Lavalin SA the management team remains the same people that customers have grown to know and trust.

The management team of the South African entity recognised the advantages of becoming a wholly owned South African company. In addition to the agility and faster response and turnaround times offered by local management the buy-out serves the country's strategy to transform South Africa's economy through increased ownership and management opportunities for previously disadvantaged South Africans.

As part of the deal the company was to undergo a full rename and rebrand and is now called Aurex Constructors. Derived from 'AU', the symbol for gold, and 'EXCELLENCE', Aurex is a business that embodies the gold standard, a place where excellence is not just expected, but consistently achieved: excellence in their service; excellence in their ethics; excellence in their standards; and excellence in their people.

As Aurex Constructors transforms into a South African owned and managed business its strategy is to focus on its core competencies and continue to deliver gold standard Construction and Turnaround & Maintenance projects across all energy sectors to their customers, as they have for more than 40 years.

"This is a very exciting time for the business" said Stuart Kent, "as we navigate the COVID-19 pandemic, recalibrate our strategy, our processes and procedures to align with the local landscape and move forward as Aurex Constructors whilst leveraging our legacy and expertise to best serve our customers."

The company is poised for continuous growth. Aiming to continue to deliver projects successfully to its existing customer base while looking at opportunities to extend its service offering into new markets targeting new customers. ■



About Aurex Constructors

- Aurex Constructors is a key player in South Africa's Construction and Turnaround & Maintenance industry with more than 40 years' experience serving a blue-chip customer base in the oil & gas, mining & metallurgy, infrastructure, petrochemical and clean power sectors. Its two main service lines, Construction and Turnaround & Maintenance, deliver structural, mechanical, electrical, instrumentation, piping, platework (SMEIPP), fabrication and management services for projects of all sizes and complexities.
- 100% Locally owned and managed with 51% black ownership and 30% black women ownership. The highly skilled workforce has a proven track record for delivering flexible, innovative and relevant project management solutions tailor-made to customer requirements.

THE ETHICS OF EMPLOYEE TRACKING

Tracking employee behaviour and movement online may fit in legal loopholes, but not ethical ones.

There are technologies that allow organisations to monitor employees through their webcams, email and networks. On the surface, these are tools that allow companies to minimise the risks associated with remote working, preventing poor performance and abuse of company equipment. But according to Nicol Myburgh, Head: CRS Technologies HCM Business Unit, if a company has to resort to such subterfuge to get the job done, then it has far bigger problems to deal with.

"We have a very different take on remote monitoring tools and solutions," he says, speaking at a webinar hosted by CRS Technologies. "Let's put the criminality element aside and look at the impact that these will have on employee morale and what the company should be looking at instead."

If you don't trust an employee to do the job they were hired to do without being constantly watched, then the issue is less the remote working and more the relationship itself. Instead of watching and making sure that someone sits at their desk eight hours a day, from eight to five, best practice is to measure their performance based on their outcomes. If they have achieved their outcomes for the day, does it matter whether they did them from seven to twelve or six to ten? It shouldn't.

"The ethics of switching on an employee camera to watch them is a big concern, especially when you don't know what they're doing at home," says Myburgh. "Plus, legislation introduced by POPIA (Protection of Personal Information Act) essentially tells the business that employers can't process personal information from employees

without their explicit consent. And consent is defined as giving conscientious consent for a specific purpose – if an employee hasn't agreed to their camera being turned on, then that would be against the Act."

There are better ways to build a culture of committed working than to monitor, track and observe. Instead, give people clarity into their roles so they know what's expected from them and give them KPIs that help them understand where they fit in the company and the role they play in its success.

"People need to know that they add value and what is expected of them," concludes Myburgh. "Involve people in the company, let them see they are valued, recognise their hard work, and make them part of something, instead of monitoring their every move. Not only is the latter ethically dubious, but it's legally risky too." ■





SIX TECH INSIGHTS FOR 2021

Based on our 2020 experience, new year predictions may seem like a game of make-believe. But predictions are one thing, trends are another. Synthesis Customer Success Manager, Peter Mülders shares technology insights into 2021 based on emerging trends. **By Kim Furman, Synthesis Marketing Manager.**

Adjustment

COVID-19 shocked all businesses last year. However, enterprises are becoming used to the new normal “and digitisation should return to previous levels of growth in 2021,” according to Mülders.

The continued growth of cloud

There was substantial growth in cloud this past year. AWS Revenue grew 29% year-on-year in quarter three to USD11,6bn and Microsoft Azure Revenue increased by 48% year-on-year in quarter three to an estimated USD6,3bn according to BMIT SA Cloud Computing Overview & Market Sizing 2019. The South African cloud market should expect a 30% four-year compound annual growth rate (CAGR) according to this same report.

“Cloud-hosted infrastructure and cloud-based software as a service is going to be big this year. We have seen how quickly Microsoft 365 grew by offering businesses the chance to connect staff without needing to deploy new servers. This is becoming the norm as you can spin up whatever you need in a matter of hours and scale it on demand. And that doesn't just mean servers and networking anymore, all the cloud providers are pushing out new software on a weekly basis to make building a digital business not only faster, but also easier.”

E-commerce growth

Lockdown and the risk of infection has pushed many new consumers to online shopping. According to the Future of E-commerce Report by Shopify, there has been a dramatic increase in demand for the convenience and immediacy of shopping online, and they expect this increase to stick.

Many retailers took to the on-line market over lockdown, but not all had the infrastructure to meet consumer needs. Infrastructures that support customer satisfaction (speed and immediacy) will be imperative this year. “E-commerce

is exploding along with mobile payments. The technology platforms supporting these two things have grown enormously in the past two to three years and are getting much easier to use and to integrate into businesses with options available from Salesforce, Magento, WooCommerce, Shopify ... it's a long list of very strong options.”

Contactless payments

COVID-19 has amplified the consumer and business demand for contactless payments to reduce the chance of infection, along with the security threats that come with having to hand over a card. “In the retail space, we've now seen contactless payments take over in 2020 after a slow start in previous years. Consumers now trust the technology, so it's gone mainstream and is definitely going to keep growing.” Halo, a first in Africa solution, is an extension of this payment method – where users simply need to tap their card on a merchant's phone to make payments. There is no exchange of card or even a dedicated POS device necessary.

Hybrid emergence

“Remote work is here to stay as businesses had to take a leap of faith, and for many of them it was a success. I think we'll see hybrid working environments emerging with some staff on site and some staff working from home offices, and in terms of security it means there will need to be a focus not only at the perimeter (firewalls, VPNs, etc) but also inside the business. There is a movement to zero trust that's best described by Google in BeyondCorp, where you need to treat every part of your digital landscape as if it's on the internet. You can no longer rely on an attacker never getting into your network as your only defence.”

The rise of personalisation

“With 2020 being such an online year, I think we'll see a lot of big businesses trying to achieve better and faster personalisation. This means we'll see them exploring lots of new technologies in the space of data streaming architectures to assist in real-time computing (Kafka is the leader in this space), and there will be lots of interest in Artificial Intelligence (AI) and Machine

Learning (ML) work to understand customer behaviour and preferences. These are two niche industries right now, but they are definitely emerging as some of the strongest solutions to the problems. But beware the sales agent that wants to throw AI and ML at everything, they are just a set of tools in an experienced problem solver's toolbox so they are not appropriate for solving all your problems.”

The key question, how do you take advantage of these insights?

This comes down to many factors, but three of which are having the right people with the right skills in an environment that enables their success through supporting processes and culture.

“I believe,” says Mülders regarding people and skill acquisition, “that enterprises often already have the people they need, but not necessarily the skills. So a focus on identifying staff that are interested in new technology, and then training those staff, will be the best option in the long term. But if you need skills today, you need to find a strong technology partner that can offer you consulting services and skills that you don't have yet. They will also inject new ideas into your business and help you with a true all-encompassing digital transformation.”

Mülders emphasises the skill of obtaining quality data, “Without good data you cannot do accurate work in a digital world.” He then explains why change management is imperative to optimise technology, “There will always be people using and supporting your digital business, and those people are an integral part of your organisation. Without their full support your digital dreams will remain just dreams, so you need to spend time on the cultural and psychological parts of your business and its systems.” An organisation's design needs to be aligned to the strategy. When transformational technology, such as cloud, is implemented, organisational change is often necessary.

Whatever trends arise in 2021 and whatever technologies you decide to implement into your organisation, focusing on the fundamentals of people, skills, processes and culture, as well as the technology, will lead to the greatest impact. ■

VERT ENERGY IS SET TO SUPPLY and support Yanmar

Vert Energy has been appointed by Yanmar as the official distributors in Southern Africa for Yanmar industrial engines from 1 January 2021



Vert Energy has been appointed by Yanmar as the Official Distributors in Southern Africa for Yanmar industrial engines. Ryan Robertson (left), Sales & Marketing Director and Grant Robertson, Managing Director, Vert Energy.

“What’s exciting for the African market is easy access to the globally respected Yanmar brand through local specialists, offering a dependable service and technical support, in line with stringent international standards,” explains Vert Energy’s Sales and Marketing Director, Ryan Robertson. “The addition of Yanmar diesel engines and power products to our electro-mechanical power generation range provides new market and application opportunities. This development also extends our services not just to genset manufacturers, but to many sectors, including agricultural, mining, climate control and construction.

“At Vert Energy, we align ourselves with companies that vertically integrate with our energy and electro-mechanical business units and provide industry with products that are at the forefront of reducing carbon footprints for use in environmentally-conscious energy solutions. By selecting the best partners and products, we are able to meet our customers’ exact requirements. Product efficiency, competitive market positioning, pristine quality standards and guarantees of extended service life, are our main selection criteria. In Yanmar, we have found a partner with whom we share all these important values.

“Our team strives to not just support the direct sale of Yanmar products, but we will also work closely with global OEM’s who integrate Yanmar engines in their equipment. Yanmar’s extensive range of diesel engines provides a variety of solutions for new capital equipment manufacturers, as well as the option of potential retrofitting in certain ranges to engines that are now Tier 4 Final Stage 5 compliant with European emission standards.

