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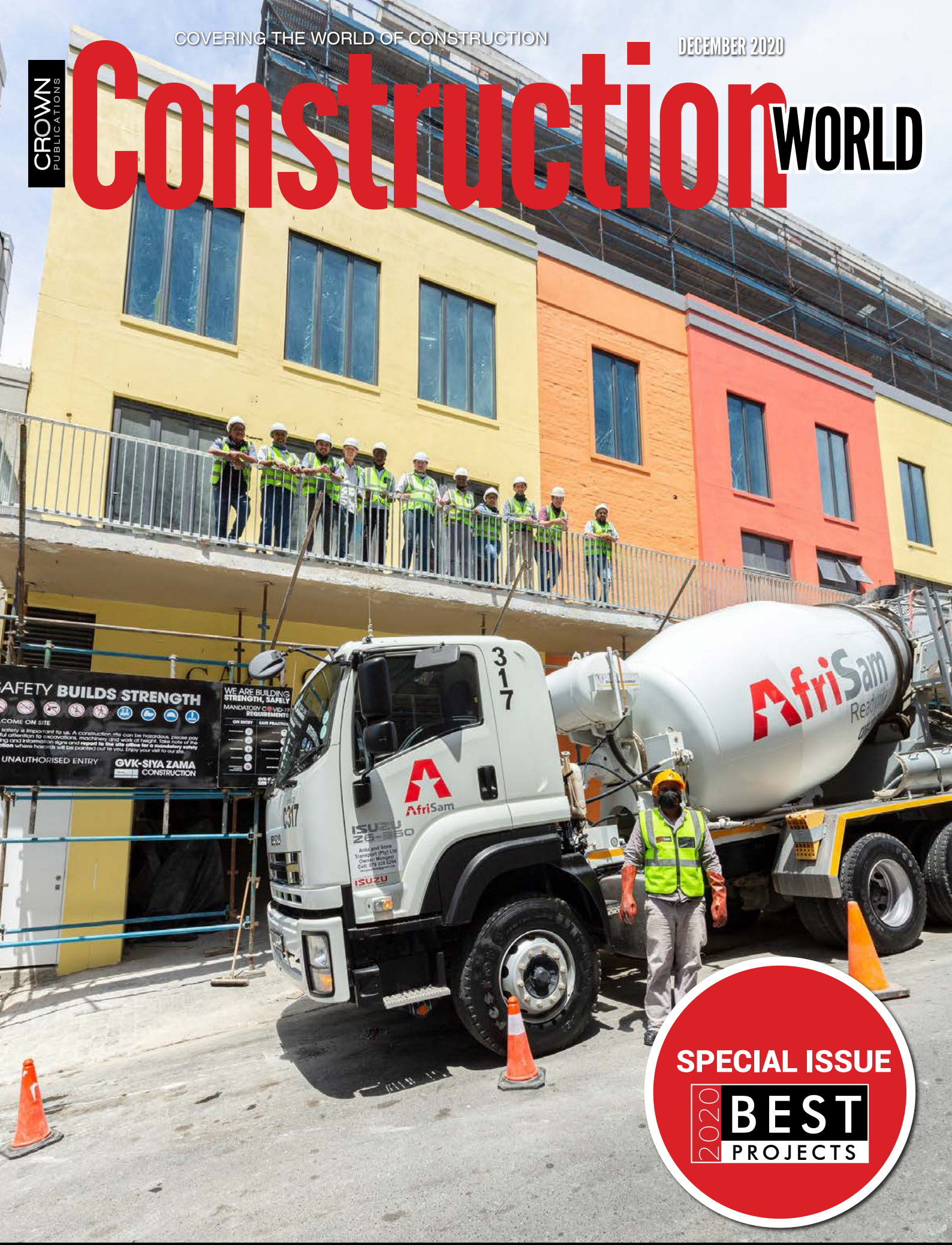

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2020 BEST PROJECTS

CONCRETE results at OLD CAPE QUARTER

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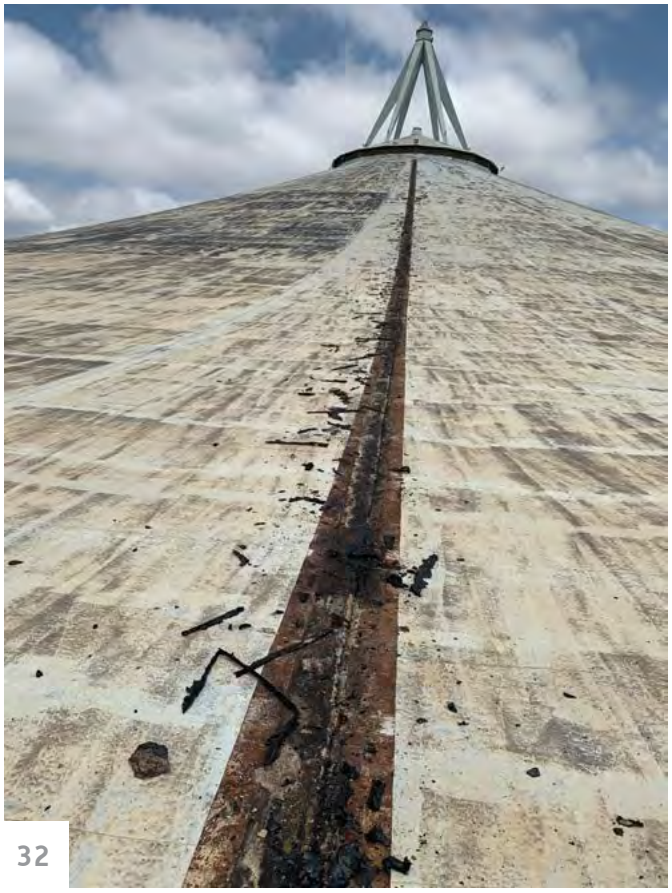

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ON THE COVER

The old-world charm of Cape Town's De Waterkant area is being captured in a new mixed-use development at the Old Cape Quarter, with main contractor GVK-Siya Zama Construction working closely with AfriSam on finding concrete solutions. Kicking off in May 2019, and scheduled for completion in mid-2021, the project is adding four floors of luxury apartments onto the existing retail level and office level, with three basements. The 55 upmarket units include one-bedroom and two-bedroom apartments, as well as three bedroom penthouses.

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Despite challenging conditions, Construction World's ***19th Best Projects Awards, sponsored by AfriSam, took place in November.***
From left: ***Debbie Harvey (AfriSam), Karen Smith (Crown Publications), Wilhelm du Plessis and Erna Oosthuizen*** Construction World.

COMMENT

According to the International Energy Agency's (IEA) Renewables Report 2020, the fears that this sector had that its momentum would be stopped in its tracks by the COVID-19 pandemic, never materialised. In fact, wind and solar energy will exceed coal capacity globally within the next five years.

This process was accelerated by the pressure to reduce costs and the meeting of climate targets. The South African government has been cognisant of this but also about the role Independent Power Producers can play in getting the huge construction sector back to work and sustainably employed. It announced that it was accelerating the implementation of the Integrated Resource Plan to provide a substantial increase in the contribution of renewable energy sources.

Defying the expected

Despite the fact that global economic growth dropped because of the pandemic, with oil prices at one point turning to negative, the renewable energy sector not only defied the downturn, but managed to post record growth in 2020. Renewable electricity generation is set to increase by 7% in 2020. The result, according to this report, is that total wind and solar PV capacity will exceed natural gas in 2023 and coal in 2024. By 2025 renewables will surpass coal to become the biggest source of electricity generation globally. South Africa may be a decade or so behind this as Eskom is still and will still be the largest source of energy in the country – but plans are afoot to ease it from its position of dominance.

IEA's Executive Director, Faith Birol says that when renewable energy overtakes coal as the biggest source of electricity generation worldwide, it will end coal's five decades as the top power provider. She goes on to say that by that time, the IEA expects renewables to supply one-third of the world's electricity. This expansion was driven by wind, solar and hydro-electricity.

However – the caveat worldwide, but especially in South Africa – is that while renewables may have been resilient to the COVID-19 crisis, it will obviously not be to policy uncertainty, something South Africa's inefficient regulatory framework is fraught with.

Recognising excellence

This issue is dedicated to the winners and entries of the 19th annual Best Projects awards. It is perhaps no coincidence that one of the big winners was the Roggeveld Wind Farm.

Despite the obvious uncertainties and challenges brought on by COVID-19, these awards took place in November at the historic Thunder Walker venue in the Johannesburg inner city. Against the odds we had a 100% turnout while the festive atmosphere reminded that excellence and achievement are revered by all. Fifteen awards were made in six categories.

Enjoy this year's overview of the achievements in the South African built environment.

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PUBLISHED MONTHLY BY
Crown Publications
P O Box 140
BEDFORDVIEW, 2008
Tel: 27 11-622-4770

PRINTED BY
Tandym Cape

TOTAL CIRCULATION:
(Third Quarter '20)
9 804

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THINK SAFE
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Construction has preserved and protected the outer heritage walls of the existing structure, which date back about 100 years.

CONCRETE RESULTS AT OLD CAPE QUARTER

The old-world charm of Cape Town's De Waterkant area is being captured in a new mixed-use development at the Old Cape Quarter, with main contractor GVK-Siya Zama Construction working closely with AfriSam on finding concrete solutions.

Kicking off in May 2019, and scheduled for completion in mid-2021, the project is adding four floors of luxury apartments onto the existing retail level and office level, with three basements. The 55 upmarket units include one-bedroom and two-bedroom apartments, as well as three bedroom penthouses.

Construction has preserved and protected the outer heritage walls of the existing structure, which date back about a hundred years. Being inside a residential area also placed restrictions on working hours, while narrow roads around the building made for difficult logistics – including the readymix deliveries. Strategies to underpin the new structures was a key focus of the early phases, requiring some innovative thinking from the contractors and close collaboration with readymix supplier AfriSam.

"Due to variable ground conditions, there were a number of piles that had to be executed through the existing bases," says Garth Robb, contracts director at GVK-Siya Zama. This meant 300 mm diameter core-holes were drilled through the old existing bases. This ensured tolerance and space for the four 250 mm diameter piles which would allow the transfer of loads onto the piles from the temporary steel structures and the construction of the new base above the piles. A number of new columns and bases had to constructed after the demolition of the old columns and bases and within the temporary steel structure; this was to the new design requirements by Sutherland Engineers.

"The challenge was the lack of space in the basement for the use of normal Class 3 formwork," says Robb. "The top of bases had to align with the top of surface beds, Class 2 formwork. Some existing columns required various types of strengthening. We had to construct biscuit columns, whereby we added reinforcing and formwork around the existing column and core-drilled at an angle through existing PT slabs from above the biscuit column – adding grout to enlarge and strengthen the existing column sizes."

This complicated the column strengthening process, consuming valuable hours and limiting the amount of concrete that could be poured at a time – hence the need for close collaboration with AfriSam. In particular, the 60 MPa concrete required for this application could not be poured fast enough before hydration set in

"After much discussion with AfriSam, we found a way forward – to receive and pour just one cubic metre of readymix at a time," he says. Readymix trucks usually carry 6 to 8 m^3, but this volume could not be poured at a fast rate as a result of the 60 mm grouting holes above the columns.

This was because the conditions demanded that concrete be poured by wheelbarrow through 60 mm core holes from the slab above into the biscuit columns. The challenge was that each column took up to an hour to pour, with admixtures accelerating the hardening rate of this highly fluid concrete.

There was no other option but for concrete to be delivered in smaller volumes, with the trucks standing by patiently for up to an hour while the cubic metre was poured.

AfriSam territory manager Melanie Ross says this meant a high level of flexibility as pours could only start in the afternoon, and often extended beyond the 18:00 deadline agreed between the contractor and the authorities. Extended permissions were obtained, and the AfriSam-contracted drivers agreed to put in the extra time until pours were completed.

"It was great to be able to sit down with AfriSam around the table to discuss challenges as they arose, and to come up with solutions that worked," says Robb. "Compromises were required, and we all contributed what we could to keep the project on track."

Augmenting some existing foundations, the geotechnical work finally included a combination of new and strengthened foundations and columns, adding significantly to the number of dowels and volume of epoxy consumed.

The added strengthening work also pushed the readymix concrete volume demanded by the project from 6 700 m^3 to 9 700 m^3. Most was supplied from AfriSam's Woodstock plant, about 8 km from site. The special column mix – a high slump mix with superplasticiser – came from AfriSam's Peninsula Quarry plant at Durbanville.

"The gaps in the column reinforcing also required that a smaller

stone size be specified, so we changed from a 14 mm to a 9 mm stone," says Ross. "We conducted a number of tests on site to ensure the solution was fit for purpose. In all, about 10 different concrete mixes were employed during the project to suit various applications."

Another of the challenges for the contractor was the continued operation of some retailers on the ground floor during the first phases of the project. These tenants required the use of one of the lifts, so the demolition of the core 1 lift shaft and stairwell – one of four cores stiffening the structure – could only begin in August after tenants moved out.

"To expedite the project, we installed props all the way down to the basement, to take the core 1 lift shaft off the project's critical path," he says. "We then started building core 1 under a suspended core, which helped speed up progress."

The heritage perimeter walls facing Dixon Street were stabilised to protect them from some of the necessary top-down demolition, with the help of an independent engineer, according to GVK-Siya Zama site agent Pieter le Roux. To strengthen and support the heritage facades, 9x3 wooden roof timbers were bolted at 45 degrees to the existing floor on level one and attached to the walls using a fixing detail approved by the engineer.

There were also pine lattice trusses in parts of the old roof, dating back to the 1930s, which will be incorporated as a feature into the new steel roof structure. This led to another challenge, as the new building is set back from the corner of Waterkant Street and Hudson Street by 4,5 metres. Columns were therefore built through the heritage trusses, casting a transfer beam and slab above. From this structure, a steel roof will be installed.

Due to the roads and limited space around the site, traffic management plans were developed to ease congestion and bollards were even installed. Efforts are made to arrange deliveries from Hudson Street, which is wider.

Ross concludes with a further unexpected challenge for AfriSam during its supply contract to the Old Cape Quarter: the closure of the steel plant at Saldanha. This brought an abrupt halt to the supply of ground granulated blast furnace slag, which is a latent hydraulic binder and a partial cement replacement material.

"We were able to source a replacement in the form of fly ash from power stations in Mpumalanga and Gauteng, to continue supplying the high standard of ready-mix for which AfriSam is well-known," she says. ■

AfriSam supplied 9 700 m³ of concrete for this project, mostly from its Woodstock plant.

About 10 different concrete mixes were employed during the project to suit various applications.

Left: The project is adding four flours of luxury apartments onto the existing retail level, with three basements. Right: A particular challenge was the lack of space in the basement for the use of normal Class 3 formwork.

EXCELLENCE AND INNOVATION TRIUMPH

At the end of a most challenging year, *Construction World* held its 19th annual Best Projects Awards in Johannesburg on 4 November. Despite challenges brought on, and exacerbated by, the national lockdown and the massive lack of government investment that existed pre-COVID, the awards had 38 entries. This is proof that even in times of difficulty, excellence and innovation triumph.

AfriSam was the main sponsor and has been sponsoring this event for 15 years. Den Braven was both a bronze sponsor and also sponsored the Architects category while Sika was an associate sponsor.

The event was held in the historic Thunder Walker on Gandhi Square in Johannesburg and limited to 100 guests to adhere to COVID-19 restrictions.

The Civil Engineering Contractors category was won by Concor for the Roggeveld Wind Farm. The project was also Highly Commended for the AfriSam Innovation Award for Sustainable Construction.

In the Building Contractors category the winning project was by Concor for Oxford Parks Phase 2 while WBHO won two Highly Commended Awards for UP Engineering 4.0 and DSV Park Gauteng. Oxford Parks Phase 2 was also Highly Commended for the AfriSam Innovation Award for Sustainable Construction.

There were two Special Mentions in the Specialist Contractor or Supplier Category. These were for Kaalfontein Pedestrian Bridge (CoreCivils) and Botha Halte (Terraforce/Decorton Retaining Systems). The winner in this category was Sika South Africa for the Rehabilitation of Durban Heights Reservoir.

The Consulting Engineers category was won by JG Afrika for Coastal Park: Material's Recovery Site. The project was also the Winner of the AfriSam Innovation Award for Sustainable Construction.

The Architects category attracted the most entries and four awards were made. A Special Mention award was given to Tshwane Regional Mall (SVA International in association with Afro Plan Architects), while dhk Architects and Bentel Associates International both won Highly Commended Awards for respectively Capitec Bank Headquarters and Destiny|Radisson Hotel.

The category was won by Boogertman + Partners/Tiber Construction for Sandton Gate Phase 01.

