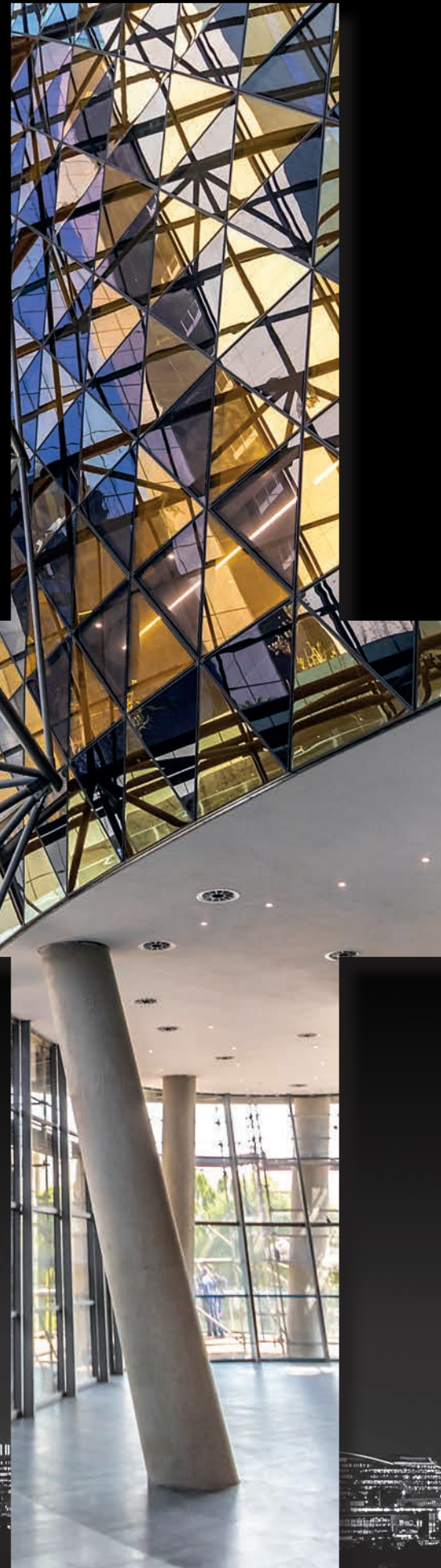


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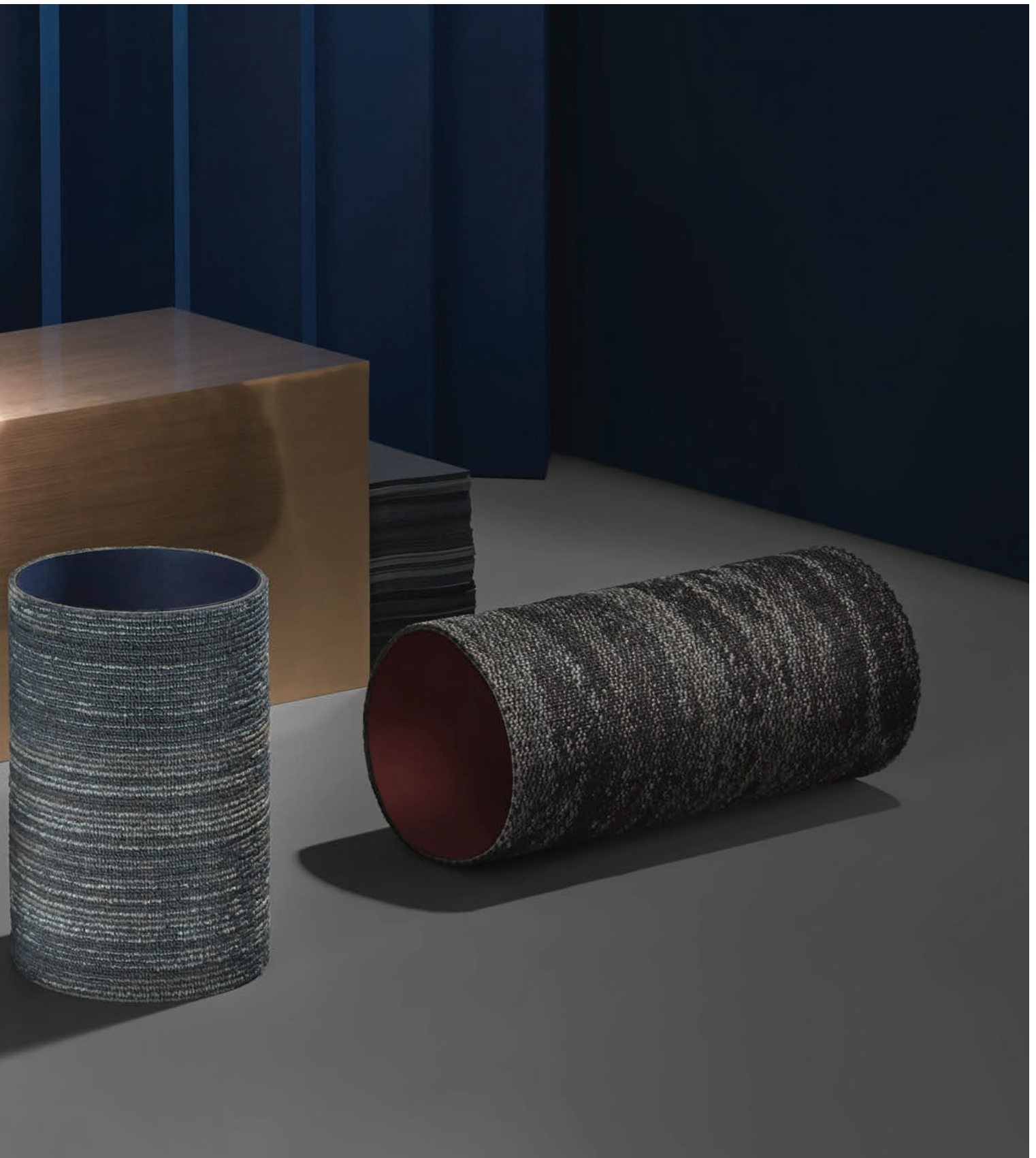
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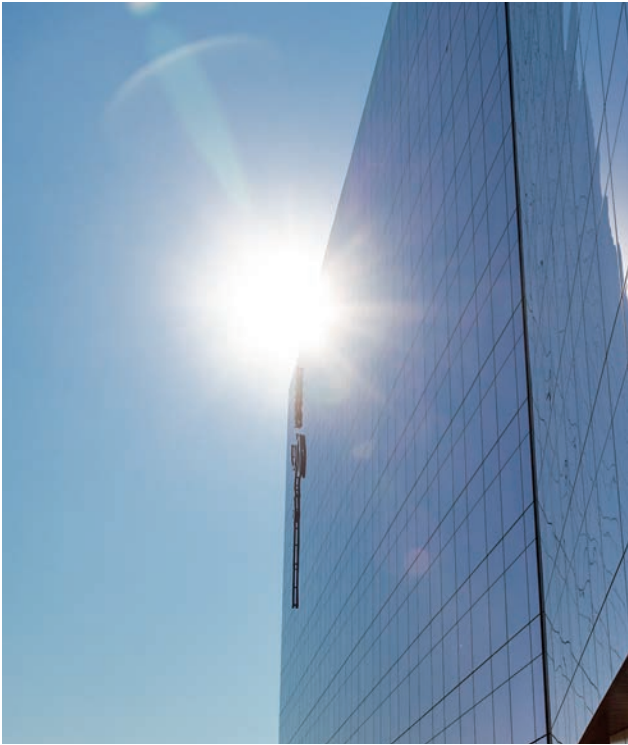
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ACHIEVING A POSITIVE IMPACT