“The addition of Yanmar’s L Series diesel engines strengthens Vert Energy’s position in the local pump industry. The company has been supplying electric motors to the pump industry for many years and the addition of a mechanical diesel powered engine as an alternative, represents an exciting opportunity for the company.”

Yanmar’s L-series air-cooled diesel engines and TN-series water-

cooled diesel engines are key products now available through Vert Energy, which are geared to enhance efficiencies of the power generation and electro-mechanical power transmission industries.

According to Vert Energy, although legislation surrounding emission levels in many African countries is not as stringent as in Europe or Asia, the need for cleaner, fuel-efficient solutions is at the forefront of product development locally, particularly in the underground mining environment.

Benefits associated with the Yanmar L-Series air-cooled diesel engines include longer service intervals and improved fuel consumption. Lower emission levels in the Tier 5 range of products present a strategic opportunity for local manufacturing companies looking to export to emission regulated territories.

Vert Energy’s service to the electro-mechanical power generation sector also encompasses a repair and maintenance facility. The company has made a substantial investment in skills training to ensure technicians are able to efficiently service and support a wide range of products throughout the region. In addition, the company holds a comprehensive range of standard products and spare parts to support the local market.

Highly skilled technicians assist with inspections, diagnostics and repair procedures, re-assembly, installation and commissioning, as well as the implementation of preventative and predictive maintenance programmes.

The combination of Yanmar’s quality branded products and Vert Energy’s technical expertise and broad distribution reach, augers well for electro-mechanical power generation on the African continent.

Vert Energy also supplies and supports the entire Leroy Somer LS range of alternators and Nexus electric motors and power transmission components. The company is also the authorised sales and support partner for DEIF generator controls, NSM alternators and Energie power products. ■

REMOTE OFFICE CHALLENGES, and how to beat them

Yes, remote working has its pitfalls, but they aren't impossible obstacles on the road to business productivity.



There is one essential thing that defines a successful remote working relationship between employee and organisation – trust. Without it, there will always be concerns around employee performance, productivity and reliability. The ‘dog ate my homework’ excuses of ‘My PC has crashed’ or ‘My Wi-Fi is down’ or ‘I can’t log in’, that are trotted out when a person would rather finish their Netflix marathon than that overdue project. The problem is, these are genuine excuses for many people which makes it difficult for the business to distinguish the truth from the lies.

“It’s difficult to determine if someone is genuinely having problems or if they’re simply making excuses,” says Nicol Myburgh Head: CRS Technologies HCM Business Unit. “Is it real? Is it fake? Many of these problems are legitimate and it’s unfair to cast a negative light on an employee who is genuinely stressed about being unable to do their job.”

Fortunately, there are some steps that the business can take to minimise the suspicion and reduce the risk while giving employees the benefit of the doubt. The first is to look at the person themselves. Have they been an exemplary performer in the past? Are they usually very good at getting the job done? Or did they work badly at the office and this behaviour is repeating itself at home? Often, if a person had no work ethic at the office, they won’t have one when working remotely either.

“You can use employee monitoring tools to establish whether or not they’re working; these can be used legally in specific situations to manage time and performance,” adds Myburgh. “You can also

work on an outcomes-based system that isn’t focused on how long a person spends at their desk but rather on how well they’ve achieved their outcomes. If they’re not working today but have achieved all of their outcomes, then this shouldn’t be a crisis for the company.”

Engaged employees who enjoy their jobs will just get on with it. If they’re complaining about connectivity or not joining meetings, then it’s likely that they have a very real issue and should be provided with support or the option to go into the office for the day – South Africa is no longer in the middle of a mandatory lockdown so employees should be allowed to opt into office work until their remote environment issues are resolved.

“It’s also worth asking yourself if getting worried about these problems – unless they are relentlessly consistent – are worth even worrying about,” says Myburgh. “If you don’t trust your employee to get the job done, why did you hire them? Give people the space they need to prove themselves and they may do just that.”

Myburgh also points out that the office is not exactly nirvana for work ethics and productivity either. People are interrupted constantly, they chat in tea rooms and boardrooms and they lose time to random conversations. When these interruptions are removed from the equation, suddenly people have a lot more time to do their jobs.

“More work gets done at home, if the person has the right tools and connectivity,” concludes Myburgh. “If they are late to their desk or take a slightly longer lunchbreak, this shouldn’t be cause for concern. Rather look at their output, focus on their commitment to the company, and treat people like the adults they are.” ■



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CASTLE GATE LIFESTYLE CENTRE OPENS

While the most significant long-term impact of COVID-19 will be issues stemming from flexible working, in the long-term “we are going to have to find the balance between working from home and the office,” points out Paragon Group Director Anthony Orelowitz. “We are going to find that our current response has many unanticipated pitfalls and that the trends of the future are going to have to address these issues.”

In this regard, office-space planning is likely to shift away from ‘a place to sit and work’ to ‘a place to communicate, collaborate and build company culture’, reveals Paragon Group Director Estelle Meiring. “Despite the fact that the lockdown has shown that we can work from anywhere, it has also emphasised that humans are social beings who need interaction to remain productive and positive.”

Orelowitz highlights: “As architects and designers, we are going to have to design buildings and workspaces that entice people back into the office and enhance culture, connections and workflows. We are going to have to reimagine what the working experience can be. COVID-19 has accelerated the dialogue around culture and new ways

of working. This is a very exciting time to be a designer.” Looking at the office of the future, this is likely to feature a lot less traditional workspaces and far more couches and social seating, even if these seats each have their own fold-open writing desks, for example. There will be a move away from open-plan layouts to wider corridors and doorways, additional partitions between departments and a lot more staircases. Although the staff numbers of companies occupying office space at any one time will decrease, other health measures may well increase the amount of space required per employee. Furniture may change, too, as office desks have shrunk over the years from 1,8 m to now 1,4 m and less, but there might be a reversal of that trend as people need to sit further apart.

It is even feasible for legislation to be introduced that mandates a minimum area per person in offices, as well as a maximum occupancy for lifts and larger lobbies to minimise overcrowding. For commercial property, some reduction in the demand for office space is anticipated, but not to the extent that companies will half their required space, for example. ■

Making sense of the COVID-era property landscape



The 2020 property market is a tricky one to make sense of. With a pandemic raging on, economic fallout leading to retrenchments and growing unemployment, and a general uncertainty about what the future may hold, the real estate market is seeing record-breaking buyer activity. Discussing the reasons for this – and helping to make sense of ways to take advantage of the situation – is Pearl Scheltema, CEO of Fitzanne Estates.

“We’ve seen a 50% increase in sales over the past few months, compared to the same time last year,” Scheltema explains. She also highlights the clear interest from investors, particularly first-time buyers, who account for half the sales concluded.

Supply and demand

Ultimately, property prices, and the real estate market as a whole, is dependent on the basic economic principle of supply and demand. The COVID-19 pandemic, and subsequent national lockdown, has turned the established real estate landscape on its head, creating opportunities for savvy buyers. Demand has shifted, particularly due to a couple of key factors.

The prime lending rate has lowered from 9,25% at the beginning

of the year, to 7% at the time of writing. This effectively means that a home loan – oftentimes a very real obstacle for those looking to climb the property ladder – is now a whole lot more accessible. According to Scheltema, around 80% of buyers are utilising home loans, with larger deposits being put down than this time last year.

Availability

Buyers are now also able to afford more, further driving up the property prices. Where you may only have been able to buy a small home a year ago, you may now be able to purchase a larger property with more space. This affordability also ties in with what buyers have come to value over the past months of lockdown.

Perhaps, having been stuck inside a small home during a long lockdown, you’ve now realised that you’d rather live in a more suburban area where you can have a large garden. Thanks to a lower prime lending rate, larger loans and, by extension, larger purchases, are now possible.

Also due to a larger buyer pool, these shifts have led to property values rising in some areas, showing a resilient property market in markets that hold long-lasting appeal for first time buyers. While settings that are heavily influenced by tourism or commercial property, for instance, may have seen a dip in asking prices, suburban homes with more space are becoming a hot commodity.

Scheltema advises both buyers and sellers to consult a qualified, experienced estate agent for advice on the current property climate. Fitzanne Estates specialises in guiding property owners in their real estate journey and are ready to assist you during this exciting yet confusing time. ■



HOW COVID-19 IMPACTED THE WASTE SECTOR AND ITS WORKFORCE

One of the biggest changes last year was how businesses globally re-evaluated their approach at facilitating their cleaning and hygiene regimes, including revision of waste management activities and protocols. This was due to the COVID-19 pandemic and 2021 will see these changes continuing.

One of the most interesting developments in major companies was how they now are including their new cleaning and waste management protocols into their communication strategies and incorporating these into their brand messaging.

“What led to this is the environment of increased regulatory compliance, public and businesses demands for cleanliness and the importance of retaining and attracting new clients,” says Brindha Roberts, Head of Sustainability at waste management company Averda.

Waste generators also have legal responsibility, according to the National Environmental Management: Waste Act, to take all appropriate steps to manage waste in such a way that it does not harm health or the environment.

With that in mind 2020 saw a change in the nature of residential waste. The COVID-19 pandemic has necessitated an increase in the use of PPE (disposable masks and gloves) and therefore disposal of medical-type waste within domestic waste streams for citizens to comply with new regulations.

Realising that waste had become more ‘healthcare’ – the waste management sector had to make some changes, firstly to help educate non-medical professionals on the correct way of handling their waste, especially items that previously were never considered hazardous, such as used tissues.

Secondly, public awareness of the measures taken to protect frontline collection employees who handle waste. This includes handling and packaging of the ‘new’ waste that is being generated due to the pandemic. This group of employees offering essential services are exposed to a significant health and safety risk, and these are the people directly employed by the waste management sector.

“Understanding this first-hand and how the pandemic impacted

the waste management sector, Averda ensured that protocols and procedures were updated to protect clients and staff from the beginning,” commented Roberts.