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BEST PROJECTS JUDGES

ROB NEWBERRY

- Initially studied Quantity Surveying and then completed Honours Degree in Construction Management.
- Has worked in construction industry for over three decades
- Former director of Grinaker-LTA
- Past president of CIOB Africa
- Founding member of Government's Statutory Council for Project Management

NICO MAAS

- Masters degree in Civil Engineering
- Chairman of Gauteng Piling
- Chairman of Federate Employers Mutual
- Serves on cidb board
- Past President of MBA North and MBSA

TRUEMAN GOBA

- Registered professional engineer since 1983
- Established Goba Maohloli & Associates, which later merged with Keeve Steyn to form what became Goba, now part of Hatch Africa.
- President of the SA Academy of Engineering
- Honorary Doctorates in Engineering awarded by Stellenbosch University, KwaZulu-Natal and McMaster in Canada

Artist's Impression of Msikaba Bridge, Eastern Cape.

CONCOR: BUILDING SA'S FUTURE

South Africa's leading black-owned construction company, Concor boasts a proud heritage that is built solidly into the fabric of the country's infrastructure.

As a pioneer of transformation in the construction sector, Concor is a Level 1 B-BBEE company, has 58% women ownership and employs just over 2500 people located across the vast landscapes of South Africa. At the same time, it has deep roots which go back to 1902 contributing to many of the iconic engineering achievements that today define our social and economic landscape. Acquired from Murray & Roberts in 2017 by a consortium led by the Southern Palace Group, Concor is active across Southern Africa.

With agility as a key differentiator, Concor offers its depth of expertise and experience across a range of industry segments – from civils and building, to roads, earthworks, property development and mining. Concor's in-house resources, including sought-after skills, plant and equipment, underpin the company's ability to provide world class solutions to clients and to deliver projects on time, within budget and safely.

Earthworks & Civils
Concor leveraged its earthmoving and civils infrastructure expertise at **Exxaro's Belfast Coal Mine** in Mpumalanga constructing four major dams, 26 concrete platforms and terraces and 37 internal roads of 16 km in length for a contract value of R800 Million. Tackling the demanding conditions of Botswana's Kalahari Desert, Concor is constructing a 35 km access road with a parallel haul road for the **Khoemacau Copper Silver Starter Project** in Botswana, as well as conducting earthworks and concrete civils at the Khoemacau Boseto processing plant. Work is underway on Concor's contract for the extension of the ash disposal facilities (ADF) at both **Kendal Power Station** and at **Majuba Power Station**. The work focuses on construction of a continuous lined ash dump and associated infrastructure for a contract value of R1.2 Billion.

Roads & Transport Infrastructure
Among Concor's landmark projects are ambitious and elegant engineering structures that have become household names, like the breath-taking 216 m high and 451 m long **Bloukrans Bridge** in the Western Cape. Another is **Gautrain**, one of the country's best-known PPP projects. Concor also played an integral role in the construction of the **Coega Industrial Development Zone close to the Port of Ngqura**, to attract investment in a range of heavy, medium and light industries. In a substantial greenfields project, Concor recently constructed the new double-lane northbound carriageway over a 34 km section of the **N2 highway between Mtunzini and Empangeni in KwaZulu-Natal** for a contract value of R1 Billion. The scope included eleven bridges, 21 major in-situ culverts under the highway and over 130 smaller crossings. Concor, in a joint venture with Mota Engil Construction, is constructing the **Msikaba Bridge** in the Eastern Cape for a contract value of R1.6 Billion. When completed this will be the longest cable-stayed bridge in Africa and the second longest main span bridge crossing ever built on the continent.

Renewable Energy
Concor has significantly boosted South Africa's drive towards renewable energy, building the majority of the wind farms across the Northern Cape, Western Cape and Eastern Cape for a combined Concor own works value of R2.5 Billion. These include **Jeffreys Bay Wind Farm** (138MW), **Noupoort Wind Farm** (80MW), **De Aar Wind Farm** (100MW), **Loeriesfontein Wind Farm** (140MW), **Khobab Wind Farm** (140MW), **Perdekraal East Wind Farm** (110MW), **Kangnas Wind Farm** (140MW), **Golden Valley Wind Farm** (120MW), **Excelsior Wind Farm** (32.5MW) and **Roggeveld Wind Farm** (141MW).

Water & Sanitation
Extensive expertise in the construction of large water projects saw Concor's involvement in the **Lesotho Highland Water Project (LHWP)** with the construction of a network of tunnels and dams. Concor also played an important role at the **Ingula Pumped Storage Scheme** on the Drakensberg Escarpment where it constructed both the lower **Braamhoek Dam** and the upper **Bedford Dam**. The impressive Braamhoek dam, at 39 m high and with a 335 m crest length, with its roller-compacted concrete design can store 26 million m^3 of water.

Buildings Works
Many iconic buildings that are part of our daily lives were constructed by Concor. These include the **Melrose Arch Precinct**, **Menlyn Park Shopping Centre** in Pretoria and **Portside**, Cape Town's tallest building at 139 metre high. Adept at meeting specialised requirements for modern **Data Centres**, Concor most recently completed projects for **Orange** in Botswana and **Amazon** in the Western Cape. The spectacular **BP Head Office** in the **Oxford Parks Precinct** is another award winning project undertaken by Concor. Work is also well underway to complete **Oxford Parks Phase 2** as well as **16-On-Bree** in Cape Town. In partnership with the Western Cape Provincial Government and City of Cape Town, Concor's development and construction of the **Conradie Better Living Model** mix-used development in the Western Cape is a significant game changer with a development value of R5 Billion.

Mining Services
Concor's comprehensive mining services offering includes surface mine development, opencast mining services, box cut development, overburden removal, drill and blast, ore extraction, load and haul and crushing as well as rehabilitation. Amongst others, Concor operates a load-and-haul contract at Anglo American's Mogalakwena open pit PGM mine where it is responsible for mining the **Zwartfontein** pit. Its drill-and-blast contract at **Vlakfontein** is further testimony to its specialist skill set.

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THE BEST PROJECTS 2020 WINNERS

THE CIVIL ENGINEERING CONTRACTORS category was won by Concor for the Roggeveld Wind farm.
The project also received a HIGHLY COMMENDED award in the AFRISAM INNOVATION AWARD FOR SUSTAINABLE CONSTRUCTION.
From left: Greg Oosthuizen, Dirk van der Merwe and Stephan Venter.

The winner in the BUILDING CONTRACTORS CATEGORY was Concor for Oxford Parks Phase 2. The project was also HIGHLY COMMENDED for the AFRISAM INNOVATION AWARD FOR SUSTAINABLE CONSTRUCTION.
From left: Bain Fowler, Janet Glendinning (Intraprop), Rui Santos, Martin Muller and Brian Carter.

DSV Park Gauteng was HIGHLY COMMENDED in the BUILDING CONTRACTORS CATEGORY.
From left: Matthew Downes, Alastair Luke, Christo van Niekerk, Fernando Ferreira, Pieter Kotze, Thulani Khumalo and Keith Willoughby.

WBHO's UP Eng 4.0 also received a HIGHLY COMMENDED award in the BUILDING CONTRACTORS CATEGORY.
From left: Gavin Loveday, Trevor Smith, Christo van Niekerk and Keith Willoughby.

SIKA South Africa won the SPECIALIST CONTRACTORS OR SUPPLIERS CATEGORY with the Rehabilitation of Durban Heights Reservoir.
From left: Andrew Ibbotson, Gerrit Visser, Mark Griesel and Shaun Saxby.

Terraforce won a SPECIAL MENTION AWARD in the SPECIALIST CONTRACTORS OR SUPPLIERS CATEGORY for Botha Halte.
Pictured is Silvio Ferraris (from Remacon, representing Terraforce)

THE BEST PROJECTS 2020 WINNERS

Kaalfontein Pedestrian Bridge (CoreCivils) was also given a SPECIAL MENTION award in the SPECIALIST CONTRACTORS OR SUPPLIERS CATEGORY. From left: Johan Muller, Clifford Mogale and Jaco de Bruin.

The winner of the ARCHITECTS CATEGORY was Sandton Gate Phase one by Boogertman + Partners/Tiber Construction. From left: Mario Ferreira, Jose Correia (Tiber), Elzanne Pieterse and Jean Grobler.

Capitec Bank Headquarters (dhk Architects) received a HIGHLY COMMENDED AWARD in the ARCHITECTS CATEGORY. From left: Peter Fehrsen and Martin Lardner-Burke.

Bentel Associates International was also HIGHLY COMMENDED in the ARCHITECTS CATEGORY for the Destiny|Raddison Hotel.
From left: André Wiese and Shershen Naidoo.

Tshwane Regional Mall received a SPECIAL MENTION AWARD in the ARCHITECTS CATEGORY (SVA International in association with Afro Plan Architects)
From left: Des Linder (LMKV Management Consultants), Zweli Mabaso (P.I.C.), Melinda Hardisty (SVA International), Shadrack Mthetwa (Isibonelo Property Services), Linda Zondi (P.I.C.) and Bertus Lombard (GD Irons Construction).

THE CONSULTING ENGINEERS CATEGORY was won by JG Afrika for Coastal Parks: Material's Recovery Facility. The project was also the winner of the AFRISAM INNOVATION AWARD FOR SUSTAINABLE CONSTRUCTION.
From left: Phakamile Ngqumshe, Jan Norris and Richard Emery.

WINNERS

For the first time in the 19 years of the Best Projects awards, one company won four awards. Concor's Roggeveld Wind farm project as well as its Oxford Parks Phase 2 were not only winners in the respective categories, but also received Highly Commended awards in the AfriSam Innovation Award for Sustainable Construction.

LUCKY DRAW WINNERS

Left: Ngage sponsored a hamper. It was won by Thulani Khumalo. He is pictured with the Public Relations Director of Ngage, Renay Tandy. Middle: Icon Group gave away a Nespresso coffee machine. The winner was Rynhardt Bezuidenhout from WBHO. Here he is with Icon's Bernadette McIvor. Right: Concor sponsored a hamper. Pictured are Concor's Stephan Venter and the winner, Martin Lardner-Burke.

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18:50
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Professor Ian Jandrell – Dean Faculty of Engineering
and the Built Environment, WITS
18:50
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19:15
AWARDS CEREMONY
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MAIN COURSE
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BEST
PROJECTS

WINNER

ROGGEVELD WIND FARM

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 m^3 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.

Unlike most wind energy projects, the turbine towers at Roggeveld Wind Farm are constructed from concrete not steel. This required several innovations from Concor Infrastructure 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 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.

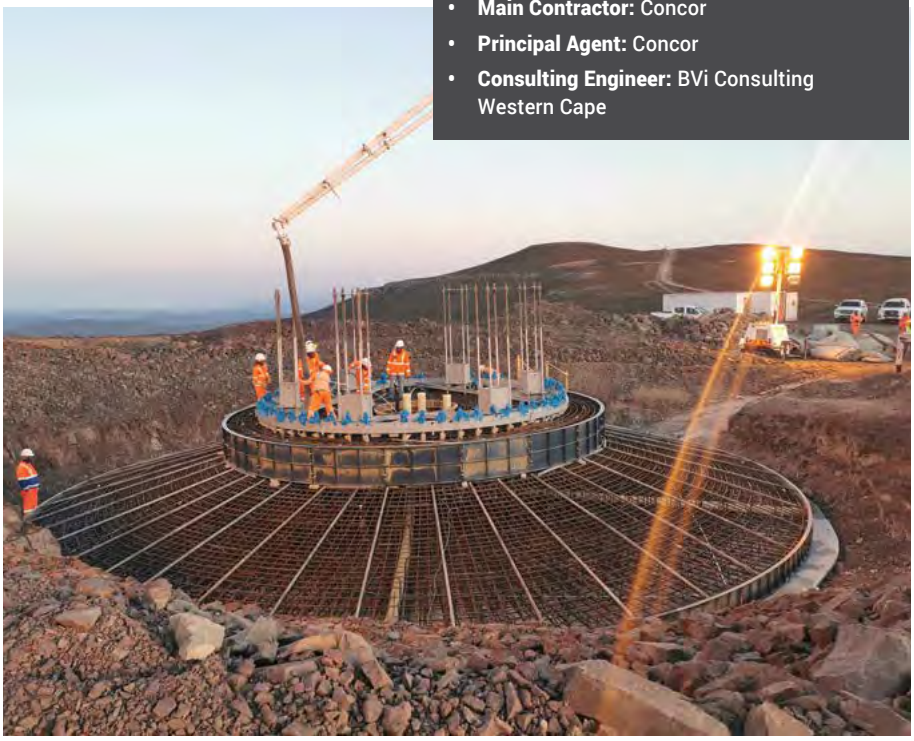
Given the challenging topography, the two main access roads had to appropriately graded to facilitate heavy vehicles hauling on these roads. This meant cuts of up to three metres, but with blasting kept to a minimum to avoid environmental disruption. The project's highest point is 1 485 metres, with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

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. ■

PROJECT INFORMATION

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



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ROADS INFRASTRUCTURE FOR THE MALL OF TEMBISA

The iconic double-level Mall of Tembisa, developed by McCormick Property Development is nearing completion, with an expected opening date in November 2020.

PROJECT INFORMATION

- **Client:** McCormick Property Development
- **Architect:** MDS Architecture
- **Civil Engineers:** SCIP Engineering Group
- **Traffic Specialist:** Techworld Consulting Engineers & EDS Transportation Engineers
- **Pavement Specialist:** Leo Consulting
- **Structural Engineers:** SCIP Engineering Group, KLS Consulting Engineers & De Villiers Consult

The Mall of Tembisa is located on greenfield land, south of the Olifantsfontein Road (R562), with the Kaalspruit creating the eastern boundary of the property, between the townships of Tembisa and Clayville. This 45 000 m² gross leasable area (GLA) regional shopping centre is situated in the under-serviced north-western quadrant of Tembisa in Ekurhuleni Metropolitan Municipality. The Mall is part of a mixed-use development project being undertaken in conjunction with KJA Developments (specialists in low-cost housing) and comprise commercial, retail and high-density residential components.

SCIP Engineering Group were appointed as the civil and structural engineers for the project. Specifically looking at the roads, they were responsible for all road, stormwater and the geometric designs. Techworld Consulting Engineers, assisted with the configuration of the traffic circles and the intersection layout, in particular the design of the signals of the main intersection at Aluminium Drive. Pavement specialists Leo Consult assisted with undertaking a condition assessment of the existing Olifantsfontein Road surface.

Bulk earthworks commenced in April 2019, piling started in June 2019 and the main building contractor began with foundation excavations during July 2019. Due to the COVID-19 shutdown, road construction only started in May 2020.

ROAD INFRASTRUCTURE

The development comprises of two Gautrans provincial intersections

for access from Olifantsfontein Road (R562, planned K27), consisting of the extension of Aluminium
Drive as a full signalised intersection and new partial access.
The 550 m lengthening of Aluminium Drive starts as a divided four-lane road narrowing to a two-lane road with 35 m diameter traffic circles. Furthermore, a 700 m two-lane ring road must be constructed to connect the new partial intersection with Aluminium Drive. Pedestrian movement will be accommodated by the construction of various paved sidewalks that link up with the new taxi and bus loading zones on Olifantsfontein Road. The development also includes the construction of a new taxi rank.

Olifantsfontein Road is a major mobility link that served on average ±35 000 vehicles per day in 2019 (pre-COVID), while the intersection with Aluminium Drive (currently a T-junction) served ±40 000 vehicles per day (the maximum throughput of a large at-grade intersection is ±70 000 vehicles per day). The Mall of Tembisa after its opening is expected to generate ±15 000 additional vehicle trips per day. Therefore, the intersection between Olifantsfontein Road and Aluminium Drive will be upgraded to 10 approach lanes (a six/four lanes split) on Olifantsfontein Road and seven approach lanes (a four/three lanes split) on Aluminium Drive which is required to serve the expected vehicle and pedestrian traffic. This intersection is a typical example of a large urban intersection controlled by traffic signals that necessitate a long cycle length (90-seconds during peak hours) to accommodate all the signal stages that are required.

DOLOMITE AND HARD ROCK EXCAVATION

The project site is underlain by dolomite. Dolomite assessments were undertaken in accordance with SANS 1936:2012 and all civil service designs were done in terms of the recommendations emanating from these assessments.

The intermittent underlying hard rock dolomite was one of the biggest challenges on the project. Substantial hard rock excavation was encountered during all stages of construction. This resulted in large quantities of dolomite rock having to be excavated.

The civil contractor, Labucon Resources, in consultation with the project team found a solution to curtail the financial and environmental effects emanating from the large quantities of hard rock excavation. Labucon Resources owns a crushing and screening plant. A cut-to-spoil was done on the bulk earthworks, in the order of 170 000 m³. The import to fill was around 50 000 m³, about 60 000 m³ of hard rock was removed, and 60 000 m² of pre-mix is going to be placed and that is excluding the provincial intersections.