SYSTEMS do not change in isolation and the Green Building Council South Africa's advocacy, certification and training processes are having a positive impact by addressing the design, build and operation phases of the value chain across the African built environment sector. SA now has a high share of green buildings; and this proportion is set to rise with SA's big four cities actively working towards a policy and regulatory framework as part of their C40 membership commitments (which require that new buildings be Net Zero Carbon by 2030). Today, with an ever-maturing green building business case I am confident that this will be achieved.

The right thing to do

We know that building green is the right thing to do. And the increase in Green Star SA-rated buildings is an indication of the GBCSA's success in pairing the case for people and the environment with the commercial case. Given the success in the commercial sector, a significant proportion of future Green Star rated buildings slides towards the residential and public sectors, where the primary operational uses of the buildings are for living, learning, public safety, health care, and the administration of public sector officials; the triple bottom-line considerations are to remain a key motivating factor.

In studies across buildings used for commerce, health care and education, the improved productivity, health and well-being of the people who use them show that they are more productive and have far fewer days off ill.

Globally, buildings generate one third of all carbon emissions through their construction and operation. Almost half the planet's energy and more than half our resources are used by buildings, which also account for 40% of end-user energy consumption and waste generation, and 12% of fresh water usage. We are working hard towards changing this.

Recorded financial savings from 25% to 50% in energy are cited by Green Star SA-rated buildings, not taking into account the clear advantages of tapering the impact of insecure supply and pricing of utility services.

The cost of not going green

In 2014 the average 'green premium' of building sustainably was 5%. Today the IPD South Africa Green Property Index shows Green Star Certified office buildings outperform similar uncertified buildings by 3.8%. It found the better returns were driven by quicker capital growth, lower vacancies and a higher net income growth. These and other findings point to green buildings having a favourable risk profile for investors. Soon, there will be a premium associated with not building green.

The GBCSA will continue the race to zero and work to maximize the positive impact that the green building value chain can have on our people, planet and profits.

Nkosinathi Manzana
Non-Executive Chairman GBCSA

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Striving To Create Liveable Green Spaces in Joburg

Johannesburg City Parks and Zoo's greening initiatives, such as planting and maintaining one of the largest man-made forests in the world, establishing parks and developing green ethos in communities, are creating a city where nature, biodiversity and man can co-exist.



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A MESSAGE FROM THE CEO

WELCOME to the launch edition of GBCSA’s official publication, +Impact (pronounced Positive Impact), published in partnership with Alive2green Projects.

As the golden thread linking and catalysing the built environment sector, the GBCSA works hard to align perspectives with multiple research findings: that every sustainability intervention – irrespective of scale makes a difference. From a certified interior fit-out that increases productivity and well-being to the 400th Green Building Certification we continue to push the sector towards ultimate sustainability

A key objective of +Impact is to give a more strategic voice to GBCSA members and stakeholders by sharing perspectives from across the built environment value chain. It is a platform for sharing of ideas, best practices, challenges and future prospects.

This first edition of +Impact will function as a yearbook for the GBCSA. It features a number of key buildings certified over the year, a lead article on Net Zero buildings, and thought leadership articles that dovetail with the GBCSA convention.

In a sluggish economic environment characterised by policy and political uncertainty, investors tend to hold back and cut upfront development costs – especially if they are building to sell or to let. This is in part a reflection of market awareness, and so our focus with tenants has been around efficiency savings, health, wellness, productivity, and, of course, environmental protection.

But as the name Positive Impact, and the Net Zero theme of both the publication and the GBCSA Convention 2018 attests, pioneering approaches in our sector are maturing from doing less harm, to contributing towards the ecosystems they are based in. And the net positive approach strikes a chord with other stakeholders, even those outside the property sector. Commercial branding now includes the manner in which the business carries itself as a corporate citizen.

Taking the lead

Do not be fooled into thinking the differences made by GBCSA members are negligible. Every small action contributes towards a larger domino effect – consider how today many corporate and retail clients require a GBCSA certification for their office buildings and environments. This is a culture we want to entrench.