Before the COVID-19 pandemic there were standard health and safety policies and protocols in place, but these were not enough.

“While South African law focuses on the control of waste within organisations and communities, there is little legislation that specifically supports waste workers who are at the coalface of this vital and hazardous industry” commented Roberts.

At the start of the lock down, March 2020 in particular, specific measures were implemented, including revision and training on stricter waste handling procedures, ensuring consistent supply of PPE, clocking stations upgraded to no-touch facial recognition biometrics, temperature testing and self-declarations (including co-morbidities) of all people who enter the sites. High risk employees were identified and on consultation with medical professionals, alternative work arrangements were made to limit their exposure.

Being a global company, Averda worked with their international teams to identify trends and adopt best practice and learnings even prior to legislation being enforced locally.

“As a company that already has a focus on the containment of hazardous materials, we were able to apply our expertise to our broader operations and sites,” says Roberts. “Every organisation in South Africa should be taking steps like this right now as we find ourselves in the second wave.”

Roberts ended, “To ensure the health and safety of everyone within the waste management value chain – as well as of the population at large – companies should contract providers with the expertise and compliance to safely manage waste while limiting harm to their employees.” ■

VIRTUAL EVENT PLACES THE SPOTLIGHT ON POSITIVE GROWTH OF WIND INDUSTRY SKILLS DEVELOPMENT

When growth gives way to subsequent supply, it's a good news story for most industries. South African wind energy is no different and it is particularly the sector's skills development and ensuing demand by wind turbine manufacturers and wind farms that have seen a massive upswing.



Cape Peninsula University of Technology (CPUT) in Cape Town.

The event: *Bolstering SA Energy: SARETEC-trained wind turbine service technicians enter the marketplace* featured a number of high-profile speakers and placed the spotlight on the importance of skills development within the country's renewable energy sector.

Highlighting the critical need for WTSTs in the coming years, Ntombifuthi Ntuli, CEO of the South African Wind Energy Association (SAWEA) said to meet the goal of Integrated Resource Plan of 2019 (IRP 2019) which aims to deploy 1,6 GW of new wind capacity yearly from 2022 onwards, 192 new WTST will have to be trained on an annual basis to match the deployment schedule.

A recent virtual event among others celebrated the graduation and subsequent employment of the fifth group of certified wind turbine service technicians (WTST) trained by South African Renewable Energy Technology Centre (SARETEC) and which is hosted at the

Dr David Phaho, Deputy Vice-Chancellor: Research, Technology, Innovation and Partnerships at CPUT indicated that SARETEC will be training 135 technicians in the coming three years and selection for WTST group 7 is already under way.

Biotherm Energy ends 2020 on a high note

Pan-African renewable power producer company, BioTherm Energy, backed by leading emerging market investor Actis, has announced the official operations of its Excelsior Wind Energy Facility at the end of 2020. This marks the completion of its third Independent Power Producer (IPP) in South Africa in 2020 as part of the fourth round of the Government's Renewable Energy Independent Power

Producer Procurement Programme, boasting a combined generating capacity of 165 MW of the country's renewable energy production.

The 33 MW Excelsior Wind Energy Facility, in the Western Cape, successfully achieved its commercial operations on 23 December 2020, adding to the already achieved commercial operation of the 132 MW combined capacity of the solar plants Aggeneys and Konkoonsies II earlier in the year,

"We ended 2020 on a high note, having led three IPP's to commercial operations, whilst having connected our fourth project to the grid expecting commercial operation in the first quarter of this year, which will add another 120 MW to our generating capacity in South Africa," said Robert Skjodt, CEO of BioTherm Energy.

The company's portfolio of pan-African projects includes what will be Kenya's second largest wind farm, the 100 MW Kipeto Wind energy project undergoing commissioning southwest of Nairobi. Thebe Investment Corporation (TIC), has a 37,5% stake in BioTherm Energy's four South African energy projects. "Thebe is delighted to be contributing to South Africa's clean energy power portfolio as the country transitions away from thermal technologies to deliver affordable energy to our people, whilst also contributing to climate change imperatives," commented Sunil Ramkillawan, CEO of Thebe



The virtual event featured addresses by:

- Dr. Ayodele Odusola, Resident Representative of the United Nations Development Programme (UNDP);
- Dr Diane Parker, Deputy Director-General, University Education at the Department of Higher Education and Training (DHET);
- Nomawethu Qase, Director Renewable Energy at the Department of Mineral Resources and Energy (DMRE);
- Professor Chris Nhlapo, Vice-Chancellor of CPUT;
- Dr. David Phaho, Deputy Vice-Chancellor: Research, Technology, Innovation and Partnerships at CPUTCPUT;
- Ntombifuthi Ntuli, CEO of SAWEA;
- Angelina Mohanpersadh, Economic Development Manager of Goldwind; and
- Henk Volschenk, Training Supervisor at SARETEC.

To date, SARETEC has successfully trained students enrolled in the WTST 1 to 4 programmes with support from GIZ, the wind industry and Denmark. The training of the WTST 5 and WTST 6 groups was sponsored by the South African Wind Energy Project Phase 2 (SAWEP) which is funded by the Global Environment Facility (GEF), implemented by the DMRE and supported by the UNDP SA country office and the South African National Energy Development Institute (SANEDI).

The R3,4-million SAWEP sponsorship was allocated towards the 24 students over a period of seven months which included five months at SARETEC and two months' workplace training at an OEM (Original Equipment Manufacturer) wind turbine supplier. The funds also provided a stipend to students during their training.

WTST is a globally sought-after qualification which trains specialised technicians to work on wind turbines undertaking construction, maintenance, service, fault finding and repairs.

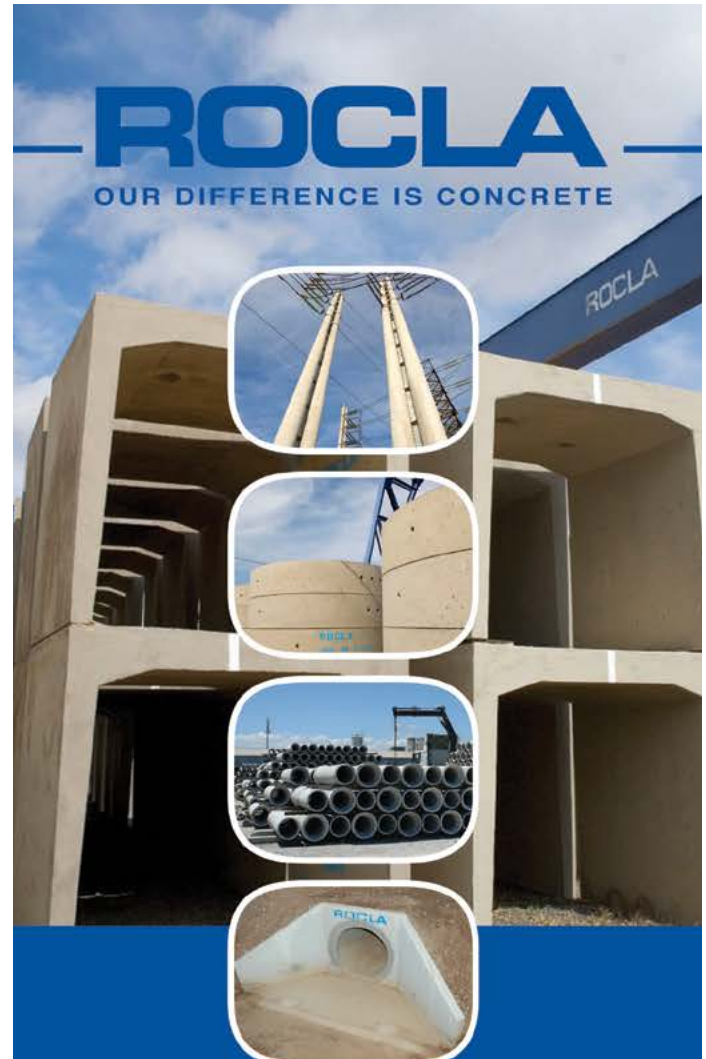
SARETEC is currently the only training centre in SA equipped to offer the seven-month WTST qualification which is accredited at the National Qualifications Framework (NQF) Level 5. SARETEC has also obtained necessary accreditation from the Quality Council for Trades and Occupation (QCTO); this means that the WTST qualification is recognised throughout South Africa and internationally.

The WTST 7 qualification is also supported by the Manufacturing and Engineering Related Skills SETA (MerSETA). ■

Energy and Resources. Excelsior Wind has a direct connection to the Vryheid substation, via an on-site substation and a dedicated 132 kV power line, and will feed over 132 GWh of renewable power, into the national grid, enough to power an estimated 35 000 South African homes each year.

The wind farm is constructed on 2 300 hectares of land in Swellendam, an area known as one of the largest agricultural producing areas in the country. By the very nature of wind power, over 90% of the land on the site will continue to yield agricultural crops as well as sustain livestock farming.

Construction commenced two years ago and provided jobs to circa 380 workers, the majority of which came from its surrounding beneficiary communities within the Overberg Municipality. These are the same communities that will benefit from economic development programmes, through the 20-year operations period of the plant. The focus of the economic development initiatives will include education; skills development; and environmental stewardship, in addition to others. During the construction programme a number of early spend programmes were implemented, focused on the provision of secondary school study guides across various subjects for Grades 8 to 12. This is in addition to the various COVID-19 relief programmes, aimed at alleviating the impact of the pandemic on local communities. ■



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INFRASTRUCTURE RECOVERY HINGES ON URGENT ACTION AND INNOVATION

Hopes of a recovery in South Africa's economic fortunes rely heavily on more infrastructure spending, but the COVID-19 pandemic is further complicating this difficult task; speed and ingenuity are now of the essence, according to SRK Consulting Partner and Principal Engineering Technologist, Steve Bartels.



US president, John F. Kennedy, who once said: "It is not wealth that built our roads, but roads that built our wealth." Bartels said: "If South Africa implemented a similar programme and managed it correctly, it could potentially be the key to the recovery of South Africa's economic fortunes." His involvement in poverty alleviation projects and labour-based projects for provincial government has given him first-hand experience of how this type of employment can transform lives and communities.