This is a massive project which could easily be underestimated when you view it on plan.

The roads infrastructure comprises municipal roads and two provincial intersections – the size of the main intersection being very significant. The double level mall will be bringing retail to a previously neglected area and this is significant for the communities in the surrounding areas. ■

OXFORD PARKS PHASE 2

Oxford Parks is a focal point along Oxford Road in Rosebank. On completion, this site will house five buildings on a master basement structure. The buildings were designed to complement each other, and their respective footprints fit together in a jigsaw puzzle configuration, proportionately occupying the site to optimise the usage of this prime precinct.

PROJECT INFORMATION

- **Company entering:** Concor
- **Client:** Intraprop
- **Start date:** February 2019
- **End date:** November 2020
- **Main Contractor:** Concor
- **Architect:** dhk/GLH
- **Principal Agent:** Morta Project Management
- **Quantity Surveyor:** Gro2 Consulting
- **Consulting Engineer:** Pure Consulting

Oxford Parks Phase 2 is a testimony to meticulous coordination on the part of Concor to ensure the concurrent construction of the different buildings would run smoothly. Phase 2 includes the simultaneous construction of Building 2 – Life Healthcare's new 10 000 m² head office, Building 3 – a 4 000 m² multi-tenanted building housing inter alia Metier Private Equity and G+D Currency Technology and Building 5 – 3 400 m² offices for Arup and Sony Music.

Concor was well positioned to take on the challenging construction of Oxfords Parks Phase 2 that commenced in February 2019 after their successful completion of Phase 1 in 2018 which houses the new head office of BP Southern Africa.

While all the buildings have a conventional reinforced concrete slab and column design, special sustainable concrete mixes allowed for early stripping of formwork. This allowed the efficient rotation of formwork kit and materials ensuring continuous production to accommodate the fast-paced construction programme on a project of this scale.

Building 5 has a unique fitted curtain wall installation with tree patterns. This not only presents well as an external façade but also doubles up as a solar shield to reduce air conditioning requirements and the use of blinds inside the office space. This application creates a forest-like graphic, enforcing the urban green theme of Oxford Parks.

Buildings 2 and 3 also have performance-glazed façades that provide added benefits in terms of energy usage of the buildings during the operational phase. The first level of Building 3 extends onto a cantilevered slab which forms a portion of the new Parks Boulevard, the new spine road of the Oxford Parks precinct. Both Building 3 and Building 5 face onto Parks Boulevard, presenting the contractor with an added challenge that requires careful planning of sequences for access of the various construction vehicles on this newly constructed cantilevered road.

Another challenge for the contractor was to optimise usage of the three rental tower cranes that are on site at the same time.

All the buildings have a modern theme with many natural finishes from stone façade cladding to recycled timber decks, textured paint finishes, and big glazed façades that allow natural light into office spaces.

The hard and soft landscaping of the outdoor podium area was specifically designed to create a natural environment for the end user ensuring a harmonious blend of business, life and leisure. Each building has its own shape and characteristics that add to the overall design feel of the precinct. These features include the patterned façade on the Arup building, stone cladding and curves on the Building 3 together with the louvered pergola on the 4th floor and the inclined shaped façade cladding and curtain walling on Building 2.

Construction work of 6 Parks Boulevard (also known as the Arup building) started in February 2020. Initially designed as a three-storey structure with the ground floor dedicated to retail space, these plans were modified to the requirements of the tenants, Arup and Sony. This resulted in another slab being added to accommodate a private entertainment area, as well as recording studios on the fourth level. The structure on this rooftop level mimics the design shape of the building, but with a smaller footprint, thus occupying only about 50% of the available rooftop space, which allowed the creation of a roof-top entertainment area in the centre of the precinct. ■

HIGHLY COMMENDED

DSV PARK GAUTENG

DSV Park Gauteng is being constructed as a move to centralise premises in each province in line with DSV's global strategy of consolidating office and warehouse space and will house most of the business units operating in the province. This will deliver a more efficient, seamless service to their customers. This single facility will accommodate approximately 2 000 DSV employees and consists of a logistics warehouse of 79 000 m^2, a cross-dock facility of 39 000 m^2, office space of 10 000 m^2, staff facility, maintenance facility and energy centre. External concrete hardstands are made up of approximately 150 000 m^2 of 210 mm thick concrete.

The approximately 120 000 m^2 internal surface beds on the project required a high quality concrete floor to minimise the total maintenance budget of the facility and as short as possible construction schedule. The bulk of normal floor maintenance costs are caused by floor joint failure in the form of deteriorated joint edges, damage by and to equipment such as forklifts so it was decided to implement a jointless concrete flooring solution. The client requirement was for a floor tolerance according to DIN 18202 Table 3 line 4 (reach trucks up to 14 m) instead of FM2 – TR34 (reach trucks up to 13 m).

A PrimX - Future Ready Joint Free Floor was chosen which was designed under PrimX's worldwide patent. A jointless steel fibre reinforced concrete system based on material chemical compressive pre-stress was used to cast jointless panels of 2 300 m^2 and only 150 mm thick. The panel sizes were only limited by the day casting capacity. The compressive pre-stress system allowed it to have a stronger material and stiffer section along with improved drying shrinkage control. The high dosages of the highest quality steel fibres allowed the floor to be built without traditional reinforcing thus ensuring a shorter construction period.

All external concrete walls are of a tilt – up design that involves the casting of wall elements in stacks and lifting them into position on pad foundations. This made sense due to the dolomitic nature of the site and the extensive foundations that would have been required if normal brick-type walls were used. All walls were cast on site on temporary casting beds in close proximity to their final position. Meticulous planning was required to minimise craneage costs. This provided a cost effective, low maintenance, fire resistant

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PROJECT INFORMATION

- **Company entering:** WBHO
- **Client:** DSV Real Estate
- **Start date:** 1 September 2019
- **End date**: 3 March 2021
- **Main Contractor:** WBHO
- **Architect:** DBM Architects
- **Principal Agent:** Metrum Project Management
- **Quantity Surveyor: Quest**
- **Consulting Engineer:** DG Consulting Engineers

solution that allows for a functional, durable and aesthetically pleasing end product. WBHO also opted for a mix of cast in situ concrete columns and precast tilt up columns. The tilt up columns were cast on site on casting beds and were up to 17 m tall weighing in excess of 23 tons each. The roof steel structure design, for both the Crossdock and Main Warehouse, was extremely economical at around 16 kg/m^2 using Metsec Purlins, single angle trusses for speed of fabrication and Compound angle girders for weight saving.

The lighting system in the facility will consist of LED lighting with low energy consumption in combination with motion and presence detection sensors to control lights. Daylight harvesting will be employed where the luminaires intensity is adjusted to compensate for the natural light. The lighting will be controlled by an addressable system where each luminaire can be controlled from a central place and respond to pre-set inputs.

The staff facility water heating is generated by air-to-water heat pumps with heat accumulators as hot water storage vessels. Water heating is by means of an indirect heating through a high pressure and low pressure heating system.

All equipment will be controlled and monitored through an external web-based management system.

A 1 000 kWP rooftop solar installation is being installed with provision for a further 1 700 kWP when the required generation licence is obtained. This will ensure that the facility's base electrical loading is powered with solar power.

Rainwater will be harvested from the office roofs to feed the landscape irrigation system with top up water fed from surrounding boreholes.

The truck wash facility will utilise the recycled water from the automated truck wash facility thereby reducing the demand on potable water. Top up water will be fed from the surrounding boreholes. ■

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ENGINEERING 4.0 AT THE UNIVERSITY OF PRETORIA

Engineering 4.0 at the University of Pretoria is a collaboration between the University, the CSIR and SANRAL to provide an education and training facility for engineers, technologists, technicians and material testers and a high quality research facility with skilled staff.

In total, the facility allows industry and stakeholders to train and educate engineers and technicians, to evaluate material properties, to test road pavement structures under simulated conditions and to compare this to real traffic and environmental responses of road pavements to real traffic.

Construction commenced on 1 August 2018 and practical completion was achieved on 28 February 2020.

The design incorporates a number of features that enhance the education and training aspects of the building. This includes features such as a boxed out, glass floored section of the 'strongfloor' showing the reinforcement inside the concrete, open roof structures showing roof trusses, an open HVAC system showing the intricacies of the HVAC system and services coordination. A visible ablutions services section shows the complexities of providing ablution facilities.

All external concrete walls are of a tilt-up design that involves the casting of wall elements in stacks and lifting them into position on pad foundations. This made sense due to the weak soil conditions and extensive foundations that would have been required if normal brick – type walls were used. All walls were cast on site on temporary casting beds in close proximity to their final position.

This provided a cost effective, low maintenance, fire resistant solution that allows for a functional, durable and aesthetically pleasing end product. This also provides another educational opportunity for students to see the result of tilt-up construction close up. The entrance building also has numerous exposed off shutter concrete elements. The internal laboratory surface beds were required to be of the FM2 classification in terms of the United Kingdom Concrete Society TR34 classification which has extremely tight allowed tolerances on the levelness and flatness of the concrete floors.

The design provides for a large volume dedicated Civil Engineering Laboratory which is inherently a large warehouse – type space, shaped into dedicated areas for the smaller laboratories, and a large volume for the concrete laboratory.

The design provides for maximum interaction between the inside and outside of the building, something not typically found in a laboratory facility. This links the civil engineering research and teaching that happens inside the building with an understanding that all civil infrastructure is placed in nature, and needs to be balanced with its location. The external design has been done in such a way that it is not just a rectangular shaped box structure, but there are enough features incorporated to make it look like much more than a large open volume from the outside. ■

PROJECT INFORMATION

- **Company entering:** WBHO
- **Client:** University of Pretoria
- **Start date:** 1 September 2018
- **End date**: 28 February 2020
- **Main Contractor:** WBHO
- **Architect:** ARC Architects
- **Principal Agent:** MDSA Project Management
- **Project Manager:** MDSA Project Management
- **Quantity Surveyor**: Gro2 Consulting
- **Consulting Engineer:** Zutari

16 ON BREE

The 16 On Bree project is an ambitious effort to repurpose and expand a modest more than century old building into the tallest residential block in Cape Town's bustling city area. Replacing a building of just two storeys high, the new mixed-use block will reach 38 floors and will accommodate 380 apartments.

Key among design and construction achievements was to preserve a fragile façade of great heritage value, and to implement the project in the highly space-constrained city centre, with almost no lay-down area while allowing continued uninterrupted flow of vehicular and pedestrian traffic.

The onset of the COVID-19 pandemic in March 2020 added further health and safety challenges, especially given the building's height and compact dimensions. Applying the necessary social distancing protocols had to confront issues of confined internal space as well as vertical movement of building teams to their floors of operation. These factors were exacerbated by the residential nature of the building. With each apartment demanding the attention of multiple trades, there were about 900 people on site at any one time before the outbreak of the pandemic.

On completion, the construction will have consumed 21 000 m^3 of concrete – mainly pumped to the required levels – as well as 1 650 tonnes of reinforcing bar and 650 000 bricks. The new height of the building has required the placement of 40 concrete foundation piles.

Beginning in May 2018 after a period of demolition, construction work on 16 On Bree was initially planned as a two year project. The impact of COVID-19 extended the planned completion date somewhat.

Located in the heart of the Cape Town central business district, a key aspect of the 16 On Bree project was the heritage value of the building it replaced. Complying with strict heritage regulations, the construction method retained a large, 16 metre high façade built over 100 years ago. This wall – built not of concrete but of rock, clay and lime – needed gentle treatment and firm support.

Concor erected a specially designed structural steel brace to support the wall and prevent any structural failure while it was cut free from the rest of the building being demolished. A concrete ground beam was also cast along the base of the façade to act as a counterweight and prevent any movement.

Once this was in place, demolition could proceed. The framework had to remain in place during construction, to keep the freestanding façade in position. As the new structure was built, it was stitched in with the braced façade until finally the brace could be removed. There were also three other heritage walls within the building – standing in a U-shape – which were preserved during the construction process.

In another heritage intervention, each floorboard of the original Oregon timber flooring was removed and safely stored, to make way for new piles and concrete bases. These joist, tongue and groove boards are being refitted on the first floor of the new building, which is to be retail space. Also, smaller stone walls of heritage value were stripped stone by stone, to be rebuilt into the new structure.

Designed by FWJK architect Tiaan Greyling, the atrium design with the associated plenum scoops allows fresh air to circulate throughout the interior of the building, thereby reducing the mechanical ventilation requirement. This also enabled the placement of bedrooms along the external passages surrounding the atria in terms of the apartment floor plan design.

To optimise the spectacular views and allow natural light into the apartments, the design employed a combination of reinforced concrete and fully glazed shop fronts with sliding doors. This also reduced the need for external brickwork and plaster, and in turn the external scaffold as the shop front was fitted from the inside out.

Better use was made of the wasted space below the core escape stairs on levels 11 and 37, by placing bulk water storage tanks there.

To allow flexibility for the possible future conversion of parking levels into living levels, the parking floor-to-ceiling heights were designed to the same dimensions as the apartment levels. While the parking area height is normally only 2,6 metres, the height for a standard apartment is 2,9 metres including services.rate high on the agenda. Efficient rolling out of apartments is a process that needs to be closely monitored and supervised if the highest standards of quality are to be achieved. Concor applied its experienced supervisors in numbers, with at least four looking after each floor, to ensure quality of work. ■

PROJECT INFORMATION

- **Company entering:** Concor
- **Client:** Cape Town 9
- **Start date:** 1 March 2018
- **End date:** November 2020
- **Main Contractor:** Concor
- **Architect:** FWJK Architecture
- **Principal Agent:** Orion Project Management
- **Project Manager:** FWJK Project Management
- **Quantity Surveyor:** FWJK Quantity Surveyors
- **Consulting Engineer:** Zutari

PRETORIA HEAD & NECK HOSPITAL

The new R450-million Pretoria Head and Neck Hospital is an 11 000 m^2 special surgical facility being developed by JSE-listed Growthpoint and Cintocare broke ground on 12 September 2018.

Located adjacent to Menlyn Maine Central Square, the new hospital will enjoy street frontage. The exterior of the building has been designed to be in sync with its particular inner purpose. Its glass façade will be complemented by design features that evocate spinal vertebra found in the neck, which serve to shade the building. The hospital will have a direct access-link to the retail and restaurants of Menlyn Maine Central Square.

The hospital would be the first of its kind in Africa and become the first the green-certified hospital in South Africa. The development's green edge is bolstered by the fact that it will be located in the burgeoning green precinct of Menlyn Maine in Pretoria.

Working closely together, Growthpoint and Cintocare are creating a clinical centre of excellence that focuses exclusively on the head and neck, spinal and vascular surgery with highly-specialised medical professionals and state-of-the-art technology. The highly specialised medical professionals will include neurosurgeons, maxillofacial surgeons, otorhinolaryngologist, reconstructive surgeons, radiologists, pathologists, audiologists as well as speech and swallowing therapists.

The development partnership is delivering the full suite of services for the hospital – from inception to completion. The building comprises seven floors in the following configuration:

- The hospital plantrooms on the roof level, which sit directly above the theatre blocks themselves. On this level are also the doctors and nurses rest areas, plus a visitors deck area.
- Five functional theatre blocks, three future theatres, CSSD area, high care, ICU wards, paediatric and paediatric ICU wards on level 6.
- A mix of surgical, ambulatory and medical wards plus eight consulting rooms and a private boardroom and offices on level 5.
- Seven consulting rooms, a radiology department consisting of a MRI, screening room, CT scanner, Bucky, Sonar rooms and Mamography area on level 4. There is also a robotic Pharmabox to be installed at the Pharmacy area.

On level 3 there will be a privately run pathology laboratory plus associated parking. Level 2 is the public parking area, whilst level 1 consists of the Doctor's parking area, main kitchen, staff toilets, laundry, maintenance, security and energy centre.

This 100-bed hospital also has a built-in capacity to expand to 160 beds. The hospital also has 335 secure, structured parking bays.

The building is scheduled for completion by the end of August 2020. ■

PROJECT INFORMATION

- **Company entering:** WBHO
- **Architect**: A3 Architects
- **Principal Agent:** GladAfrica
- **Project Manager:** GladAfrica
- **Quantity Surveyor:** TMS Group
- **Consulting Engineer:** Sotiralis Consulting

SOUTH POINT JORISSEN STREET STUDENT ACCOMMODATION

Situated in the ever transforming area of Braamfontein, across from Wits University and Art Museum, is a remarkable 17 floor new build that has forever changed the skyline of Johannesburg.

WBHO were awarded the project in January 2019, this after the unfortunate closing of Liviero Building who previously completed the earthworks and the basement. With a property footprint of 2 000 m^2 and a building footprint of 1 760 m^2, the first challenge arose from establishing and progressing into the construction phase with limited space. With only 240 m^2 around the building perimeter to work with which included the one lane closure on Jorissen Street, WBHO needed to ensure our planning was accurate in all areas.