MCI recently released findings that Green Star Certified office buildings outperform similar non-certified buildings by 3.8%; it's clear that the commercial sector gets it. Now we are including the residential sector in our focus, where the developers' mind-set is different. Incurring a green premium on a build-to-sell building only makes sense if tenant demand justifies it.

So, we are working towards catalysing that tenant demand. Not just among top and middle consumers, but also those at the bottom of the pyramid where green building practices will make a significant impact on pockets. Savings on electricity and water, gains from a healthy indigenous garden and food crop can contribute significantly towards households on, or below, the breadline.

Transcending our current focus

The work of the GBCSA is to advance sustainability, not simply create green building islands in dirty, carbon-intensive neighbourhoods. And so we need to transcend the green sector's current focus on buildings, to the spaces between them.

You will see echoes of this theme in +Impact and in topics at the convention, where we have the opportunity to meet and discuss pertinent issues that affect our day-to-day operations and long-term trajectory as players in the green building – and precinct – value chain.

Another objective of the GBCSA in launching +Impact is to add a significant communication channel to an existing portfolio that includes the convention and other seminars, and serves to in-house the commercial opportunity associated with an official publication.

Enjoy reading this first edition, and please do send me your thoughts and comments as we go forward with this exciting endeavour.

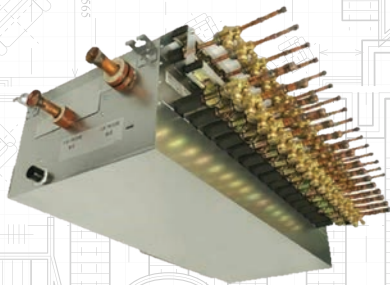
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DOWN TO ZERO: CHANGING THE WORLD, ONE BUILDING AT A TIME

By Alan Cameron

IT'S a matter of shifting perspective, argues sustainability strategist and environmental designer Ed Garrod. It may not be that there is a green building premium so much as there is a sick building discount.

Garrod is one of a growing number of sustainability advocates arguing that green alternatives are not alternatives, as such; and that green designs are no longer a negotiable part of driving economic growth. In pursuit of Net Zero – the acceleration of net zero carbon buildings to 100% by 2050 – it's a crucial mind shift. Garrod and fellow Integral Principal Brenden McEaney have travelled across the globe advancing the idea that harm reduction is not a luxury but a necessity.

Rising demand

It can be a tall order, where there is still a widespread perception that sustainability necessarily comes at a cost. In 2016, a GBCSA-sponsored study with the SA Association of Quantity Surveyors and Pretoria

University found that the cost premium of local green buildings averaged about 5%. But Garrod says mindsets are changing, costs are shifting, and most importantly, demand is rising.

The IPD South Africa Annual Green Property Index for 2017 found Green Star Certified office buildings outperform similar uncertified buildings by 3.8%. Dodge Data & Analytics has previously reported that the number of green buildings is expected to double every three years going forward. "Demand is growing at an incredible rate," Garrod says. According to him, it's being driven by increasing awareness of the benefits of building green: "for our health, for the prosperity of our communities and because of our rapidly changing climate." And, he adds, the ability to deliver green buildings is keeping pace with demand – with new ways of working making it easier to design and build green, and rapidly falling costs for technologies such as renewable energy making it the smart choice economically as well as environmentally.



Ed Garrod



James Law



Luyanda Mphahla

Witness innovations such as James Law's OPod homes, which transform concrete water pipes into micro-apartments; or Luyanda Mphahla's award-winning sand bag house design, first seen in Mitchells Plain, Cape Town. Mphahla, who is director of DesignSpace Africa, and James Law of James Law Cybertecture, share Garrod's view that re-imagining urban spaces is the key to affordable sustainability. "Does architecture have to be permanent?" asks Law. "Does architecture have to be built in the traditional ways, or can we consider new forms of construction? I think somehow the OPod has awakened us to the possibilities of thinking beyond our traditional notions of architecture, and perhaps opened up the chance to look at new solutions."

The real cost

The greatest misconception, argue Law, Mphahla and Garrod, is that green architecture comes at a price. Rather, they argue, it can be a boon both in the corporate and housing sector. Effective designs should maximise natural capital, meaning green buildings don't need to cost more than conventional buildings, Garrod says. "Every one of our projects [at Integral Group] starts with an assumption that there is no extra money for green features. The best green buildings are designed to do more with less, so construction costs can be lower." Moreover, he says, it's not just building costs that should be taken into consideration.

Insulation, for example, has long been used to improve the heating and cooling systems in buildings. Used effectively, insulation can reduce the approximately 60% of wasted energy in home or office heating and cooling. Better insulation can reduce heat exchange, saving energy and reducing emissions. By the same token, retrofitting – though representing an initial investment – can reduce the lifetime operational and environmental cost of a building. Project Drawdown (see page 16) has

argued that retrofitting existing building stock – 99% of which is not green – can provide returns in just five to seven years.

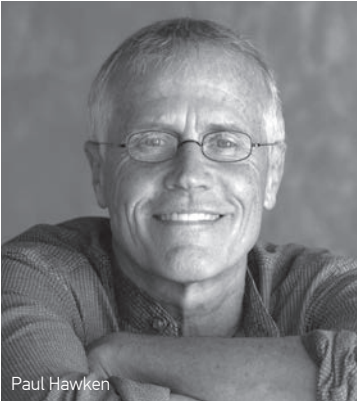
Where buildings are used for industrial purposes, there's an important consideration regarding employee health and safety. In South Africa, the cost of absenteeism is estimated to come in at a whopping R12 billion annually. Worldwide, absenteeism rates vary widely, but in 2013, Forbes reported that the US lost \$84 billion. Remarkably, research conducted by the World Green Building Council found that instituting green building practices had a marked impact on absenteeism, positively impacting both individual businesses and, potentially, economies as a whole.