"Government's establishment of Infrastructure South Africa to streamline project roll-out, and the recent prioritisation of strategic integrated projects, is a promising step," said Bartels. "But all this work needs a strong and capable construction sector – and years of decline are now being aggravated by

the local impact of the pandemic." He said the role of infrastructure investment in stimulating economic growth should not be underestimated, citing the creation of eight million jobs by President Franklin D. Roosevelt's Works Progress Administration in the US after the Great Depression. He also pointed to the similar vision of another great

"I witnessed how local contractors and workers were lifted out of poverty by infrastructure projects in KwaZulu-Natal – and no longer relied on handouts to feed their children," he said. "A little done wisely goes a long way." He said the construction sector had been under significant pressure in recent years

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as government spending on infrastructure declined, with a number of large contractors closing doors or entering business rescue. During 2020, restrictions related to COVID-19 were expected to cause an 8,7% decline in the construction sector this year, and the loss of up to 100 000 jobs. This situation needed to be turned around as a matter of urgency, to preserve the capability of the sector, he said.

While having to redirect funds to address Covid-19 impacts, government still plans to commit R100-billion to its National Infrastructure Fund over the next decade – to help prepare and package projects and provide catalytic finance.

“South Africa’s future demands that we make full use of our scientific and engineering expertise, to focus our development efforts and achieve more with the fewer resources at our disposal,” he said. “The COVID-19 pandemic has reminded us that science-based decision-making is the only way out of the various crises we currently face.”

He highlighted that consulting engineers and scientists are important sources of the skills and experience required to build infrastructure and re-ignite the economy. Vis Reddy, Managing Director of SRK

Consulting, warned that the plight of the construction sector during 2020 had seen many consulting engineering firms having to reduce pay or even shed jobs.

“This sector could risk losing essential talent and experience, which could seriously undermine South Africa’s recovery efforts in the infrastructure space,” said Reddy. “The danger is that large-scale job shedding invariably means that many qualified and experienced professionals are forced to take up other careers – so we often can’t get them back after a prolonged downturn.”

He emphasised that the skills and experience of consulting engineers were a crucial foundation for recovery and needed to be well-deployed and nurtured.

Bartels also highlighted the importance of leveraging technology in the infrastructure sector, to enable a recovery to proceed even under pandemic conditions. He noted that communication and data-sharing technologies will be increasingly important tools in the ‘new normal’ working practices and social distancing.

“While most of these technologies were available before – such as virtual private networks to facilitate the sharing of documents and information – not everyone was using them effectively,” he said.

“Now they will become vital for continued efficiency.” He said that infrastructure development would also benefit from innovative new ways of gathering detailed visual and other data, which were traditionally gathered by physically visiting and investigating project sites.

“High-definition photography and photogrammetry, as well as the technologies such as drones and remote sensing to deploy these tools, will become more valuable,” said Bartels. “GIS and GPS technology will continue to grow in their applications, helping to accurately geo-locate data points for various scientific and engineering applications.”

The adversity of the COVID-19 pandemic had also been accompanied by opportunity, he said, where more use was being made of younger scientists and engineers within SRK Consulting.

“Many of our most experienced staff are vulnerable to COVID-19 due to their age, so we have made more use of younger staff where projects require travel and on-site time,” he said. “These young, well-qualified and resourceful professionals have already proved to be valuable assets in their new roles – and are now accelerating their contribution and their learning curve.” ■

AQUATECTURE: Every drop counts with new rain harvesting panels at the V&A Waterfront

The V&A Waterfront will be among the first companies in South Africa to test a highly innovative new design in rainwater harvesting technology.

The Aquatecture rain harvesting panel collects water by diverting raindrops flowing over the perforations on the surface to the inside of the system. From there the water trickles down into a collection tank where it can either be stored for later use, or can be pumped back into a building’s grey water system.

The panel is also currently being developed to harvest moisture from the atmosphere.

Aquatecture is the brainchild of South African born designer Shaakira Jassat. Although she lives in the Netherlands now, Jassat witnessed Cape Town’s devastating drought when she attended the Cape Town Design Indaba as a speaker in 2018. She was determined to design a rain harvester that was compact and aesthetically suited to the urban environment, which is now the Aquatecture panel.

Manufactured from aluminium, the panels are resistant to corrosion and can be installed on the exterior of buildings or they can be used as freestanding units in areas with more open space. They will be tested at the Granger Bay parking garage over the next two years, and all water collected will be used at the Oranjezicht City Farm Market. This test facility is made possible in collaboration with Arup, Geustyn & Horak, JoJo Tanks, Baloo Plumbing and Longspan Gutters.

Rainfall data specific to the area will be collected during the testing period and measured against weather variables, for example, the direction of rain, wind, and the amount of rain that fell during each period. The panels will also be tested for efficiency and impact on

the surrounding environment. V&A Waterfront CEO David Green said, “The V&A Waterfront has been at the forefront of water saving in Cape Town since 2009, when we first introduced water conservation measures. We recognised even then that water was a highly pressured resource. By 2016 when the drought was first making its effect felt, the Waterfront had saved 25% on overall water consumption based on year-on-year figures from 2010.

“Saving water is now an integral part of every development and of our overall sustainability programme. In addition to rainwater harvesting, the Aquatecture panels are also compact and visually appealing so they will integrate well into most urban architectures.” ■



STATE-OF-THE-ART LININGS INSTALLED



Well-known and highly regarded for their work on earthworks and demolitions, the Icon Group expanded their service offering last year to better leverage their inhouse skills and provide various industries with high-quality dam linings. The company has been successfully offering clients reliable and cost-effective installation of HDPE geomembranes. “With a combined lining experience of over 50 years within the ICON team, we are glad to be able to offer this solution and grow our footprint throughout Africa,” explains Wayne Neary, ICON Group MD.

The Group recently completed an installation for Ikwezi Mining in KwaZulu-Natal, a company which strives to consider its future impact and environmental footprint. Commonly used on mining tailings dams, HDPE geomembranes, also known as geomembrane liners, play a very important role in ensuring pollutants from contaminated waste or water don’t seep or leak. The geomembrane is a synthetic waterproof hydraulic barrier produced from high-density polyethylene resin. It has excellent environmental stress crack resistance, low temperature resistance, aging resistance, corrosion resistance and a large operating temperature from -60 to 60°C.

With a factory guarantee of 20 years if correctly maintained it can have a lifespan of more than 50 years. Icon has a maintenance plan that can assist all clients. They have a standard 10-year installation guarantee. The membrane liner is used across a range of applications from waste containment, water containment, aquaculture, industrial projects, energy projects and mining projects. “When it comes to preventing pollution, you can’t cut corners. Our team makes use of

the highest quality linings with state-of-the-art welding technology to ensure we deliver the most effective lining solutions currently available to the market,” says Neary.

Installation of the membrane is complex and must comply with ISO 9001 – 2008 GRI standard. “With our substantial inhouse expertise on geomembrane installation, customers can rest assured that the job will be done right,” says Neary. The company makes use of a careful five-step installation plan.

- Preparation, including assessing design requirements, and ground treatment to remove sharp objects.
- Installation, making use of tractors, hoists and other machinery to ensure correct and careful placement of the membrane in sheets.
- Field connection and joint testing, to ensure a functional lining in the correct position.
- Welding, where joints are carefully welded together seamlessly.
- Quality inspection to ensure all joints are properly sealed and will hold under a variety of circumstances.

“We look forward to bring this solution to new and existing customers across the continent, and aim to be the linings supplier of choice for the region,” concludes Neary.

The ICON Group, established over 30 years ago, is the trusted provider of bulk earthworks, demolitions and other related civil engineering and construction services that are needed to get a commercial, industrial or mining site into an ideal state of build readiness. The ICON Group has an unrivalled reputation for delivering on specification and well within the deadlines provided. ■

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A general view of the enormous Irene sinkhole and adjacent residences, with large stabilising soil nails in place and Gauteng Piling drilling taking place to add more.



CHALLENGING CONTRACT TO STOP HOUSES FROM SHIFTING TOWARDS SINKHOLE

Leading foundation specialist, Gauteng Piling, proved its versatility by successfully completing an unusual and challenging project to stabilise a massive, gaping sinkhole near residences in Irene, Centurion. The 6,5 m deep sinkhole – 25 m wide and 45 m long - was formed about five years ago and filling it up posed a threat to the houses nearby.

Gauteng Piling is this year celebrating its 25th anniversary. The Johannesburg company, founded in 1996 by its MD, building industry veteran Nico Maas, was appointed by the sinkhole repair main contractor, AST Africa Trading 465CC, to provide lateral support for the unstable walls of the sinkhole to prevent the movement of the foundations of two adjacent houses in the upmarket Irene Farm Villages complex in central Irene. “The one residence was about 5 m from the sinkhole and the other, just 2 m away. In general, excavations deeper than 1,5 m always need to be secured to prevent the collapse of the walls and this sinkhole walls were more than four times deeper,”

says Keoatlaretse Tema, Contracts Manager for Gauteng Piling, who was in charge of the project.

Tema says a Casagrande C6 Crawler drilling rig suitable for drilling micro piles, soil nails and anchors, was brought to site by Gauteng Piling. The specialised and extremely versatile rig’s capacity to drill vertically, horizontally and at angles was vital for this project.

“To provide the lateral support for the sinkhole walls, we had to install 40 micro piles, placed to a depth of 6 m. Micro piles are small diameter drilled and grouted friction steel piles that are bonded into the bearing soil or rock with gunite, a mixture of cement, sand, and water applied through a pressure hose to produce a dense hard layer of concrete,” she explained.

“We also had to drill horizontally into the sinkhole walls to install 40 soil nails 6 m long, as well as 40 other soil nails 4,5 m long and 40 more, 3 m in length. The soil nails were inserted and gunited into place into the sinkhole walls. Mesh was attached to the bar ends to hold the slope face in position.”