Due to the site constraints, only one tower crane was utilised. WBHO therefore had to optimise the hook time and each and every lift was managed and recorded. With the crane being a limited resource WBHO utilised Alma hydraulic climbing gear system on the lift shaft which houses three passenger lifts and one fireman's lift and conventional Doka climbing system on the three shear walls. At peak production, the project saw over 450 people and over 45 subcontractors in operation. Ongoing work throughout the building on all levels meant that multiple teams and multiple trades worked in close proximity and demanded careful planning, supervision and control. The site management identified possible high risk areas and activities on bi-weekly site walks and safety meetings. The project is currently just short of 1,3 million man hours without any Lost Time Injuries (LTI's) and no recordable cases. As with most sites in current times, WBHO had challenging times with the Local Community. However, it was able to form a partnership where up to 10 different local subcontractors worked on various trades which included bricklaying, blocklaying, plastering, painting and tiling.

The key to the success was in the planning and organising of finishing trades to allow access into floors at the earliest opportunity. The interior of the building consists mainly of the trending lightweight Hebel (AAC) block. Approximately 200 000 hebel blocks, 150 000 bricks and 2 075 fire doors and standard frames were loaded into the building and built in just under nine months to close up the internal structure of the building. The total crane loads to get the required river and plaster sand into the building added up to over 1 100 and 2 000 loads respectfully. With only one crane operating 24 hours a day to get the enormous amount of material into the building required careful crane tracking schedules and per minute monitoring and planning and coordination to achieve the perfect balance between the structural requirements and finishing trades.

This student accommodation consists of an average of 21 clusters per floor with the rooms totalling around 927. There are double rooms, single rooms, one bedroom units, private studies areas, communal studies, auditoriums, boardrooms and a communal entertainment area including braais on the top floor. The ground floor area has been set up for retail and includes the main entrance to the apartments. The basement area houses all the buildings services and only accommodates 14 parking bays along with the buildings plant rooms. High quality standards of the project were achieved by starting with quality inspection from commencement of the project not only by WBHO but also by consultants and architects. WBHO and LYT worked closely together to ensure quality remained of a high standard and consistent by utilising SnagR. ■

PROJECT INFORMATION

- **Company entering:** WBHO
- **Client:** South Point Management Services
- **Start date**: 8 January 2019
- **End date:** 13 August 2020
- **Main Contractor:** WBHO
- **Architect:** LYT Architecture
- **Principal Agent:** LYT Architecture
- **Project Manager:** LYT Architecture
- **Quantity Surveyor:** EthiQS Quantity Surveyors
- **Consulting Engineers:** ADA Consulting

DURBAN HEIGHTS RESERVOIR 3

Durban Heights Reservoir 3 is a 350 Mℓ reservoir situated just outside the Durban CBD, in the suburb of Reservoir Hills, KwaZulu-Natal.

This reservoir was constructed in 1971 and is one of the biggest concrete reservoirs in Southern Africa. It supplies potable water to over five hundred thousand people in Durban and the surrounding area. The reservoir design is unique in the sense that it has a single support in the middle and the roof is shaped like a circus tent. The roof is made up of 120 steel post-stressed cables that radiate from the centre roof support to the outer base support, which again supports 4 440 precast panels. The total roof area is about 26 000 m^2. Each post tensioned cable consists of 41 x 7 mm mild steel strands, protected by a metal duct filled with a bitumen mastic – an engineering masterpiece in its entirety.

In 2003, Umgeni Water engaged with civil engineering consultants, requesting a full diagnostic survey of the concrete roof panels. The objective of the survey was first to establish the current condition of the roof panels, and then to establish an effective repair and rehabilitation strategy, which would also be applied to future repair projects. The varied diagnostic survey included testing of chloride ingress, carbonation ingress, and existing cover to reinforcing. A variety of issues were identified but of interest was the existence of a micro-climate within the reservoir. It was noted that where the roof soffit at one point totally saturated, was found to be perfectly dry in a few hours. This wet and dry cycle was found to be a daily occurrence. This micro-climate with wet dry cycles creates a favorable environment for contaminants to be absorbed into the reinforced concrete panels causing corrosion of the reinforcing.

Based on the original diagnostic survey, rehabilitation proposals and the subsequent product trials, the Sika solutions and innovative products were deemed the best performing repair system for this project. Following the final trial results, Umgeni Water appointed Royal HaskoningDHV to take on this rehabilitation project, and Sika products were specified on the tender. The project engineer Royal HaskoningDHV compiled Tender Documentation for the repair and rehabilitation of the Durban Heights Reservoir 3 concrete roof structure. Smart Civils Construction, a specialised civil contractor, was appointed as the successful tenderer.

Smart Civils investigated the project's next challenge namely identifying alternative methods of gaining access to the roof structure and shortening the repair time. The original scope of works involved a moveable gantry that allowed access to the roof, but the work area was only 3 m wide and thus limited the reach over the entire roof to increments of 3 m. This put constraints on both work

PROJECT INFORMATION

- **Company entering:** Sika South Africa
- **Client:** Umgeni Water
- **Start date:** 8 August 2019
- **End date:** 12 December 2020
- **Main Contractor:** Smart Civils
- **Principal Agent:** Umgeni Water
- **Project Manager:** Smart Civils
- **Consulting Engineer:** Royal HaskoningDHV

method and space. Smart Civils developed an inventive idea where access to the roof was provided by a design innovation. This design innovation involved erecting 550 tonnes of scaffolding, in a bird-cage configuration, from the floor to just under the soffit. This unique scaffolding design was erected with precision using a highly skilled workforce. Both compliance with the scaffold engineers design drawing and the requirements of the SANS code 10 085 were adhered to during the whole process. Sixty percent of this scaffolding was erected at a 30-degree slope which made it extremely difficult to base out.To prevent the scaffolding from slipping down the slope it had to be secured with foot bracing, upright to upright and every eight bays. These safety precautions were necessary to ensure that a scaffolding structure of such proportions was safe and secure. The scaffolding required a working platform of +- 4 500 x 2,5 m steel boards, which were physically moved by hand, from a minimum of 3 m height from the top to a maximum of 55 m in height.

This structure allowed for approximately 3 250 m^2 of platform where the gantry only allowed for 162 m^2 of work area and a maximum of 10 people with tools at any one time. The scaffolding would give the contractor access to a quarter of the roof at any given time, before being dismantled and re-erected as the works progressed. ■

BOTHA HALTE

At the start of 2017 construction of a new Information and Communications Technology (ICT) school building began at Botha Halte Primary, off the R43 near Botha Wine Cellar in Worcester, South Africa. Initiated and privately funded by Farmprops, representing the Bosjes Family trust, the school forms part of the LitNum Hub for the Breede Valley area, providing tuition in Mathematics and Afrikaans to primary school learners up to grade seven.

Great pains were taken to make the school as environmentally friendly as possible, which included specifying sustainable materials and products, such solar panels, water storage and wind turbines, wherever possible.

When retaining walls and steps were specified for the outdoor recess area, Tiaan Meyer, Architect and Director of Meyer & Associates Architects and Urban Designers, suggested using the Terraforce 4x4 Step block for cost effective and robust seating and the Terraforce L11 block for plantable and permeable earth retaining walls on the school grounds.

The Terraforce 4x4 Step blocks were designed specifically to provide efficient and economical steps in conjunction with the L range Terraforce retaining blocks and have, over the last two decades become popular for practical stair and seating arrangements at leisure amenities and school sports facilities.

Says Meyer: "the blocks offer a good looking and neat finish, and Decorton Retaining Systems – subcontracted by JJ Dempers Group – specialising in Terraforce retaining walls, did a great job installing the blocks. The seating also fits in seamlessly with the rest of the architecture, that showcases modern, clean finishes, fresh colours and sustainable technology."

Meyer also adds that the project is one that has the potential to affect real change for future generations in the Breede Valley: "This is a love project, to give back and uplift to the local community, while implementing the same technology and applications in a rural environment as are normally seen in an urban environment."

After completion of the project in September 2019, landscaping was undertaken by Square One Landscape Architects together with Afri Landscapes. All future learning activities taking place at Botha Halte will be provided by Bosjes Trust, in partnership with the Western Cape Education Department (WCED). ■

PROJECT INFORMATION

- **Client:** Bosjes Trust and Department of Education in the Western Cape (WCED)
- **Architect:** Meyer & Associates Architects
- **Main Contractor:** JJ Dempers Group
- **Subcontractor:** Decorton Retaining Systems
- **Terraforce block supplier:** Klapmuts Concrete

HOUSE GROSVENOR

When the owner of a home on the slopes of Table Mountain in South Africa noticed her existing retaining wall was dangerously leaning over with partial collapses in places, she turned to her trusted builder Zane Samuels, Zane Samuels Construction, for help.

He immediately recommended replacing the wall with the Terraforce ® retaining wall system: "I suggested Terraforce because of the system's ability to handle the tight space we had available, the varied inclines and finishes the blocks can be installed with and most importantly, the superior aesthetics offered.

The wall design was provided by Fred Laker, ICOS Engineers, who has extensive experience with the Terraforce system. Working with the existing contours of the property boundary, this included a new curved feature that hides a bulky section of the previous retaining wall, while at the same time adding visual character to the backyard area. To highlight this change in wall profile even more, Samuels chose to install the rock face of the block following the span of this arch, with the contracting flat face of the block behind the main building: "The garden behind the wall needed to be enjoyable to look at as an office window opens up onto this space, while the wall behind the main home just needs to do what it was designed for. ■

PROJECT INFORMATION

- **Engineer:** Fred Laker, ICOS Engineers
- **Main Contractor:** Zane Samuels Construction
- **Block Supplier:** Klapmuts Concrete

DUBAI HILLS

Dubai Hills Estate is a unique blend of elegantly planned neighbourhoods crafted around a magnificent 18-hole championship golf course.

The project consists of various communities with different property configurations such as villas, townhouses, apartments and residential plots. The area is also set to boast three schools, three hotels, two hospitals, a 54 km bicycle route, two metro lines and its own mega mall, Dubai Hills Mall.

During the planning stages of the estate, it became evident that the all the different levels created by man-made hills throughout the expansive site would leave many cut and fill slopes vulnerable to erosion, especially the spaces dedicated to outdoor activities and entertainment.

Consequently, Terraforce L16 retaining wall blocks, manufactured under license in the United Arab Emirates by Consent LLC for the past 14 years, were specified as a hardscape measure to provide effective and attractive erosion control in the third zone – residential communities Sidra and Maple – specifically designed for higher density villas and townhouses.

The result exemplifies a superb example of a low, understated earth retaining measures that allow for generous soft scaping.■

PROJECT INFORMATION

- **Developer:** Emaar and Meraas
- **Architect:** KEO
- **Engineer:** KEO
- **Main Contractor:** ARCD
- **Main Contractor:** Gulf Landscape
- **Main Contractor:** Desert group
- **Subcontractor:** Al Aamal Construction
- **Terraforce block supplier:** Consent LLC

SPECIAL MENTION

KAALFONTEIN PEDESTRIAN BRIDGE

Coreslab helped BMK Consulting Engineers to design an innovative means of fast-tracking the construction of two 100 m long and 3,5 m wide pedestrian bridges in Kaalfontein and Diepsloot. Valued at R14-million each, these construction projects are part of the Johannesburg Road Agency's significant investment into low-income communities in the larger Midrand area to create jobs and provide access to service delivery.

The precast-concrete specialist was initially approached to manufacture and supply rib-and-block suspended slab systems to construct the superstructure of the two bridges. However, Coreslab suggested a simple but novel alternative design based on hollow-core slabs (HCS) to also overcome some of the site constraints on these two projects. This included working within proximity to many informal dwellings and limited access to both construction sites.

Coreslab's design entailed using standard HCS planks, significantly lighter than a large solid concrete floor slab of equal thickness or strength due to the use of fewer raw materials. This reduces the cost of manufacture and transportation of the slabs to site where they are lifted and placed, levelled and grouted.

The HCS were placed on top of the 14 precast-concrete beams, two per span, and each 15 m in length and weighing four tons.

They were then covered by a thin 150 mm-thick concrete slab. Services were first installed and then covered with polystyrene moulds with voids and a steel mesh. The concrete was then placed in an approach that reduced the load of the final slab on the beams.

The contractor also achieved cost-savings for the client by doing away with the need for construction materials, including propping and concrete. Another major advantage of Coreslab's solution was the extremely high-quality outcome that was achieved the first-time round by outsourcing the manufacture and installation of the floor structure to a specialist. This eliminated the risk of having to redo work. Notably, there were no safety or injury-related incidences on these projects, despite working at heights and close to many dwellings. Part of this success can be attributed to the use of HCS, which were manufactured at ground level in a controlled factory environment and far removed from the many variables encountered on a traditional construction site. ■

PROJECT INFORMATION

- **Client:** Johannersburg Roads Agency
- **Start date:** 2018
- **End date:** 2019
- **Main Contractor:** Axton Matrix
- **Project Manager:** BMK Group
- **Consulting Engineer:** BMK Group
- **Specialist Supplier:** CoreCivils

DELOITTE RIVER CREEK

Spraylock Africa helped provide a more precise and cost-effective, as well as faster means of waterproofing a total of 18 828 m² of concrete slabs for new Deloitte head-office in Waterfall City in Midrand. The area covered on this new development included the ground and first floor, as well as roof.

Located right on the Allandale interchange of the N1 highway, at the eastern side of this latest growth node in Gauteng, the new premises consolidates Deloitte's Woodmead and Tshwane offices in a single central location.

Consisting of 42 500 m² of workspace to accommodate close to 5 000 employees, the building comprises a ground floor with six storeys of offices and four basement parking levels, including nearly 2 000 parking bays. The more than R1-billion building is co-owned by Johannesburg Stock Exchange-listed Attacq and Atterbury, which was also the project developer.

Storm Waterproofing Systems, a leading South African waterproofing contractor, was contracted by the principal building contractor, WBHO, to provide the cutting-edge waterproofing services. The company was awarded the contract based on the high-quality service it supplied to the leading building contractor on previous projects as a specialist waterproofing subcontractor. This is in addition to its longstanding working relationship with other representatives of the professional team, namely Norval Wentel Steinberg quantity surveyors and Empowered Spaces Architects. Both companies could also attest to the high-quality service that Storm Waterproofing Systems offers.

SCP products penetrate into the concrete capillary and pore structure after bleed water exits, reacting with free alkali to primarily form additional Calcium Silicate Hydrate (C-S-H) within the concrete. This reaction stops harmful moisture migration within the concrete matrix to acceptable levels for coatings, coverings and flooring. It enhances resistance to chemical and environmental attack; provides permanent protection; increases durability.

SCP 327 is applied within 24 hours of placement of the concrete and once the substrate is hard enough to accommodate the application team. Generally, SCP 327 is applied once the power floaters have finished floating the concrete.

Working to a strict programme that was determined by the principal contractor, Stormwater Waterproofing Systems' team treated between 300 m² and 400 m² of surface in a day. This impressive production rate included preparing the surface ahead of application. The task at hand was an extensive undertaking, starting with 2 817 m² of ground floor, followed by the 2 423 m² first floor and 8 348 m² roof structure. Waterproofing commenced at the end of 2018 and was completed on time and according to quality in mid-2019.

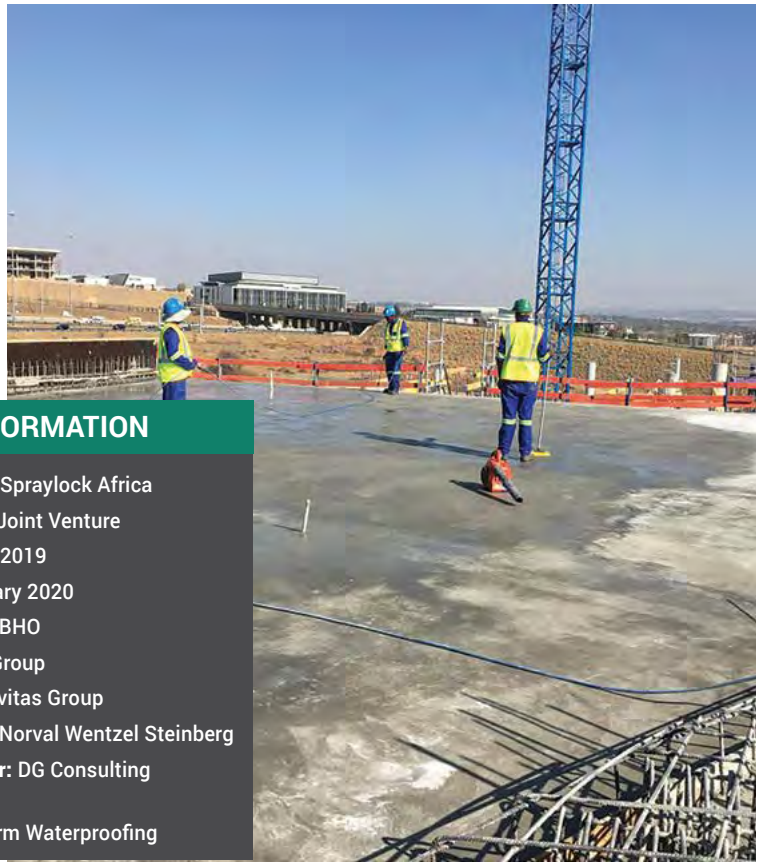
Impressively, the same team, which was also trained by SprayLock Africa ahead of the application and received additional support on-site by Sheldon White and a representative of the company's principal, also treated 17 500 m ² of concrete slabs at the Illovo Central development in Sandton with SCP products during this period. Illovo Central is another of FWJK's attractive residential high-rises to grace the Sandton skyline. This exclusive selection of sophisticated residences offers 16 storeys of elevated luxury living.