Boosted well-being

Of the businesses studied, the Akron Children's Hospital achieved \$900 000 in annual energy savings and family satisfaction with the space increased by 67%; Cundall's in the UK reduced absenteeism by 58% and reduced staff turnover by 27%; while Sherwin-Williams in El Salvador saw a 64% reduction in reported allergy problems and a 44% reduction in absenteeism.

Mphahla believes that in economies plagued by inequality, reimagining urban spaces sustainably offers them revival and the opportunity to be busy at all hours. "It brings economic opportunities for retail, rental accommodation, entertainment, which all rebound well-being and sustainable neighbourhoods because people have more to spend," he says.

As for Garrod, he's approaching the Net Zero goal one step at a time. "The impact of a single net zero energy building on climate change is frustratingly small," he says. "But its ability to accelerate change by spreading best practice and inspiring others is huge."



DRAWDOWN COUNTDOWN

By Alan Cameron

“PROJECT DRAWDOWN,” the website introduces itself, “is the most comprehensive plan ever proposed to reverse global warming. We did not make or devise the plan – the plan exists and is being implemented worldwide. It has been difficult to envision this possibility, because the focus is overwhelmingly on the impacts of climate change. We gathered a qualified and diverse group of researchers from around the world to identify, research, and model the 100 most substantive, existing solutions to address climate change. What was uncovered is a path forward that can roll back global greenhouse gas emissions within thirty years.”

Drawdown is that moment in time when the concentration of greenhouse gases in the atmosphere begins to decline annually. And Project Drawdown is one of author, environmentalist and Sustainability Pioneer Paul Hawken’s more recent occupations, as executive director. Drawdown, Hawken said in an interview earlier in 2018, aims to help people who “feel overwhelmed by doom-and-gloom messages” to see that reversing global warming is not just doable, but “bursting with possibility”. Hawken’s description includes “walkable cities, afforestation, bamboo, high-rises built of wood, marine permaculture, multistrata agroforestry, clean cookstoves, plant-rich diets, assisting women smallholders, regenerative agriculture, supporting girls’ ongoing education, smart glass, in-stream hydro, on and on.”

Do the math

It was born, Hawken explains, because in 2001, when the Carbon Mitigation came out of Princeton, 11 out

of 15 proposed solutions could only realistically be proposed by “boards of directors of very conservative, large corporations, and every solution was financially underwater”. Drawdown, he says, provides accurate and accessible information where it is needed most. “People who are earnestly guiding us to climatic stability have not done the math. That’s all we do at Project Drawdown: math.”

Hawken, who authored the groundbreaking *The Ecology of Commerce* in 1993, is known for his philosophy that change does not occur in isolation. “All is connected,” he says. More specifically, he argues, change cannot occur if the solutions are not widely accessible. “Good management is the art of making problems so interesting and their solutions so constructive that everyone wants to get to work and deal with them,” he argues. For Hawken, who has long fought for sustainability to stand front and centre in both business and individual ethics, Drawdown helps to achieve this objective. It makes the solution possible, interesting and accessible. And it lays out a new instruction manual – which he has long argued is necessary.

“This planet came with a set of instructions, but we seem to have misplaced them,” he famously told graduates at the University of Portland in 2009. “Civilisation needs a new operating system.”

Visit <https://www.drawdown.org/> to find out more.

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ZEROING IN

By Christy Borman

Sometimes simply having the goal fosters innovation to meet the challenge. Net Zero targets are inspiring better buildings.

THE Net Zero certification challenge has been taken up with enthusiasm by green building professionals and decision makers, and the Green Building Council SA (GBCSA) has been working with more registered projects under the pilot phase than expected.

With five projects already having received Net Zero certification, and another six registered certifications in the pipeline, Net Zero is already having an impact on South Africa's built environment. "It's been proven

that Net Zero is achievable in a commercial context. The impact and benefits are very significant, as we have seen from some of the projects that have been certified," says GBCSA Managing Executive: Sector Development & Transformation, Manfred Braune.

"If you are really serious about sustainability and making a change, Net Zero should be on the table for every single development, until proven not feasible. In many instances it is entirely possible," says Francois Retief, sustainability consultant from Sow & Reap, which was responsible for the Net Zero Carbon (Level 1) modelled certification at Growthpoint's Greenfield Industrial Park.

“Net Zero Ecology for an urban project is achievable and is transformational for these urban environments. Net Zero Waste is also achievable – even in projects where we were not aiming for it, it has very nearly been achieved. Net Zero Carbon, as has been shown, can be done and can be an incredible business case on its own. With water, it’s an amazing risk mitigation opportunity. If you’re building a building in Cape Town right now and you’ve not at least considered a Net Zero Water strategy, you should change that,” Retief adds.

The GBCSA affirms that Net Zero is about inspiring the ultimate goal of environmentally sustainable development now. With the planetary environmental outlook the way it is, buildings, and the property developers and professionals creating them, should go beyond partial reductions in environmental impact and aim to do zero harm from the outset, or even beyond this, where buildings have a restorative or regenerative effect.

Having tested the Net Zero tool in its pilot version, Version 1 of the Net Zero rating tool is set to be launched

towards the end of the year. It will incorporate the learning gathered through the pilot phase, which ironed out many of the technical details in the manuals through applying it to real projects.

“The tool is much more accessible for projects to target, as it is cost effective and you can spend your money on the project and reap the benefits on renewable energy, water recycling/reusing initiatives rather than on certification costs,” says Annelidé Sherratt from Solid Green Consulting, who worked on the certification of 78 Corlett Drive, which achieved a pilot Net Zero Carbon (Level 1) modelled rating from the GBCSA.

The cost effectiveness and flexibility of Net Zero ratings is definitely attractive, agrees André Harms from Ecolution Consulting. André is working on a number of projects, including another Growthpoint project, The District, in Woodstock, which provides office space for between 700 and 750 people. The project is targeting a Net Zero Water certification and has implemented novel solutions utilising basement seepage water and reverse osmosis filtration systems to meet its targets.