Among the challenges of the contract was the exceptional – and unexpected - hardness of the dolomite rock which delayed drilling progress. It then also proved difficult to install the micro piles as the drilled holes were collapsing as soon as the drill bit was extracted. This problem was overcome by the use of self-drilling anchors.

“Self-drilling anchor rods have sacrificial drill bits, with hollow steel bars of the appropriate outer and inner diameter and coupling nuts. Their design provides consistent grout cover around the hollow steel bar and ensures that the bar remains in the centre of the drilled hole.

“After we had completed the required lateral support to the walls of the sinkhole, the main contractors filled it with dump rock and pumped concrete,” Tema adds.

Nico Maas, MD of Gauteng Piling, says the successful completion of this unusual and formidable contract highlights the value of experience when it comes to providing foundations and site stabilisation.

“Gauteng Piling has in the past 25 years handled such a diverse array of projects that we now can confidently tackle just about any foundation assignment. We have gained the trust of the industry and the volume of contracts secured after the early severe lockdown last year testifies to this. The market is now not taking chances and cutting corners. Work allocation during the pandemic is centred on professionalism,” Maas observed. ■

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A completed foundation at Roggeveld Wind Farm ready for tower erection.

ROGGEVELD WIND FARM'S INNOVATIVE DESIGN AND IMPLEMENTATION

Remotely located in an area of rough terrain and challenging topography, Roggeveld Wind Farm in the Karoo demanded innovative construction design and implementation, as well as careful scheduling, logistics and environmental management.

Leveraging its experience in wind energy facilities, Concor constructed specially-designed concrete bases for 47 wind turbines. The company also built 34 km of roadway, with appropriate gradients to facilitate access for readymix trucks as well as the large, specialised vehicles that must haul the turbine towers and equipment.

With a construction footprint of 40 hectares, the project dealt with reaching inaccessible areas to build the bases and hardstands. The highest point of the project area is 200 metres higher than the site office, with many construction areas difficult to access even using 4x4 vehicles.

The 25 000 m³ of concrete required for the project was batched on site, but the nearest turbine was 12 km from the batching plant. Aggregate had to be sourced from 180 km away.

Construction innovation technology

Unlike most wind energy projects, the turbine towers at Roggeveld Wind Farm are constructed from concrete not steel. This required several innovations from Concor including establishing a yard for placing and preparing tower sections as well as pre-assembly slabs – or 'doughnuts' – for the trestles used in the erection of towers.

The heavier weight of concrete towers impacted the design and

construction of the foundations and the pre-assembly slabs. Each tower required the construction of the concrete doughnut-shaped slabs at its base, on top of which the five key-stones making up the bottom tower section were placed.

The hilly rugged topography of the area – combined with strict environmental controls – had an impact on concrete slab construction, demanding the size of the hardstands be smaller. Topography limited the reach of the new roadway network, while the project footprint was constrained by the area's sensitive ecology, leaving only a 12 metre corridor in which to work.

A precast yard had to be built for the construction of the 'doughnut' slabs, from where they were transported to the hardstands. Using precast slabs in this application is not common practice in South Africa, although it is routinely applied in Europe.

Each tower base required blasting, excavation and cleaning, after which blinding was poured. Levelling legs were installed on top of the blinding to hold the levelling template in place during casting. Approximately 2 000 tonnes of reinforcing steel were used for the turbine bases.

The considerable weight of the concrete 'doughnut' slabs meant they had to be cast in two pieces, facilitating transportation across site. Once moved, the two items must be fitted together, with tight



Processing of the wearing course on WTG 5 at Roggeveld Wind Farm.

tolerances demanding accurate and professional casting.

The unusual shape of these slabs required special shutters to be made up, as off-the-shelf shutter designs would not be fit-for-purpose. Fifteen sets of four slabs – one set for each turbine tower – had to be built, using just two sets of shutters.

Given the challenging topography, the two main access roads had to appropriately graded to facilitate heavy vehicles hauling on these roads. This meant cuts of up to three metres, but with blasting kept to a minimum to avoid environmental disruption. The project's highest point is 1 485 metres, with the site offices below at 1 289 metres.

Corporate social investment

In line with Concor's policy of community upliftment, the project team employed 145 people – out of a total of 200 hourly-paid – from surrounding communities including Sutherland, Matjiesfontein and Laingsburg. Their capacity ranged from general labourers to concrete hands and operators.

A number were empowered with training as operators on readymix trucks and loaders, in administrative roles and on the site weighbridge system. Also, 22 labourers were trained and certificated as concrete hands. Training was also conducted in first aid, firefighting and traffic administration. Some R3-million was spent on local subcontractors for contracts including bus hire, fencing, security, cleaning, and installation of road signs.

A substantial donation was also made to a local school for their various educational needs.

Design innovation

Considerable innovation in design was demanded by the project's constricting 12 metre environmental footprint. This restricted steep cuttings or high fills during the earthworks necessary to achieve the gradients that would be manageable by haul trucks.

This also required finely balanced cut and fill planning to ensure no

surplus material as limited stockpile areas were available.

Walking the site was necessary to make adjustments to roadways, with some micro-siting of the hardstands. Careful consideration in hardstand design was given to how the 'doughnut' slabs would be positioned, meeting the parameters of the main crane lift while not blocking access on the single roadway for through-traffic. Each of the 47 hardstands needed its own configuration.

The boom assembly area for the main crane (for tower erection) also required special attention at design stage. To limit the environmental footprint, this area – usually comprising a 200 metre long hardstand – was reduced to about a quarter that length, with a separate area dedicated to the boom assembly. The design had to work with just a six metre wide road and three 10 metre by 10 metre auxiliary crane pads just off the road.

Environmental impact consideration

Roggeveld Wind Farm is built in an environmentally sensitive area. There were red-listed plants identified on the project footprint, with 16 vulnerable and near-threatened plants. Under the supervision of the on-site environmental officer, protected plants potentially affected by construction were removed and relocated.

Several no-go areas were declared to protect other in-situ plants. Great care was taken not to encroach on these areas, with vehicle travel strictly restricted to internal roadways. Even the disturbed footprint for the road was kept to the absolute minimum.

Among endangered fauna on site is the Padloper Tortoise. When anyone encountered one of these small creatures, the environmental officer was alerted and the tortoise moved to a safer place in the area.

It was critical for the contractor to ensure legal compliance with environmental regulations, while undertaking construction safely to meet scheduled targets. The environmental sensitivity meant limited space for stockpiling, so this was tightly controlled. Sufficient tonnages therefore had to be crushed in the area where required. A mobile crusher was used in areas on the project footprint where stockpiles could be maintained.

Environmental inductions formed part of the general induction for all employees and subcontractors before working on the project. This also provided information on the local flora and fauna to members of the local community.

Drought remains a significant issue for any project in this region. Dry conditions rendered the designated project boreholes dry or

Cleaning of a foundation underway at Roggeveld Wind Farm.



insufficient for the originally budgeted project water needs. Water consumption on site was reduced, and water recycling settlement ponds were constructed at the batch plant.

Health & Safety

Concor's Visible Felt Leadership strategy was fully applied on the project. The excellent safety performance achieved is through a high level of teamwork implemented across all disciplines, with ongoing commitment from top management downwards.

Living safety values daily was an ethos instilled in the full project team by consistent and continuous communication. Concor's safety culture encourages employees to be custodians of their own team's safety.

In addition to initial inductions, Daily Safety Task Instruction sessions were held to identify risks related to daily activities that may have deviated from the issue-based risk assessment.

Being located in the Western Cape – which bore the brunt of the early phase of the COVID-19 pandemic – the project introduced extra procedures. Returning to site after national lockdown, method statements were revised to cater for regulatory requirements. An ongoing education campaign was introduced to ensure the entire workforce understood the “new normal” way of working.

Quantifiable time, cost and quality

Key to keeping the project on schedule and within budget was quality workmanship, especially on concrete foundations. No major rework was required, allowing work to flow according to the tight schedule on this fast track project.

There were no major breakdowns of plant, with critical batch plant wear parts and spares strategically kept on site for quick access ensuring minimum downtime. The plant was required to produce 25 000 m³ of readymix, with 10 readymix trucks working efficiently to meet defined pouring rates at the bases, which were more than 12 km from the plant. Regular maintenance was conducted on trucks by the onsite workshop, with a mobile service available.

Mid-project, the concrete mix had to change from using slag to Pulverised Fuel Ash (PFA, or fly ash) due to an industrywide shortage of slag in the region following the closure of the steel plant at

Saldanha. This changeover was well managed with all the necessary quality assurances and testing implemented without interrupting production. To accommodate the extra cost of transporting PFA from Mpumalanga, pricing was negotiated to suit the budget.

The planning and scheduling of resources was critical, with concrete aggregates being supplied by a commercial quarry in Worcester, the closest large town at 180 km away.

On-site casting of the doughnut-shaped slabs was expedited by the use of an over-spec 40 MPa concrete to achieve early day strength and speed up production. Fifteen sets of slabs (four in a set) could be completed in less than three months.

Risk management

The project involved five different contractors on site, so close communication and collaboration was vital to manage the overall project risk.

A risk register was developed and updated monthly. This included Concor Infrastructure's activities as well as those of the other contractors, and was discussed with the client at monthly meetings. It highlighted issues to be addressed, which were rated in terms of potential impact on project cost, time and quality. The items in the risk register were prioritised, so the most important were addressed

Casting of foundation WTG 6 at Roggeveld Wind Farm.



timeously by all involved parties. Daily co-ordination meetings were held on site with all contractors, highlighting the activities planned for the next day and how these would impact each contractor. This detailed level of planning was vital in mitigating ongoing operational risk.

A planning schedule, looking ahead two weeks, was submitted to the client by the construction manager, outlining what Concor intended to accomplish over that period. This was circulated to all contractors keeping everyone informed, allowing each to make necessary adjustments to keep all activities on schedule and minimise the risk of delays.