Certainly, coordinating operations between the two project sites was a complex undertaking – a challenge that was exacerbated by many rainy days during the summer season.

Topical sealers, which include acrylics, epoxies and polyurethanes, form protective barriers on top of the concrete surface. Some of the common issues when applying protective film sealers are surface traffic and proper application. Acrylic and epoxy sealers require regular maintenance as they both have a high wear potential. While polyurethane sealers are thicker, with a durable abrasion-resistant finish, there cannot be any water on the surface during application. All topical sealers also need to be reapplied when flooring is removed over a sealed surface.

While SCP products also penetrate the surface, they work differently than other sealers. The C-S-H that is created when the colloidal silica chemically reacts with the available alkali in concrete blocks capillaries and pores and chemically stabilises the pH within. SCP technology is a one-time treatment that penetrates the concrete matrix, reducing water migration levels to an acceptable range for most coatings, adhesives and floor coverings.

Within the SCP product interaction zone, the concrete becomes permanently dampproofed for the life of the concrete. Unlike topical treatments, SCP technology does not wear away or need to be reapplied. SCP treatment also provides many additional benefits. Testing has demonstrated a typical decrease of 40% to 60% of drying shrinkage at 28 days and a typical decrease of 70% to 80% of water vapour transmission of SCP-treated concrete compared to controls. ■



PROJECT INFORMATION

- **Company entering:** Spraylock Africa
- **Client:** River Creek Joint Venture
- **Start date:** 18 April 2019
- **End date:** 18 February 2020
- **Main Contractor:** WBHO
- **Architect:** Aevitas Group
- **Principal Agent:** Aevitas Group
- **Quantity Surveyor:** Norval Wentzel Steinberg
- **Consulting Engineer:** DG Consulting Engineers
- **Waterproofing:** Storm Waterproofing

COASTAL PARK: MATERIAL'S RECOVERY FACILITY CONSTRUCTION OF BULK EARTHWORKS PLATFORM OVER MUNICIPAL SOLID WASTE

Culture change and embracing a green economy starts with design and embracing that risk and change through design.

The City of Cape Town understands this need, and that the recycling of everyday recyclable waste products will not only extend landfill life in the City, but also promote a culture of waste reduction and create an economy for the re-use of recyclable waste materials.

A Materials Recovery Facility is a specialised plant that receives co-mingled recyclable waste, and through a combination of mechanical sorting and hand picking by labour, separates and prepares recyclable materials into dedicated streams for marketing to end-user manufacturers who use recycled products as raw materials in their manufacturing or industrial process.

Recyclable waste in Cape Town, can form between 20-30% of the waste stream by volume, and accounting for successful diversion to a MRF, can result in a landfill airspace saving of close to the same percentage. Not only does this extend the landfill operating life, making waste disposal more economical, but also promotes sustainable re-use of recyclable waste products in the waste economy.

The Coastal Park MRF will be the City's 3rd MRF facility after Kraaifontein MRF and Athlone MRF were completed in the 2010s, and the first to be sited on an existing operational landfill site where waste collection and disposal routes are already established.

The catch? The only land available for the MRF facility, was a 65 000 m^2 area underlain by a 5 m thick municipal solid waste deposit. In addition, a 20 m high, 450 000 m^3 builder's rubble deposit laid over a portion of the site, with no land available on the site for it to be moved to.

Approximately 60-70% of the site, was underlain by a 5-6 m thick municipal solid waste (MSW) deposit. During the geotechnical investigation, undecomposed newspapers confirmed the age of the waste as being from the late 1980's. Not only is MSW not a well understood geotechnical material, the waste deposit is highly variable by nature, with very different material properties possible over the entire development area. Excavating the waste and disposing of it on the operating landfill face and importing of competent material would not only have reduced landfill life by +-325 000 m^3, it would also have come at a cost of R21-million. Adding in the cost of importation of competent new material at a cost of at least R55-million, the project would not be feasible unless an innovative and unique solution could be found by the team.

The builder's rubble had been collected by the City of Cape Town at the landfill over the past 5-8 years as part of an initiative to help prevent illegal dumping. The stockpiles consisted of variable construction waste, including large rocks, concrete, and building materials within a soil matrix.

At an early stage, JG Afrika recognised the importance of being innovative, and engineering sustainable solutions to the many problems posed by the site.

Engineering the building platform as well as supporting the foundation loads of the structures were one of the major challenges that faced the design team. The geotechnical engineer's immediately ruled out supporting any of the main structures directly on a stiffened waste body due to the differential settlement risk, as well as the inconsistent nature of the material. As such any conventional foundations would need to be founded on the underlying unconsolidated aeolian and beach sand deposits, which would not only be under the water table, but the OH&S risk of trenching 5 m through municipal solid waste material was not an acceptable solution.

JG Afrika prepared a performance specification for the dynamic compaction which required the appointed contractor (JVZ/SR Civils JV, using Franki as a specialist subcontractor) to achieve a bearing capacity across the entire site of 150 kPa, with a stiffness modulus (E-modulus) of at least 35 MPa to be verified post-compaction by plate load test, and Continuous Surface Wave (CSW) testing. After conducting trials with different applied energies on site, the dynamic compaction contractor was able to ascertain the energy requirements required to meet the design specification, with the performance specification having been met by the contractor to date. ■

PROJECT INFORMATION

- **Company entering:** JG Afrika
- **Client:** City of Cape Town: Solid Waste Management
- **Civil Main Contractor:** JVZ Joint Venture (JVZ Construction-SR Civils)
- **Dynamic Compaction Subontractor**: Franki Africa

JG AFRIKA

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SANDTON GATE PHASE 01

Tiber and Abland have joined forces to establish Sandton Gate as a world-class precinct. Both companies have brought their expertise in property together to create Sandton Gate as a sustainable and smarter choice for businesses, residents and the general public.

The precinct's developers, Abland and Tiber, employed architects Boogertman + Partners from the project's inception to conceptualise a comprehensive offering, ranging from the concept, urban framework and individual buildings. Sandton Gate is a pioneering mixed-use precinct promoting the health of individuals, the environment and the city. Located on the outskirts of the Sandton CBD in Johannesburg it is situated along William Nicol Drive which connects the Northern suburbs to the Sandton CBD and the city of Johannesburg. On the other side, it borders on the Braamfontein Spruit considered to be one of the longest municipal parks in the world. The precinct demonstrates sector leadership in sustainability as it piloted the implementation of the Green Star Sustainable Precincts tool.

As the first building completed in the precinct, the phase one building, designed by Boogertman + Partners, which includes a gym, retail and office space plays a critical role in the exposure of the precinct to the public and in establishing its presence in the city.

As part of the Green Star Sustainable Precinct Certification the precinct was meticulously designed to reduce the impact of urban development on ecosystems through investigating and implementing the following: sustainable transport and movement, sustainable site selection, waste management, reduction of greenhouse gas emissions and limiting light pollution.

Vehicular access is limited within the precinct and pedestrian walkways connect each building to the next, giving the precinct a sense of fluidity and energy. Smart streets include bicycle paths, wide sidewalks, resting places and shading.

When it comes to liveability, the precinct is holistically designed for healthy and active living.

The precinct is situated on a key point overlooking the Braamfontein Spruit – a popular mountain biking and hiking route. The entire stretch of river running along Sandton Gate will be upgraded and refurbished with cycling and pedestrian paths as well as sporting amenities and facilities. Drawing this urban green spine into the precinct was one of the most important design considerations. As part of the Green Star Sustainable Precinct certification interventions were implemented such as community participation and governance, sustainability awareness and the required environmental management plans and permits. The project team consisted of multiple Green Star Accredited Professionals – all contributing sustainability driven solutions from the schematic design phase through to construction completion.

The green consultants in collaboration with both Abland and Tiber created a Community Users' Guide to provide and enhance knowledge and understanding of the precinct's sustainability attributes. The option of investments in infrastructure was created for the benefit of the community by upgrading the Parkland landscapes and rehabilitation softworks, providing cycle path landscapes and integrated artworks across the precinct. The building is a commercial development that comprises five floors with a gross floor area of approximately 16 000 m^2 excluding car parking areas. The building includes a 2 800 m^2 Planet Fitness gym, 800 m^2 of retail and 12 400 m^2 of P-Grade Office Space. It is positioned on a prominent point near the entrance of the precinct on William Nicol Drive, which has been added to prevent traffic congestion resulting from the densification of the area. Its position ensures accessibility

PROJECT INFORMATION

- **Company entering:** Boogertman + Partners/ Tiber Construction
- **Owner:** POD Property Fund
- **Developer:** Abland and Tiber
- **Architect:** Boogertman + Partners
- **Electrical Engineer:** CKR Consulting
- **Fire Engineer:** IFESA
- **Transport Engineers:** Kantey & Templer
- **Mechanical Engineer:** C3 Climate Control, Consulting Engineers
- **Structural/Civil Engineers for the Precinct:** Kantey & Templer
- **Quantity Surveyors:** Quanticost
- **Structural/Civil Engineers for the Buildings:** L&S Consulting
- **Landscape Architects:** Landmark Studios
- **Sustainable Building consultant:** Solid Green
- **Wet Services:** CKR Consulting
- **Main Contractor:** Tiber
- **Project Manager:** Abland

Overall WINNER in the Architects Category

SANDTON GATE
PRECINCT

WILD WALL
VERTICAL GARDEN TILES

L&S CONSULTING

CKR
CONSULTING ENGINEERS

QUANTICOST
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as well as visibility from this arterial route, particularly emphasising the activity on the landscaped piazza surrounding the building.

The Phase 01 building, acting as anchor to the precinct, is designed over two podiums. The building design makes use of the steep 12 m slope and ensures that the upper podium, located on the corner createdby the new link road and William Nicol, is visible at eye level from this arterial route, particularly emphasising the activity on the upper podium which include restaurant and retail components facing the piazza and landscaping surrounding the building. ■

CAPITEC BANK

Capitec Bank, one of the largest and most progressive banks in Africa, has unveiled its innovative new headquarters, iKhaya, meaning 'home' in Xhosa. Designed by multidisciplinary studio, dhk Architects, the three-storey curvilinear building is defined by its dynamic interior architecture, which embodies the company's progressive outlook and embraces the concept of agile working. Striking and otherworldly, dhk's holistic architectural approach considers both the exterior and interior to optimise corporate expenditure, internal flow and sustainability – demonstrating that commercial offices can be innovative and cost-effective while driving operational efficiencies.

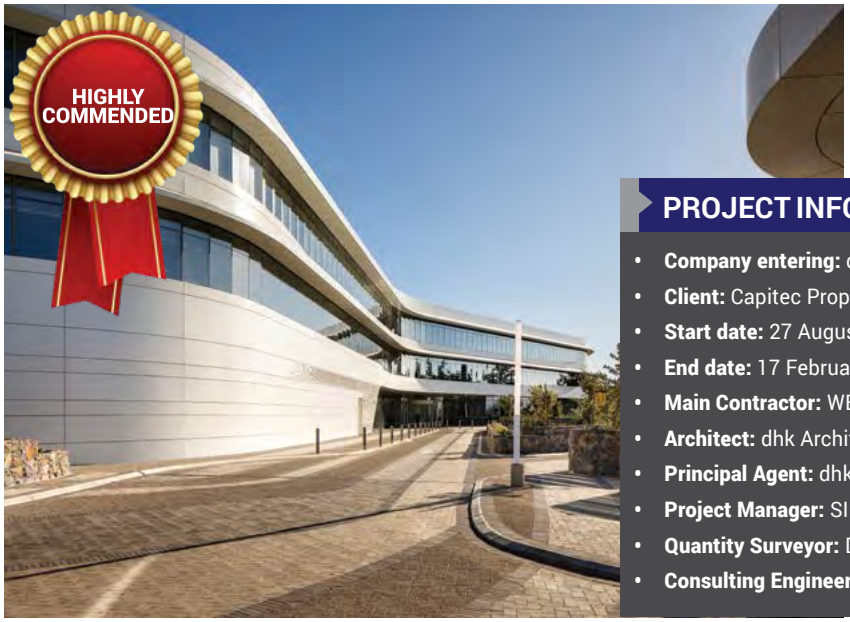
Capitec's success and growth over time meant that the company came to occupy numerous offices. These offices were geographically dispersed, resulting in departments becoming increasingly isolated from one another with the need to move between buildings to meet face-to-face. Consequently, Capitec opted to consolidate its staff and facilities into one operationally efficient headquarters. Located in the scenic Cape Winelands in South Africa, a key driver of the design concept involved capturing panoramic vistas and drawing the landscape within.

The building form optimises the shape and size of the site while referencing the brand's distinctive curved logo. The three-storey superstructure wraps around itself, which creates a unique 'doughnut' shape and forms a central triple-volume atrium – an internal 'social spine' at the heart of the building. Contributing to the contemporary appearance, white aluminium panels clad the building's sinuous form which is further accentuated with continuous ribbons of fenestration.

Reinforcing Capitec's brand identity, the company logo is embossed into the ceiling above reception. Overhead, clerestory windows and large roof lights ensure plentiful natural light and further facilitate the connection to the outside world. Meanwhile, touches of timber have been added throughout the office to introduce a feeling of warmth.

Internally, the design resonates with the company's progressive outlook – ensuring guests and staff unequivocally feel the spirit of the brand throughout the building. Once at reception, visitors are greeted by a generous triple-volume space that immediately showcases the sophistication and simplicity of the interior architecture. Wide open-plan floorplates loop around the periphery of the atrium which are connected by a series of dramatic bridges and staircases. This was an intentional design element which inter-connects the various departments, creating opportunities for chance collaborative encounters and personal interactions. The new headquarters fosters a company culture of creativity, innovation and collaboration with a large emphasis placed on optimising internal flow and departmental interaction. The first and second floors, containing the office's open-plan work areas, are largely void of hierarchal structure and closed-off cubicles. Embracing the concept of agile working, a raised access floor throughout the building facilitates maintenance and future upgrades to services. On each level, a total of four 'cores', containing centralized amenities such as kitchenettes, meeting rooms, breakout areas, lockers, bathrooms and fire escapes, serve to augment the floorplates into departmental zones.