78 Corlett Drive



The District Water Treatment

PHOTO: Ecolution



78 Corlett Drive

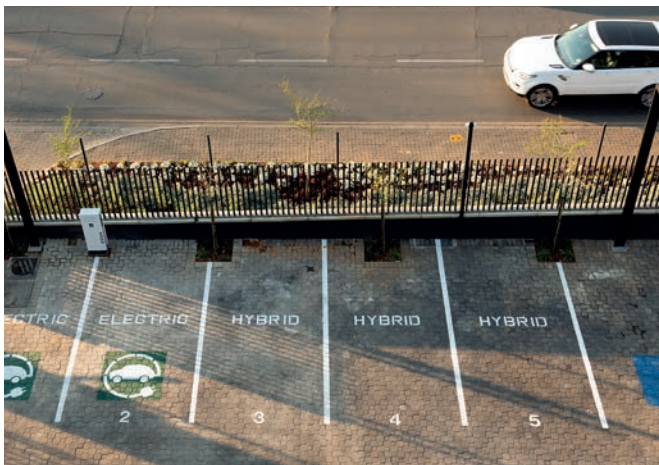


While certifications are happening steadily, the pace at which they happen needs to be ramped up. “Considering the global climate commitments that South Africa has made, we need to see a lot more ambition from broader sections of the property market, over and above what industry leaders are doing already,” says Braune.

The bigger picture

The GBCSA’s Net Zero Carbon certification is driven by broader climate change targets set by global leaders. It is the practical realisation of how the built environment is to play its part in cutting greenhouse gas (GHG) emissions.

Following COP21 in Paris with its ambition to keep global temperature rise below 1.5°C, South Africa’s goal is for GHG emissions to peak between 2020 and 2025, plateau for about ten years and then decline. If there is any hope of this happening, the built environment sector, which globally accounts for at least one third of emissions, will need to dramatically reduce the amount of carbon dioxide emissions it is responsible for.



Aligned with these global and city level goals is the work of the World Green Building Council (WGBC). The WGBC Advancing Net Zero project has set targets for all new buildings to operate at net zero carbon by 2030, and all existing buildings to reach net zero carbon by 2050. The groundwork happening at the GBCSA will help to deliver the independent tools to assess progress toward these goals.

Moving down a level from the overarching global targets, the C40 Cities South Africa New Buildings initiative is working to push South Africa’s four major cities toward net zero carbon by 2030 for all new buildings. The C40 Net Zero Carbon Buildings declaration commits participating cities to the 2030 and 2050 targets. The City of Johannesburg and the City of Tshwane have signed the declaration, and the City of Cape Town and eThekweni are preparing to do the same. The commitment also requires participating cities to establish a roadmap for the commitment to reach net zero carbon buildings and to develop a suite of supporting incentives and programmes. Yearly reports

on progress toward meeting the targets and evaluation on the feasibility reporting on emissions other than just carbon are also required.

For Cape Town, these goals mean enhancing the City’s existing Energy 2040 goals and Sustainable Energy and Climate Action Plan to meet the new levels of ambition by 2030. “The City of Cape Town is considering a range of approaches and interventions to meet the ambitions of the commitments. These include the development of ambitious building energy performance requirements for new buildings and precincts city-wide; retrofit plans for existing buildings, incentive packages to promote net zero carbon buildings and precincts and accelerating the transition to a cleaner energy supply. The City also has two dedicated staff members with specialist expertise working on each of the programmes, South Africa Buildings Programme and the Climate Action Planning in Africa Programme, supported by C40 and Sustainable Energy Africa (SEA),” explains Lesley Sibanda, C40 – SEA technical officer: energy efficiency in new buildings in Cape Town.



Practically, this means that once the proposed new building energy performance requirements come into effect as a by-law or as national building regulations, they would be applicable to all new developments and all projects would need to demonstrate that they achieve net zero carbon before approvals can be granted.

“Considering that the energy used for powering, heating and cooling of buildings accounts for more than 25% of the GHG emissions produced by South African cities, action to make buildings more energy efficient has a huge potential to reduce GHG emission. Expect to see major shifts in our approach to powering our buildings as we become one of the first African Capital Cities to make a clear commitment towards Net Zero Carbon in new buildings by 2030, a development we are so excited about! By virtue of their national status, Capital Cities are home to government departments, diplomatic missions, scientific research and academic institutions. The City of Tshwane is leveraging on strong partnerships with such institutions to influence an uptake of the ambitious target of cutting emissions

in buildings and meet our targets by 2050,” said City of Tshwane’s executive mayor Solly Msimanga after signing the declaration in August 2018.

Pace-setting businesses

The private sector is also providing inspirational examples of taking up the net zero challenge. Under the direction of business revolutionary and environmental envelope-pusher Richard Branson, Virgin Active South Africa has committed to net zero environmental impact by 2030. This means net zero carbon emissions, zero waste to landfill, net zero water waste and paperless and efficient green health clubs: 143 health clubs nationwide, to be precise.

“We made the commitments before the Net Zero rating tools existed and have partnered with the GBCSA to assist with the development of these tools and standards, because we see the value of independent verification of the goals we have set within Virgin Active,” says Virgin Active SA’s head of changing business for good, Wesley Noble.

A formal way to measure progress toward the net zero goal was needed. “We have a rollout plan for at least 40 health clubs to target Net Zero Carbon, which will mean lowering energy consumption as much as possible and using renewable energy to generate the power needed for the clubs,” says Noble.