With the scarcity of water in the project area, Concor contracted an expert to conduct a hydro-census study before the project commenced. This allayed the risk of insufficient water to conduct site activities. Studies on boreholes showed certain water sources were dry, and the company registered its own boreholes. It also negotiated with local farmers to secure supply, and installed the necessary piping and pumps.

The unexpected risk presented by work stoppages due to the COVID-19 pandemic also had to be managed to accommodate the fact that the turbine suppliers were already in the country and components had been shipped. Work schedules were adjusted to allow for longer working days, so component delivery and turbine pre-assembly are not delayed. Concor's flexibility and innovative approach allowed the company to adjust plans so hard deadlines were met, and the project could roll out in a manageable way to the satisfaction of the client. ■

Quick overview of Roggeveld Wind Farm

- Built in a wind channel with some of the highest wind speeds in the country will make Roggeveld Wind Farm in the Karoo one of the most energy efficient wind farms to be constructed in South Africa to date.
- **Location:** 20 km north of Matjiesfontein, on the boundary between the Western and Northern Cape.
- **Owner:** Red Rocket.
- **Turbine equipment:** In total 47 wind turbines, with a rotor diameter of 130 metre and a hub height of 100 metres, will be erected. Seven of these are 3 MW turbines and 40 are 3,15 MW.
- **Output:** This 147 MW wind farm will contribute 555 000 MWh a year of clean energy to the national grid.
- **Concor Infrastructure Contracts Manager:** Stephan Venter
- **Concor Infrastructure Project Manager:** Greg Oosthuizen
- **Concor Infrastructure Construction Manager:** Marritus Bezuidenhout
- **Time frame:** contract started in May 2019 and the final base was cast in September 2020.

PROJECT INFORMATION

- **Client:** Nordex Energy South Africa
- **Start date:** May 2019
- **End date:** October 2020
- **Main Contractor:** Concor Infrastructure
- **Principal Agent:** Concor Infrastructure
- **Consulting Engineer:** BVI Consulting Western Cape

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GREEN, COST-SAVING PUMP SET TICKS ALL BOXES FOR HILTON

When the Hilton Hotel in Sandton was looking to upgrade the water pumping system for its buildings, it wanted a solution that was good for its staff, the business as a whole, and the broader environment; a Grundfos pump set ticked all these boxes.

According to Charmaine Spasojevic, chief engineer at the Hilton Hotel, the company's focus when investing in new plant is not on short-term economy.

"Our prime responsibility is to take care of our team members, the environment and the business itself, so we do not necessarily choose the cheapest item from an initial capital perspective," she says.

The solution selected was a Grundfos Hydro MPC-E booster pump set with four 7,5 kW motors and CIM 500 control system. This provides a complete system which is engineered to offer energy efficient operation with a high level of control capability. The pump set meets all the requirements of the Hilton's 12-floor, 329-room Sandton hotel, while delivering significant savings in electricity costs.

"This new energy efficient installation has allowed us to reduce our carbon footprint, helping us to combat climate change and help fulfil our value of social responsibility," she says. "Over and above the monetary saving on energy costs, the reduction in size and the added intelligence of the pump set, we will also achieve lower maintenance costs by eliminating separate variable speed drives (VSDs) and thereby reducing the quantity of items in our plant portfolio needing maintenance."

Real-time control

Spasojevic points out that the data and communication capabilities of the Grundfos CIM 500 control system add substantial value by providing real-time insight into the pump set's operation.

"From a management and monitoring perspective, the system integrates seamlessly with our building management system (BMS) and allows us to extract all the available information, and allowing us full control over our service," she says.

The hotel can now monitor various aspects of the pump set, including its running hours, energy consumption and discharge pressure, as well as any power supply problems or water shortages.

In addition, the system will alert management when services are required. The new equipment is also exceptionally quiet, notes Spasojevic, enhancing the ergonomics of the working environment.

"The pump set runs at such low noise levels that there is no



The Grundfos hydro MPC-E booster pump set with four 7,5 kW motors and CIM 500 control system.

concern for our team members' well-being when performing tasks in the immediate area," she says.

Energy efficient

Collaborating with the Hilton Hotel to design and supply the optimal solution was Grundfos SA team leader building service Errol Dobson, and API Pumps Gauteng sales director Johan Truter. Dobson says the hotel's previous system comprised components from a number of manufacturers.

"This complicated the control, maintenance and monitoring functions," he says. "The old pump set's control system was also unreliable, with pumps having to be manually reset on a regular basis."

After their detailed site visit and in-depth discussions with the customer, Dobson and Truter recommended the Grundfos pump set, which would replace the old 22 kW motors with new energy-efficient 7,5 kW motors. By installing the new system, the total plant's power demand was reduced from 74 kW to 30 kW.

The Grundfos Hydro MPC-E maintains a constant pressure through continuous adjustment of the speed of the pumps. The system's performance is therefore adapted to the demand through the pumps being cut in and out as required, and through parallel control of the pumps in operation.

Constant pressure control is also ensured through the continuous variable adjustment of the speed of each individual pump.

"Management at the Hilton Hotel wanted a reliable and energy efficient system with good backup support," Dobson says. "Grundfos was also able to offer the customer a two and a half year extended warranty on the booster."

Quick installation

The installation and commissioning were carried out in June 2020, and completed in just one day, he says. This included the removal of the old pump set, and the installation of new pipework and electrical work by API Pumps Gauteng. All the necessary pipes were measured

and sourced well in advance, as were the electrical componentry and cabling. Grundfos service engineer Marius van Wyk then undertook the commissioning of the pump set at the end of the day – completing a successful delivery to the customer.

"In line with our commitment to quality customer service, we prepared a project documentation file and handed that over to the Hilton Hotel for ongoing reference," he says. "This valuable documentation includes the original Grundfos pump set commissioning report, full Grundfos pump set datasheets and the certificate of compliance for electrical work done."

It also includes the original pump set factory test report, the full factory pump set wiring diagram and spare parts list, and the full installation and operating manual for the pump set. As part of the total solutions approach from Grundfos, a Service Level Agreement (SLA) was signed with the Hilton Hotel and will ensure the customer reaps the benefits of prolonged system life with predictable service and maintenance costs and well as lower total cost of ownership. ■



Constant pressure is assured through continuous adjustment of the speed of the pumps.



Charmaine Spasojevic, Chief Engineer at the Hilton Hotel, in front of the Grundfos booster pump installation.

COVID-19 REINFORCES NEED TO INVEST IN WATER INFRASTRUCTURE

The lack of a secure water supply in many areas of South Africa has exacerbated the COVID-19 crisis and again shed light on the worrying state of the country's water infrastructure, especially in outlying areas.

South Africa's water resource and supply, as well as sanitation infrastructure remain at risk. Bulk water resource infrastructure is struggling to cope with a rapid increase in demand in many areas of the country and the situation is being compounded by inadequate maintenance. Water supply in many urban areas is stable and will require investment in the medium and longer terms; however, it is severely compromised in less developed areas and, therefore, requires urgent intervention.

To provide clean water for washing hands and surfaces as part of the fight against the spread of the virus, thousands of tanks were delivered to many communities as South Africa went into a hard lockdown. While a commendable and effective short-term solution, these communities will require more reliable and sustainable water, sanitation and healthcare infrastructure well into the future.

Notably, the rollout of municipal water and sanitation infrastructure has been prioritised by government as part of a large public works programme that is also intended to stimulate economic recovery. This follows widespread job losses because of the shutdown and restrictions that have been implemented to contain the spread of the virus.

These projects are intended to create many jobs during the construction phases, in addition to the important role that they will play in ensuring water security well into the future.

However, investing in new water and sanitation infrastructure will result in further benefits, including helping to reduce multidimensional poverty and inequality. This is a challenge with which South Africa continues to grapple and the extent of the problem again highlighted during the crisis. Lack of essential service delivery infrastructure in many poor areas of the country has made it almost impossible for communities to adapt to the 'new norm'. For example, communities in highly densified informal settlements and low-cost housing developments are unable to practice social distancing. Meanwhile, limited or even non-existent water supply to many rural schools in extenuating circumstances, such as outlying areas of Limpopo, delayed their reopening last year.

Inadequate access to water and sanitation systems are among the lead contributors towards extreme poverty in many areas of the country. Amid other complexities, poor living conditions continue to place an immense strain on already-stretched government welfare and healthcare systems. A sound investment made into bolstering water supply infrastructure in these areas will, therefore, relieve pressure on limited state resources.

Water and sanitation infrastructure also stimulate industrial development which, in turn, creates longer-term employment prospects after the construction phases.

President Cyril Ramaphosa recently noted that the rapid deterioration of municipal water infrastructure, such as wastewater treatment works and water treatment plants, in the country was undermining the economy.

Importantly, a focus on developing water and sanitation infrastructure is also a fundamental component of the South African government's transition into sustainable development. Access to water and sanitation is one of the United Nations' 17 Sustainable Development Goals and supports circular economy principles, which will also create jobs along the entire value chain.

Corestruc is proud to be playing its part in the rollout of water infrastructure in South Africa, with its strong order book for precast-concrete reservoirs reflecting government's commitment to bolstering bulk water supply in the country.

By mid-2021, the precast-concrete specialist will have assisted municipalities in the country to fast-track the delivery of more than 140 Mℓ of water-storage capacity, despite the impact of the COVID-19 lockdown period on most construction projects in the country.


Its projects include large reservoirs with storage capacities of up to 30 Mℓ that are being built on behalf of a leading metropolitan municipality. These will complement smaller structures that the company has already constructed in poor areas of the country that are grappling with severe water shortages.

Corestruc's unique precast-concrete technology enables professional teams to significantly accelerate the construction of this critical infrastructure. For example, the precast-concrete specialist was able to build the wall of a 25 Mℓ reservoir in less than two weeks. This excludes post-tensioning with work on the wall commencing on 3 December and successfully completed by the 17th of the month, despite delays to the construction programme due to heavy rain.

Work on finalising the installation of the roof of the structure commenced in the second week of January and will be followed by the post-tensioning of the structure before the reservoir is filled with water.