Throughout the building's 'social spine' there are a variety of breakaway areas; from a large ground-floor lounge at reception for guests to await meetings and co-workers to engage, to pause areas on bridges, and an internal landscaped courtyard for staff to rest. These spaces fuel creativity and innovation by allowing employees to slip away from their resident desks to enjoy a moment of solitude, conduct a private meeting or brainstorm ideas in small groups. Not only do these breakout areas increase job satisfaction, but they boost staff productivity and efficiency. Furthermore, there is a full-service kitchen and canteen area with ample seating, a small satellite café, and a grand multifunctional stadium staircase/seating area for company presentations and talks. Other useful facilities include a recording studio, Capitec Bank branch and an ATM lab facility. In terms of construction innovation, the architectural, engineering and construction teams collaborated using BIM design technologies utilising cloud-based collaboration platforms. This enabled the teams to engage in immersive 3D visual experiences including virtual walkthroughs of the building at various stages. Additionally, it provided the opportunity for all to partake in the design process including not only the design teams but people moving into the building. According to dhk partner, Peter Stokes, "Using a cloud-hosted collaboration platform like BIM360 and having a combined team so heavily invested in using BIM tools, enabled collaborative delivery such as I have not experienced before in any architectural practice." ■

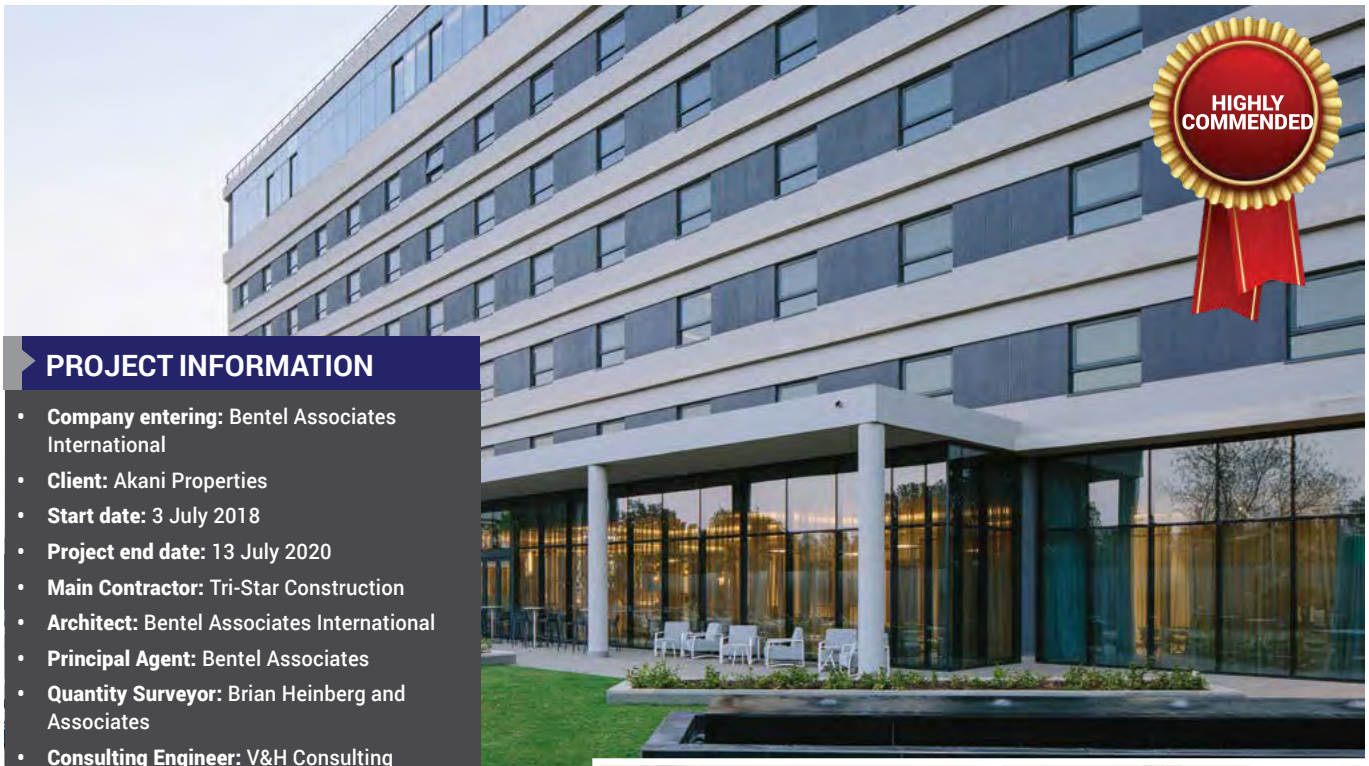


PROJECT INFORMATION

- **Company entering:** dhk Architects
- **Client:** Capitec Properties
- **Start date:** 27 August 2018
- **End date:** 17 February 2020
- **Main Contractor:** WBHO
- **Architect:** dhk Architects
- **Principal Agent:** dhk Architects
- **Project Manager:** SIP Project Managers
- **Quantity Surveyor:** De Leeuw
- **Consulting Engineer:** AECOM

DESTINY|RADISSON HOTEL

Situated 13 kilometres from O.R. Tambo International Airport, and a stone throw away from the Kempton Park Central Business District, the Destiny|Radisson Hotel and Convention Precinct in Bredell has become a highly recognised conferencing destination in the Ekurhuleni Metropole and Gauteng alike. The brainchild for visionary developer, Zamani Letjane, the new 248 key 4 star hotel is the latest addition to the existing conferencing precinct and has now firmly established itself as a premium contender in the South African hotel conferencing arena.



PROJECT INFORMATION

- **Company entering:** Bentel Associates International
- **Client:** Akani Properties
- **Start date:** 3 July 2018
- **Project end date:** 13 July 2020
- **Main Contractor:** Tri-Star Construction
- **Architect:** Bentel Associates International
- **Principal Agent:** Bentel Associates
- **Quantity Surveyor:** Brian Heinberg and Associates
- **Consulting Engineer:** V&H Consulting (Structure)

On completion of rezoning the three consolidated stands had seven storeys and over 20 000 m² of Floor Area (Bulk) available to the hotel development. In order to unlock this potential, and work within the perimeters of the site all storeys were utilised, together with a single level of basement dedicated to hotel service spaces and parking.

Geotechnical investigations revealed that expanses of the property are underlain by shallow dolomite and has a perched water table. This presented a challenge in terms of founding conditions considering the height of the building. As a result the foundation design was first on the agenda and an end bearing piled support system was chosen early on to support the entire structure including the cellular raft foundations on various levels. A herring-bone sub-soil drainage system was installed under the approximate 5 800 m² of basement to prevent the perched water table from reaching the underside of the cellular raft.

The super structure was the next design element to be tackled, the length of the building from end to end was not conducive to the buildings structural longevity, so the decision was taken to split the single structure into four individual, free standing concrete frame structures that function independently, separated only by a 10 mm construction joint. Cast in-situ slabs were chosen as the main floor design at 300 mm thick, this allowed the removal of column caps and relative easing of the internal construction difficulties.The structural steel Porte Cochere proved to be the most challenging structural design element on this project. The challenge set by the initial architectural design was to provide a long spanning, aesthetically seamless and very thin element that covered the drop off zone at the hotel entrance. The initial structural concepts included casting the entire frame in concrete. This was scrapped very soon after due to the poor long-term performance and undesirable weight of the structure. Structural steel elements that included I-beams rolled into

Structural Engineering Consultants

With over 20 years experience

V&H Consulting considered the serious dolomite challenges on site with a cautious, yet thorough approach. From the design of the piled foundations to the multi-storey concrete frame super structure, every precaution was taken to ensure the anticipated longevity of the building, including the splitting of the lengthy structure into four, individual, free standing, structures. The Architectural design, conceptualised by Bentel Associates International, provided challenges ranging from large spanning cantilevers, rooftop pools, an internal 1000 m³ underground storm water attenuation tank and a highly sophisticated structural steelwork Porte Cochere design. VHC takes pride in the structural designs they are involved with. This is clear when you see the Radisson Hotel & International Conference Centre.

VHC

V&H Consulting (Pty) Ltd

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Web: www.vh-consulting.co.za l **Email:** info@vh-consulting.co.za

curves on two different planes were also explored, this too provided too many challenges including technical fabrication limitations and general installation issues on site. After a complex design and detailing saga between the architect, structural engineer and steel detailer, latticed and faceted steel plates were chosen as the superior design option with the inclusion of tensile steel cables connected to the hotel concrete frame as additional support. Each of the 264 plates and their unique connections were analysed, designed, fabricated and installed in their unique position to create the low profile complex multi curve Porte Cochere that stands today.

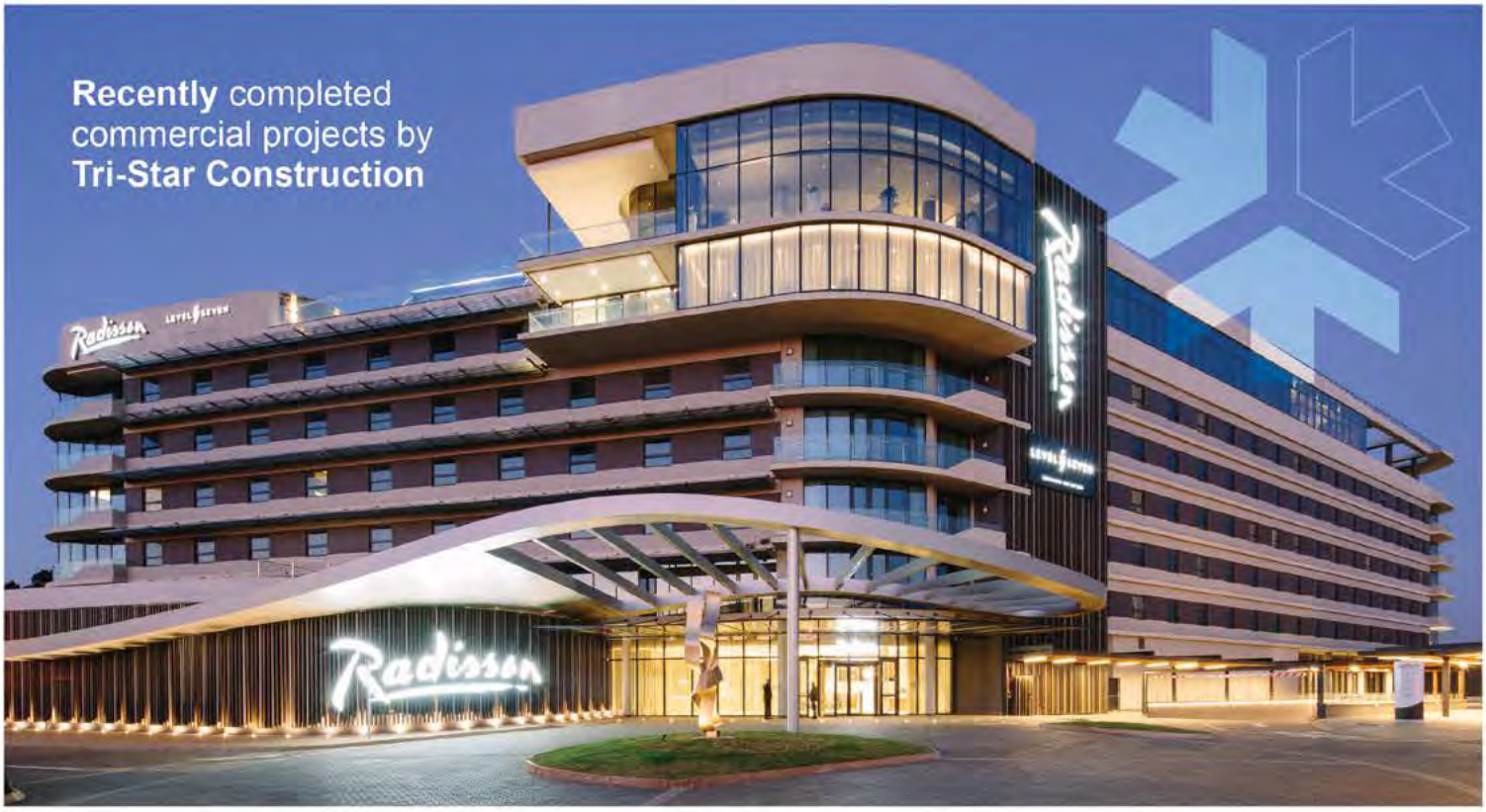
The new hotel provided employment opportunities for a notable number of people and has boosted investment interest in what was once a peripheral part of Ekurhuleni.

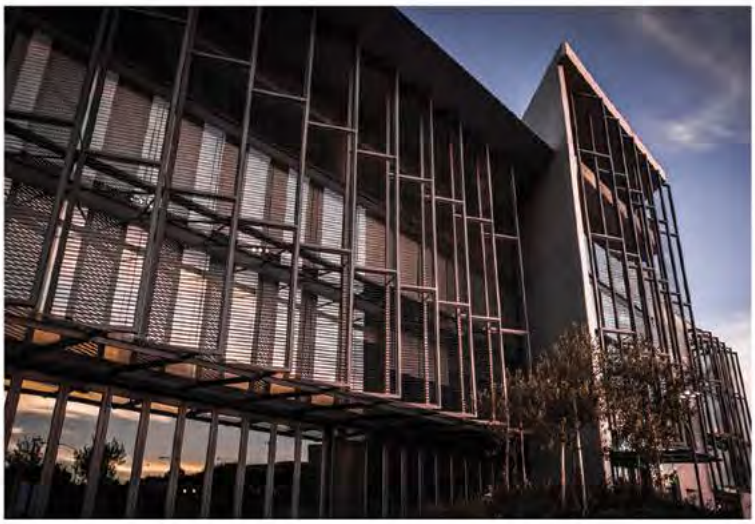
Further to the above, this particular hotel offering from the Radisson Hotel Group is the first of its kind in South Africa.

As part of the road upgrades for the new hotel, the parking and drop-off area for the high school was improved and made safer.

A dedicated drop-off lane was constructed, and two traffic circles were introduced for traffic calming along the street frontage of the school. The road has also been paved to improve the entrance experience for all road users.

It would be amiss to not reference the incredible vision of the Developer and Property Owner, Zamani Letjane. Letjane used to live on the property where the convention centre and new hotel now stand. The house he lived in is still on the property as well, and if you were to ask him, he can direct you to what was once his room, with a view out to the then vacant land where these world-class facilities have now been built. His story is an inspiration to many South Africans, and is an example of what one can achieve if they set their mind to it. ■





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TSHWANE REGIONAL MALL

Tshwane Regional Mall (TRM) sits on a long, narrow site, hemmed in by the railway to the south, and an electrical servitude to the north. Defining nodes, or points of interest within such a long mall, as well as emphasising entrances externally, was important in the initial design stages. The goal in these internal courts was to bring in as much natural light as possible, and emphasise space and volume as a counterpoint to the long malls. The intent was to achieve a very thin, 'floating' roof structure above almost uninterrupted clerestorey strip windows. This was achieved by using steel structure, including diagonal steel spars and 'tree branches' on concrete columns, adding further interest to the spaces.

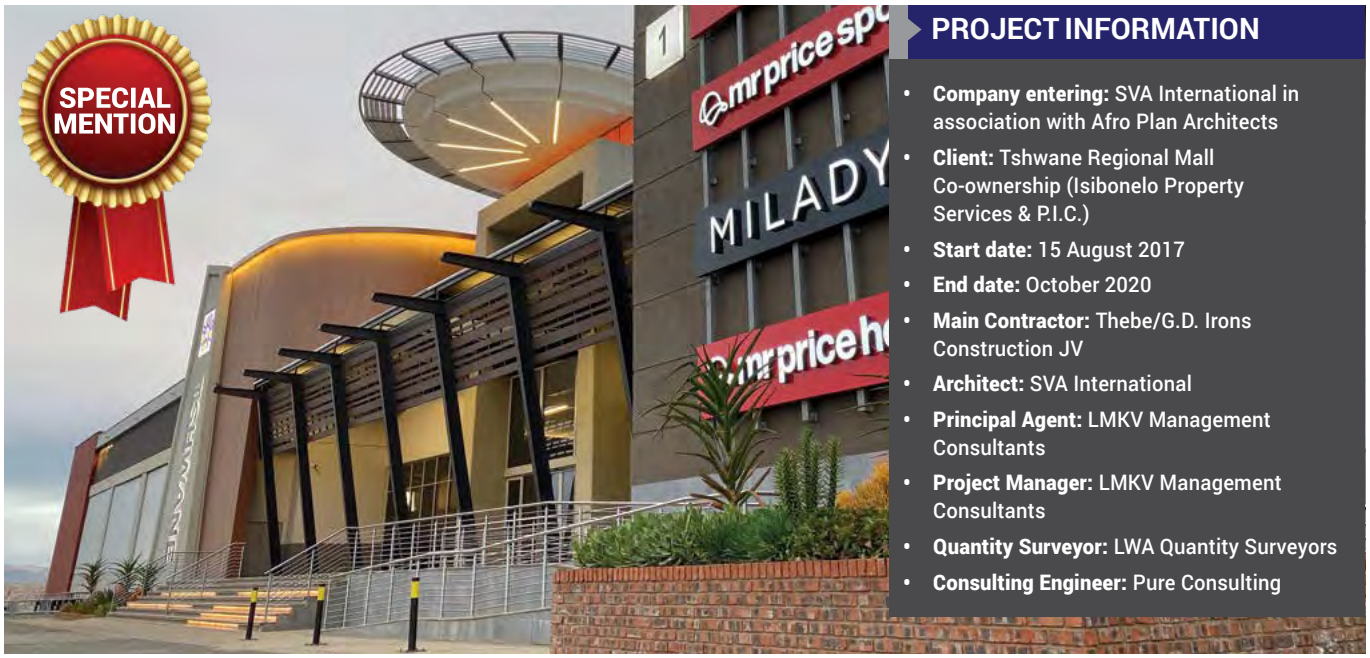
Lightweight feature walls at the entrances were clad in powder-coated aluminium expanded metal and ETICS walling. Initially precast concrete had been considered for the large, triangular signage walls, however this didn't prove to be feasible due to the height requirements. That is where the ETICS wall, with a concrete-look finish proved very successful and achieved the required aesthetic. The architectural design brief was to create a retail centre that would rival other high end regional malls nearby, offering a local alternative shopping experience to the residents of Mamelodi. The entrances and related internal courts, as described above, form the main focal points with high quality finishes including tiles, mosaics, timber cladding, and vinyl lifestyle graphics. The finishes had to be carefully considered for both their aesthetic appeal and their longevity as the expected foot traffic through the mall, between all the different transport hubs (estimated at 200 000 commuters daily), was extremely high.