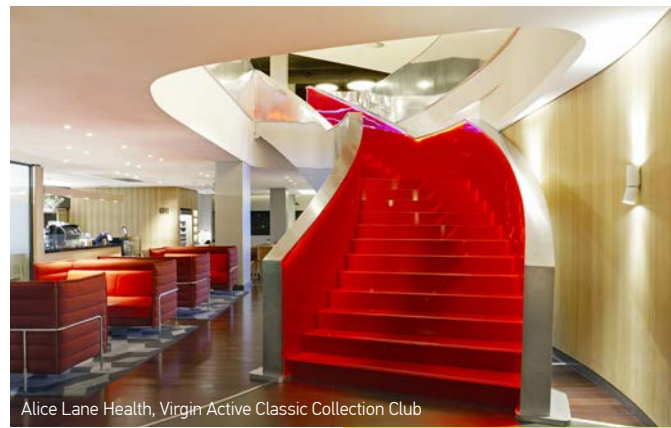
“Because we don’t own any of the facilities where our 143 health clubs are located, it makes sense that the Net Zero certifications can be achieved at an operational level.”

Sometimes it’s more challenging when facilities are leased, but Virgin Active SA has engaged with all landlords, particularly in the Western Cape on water interventions, and aims to be part of the solution. “It’s easier when we are the sole tenant on a property and more difficult in retail spaces, but we want to ensure that everything we achieve in the pilot clubs can be rolled out to clubs nationally,” adds Noble.

Practically, this ambitious commitment means that every single decision and touch point in the company has changed, and is critical. “From where you throw your teabag, to deciding what material new staff uniforms will be made of, the procurement process and where everything will ultimately end up... Our people, suppliers and members are all influenced and are part of the solution.”

An environmental impact task team assesses every aspect of the business. “We have environmental policies and procedures which we constantly work on and are extending to bring our suppliers on board.”

While there has been much global focus on carbon, water is the biggest challenge for Virgin Active SA. “We have to be a good steward, because a lack of water



Alice Lane Health, Virgin Active Classic Collection Club



and water quality is a huge business risk for us, but it’s also a basic human right,” says Noble. There is a water crisis task team (comprising the COO, property director, regional managers, a utility specialist etc) and because of the huge footprint of 143 clubs, the systems must be well entrenched. The team is critical to the implementation of interventions. On the technical side in the Western Cape, things have been driven by Virgin Active’s head of maintenance and engineering, Jaco Wiese, and health and safety manager Chris Evans on the water quality side. They, in turn, have worked with various trusted specialists like Proxa on reverse osmosis, Geoss on groundwater use and Aquamat on greywater.

“We’ve already reduced municipal water usage by 67%, from the 2015 baseline, in the Western Cape. The focus is strongly on reduction coupled with reuse, and we’ve rolled out greywater systems in clubs, made showers and ablutions more efficient. We will be rolling out reverse osmosis filtration plants in the Tygervalley, Constantia, Mitchells Plain and Steenberg clubs,” says Noble.

Some R25 million has been spent on water resilience. Water usage in the Western Cape now stands at an average of 9 litres/member visit, compared with 18 litres/member visit in 2016. The average in the EU is 27 litres/visit.

All the water resilience investments that have been successful in the Western Cape, are now being rolled out in the Eastern Cape, which is also suffering drought conditions.

In addition to the impressive water wins, there are exciting things in the pipeline for waste at Virgin Active. There are two Net Zero Waste certifications planned, with one in progress at the Constantia health club and the other at the Mitchells Plain health club. André Harms from Ecolution Consulting is the AP responsible for these certifications, and explains

that working with the net zero rating tools has been incredibly inspiring because it is a very focused process that yields an impressively positive impact.

The first priority is to divert waste from landfill, and this has meant separation at source and making sure waste is moved into the appropriate streams. In 2015, a waste categorisation study was done and showed that 93% of waste could be diverted. The majority of waste is generated in the cafés where some easy wins could be implemented. All products will be labelled and colour coded, so that people know in which bin to throw different materials.

As a way of offsetting the small percentage of waste that can't be diverted from landfill, the clubs will offer members the opportunity to take their recycling to drop off points at health clubs. This could make a big difference to reluctant recyclers who, because of the

lack of separation at source programmes and depots at a convenient city level, use 'not knowing where to take recycling' as an excuse not to recycle.

“Our strength is that we have in excess of 700 000 members nationally. The greatest impact we can have on the environment is through our members and getting them involved,” says Noble. “If we can change their behaviour, our impact will be greater.”

As with a dedicated and rigorous exercise plan, the ambitious efforts to trim the negative environmental fat are yielding impressive results. In both public and private sectors, serious dedication toward meeting the ambitious net zero targets is visible. Reaching net zero, and in fact going beyond it, has been proven entirely possible in the commercial property sector, and having the goal is inspiring brilliant solutions to the problems faced in the built environment.



Certified projects:

1. 78 Corlett Drive (Net Zero Carbon pilot level 1, modelled. Aiming for As Built, modelled (Read more on p30)
2. Vodafone Site Solution Innovation Centre (Net Positive Ecology pilot, level 1 As Built, modelled, and Net Zero Carbon pilot level 2 As Built, modelled)
3. The Estuaries, Century City (Net Zero Water pilot, level 2, As Built, modelled)
4. Greenfield Industrial Park (Net Zero Carbon pilot level 1, As Built, modelled)
5. Two Dam Sustainable (Net Zero Carbon pilot, level 2, measured)



NET ZERO IN A NUTSHELL

AS with all rating tools, the GBCSA takes guidance from global organisations and works to make them locally appropriate. While the World Green Building Council's Advancing Net Zero project focuses only on carbon, South Africa has taken this further, considering the critical and often interconnected environmental challenges faced in the country. Hence there is also Net Zero certification available in the categories of water, waste and ecology in South Africa.

The GBCSA also differentiates between modelled and measured Net Zero certifications. Modelled is essentially equivalent to a 'Design' or 'As Built' rating in Green Star terms, proving that a new building, or a major refurbishment has been designed or built to meet certain targets, and is thus based on drawings. The 'measured' certification is equivalent to an Existing Building Performance rating in Green Star terms, and evaluates 12 months of operational performance of the occupied space. New and existing buildings as well as precincts and tenants can achieve this certification. The rating expires after three years to ensure that owners are continuously keeping their net zero status intact.