This project supports large developments that have been planned in this growing urban area of Gauteng.


"Corestruc continues to build strong working relationships with urban and rural municipalities, as well as their professional teams. Our unique precast-concrete solutions have revolutionised the way in which these technically complex structures are being built at a time when water infrastructure has been placed high on the agenda," Willie de Jager, Managing Director of Corestruc, concludes. ■




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Trafo gains ground with dry-type transformer solutions

Dry-type transformer specialist Trafo Power Solutions is growing its footprint in mining and beyond with increased take-up of its safe and reliable technology.

“Our contract pipeline is a clear demonstration of the market’s confidence in dry-type transformers, especially for indoor applications, hazardous areas, remote locations and demanding outdoor environments,” says David Claassen, managing director of Trafo Power Solutions.

Recent orders have included a specialised 3 900 kVA unit for a large coal mine in Limpopo province. With a primary voltage of 11 kV, this dry-type transformer delivers through four different secondaries of 1 810 V, 1 500 V, 1 400 V and 1 200 V. To operate reliably in the dusty outdoor location, it is installed in an IP54-rated enclosure and cooled using air to air heat exchangers

Even during the COVID-19 lockdown, supply from the company has continued. Two 2 000 kVA dry-type transformers were installed in a modular substation for a diamond mine expansion in Sierra Leone.

Trafo Power Solutions also recently supplied Africa’s largest liquified natural gas (LNG) project, under construction in northern Mozambique. Eighteen dry-type transformers are already on site,

inside modular substations for the project’s first construction camp of about 9 500 contractors. Also being supplied are 20 specialised dry-type transformers for the project’s gas plant.

“We have been active in many other industries too, such as telecommunications, health, food and beverages, and commercial buildings,” says Claassen. “Our strategic partnership with a leading global player, TMC Transformers in Italy, allows us to leverage world-class technology and expertise for application in Africa.”

He highlights Trafo Power Solutions’ responsiveness to specific customer requirements, and its experience in custom engineering solutions that are fit for purpose. Backing up these offerings is a flexible, 24/7 support service from technicians in South Africa, who are ready to provide interventions on site where necessary. The company also provides customers further access to the engineering expertise at TMC Transformers’ state-of-the-art design and manufacturing facilities. ■



Zest WEG – 40 years and growing in Africa

Zest WEG’s four decades in Africa have produced a powerful local manufacturing base, and a growing footprint across sub-Saharan Africa – strengthening supply chains and local economies.

“Progress in skills development has been significant in the past few years, as we have invested heavily in technology and skills transfer between the company and our holding company WEG in Brazil,” says Juliano Vargas, chief executive officer of Zest WEG. “Leveraging WEG’s global manufacturing productivity logic, we have also installed the latest equipment and systems to pave the way for a sustainable future.”

As a result, local content in the company’s manufacture of transformers is now nearly 90%, while for products like E-Houses and electrical panels has exceeded 70%. Vargas highlights the strategic importance of local content not just in terms of the mining industry’s commitment to the Mining Charter, but for the sustainability of the South African economy as a whole.

“Our local manufacturing capability has helped to strengthen the supply chain for our customers, making businesses more secure,” he says. “The value of this has been well demonstrated by the economic impact of border closures during the COVID-19 pandemic.”

Vargas emphasises that Zest WEG’s own supply chain has been actively nurtured through enterprise development initiatives, fostering the sustainability of local businesses. This local manufacturing ecosystem shields the company from market fluctuations and gives it a competitive cost advantage on locally manufactured products.

Success in South Africa has fostered growth into 47 other African countries, where customers are not only supported by wholly-owned operations but also by Zest WEG’s Value Added Resellers (VARs) in over 20 countries around the continent.

“These VARs understand their local markets and are skilled practitioners in their fields,” he says. “This ensures that they can apply Zest WEG solutions appropriately and optimally to customers’ specific needs.”

VARs are a key aspect of the company’s strategy to become rooted all over sub-Saharan Africa, collaborating with in-country experts and enhancing technical expertise and local capacity for economic development. Vargas notes that WEG’s range of products serve many industrial sectors, allowing Zest WEG and its VARs to explore opportunities not only in mining, but also in oil and gas, agriculture, water, cement and general industry. ■



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TYPES OF MINOR CONCRETE defects and their remedies

The durability of concrete is exceptional and well-recognised but sometimes operational errors or unforeseen circumstances can cause unsightly superficial surface damage.

Here Bryan Perrie, Managing Director of The Concrete Institute (TCI), provides guidance on the types of defects likely to be encountered and the types of materials available for repairs:

The quality of any cast concrete product depends on material selection, equipment used and workmanship. Surfaces of acceptable quality and accuracy are difficult to achieve and, depending on functional and aesthetic requirements, some repairs may be necessary. Repairs may also be necessary where surfaces are damaged in service.

Minor defects include:

- Small cavities: such as those formed by tie-bolts and impact damage to the surface.
- Honeycombing: concrete in which mortar is partially or completely absent, caused by mortar loss during placement, or segregation of the stone and mortar.
- Misplaced surfaces: usually the result of incorrectly aligning or positioning formwork, or movement of formwork during concrete placement. Under- or over-filling of formwork may also be the cause.
- Blowholes: relatively small voids of roughly spherical surface shapes formed against formwork or moulds, usually caused by inadequate compaction of the thin layer of concrete in contact with formwork, or incorrect mould release agent for the particular type of formwork.

Basic types of repair materials

Repair materials are formulated to reduce the likelihood and severity of cracking. This is done by reducing potential drying shrinkage which will reduce the tendency to crack.

Two approaches are possible:

- The use of "semi-dry" mixtures of cement, water and aggregate, compacted by being rammed into position. Semi-dry mixtures have low water content and therefore very low potential drying shrinkage and consequently resistance to cracking. But water content is critical: if too low, thorough compaction is impossible; or if too high, the repair may slump or crack. These mixtures can be used only in confined spaces such as cavities and, ideally, applied by trained, experienced and skilled operators.
- The use of plastic mixtures of cement, water, polymer emulsion and aggregate (polymer-modified mixtures) applied by trowel or spatula to reduce the amount of water required for a given consistence. The hardened material, which incorporates a 3D network of coalesced polymer, exhibits greater creep and toughness. Consequently, potential drying shrinkage is relatively low; tensile stresses resulting from restrained

shrinkage reduced; and cracking significantly reduced.

Selecting materials for repairs:

- Repair materials are mixtures of cement, water and aggregate, with the possible inclusion of a polymer emulsion.
- Cement must meet the requirements of SANS 50197 for Common cement and the National Regulator for Compulsory Standards (NRCS) requirements as detailed in NRCS VC9085. Bags should be clearly marked with the strength grade, notation indicating composition and a Letter of Authority (LOA) number issued by the NRCS. To verify valid LOA numbers, contact the NRCS on 012 428 5199 or www.nrsc.org.za.
- Water that is potable from a municipal supply is suitable but if from other sources needs testing to establish acceptability.
- Maximum aggregate particle sizes must not exceed a quarter of the thickness (or least dimension) of the repair and, preferably, be spherical. If such materials are unavailable, particles should be rounded or roughly cubical or "chunky". Flaky and elongated particles should be avoided.
- Sand used for repair work should have particle sizes ranging from dust to the largest size. Sands with similar-sized particles produces mixes with poor workability and high water requirement, and should be blended with other sands to improve grading.
- The following aggregate types, blended where necessary, may be suitable for repair work:
- Plaster sand: Useful for blending with a coarser sand to improve workability or on its own for making priming slurry and filling blowholes.
- Concrete sand: Naturally derived pit sands or river sands and well-shaped crusher sands, with coarse particles removed by sieving if necessary and blended with a finer plaster sand.
- Stone pebbles and crushed stone with well-shaped particles.
- Polymer emulsions, formulated for use with cement, obtainable from specialist suppliers. Such emulsions should be based on styrene butadiene rubber (SBR) or acrylic. ■



Construction industry needs to NEGOTIATE INCREASINGLY COMPLEX WORLD

“When nothing is certain, anything is possible. The complex world we are moving into requires economies of learning and robustness,” says John Sanei, futures strategist, human behaviour specialist and best-selling author.

Sanei was speaking at a virtual conference held by construction software company RIB CCS – #futurenow – which explored the urgent need for the engineering and construction industry to embrace digitalisation to remain relevant and future-proof their businesses.

He stressed the need for organisations to move beyond economies of scale and mass efficiency and recalibrate themselves for what’s coming: uncertainty. “To prepare for uncertain times, we need to develop robust business models and structures that allow for experimentation and to see what grabs and what doesn’t grab.”

RIB CCS CEO, Andrew Skudder, says the engineering and construction sector has been operating in the same way for decades, is one of the least digitised industries in the world (21 out of 22 industries) and has not enjoyed significant productivity growth in recent years.

“With the world shifting towards the next great technological transformation, the ability to move with the tide of innovation is essential for industry players to gain a competitive advantage and set the pace in the built environment.”

Skudder says one of the conference speakers, Marc Nezet of Schneider Electric, highlighted three major challenges the world is currently facing – a global pandemic, recession and, most notably, climate change.

“World Economic Forum statistics indicate that construction accounts for 13% of the global GDP, 6% of world employment and a staggering 40% to 50% of worldwide emissions, meaning climate change cannot be solved without transforming the building and construction industry.”

In Nezet’s words: net-zero carbon cities and buildings can only emerge after being thoughtfully designed and built. And thanks to digital software technologies, users are empowered across the lifecycle of any construction project to make decisions for a more efficient and lower carbon future.

McKinsey & Company partner, Gerhard Nel, reiterated the need for change in the industry. “This need is driven by an industry that is currently characterised by increasing complexity, changing customer preferences, sustainability considerations, a move to modular, a shortage of skilled labour and a stricter and more complex regulatory environment.”

He suggests new industry dynamics are at play with emerging disruptions such as industrialisation in the form of modularisation and product standardisation, as well as industrialising workflows from engineering to planning and procurement. “In addition, he says new entrants with new business models or unicorns will lead to disruption of the market.”