The TRM logo was important to the client as the colours are symbolic of the area and the transport interchange that converges on the mall, with each colour representing the city, the people, and different modes of transport. This vibrant palette of colours was used to bring energy and interest into the mall, and also to define different spaces, with each internal court using one of the logo colours to identify it. The site itself was not highly environmentally sensitive. There is an existing retail development attached to the train station, and a fuel station that needed to be retained and worked around. Most of the balance of the site was previously occupied by a motley collection ablution and storage buildings, taxi rank carport structures, and paved surfaces. Immediate neighbours include the railway, the enormous Ford Motor Company factory, and various other bulk retail and industrial complexes.

Design consideration was given to ensuring lowest possible energy use in terms ofmechanical services and electrical fittings. The structure is well insulated to reduce heat gain and high air conditioning requirements. Electronic taps were fitted throughout to reduce water use.

The landscape designers created a living masterpiece of indigenous and low water plants, including the much hailed Spekboom. Much of the vegetation has already grown in well and is arguably a vast environmental improvement on the dusty landscape that existed prior to this development. This development has provided a much needed upgrade to the retail offerings available to the local Mamelodi community. Shoppers will no longer need to travel long distances to find the retail chains and aspirational brands they're looking for. With two taxi ranks (one in the main building basement and one in a separate building alongside the mall), direct access to the Denneboom Metrorail station, adjacent city bus stops, and a future TRT bus terminal, this has also become a transport node, making it easy for commuters to move between transport options and to do some shopping or grab a bit to eat on the way.

The adjacent mall, with two direct connections through the Tshwane Regional Mall, and connecting directly into the Denneboom train station, has embraced the opportunity to upgrade and revive portions of their mall to engage more seamlessly with TRM's offering. The combined GLA for both malls is approximately 59 000 m² (TRM is approximately 53 000 m² on its own), making it a definite rival for other malls in the region. ■



PROJECT INFORMATION

- **Company entering:** SVA International in association with Afro Plan Architects
- **Client:** Tshwane Regional Mall Co-ownership (Isibonelo Property Services & P.I.C.)
- **Start date:** 15 August 2017
- **End date:** October 2020
- **Main Contractor:** Thebe/G.D. Irons Construction JV
- **Architect:** SVA International
- **Principal Agent:** LMKV Management Consultants
- **Project Manager:** LMKV Management Consultants
- **Quantity Surveyor:** LWA Quantity Surveyors
- **Consulting Engineer:** Pure Consulting

TSHWANE

REGIONAL MALL

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39 COMMERCE CRESCENT

The building is the 4th building to be completed by Alchemy on the street. All the buildings draw from the same pallet of materials – off-shutter concrete, black brick, and glass. This building uses the same pallet but its form breaks away from the rectilinear lines of its neighbours. The façade is made up of angled forms that cantilever 1,2 m off the existing structure.

The building is a conversion of an existing three storey commercial building into a storey showroom. The conventional industrial facades were transformed by sloping off-shutter concrete and black brick facades that are cantilevered off the existing structure to form the futuristic exterior. The façade forms are punctuated with reflective glass panels.

Internally a new atrium was created to bring light into the centre of the deep floor plate. The internal atrium formed a secondary function of future-proofing the building. It allows all the floors to be accessed from a central common area which allows the building to be let to multiple tenants.

The building is let to a single tenant who wanted to maximise the usable area of the building. Early on in the project, it was decided to convert the roof space into an open-air showroom which has an incredible view out towards Sandton.

The existing structure was retained and strengthened where required. To add an additional floor to the building the foundations needed to be stiffened and their size increased to accommodate the additional loads to the building.

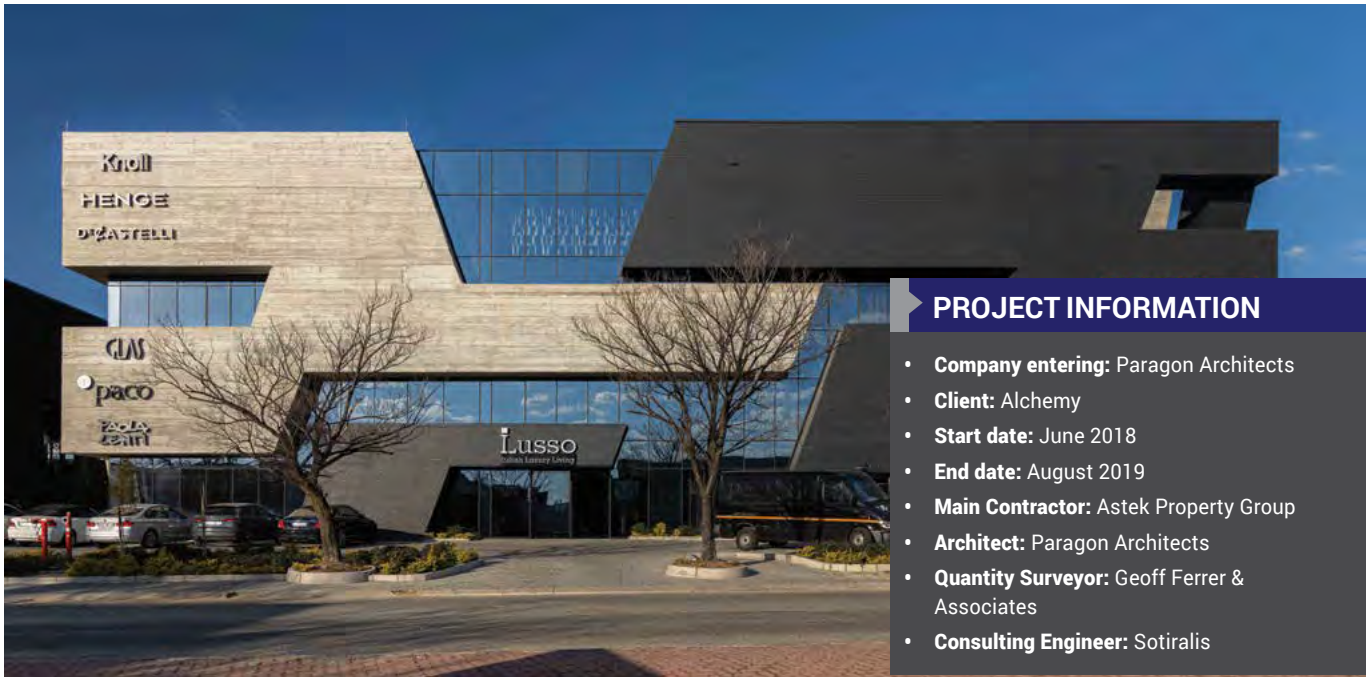
Large openings needed to be created in the existing floor slabs for new fire escape stairs, and service ducts as well the atrium opening in the centre of the building. Carbon-fiber strips and steel i-beams were installed on the underside of the existing slabs to strengthen them, reducing the need for additional columns to be built. This allowed for the floor plate to remain as open as possible which is ideal for its showroom function.

To improve the quality of the space the existing floor slabs were demolished to create an atrium in the centre of the building. A skylight was installed on the new roof level and allows light to flood into the centre of the floor plate. A central staircase was installed in the atrium void to connect the 4 levels. The staircase is cantilevered off the floor slabs and spirals up through the space.

The sculptural stair was designed in Rhino and the 3D form was flattened to form panels which were laser cut to create the formwork that would be cast in place to form the stair. This formwork allowed us to create a complex form that would not have been possible with conventional formwork. The staircase was finished with a light grey polished plaster.

Traditionally brick façades are rectilinear due to the nature of the bricks that they are constructed from. At 39 Commerce Crescent bricks were set out at 70-degree angles to create the sloping forms that wrap around the building. To create the sloping walls Paragon had to alter the pattern that conventional face bricks are laid in. Each course is offset from the one below. Detailed drawings of the brick facades were created to determine what would happen to the pattern when it needed to change direction around a 90-degree corner. Cut bricks were inserted into the pattern to ensure that the pattern could be continued around corners without the visual impact of the staggered pattern being broken. The rough off-shutter concrete facades mimic the slope of the angled brickwork. Reflective glass was used to punctuate the junctions between these two materials.

The existing structure of the building was retained. This reduced the overall environmental impact of the build by reducing the amount of concrete and steelwork required on the project. The development also improved the energy efficiency of the building. Performance glazing was used throughout, along with an insulated roof, cavity walls, and insulated spandrel panels that all contribute to a more stable internal environment that requires less energy to maintain a comfortable internal temperature. Energy-efficient HVAC systems were installed throughout and energy-efficient lighting was used. The atrium and large windows allow natural light into the space from all sides. ■



PROJECT INFORMATION

- **Company entering:** Paragon Architects
- **Client:** Alchemy
- **Start date:** June 2018
- **End date:** August 2019
- **Main Contractor:** Astek Property Group
- **Architect:** Paragon Architects
- **Quantity Surveyor:** Geoff Ferrer & Associates
- **Consulting Engineer:** Sotiralis

CONSTANTIA EMPORIUM

Constantia Emporium is a boutique convenience centre, located in the leafy suburb of Constantia, Cape Town. Located on a land restitution site, previously Lot 10 and 11 of a Constantia Farm known as Sillery.

It is envisaged that the new retail centre will act as a catalyst for further development on the remaining restitution sites. The completed project has been noted a positive example of the development potential of other restitution sites. The reunification of the family, however, is regarded as their ultimate achievement through the entire restitution process.

The heritage of the site and the journey of the land owners has been remembered in the public spaces of the centre. A solid brass memorial strip imbeds the location of the old site dividing boundary within the parking lot surface and the feature stair case contains a permanent historical photographic exhibit.

The contemporary convenience centre is inspired by rural homestead architecture and celebrates familiar homestead forms using exposed portal steel frames, timber beams, slatted timber and profiled steel cladding. The development aims to be what it could have been, if allowed to develop naturally, by creating what is perceived to be a grouping of individual buildings connected by a double volume mall. The massing and set backs were key to creating an appropriately sensitive response to the farm-land context.

The use of off-shutter concrete, painted walls, steel and glass in contemporary monochrome shades is offset by the warmth of slatted timber elements creating a sophisticated, layered exterior.

The design of the centre pushed the boundaries of standard retail aesthetics. The project team and client ensured that there was attention to detail in all the building features and finishes. Examples include the stepped soffit off-shutter concrete feature stair, bespoke planters to the exterior parking, the continuous LED strip light that weaves its way through the mall and the feature steel and timber trusses and ceilings over the central eatery. ■

PROJECT INFORMATION

- **Company entering:** SVA International
- **Client:** Shoprite Checkers
- **Start date:** 12 June 2018
- **End date:** 26 November 2019
- **Main Contractor:** WBHO
- **Architect & Principle Agent:** SVA International
- **Quantity Surveyor:** AECOM
- **Structural Engineer:** DVP Inc
- **Electrical Engineer:** Solution Station
- **Mechanical Engineer:** Solution Station
- **Landscape Architects:** GBI
- **Civil Engineers:** Ekcon

FOUNDRY PARK

On inception, Foundry Park's site was carefully analysed to ensure the development's maximum bulk was achieved along with the parking and loading requirements associated with the floor area. The development was carefully puzzled together to ensure the best possible solution was achieved.

Foundry Park's steel framed structures have been designed with maximum possible spans over the different block's varying sizing. The frame is integral with the external envelope allowing for flexibility in the required unit sizes as and when requested by potential buyers.

Individual unit sizes range from under 100 m^2 to 350 m^2 with possible variations to accommodate the client's needs. Parking is made available with direct drive-up access to the units on a common driveway, which can accommodate six WB-50 trucks to articulate through the development. Each unit on average has a 3 m wide x 3 m high roller shutter entrance as well as glazed shopfront frontage. Double volume height allows for varied individual requirements and space is maximised with mezzanines. The outer perimeter mezzanines lead out onto private balconies providing breakaway spaces for the occupants. Private toilets and possible kitchenette facilities are value added bonuses.

The façades are architecturally designed with an industrial aesthetic. The industrial aesthetic used throughout the design includes exposed bare brickwork, raw off shutter concrete, black metal, polished concrete and exposed services creating a perfect play of contrasts and textures. Foundry Park's design combines sleek modernity with an old world charm, creating a bold statement within the industrial park.

Located at the entrance to Foundry Park is a coffee shop, encouraging and attracting pedestrian activity within the greater park. The coffee shop services the greater park and therefore sets the development a step above the rest.

Foundry Park set out to set a new bar in terms of aesthetic appeal of an industrial park in the Cornubia Industrial Precinct. The issue the team faced in achieving this was to try keep the costs low while at the same time not compromising on the quality or the time required to produce the end product. In all instances of the aesthetic of the park, careful costing exercises were completed in order to determine the most cost effective solution which still maintained the core feel of the park.

The results of these exercises can been seen in feature items ranging from the choice of a Loffelstein retaining wall (which not only gave a cost advantage but was plantable as well) all the way through to the painted signage (which gave a distinct aesthetic appeal to the project along with the cost advantages). ■

PROJECT INFORMATION

- **Company entering:** FWJK
- **Client:** CARDILOX
- **Start date:** 5 November 2018
- **End date:** 15 February 2020
- **Main Contractor:** Rubro Building
- **Architect and Principal Agent:** FWJK
- **Quantity Surveyor:** FWJK
- **Consulting Engineer:** NJV Consulting

CORAL POINT

Coral Point's unique structure is composed of 1,5 basement parking levels and 5,5 residential levels. Post tensioned concrete slabs have been used to allow for thinner slabs, larger column spans, larger cantilevers and fewer structural joints thereby allowing optimal efficiency for the parking design, the residential units and the cantilevering walkways and balconies.

The design splits the development into two wings, the east and the west wing, between them a complex terraced, central park links the development to the adjacent coastal forest. The terraced podiums are made up of a variety of tilting, folding polished concrete slabs and roof gardens linking the two wings.

Each apartment leads onto a private balcony from the open-plan kitchen and living area, embracing the relaxed KZN lifestyle of indoor/outdoor living. The complex terraced central park is designed as an extension to the indoor/outdoor lifestyle, incorporating pocket park roof gardens, a fully lawned roof garden, a swimming pool and a clubhouse. The two principal façades of the building are designed in response to their contrasting surroundings whilst incorporating face brick as a key natural material threaded throughout the external design. The West Wing is more urban and robust in form and the use of vertical aluminium shading aerofoils respond to the curvilinear boulevard and the inland views to the west. The central park and sea facing façades are more open and lightweight, using generous balconies, glazed openings, moveable lightweight aluminium solar screens and glass balustrading to freely interact with the surrounding landscape. The architecture on the East Wing elevations is streamlined, simple and uncluttered, allowing continuous connection to the coastline views. The design of the residential complex fuses the symbiosis between architecture and landscape which defines a sense of place and belonging in the environment. The East Wing has been designed in response to the adjacent coastal forest, considering the late afternoon shadow cast onto the forest, the building steps down to minimise the shadow impact. Surrounding environment. ■

PROJECT INFORMATION

- **Company entering:** FWJK
- **Client:** Coral Point Development
- **Start date:** 23 January 2018
- **End date:** 17 August 2019
- **Main Contractor:** Grinaker-LTA
- **Architect:** FWJK
- **Principal Agent:** FWJK
- **Quantity Surveyor:** FWJK
- **Consulting Engineer:** NJV Consulting

RIDGE 7

Ridge 7's unique structure is composed of a storey lower parking basement cutting into the western bank, tucking most of the parking underground. Post tensioned concrete slabs have been used to allow for thinner slabs, larger column spans, larger cantilevers and fewer structural joints thereby allowing optimal efficiency in the parking design, the office levels and the striking angular cantilevering balconies.

At ground level, pedestrian activity was an important design generator, the pedestrian entrance mimics the angular design with splayed angular columns supporting the angular entrance canopy.

The corporate social investment was managed by the main building contractor, Rubro Building. The construction of Ridge 7 successfully incorporated the local community labour force in a variety of trades. Local community small business enterprises were used for the sourcing and supply of a variety of building materials and finishes.

The office floor plates have been designed with flexibility in mind, a total office floor area of 7 700 m². The post tensioned slabs allow for greater spans in the column design thereby minimising the amount of columns in the floor plate allowing for greater flexibility in office planning. Centrally positioning the services, the circulation system and public toilets per level allows for flexibility in office space sizing requirements, whilst future proofing the building to allow for interchangeable functionality.