"We created the modelled option because we felt industry should be incentivised and rewarded for designing/building net zero buildings. If it is missed at design it is often much more difficult to retrofit to Net Zero aspirations afterwards. It's not a matter of making it easier to achieve by differentiating and creating levels, it's a matter of making it relevant and applicable to the South African market, where environmentally sustainable design is not the norm," says Braune.

A modelled certification may only be achieved once and is valid for three years and then must be renewed, which means it must be renewed as a measured rating using 12 months of operational consumption data.

The certifications are also further broken down into levels. Level 1 assesses base building (landlord) carbon emission/water consumption/waste to landfill, while Level 2 considers the base building (landlord) and building occupant/tenant carbon emission/water consumption/waste to landfill. Level 3 goes further and analyses buildings on the above plus embodied carbon emissions from the building materials, and Level 4 goes yet another step further to include renovation carbon emissions. Finally, Level 5 considers the carbon emissions associated with the ultimate demolition of the building.

"We are only anticipating certifications at Level 1 and 2 for the moment and near future, but we felt it was important to indicate that there are plans to keep pushing boundaries and see what is ultimately possible. Guidance in the technical manual will be provided as and when demand for this grows for certification on further levels (3-5)," says Braune.

Net Zero Carbon – a building that is highly energy efficient and provides for its energy needs through on-site renewable energy, or if necessary off-site. There should be zero net energy-related carbon emissions, and as a last resort if there are emissions, these should be offset through recognised programmes. Net positive buildings generate more renewable energy than is consumed on site.

Net Zero Water – a highly water-efficient building with reduced consumption, which also harvests, recycles and reuses water, so that the amount of water consumed is the same as the amount of water produced. Net positive buildings recycle or produce more water than is consumed.

Net Zero Waste – A building with zero solid waste sent to landfill, through reducing, reusing and recovering waste streams to convert them to valuable resources. A net positive building takes additional waste from other sites and diverts it from landfill.

Net Zero Ecology – For greenfield sites; a project that does not reduce the ecological value of the site during development. Net positive buildings increase the ecological value of the site or development, or brownfield site. Net Zero is not applicable to brownfield sites, only Net Positive.

All projects should follow the inverted pyramid or hierarchy of preferred pathways to net zero. This always places efficiency first, then on-site solutions, then off-site solutions, and finally, the least preferred method, which is through offsets through the voluntary carbon trading market.

Net Zero certifications can be submitted as part of a Green Star SA, EDGE or EWP rating, or they can be done as standalone submissions. A Net Zero submission must be submitted by a Net Zero Accredited Professional (AP) and training is provided through the Net Zero Accredited Professional (AP) workshop with the GBCSA. Annelidé Sherratt from Solid Green Consulting, who worked on the Net Zero certification for 78 Corlett Drive, was one of the first registered Net Zero AP's in South Africa. She says the half-day workshop and open-book exam is also a great opportunity to meet up with like-minded green building enthusiasts and discuss ideas.

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A TALE OF TWO TOWERS

By Mary Anne Constable

The MARC on 129 Rivonia Road is making its mark on the mixed-used development landscape in Sandton.

ON the corner of Maude Street and Rivonia Road, two tall towers rise to meet the street edge, enfolding between them a pedestrian-friendly realm surrounded by a two-storey retail centre. They form a prominent part of a new mixed-use development in Sandton called The MARC and have achieved 4-star and 5-star GBSCA Green Star SA Office Design ratings.

The MARC (Maude and Rivonia Corner) is situated on the site of the old Village Walk Shopping Centre in Sandton. It is located centrally in an already

commercial district, a few hundred metres from the Gautrain station, and along Maude Street – one of Sandton’s key pedestrian routes. Village Walk was a well-established centre and landmark in the area for several decades, prior to its eventual struggle to keep up with the fast-paced evolving landscape of Sandton and the expectations of the market, explains Barend de Loor from The MARC’s developer, Eris Property Group. After countless iterations for the design of a new mixed-use development were presented to the owners, The MARC came to life, and although already partially operational, will near full completion towards the end 2018.

The MARC brings many additional services to the area including two floors of retail space (15 000 m²) comprising shops, restaurants, a Pick n Pay and a Planet

Fitness gym. These are all accessed through a series of pedestrian walkways and “urban” spaces which are surrounded by the building envelope. Serviced by a 6.5-floor super-basement, the two towers which mark the corner of the site and create an iconic presence, provide 62 000m² of office space on 17 floors (Tower 1) and 12 floors (Tower 2).

Shooting for the stars

Eris Property Group endeavours to target 4-star Green Star SA ratings as a minimum benchmark for each of its developments and where possible go over and above this, and The MARC was no exception. This kind of approach is spreading across the property industry, according to de Loor: “Over the last few years, the paradigm shift with many clients and businesses initially questioning whether going green was required, has now evolved to them rather asking: ‘To what extent of green should one go?’”.

Green premiums are reducing and “with the market placing a greater emphasis on sustainability, the implementation of green initiatives and technologies is becoming the industry standard,” he adds. Tower 1 achieved a 4-star Office Design rating but for Tower 2, during the design process it was found that planned green initiatives exceeded the requirements for 4-stars, therefore a 5-star rating was targeted.

Architecturally the towers are treated quite differently. The taller of the two, Tower 1, has a rectangular plan which is elongated in the direction of Maude Street, creating a slimmer profile from the Rivonia Road side.

Large leaning concrete columns at its base, which span several floors, create an elegant sense of movement in what could feel like a static environment.

Tower 2, referred to as “the jewel”, boasts a golden curved facade formed by triangular glass segments, around an oval floor plate. It is connected at its base to a more traditional rectangular building known as “the jewellery box”. Of the two it is the most striking, and was influenced by a desire to visually set it apart from other corporate buildings in the area by exploring shape and colour, says lead architect Bob von Beber from Boogertman and Partners.