He says McKinsey & Company conducted a survey of all the digital solutions in the market, surveying 2 400 companies. “Clear trends have emerged around firstly – digital twinning; secondly – 3D printing, modularisation and robotics; thirdly – AI and analytics (using big data); and fourthly – supply chain optimisation and marketplaces.”

Skudder says from RIB CCS’ perspective, the most interesting aspect was the digitalisation of the industry as a key disrupter. “With a plethora of digital solutions out there, we have witnessed two ‘plays’ in digitalisation.

“One is the platform play where software companies like RIB look



RIB CCS CEO,
Andrew Skudder.

to creating a common or single database with applications on top that give clients a holistic view and the ability to access to their data, but where each participant in a project has their own applications to suit their work, be it estimation, planning or quantity surveying, amongst many others. This allows for enhanced collaboration and the harnessing of structured data for better decision making around projects.

“The second play is the tool-set play whereby software companies build specific applications to solve specific problems such as estimating or planning. The problem with this is that data is then situated in silos and becomes difficult to consolidate.

“That’s why we believe that when it comes to digitalisation, it’s about embracing a single platform that connects the organisation’s data, business processes and people in one environment, which leads to greater efficiency, increased access to information and better run projects,” adds Skudder.

Referring to the topic of disruption raised by John Sanei, Skudder agrees that sometimes meaningful transformation requires creating ‘future teams’ in the business to experiment on new ways of doing things.

“Innovative organisations do this as a matter of course, but I don’t think construction companies do it enough. I think it’s a great suggestion for them to consider, especially with the way the sector is evolving.”

Importantly, Skudder says, significant change management and digital transformation need to be leadership-driven. “Clients also need to establish a digital roadmap of the journey they intend to take and deliver good quality training to employees. Our philosophy at RIB CCS is that organisations need to be empowered to train themselves, thereby allowing them to own their projects.”

Perhaps, Skudder and the other conference speakers’ sentiments can be best summed up by Rukesh Raghubir, CEO of M&D Construction Group, who says: “We need to understand that as an industry, if we do not disrupt ourselves, someone else will do it for us.” ■

ALUMINIUM COMPLEX GREASES

While no grease can truly be an 'all-purpose' lubricant, aluminium complex grease is a valuable multifunctional, multipurpose product. Since they first came into the market in the 1960s, they have undergone numerous improvements, especially in terms of water resistance and thermal and mechanical stability.

Callum Ford, National Marketing Manager at Lubrication Engineers (LE) South Africa, explains that idea applications include vehicle wheel bearings, manufacturing and assembly plants, steel mills, boat trailers, paper mills, and in the rubber, textile and agricultural and construction industries, among others.

"Aluminium complex greases are easy to pump at low temperatures because of their relatively low soap content and higher oil content," he says. "They readily accept extreme pressure additives, plus all the usual rust and oxidation inhibitors and speciality additives. Formulations of specially selected oils and additives can also be made to produce sophisticated lubricants for moderately lower and higher temperature conditions. We categorise the mechanical or shear stability of aluminium complex greases in the range of 'good to excellent'."

LE's aluminium complex greases include the company's proprietary and exclusive wear-reducing additives. Ford says that the products also offer good 'heat reversion characteristics'. This is the ability of the grease to revert to its normal consistency after it has been heated and cooled repeatedly.

Many industrial and automotive applications involve intermittent



temperatures within a bearing that will approach or exceed the dropping point of the grease. Grease in such bearings may return to an ambient temperature periodically (for example, in a vehicle with disc brakes). If the grease in such an application does not maintain very nearly its initial consistency, it is obvious that the bearing is a candidate for failure. Aluminium complex greases, in addition to having a typical dropping point of 232°C to 246°C, also rate 'excellent' in heat reversion characteristics when compared to other multipurpose greases.

A well-formulated aluminium complex grease will also have excellent water resistance. Ford says that aluminium complex greases excel in resistance to both washing out of a bearing and being washed off a flat surface. "This resistance to water washout is very important where it is necessary to

prevent lubricating grease from entering plant discharge water," he says. "It also cuts down on lubricant consumption. The shear stability of aluminium complex grease is only moderately affected by water in the grease."

LE's aluminium complex greases include Monolec Industrial Lubricants (4700-4702) and Almaplex Industrial Lubricants (1274-1275). In addition, LE offers modified versions of aluminium complex greases, without EP additives, but containing the proper food grade oil to produce food-grade greases. These include LE's Quinplex Food Machinery Lubricants (4023-4025), which meet the USDA and FDA H1 requirements. ■

New focus on earthmoving wear and tear

Bearing and wear material manufacturer Vesconite Bearings has placed renewed emphasis on the earthmoving industry with the appointment of Lorraine Deans as industry champion.

Deans has a background in customer service, as well as research in construction.

It is this latter experience, compiling construction project information for a subcontractor bulletin, that particularly drew her to her current role.

"I found out about new projects before construction began," informs Deans of her previous position.

"This was particularly useful for civil engineers, quantity surveyors and other service providers who wanted to know about projects in the planning phase," she says.

When Vesconite's front-line work was streamlined, Deans was asked which industry she had a passion for. The answer was obvious - after years of work in the building and construction, she was keen to return to a familiar industry.

Vesconite's no-swell wear-resistant self-lubricating bearings, that were developed for the notoriously harsh deep-level South African gold mines, which are characterised by extreme dirt and wet, are also suited to earthmoving, she reasoned.

"Vesconite has an enduring long-life, offers reduced maintenance, reduced shaft wear and is suitable for wet and abrasive environments," notes Deans.

"It is also particularly valued for its self-greasing ability which provides clients with valuable savings on labour and greasing costs," she says. Since her appointment in earthmoving, Deans has

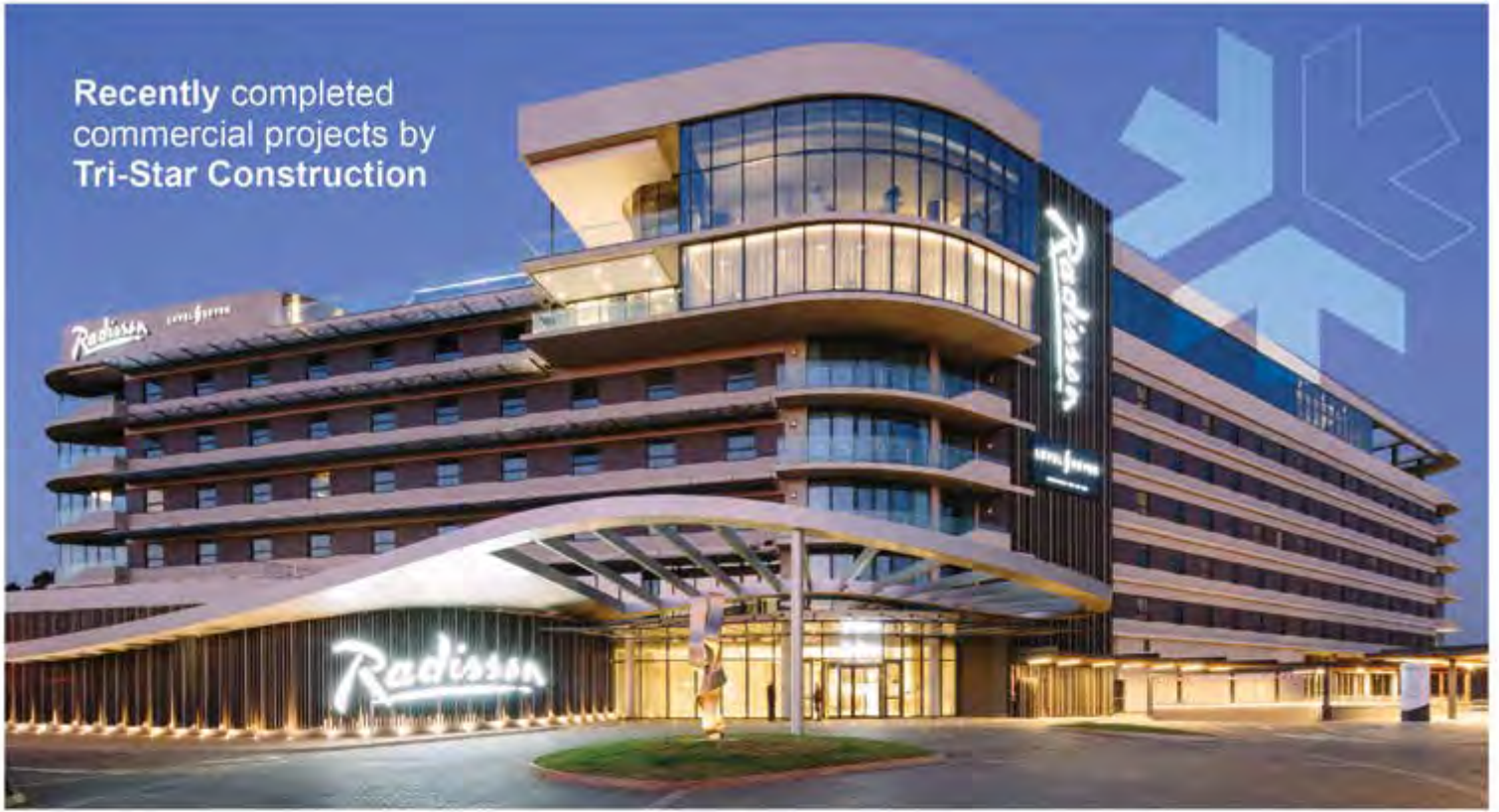


introduced herself to present and prospective clients, has become familiar with many of their pain points, and has provided prototypes for some of their most difficult applications.

"We have seen a lot of interest in plain bearings that can be used in suspension systems, oscillating joints and pivot points," notes Deans.

While testing can take between three and six months, she believes that articulated dump trucks, front loaders, back hoe loaders and grabbers have high potential as applications in which Vesconite will bring considerable savings. ■

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