A pedestrian friendly building design directs the vehicles with the use of bollards and landscaping, removing all kerbs. This solution allows for easy pedestrian movement from the street to the forecourt of the building. Ridge 7's cafe is situated at the street level fore-court activating the pedestrian friendly street edge. ■

PROJECT INFORMATION

- **Company entering:** FWJK
- **Client:** Ridge 7 Developments
- **Start date:** 21 August 2017
- **End date:** 15 August 2019
- **Main Contractor:** Rubro Building
- **Architect:** FWJK
- **Principal Agent:** FWJK
- **Consulting Engineer:** NJV

RIDGE 8

On inception a combination of 3D modelling and drone technology was used to model the exact site and a basic building form to the site's controls and compact size using drone technology able to assess the levels and angles towards the optimal views. These assessments helped model and form the design of Ridge 8, the striking glazed façades and balconies.

Ridge 8's unique structure rises out the site, with storeys of parking and storeys of superior office space. Post-tensioned concrete slabs have been used to allow for thinner slabs, larger column spans, larger cantilevers and fewer structural joints thereby allowing optimal efficiency for the parking design, the office levels and the cantilevering balconies. The slab edges of the building have been designed and constructed to showcase the raw off shutter concrete finish, reducing the maintenance required to the facades in the future.

The second floor of the building is home to a quadruple volume tree void, breathing the surrounding ecosystem into the focal façade of the building. The focal façade incorporates large glazing elements towards the panoramic sea views. Central to the focal façade is a 14 storey unitised glazing system emphasising the slender, grandeur of the development.

At ground level, pedestrian activity was an important design generator, the pedestrian entrance sits adjacent to the ground floor retail space, spilling out towards the pavement, attracting, and engaging with pedestrians passing by. Ridge 8 is designed towards the panoramic sea views whilst engaging with the street edge. Each office level enjoys a private balcony overlooking the breath-taking views. The parking levels continue this theme and repeat false balconies giving the illusion of an active edge towards the street. An innovative aluminium mesh screen design blurs the visibility to the parking whilst maintaining the views. With the parking levels designed above ground, the office levels reach the full mean sea level height allowable and therefore maximising on the unobstructed views. ■

PROJECT INFORMATION

- **Company entering:** FWJK
- **Client:** Ridge 8 Properties
- **Start date:** January 2019
- **End date:** August 2020
- **Main Contractor:** WBHO
- **Architect:** FWJK
- **Principal Agent:** FWJK
- **Quantity Surveyor:** FWJ
- **Consulting Engineer:** NJV Consulting

JOHANNESBURG MARRIOTT HOTEL & MARRIOTT EXECUTIVE APARTMENTS

The brief to the design team was to produce a world-class design for an internationally branded 5-star hotel and serviced apartments scheme. The design had to seamlessly integrate the building with the existing principles of New Urbanism already established in the Melrose Arch precinct, and to provide for a dual branded property with shared services.

The 390-key Marriott Hotel and Marriott Executive Apartments, in tandem with a similar height adjacent residential scheme called One on Whiteley, was designed around an enclosed private landscaped courtyard for the two buildings.

Additionally, a double volume perimeter public areas of the hotel and branded apartments, was envisioned to create a human scale interface with the public at street level, and to integrate this new offering within the precinct.

The Johannesburg Marriott Hotel offers the public access to a unique new offering within the greater precinct, with an aesthetic affinity to the existing architectural expression, but an expression of materials which provides a distinct identity.
The Marriott Hotel is the signature brand of Marriott International whose F&B offering is integral to the guest experience, including The Archery Bar & Eatery as well as Keystone Bistro.

The Marriott Hotel is divided into three distinct vertical zones consisting of basement parking, two public floors, and the hotel and serviced apartment above. ■

PROJECT INFORMATION

- **Company entering:** Bentel Associates International
- **Client:** AMDEC Property Development
- **Start date:** 1 October 2016
- **End date:** 1 December 2019
- **Architect:** Bentel Associates International
- **Principal Agent:** AMDEC
- **Quantity Surveyor:** Darcy Hedding Partnership
- **Consulting Engineer:** Anderson Consulting Engineers

LA LUCIA MALL

La Lucia Mall is conveniently located off the M4 highway to Durban in the leafy suburb of La Lucia. Originally completed in 1974 the mall has received numerous extensions and refurbishments over the years, each resulting in added value of an additional tenant offering or aesthetic modification.

A key feature to this refurbishment is that of the warm natural timber slatted ceiling detail located at the atriums on both the lower and upper levels. Challenges faced were the limited void space above the ceiling height into which the detail was set, the weight of the structure as well as the coordination of existing services. Great lengths were taken to ensure a sophisticated compilation of the members with concealed fixing. This was achieved by collaboration between the architect, engineers, principal contractor and the subcontractor.

The most important design intention was to lean towards clean, cool designs that would allow the shops themselves to be the centre of attention. It's a step away from the baroque extravagance of La Lucia Malls old interior and a step towards neutral elegance to provide a more tranquil experience for both the retailers and the customers. Warmth, material and various textures have been used in the palette, but it's executed in a way that's quite restrained, to allow the retailer, the shop front to shine.

The project commenced in January 2019 and ran through to practical completion in September 2019. Night shifts introduce a level of disruption as areas under construction need to be made clean and safe for public access the following day thereby extending the project duration. The refurbishment incorporated excellent finishing specifications which were executed with a high standard of quality allowing the centre to continue is reputation within the retail space. A detailed quality process was implemented and carried out with much attention to detail from the onset of the project. ■

PROJECT INFORMATION

- **Company entering:** Bentel Associates International
- **Client:** Growthpoint Properties
- **Start date:** January 2019
- **End date:** September 2019
- **Main Contractor:** WBHO
- **Architect:** Bentel Associates International
- **Principal Agent:** M3 Africa Consulting
- **Quantity Surveyor:** RLB Pentad
- **Consulting Engineer:** Escongweni BPI

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PNP ON NICOL

Located adjacent to the Braamfrontein Spruit at the junction of On Nicol and Republic Roads, this centre was first completed in October 2010. The centre has the advantage of visible exposure and convenience for both private and public transport. The centre has been fortunate to enjoy success since the day it opened its doors to the local communities, Sandton, Hurlingham to name a few.

With the re-arrangement of the food depts., new 'floating' bulkheads were introduced above. The exceptionally high volume made this rather challenging, but was overcome with an intricate supporting timber truss design behind which allowed us to eliminate any visible hanging from the structure above.

The construction of the butchery coldroom was innovative in that it comprised of a large curved glass frontage. The glazing came in three sections due to the large radius. Standard glazing would not be suitable for this application. A gas injected hardened glass was installed with a bitumous product applied at but joints to accommodate the ambient temperature of the trading floor (23 deg) and the chilled temperature of the coldroom (3 deg) without any condensation developing.

Internally to the coldroom a rotating galvanized steel meat rail was installed to showcases the carcasses.

The entrance to the Liquor Store via the supermarket, has an elegant frameless automatic sliding door shopfront.

Old heavy durus doors separating the back of house areas with that of the trading floor have been replaced with modern automatic high speed fabric roller shutters.

Originally designed by Bentel Associates International, this centre has been an iconic landmark since its opening in 2010. In collaboration with Air & D the industrial look and feel with exposed steel members and services has been amplified by improving sight lines across the store. Any bulkhead or signage hindering sightlines has either been removed or repositioned. This exercise accomplished an improved sense of the exterior environment whilst shopping within the store.

Bulkheads now have the form of floating bulkheads which have an intricate supporting structure unseen to the public.

The single Marley specification floor finish throughout creates a softer feel underfoot and reduces the noise level of trolleys passing over. Rather than a standard application of light across the trading floor, subtle variations to light levels and specifications has been introduced to draw customers to the certain nodes through the store, clothing vs butchery or wellness vs household goods.

The colour palate has been transformed with the use of more dramatic and contracting contemporary colours of charcoal greys and neutral whites.

The existing terrazzo walkway has been replaced with a mottled charcoal floor tile creating a homogenous appearance with white linear inserts which is a play on the dappled light stripes on the walkway via the timber slatted louvers.

The staircase that served the first flor tenants has been omitted. Access to the first floor is now of light steelwork and glazing at the end of the building. This has positively improved visibility of all tenants on this wing of the building.

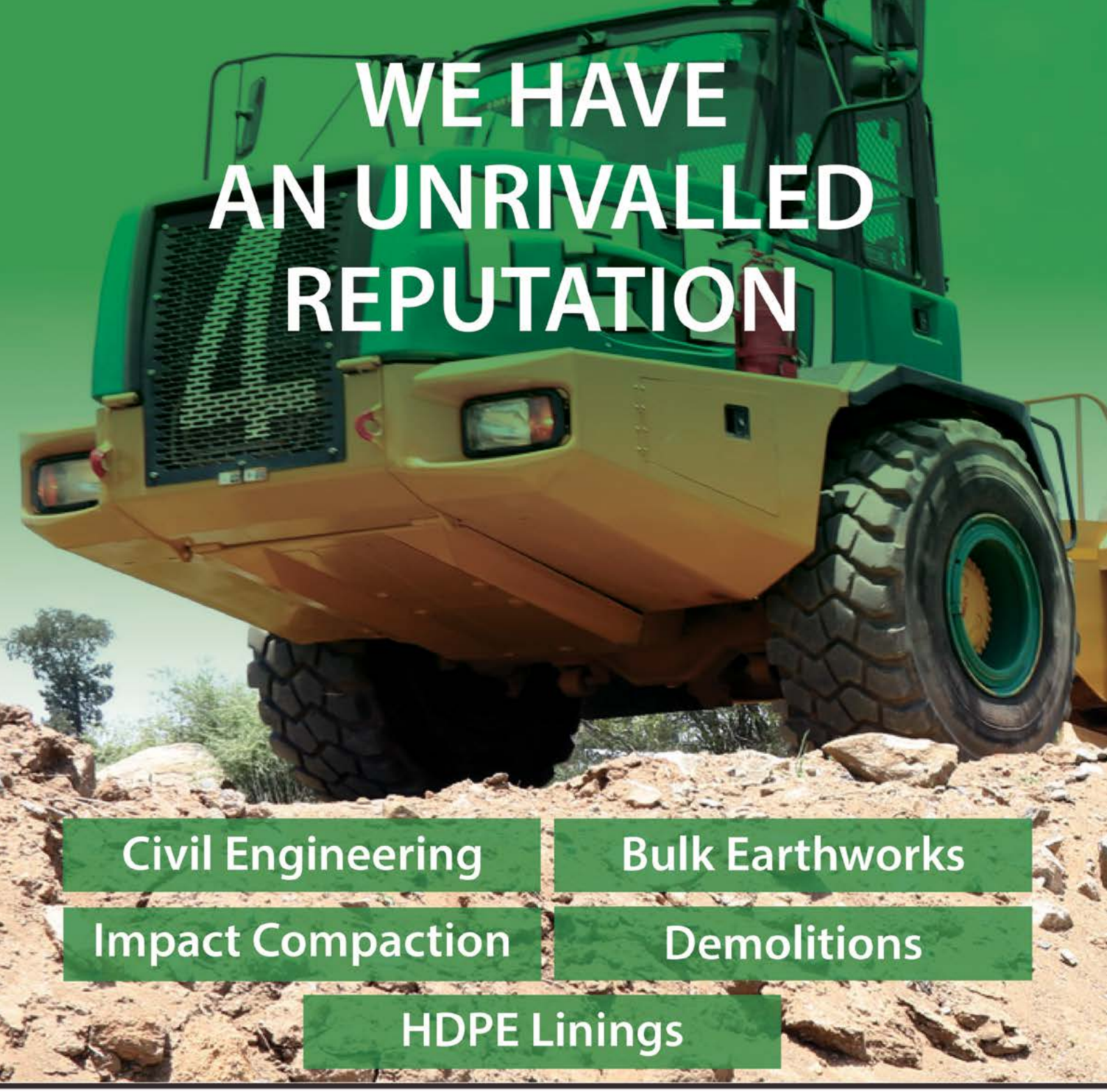
Sustainable initiatives have formed part of the heart of the centre from plant systems to landscaping to provision for pedestrian circulation around and within the centre. Over the last nine years Pick n Pay has continued to service and maintain these systems.

With the refurbishment carried out, heat that is discharged from the gas cooler of the refrigeration plant is reclaimed and in turn heats the water in the boiler which provides hot water via a ring main to all basins within the food preparation areas thereby eliminating the need for numerous geysers.

Where lighting was replaced, all alighting is energy efficient LED specifications. ■

PROJECT INFORMATION

- **Company entering:** Bentel Associates International
- **Client:** Pick n Pay Retailers
- **Project start date:** May 2019
- **End date:** November 2019
- **Main Contractor:** Beurden Construction
- **Architect:** Bentel Associates International
- **Principal Agent:** Betts Townsend
- **Project Manager:** Betts Townsend
- **Quantity Surveyor:** Quest Quantity Surveyors
- **Consulting Engineer:** Arup Group SA



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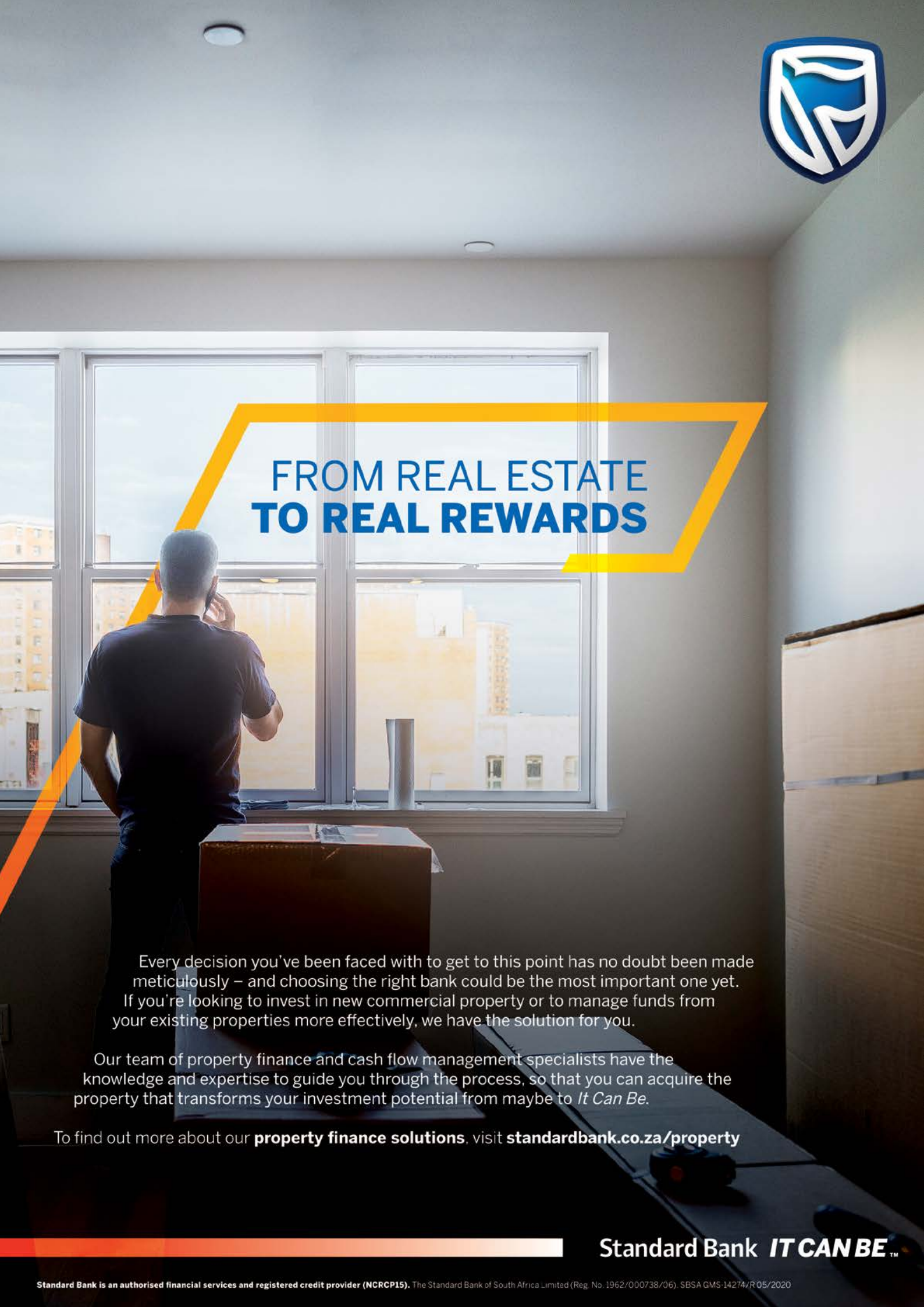

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