The floors of the towers intersect at multi-storey atria where the main entrances are situated off a grand urban staircase that ascends from the corner of the site. At the top of the grand stair the pedestrian realm gives access to the retail floors.

The impact of the building facades

The high-performance double glazed facades form a major component of each tower and also perform well environmentally. While Tower 1 is enveloped by a more standard full-height curtain wall with alternating spandrel panels, Tower 2’s curved form was generated by symmetric double spirals in plan and the skin consists of interlocking gold and silver glass triangular facets. “In contrast to a typical unitised facade with one panel per floor height, the jewel facade is made up of four interlocking units per floor,” says facade engineer Matilde Tellier from Arup, and the result is a delicate patterned skin – quite otherworldly.





Arup ran multiple simulations to understand the performance of the facades, and their overall impact on the buildings' comfort levels and expected energy consumption. "The problem of designing a building envelope involves a fascinating process of compromise between the need to maximise the utilisation of daylight, reduce indoor solar gain, reduce costs, improve comfort, and improve aesthetics, subject to a set of project-specific constraints. The quest for a solution requires making trade-offs among the available options," says Tellier. Greg Rice, sustainability consultant from WSP, concurs: "It's often a challenge meeting the architect's vision, as well as the comfort, energy and user experience – essentially the sustainability consultant's vision." The team are extremely proud of how the building looks and is expected to perform, he adds.

Managing water and waste

Beyond the facades, and the carefully designed pedestrian realm, the project sports several other green accolades which have earned it its well-deserved Green Star status. Aside from the obvious considerations (such as energy efficient HVAC and low-energy lighting) one often overlooked yet vitally important aspect, is the on-site management of water and waste during the building construction process and this has been managed particularly well at The MARC.

The brownfield project required the demolition of the existing Village Walk building which generated a lot of waste material. At least 85% of the demolition rubble was recycled as crushed aggregate for the production of pre-cast concrete products, explains environmental officer, Ricky Schnetler, from contractors Aveng Grinaker-Ita. Reinforcing steel used in the concrete frame structure has a post-consumer recycled content of over 90%, and therefore a lower embodied energy.

"In a water scarce country, it is of utmost importance that new technologies or methods are implemented to reduce the amount of waste generated as well as reduce the demand on municipal water," says Schnetler, particularly in the building industry which contributes to 40% consumption of natural resources. Groundwater pumped from the excavated areas (basements) was stored on site and reused for flushing of toilets and dust suppression. A wastewater purification and recycling system was implemented on site, which is also currently the subject of Schnetler's MSc Geohydrology thesis. This system purifies cement-contaminated effluent and the results indicate that "the wastewater purified is 'clean' enough to reuse for the batching of cement or concrete, and will more specifically yield improved results in the concrete's durability, strength and setting time". Schnetler is working closely with WSP and GBCSA to recognise this process by adding a wastewater credit into the Green Star SA Office As Built rating system to reward construction companies for implementing this environmentally sustainable system during the construction process.

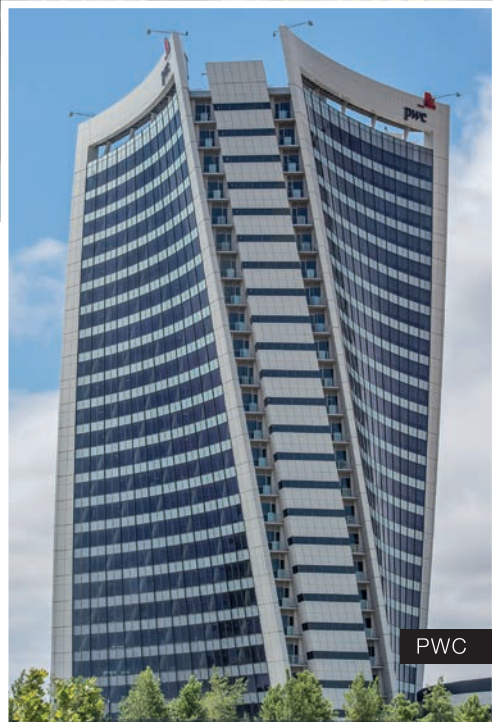
Unique, yet integrated

As far as contemporary mixed-use developments go, The MARC is particularly eye-catching says de Loor, and "is a testament to human ingenuity at its finest" – a beautiful and sculptural response to some pragmatic requirements. Despite each tower being quite unique, they are still integrated within the greater development, and the pedestrian environment in the centre has reinforced some key movement routes, successfully knitting the development into the Sandton urban fabric.

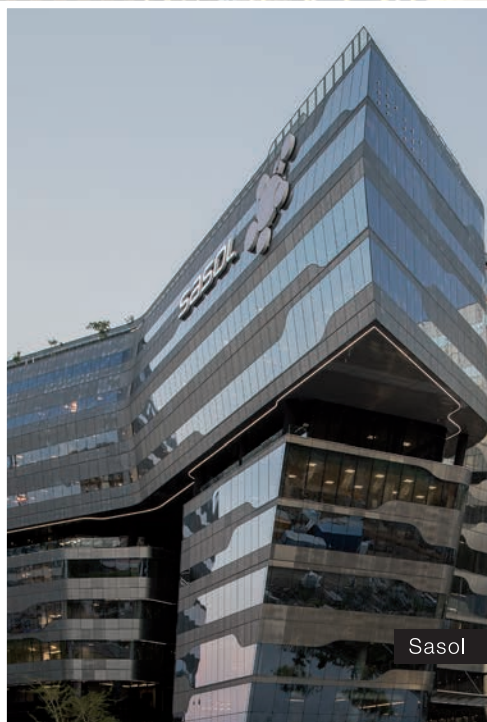
The MARC shows that beauty and sustainability don't have to be two separate entities. It is key initiatives like these that will move the building industry forward onto a more sustainable path.



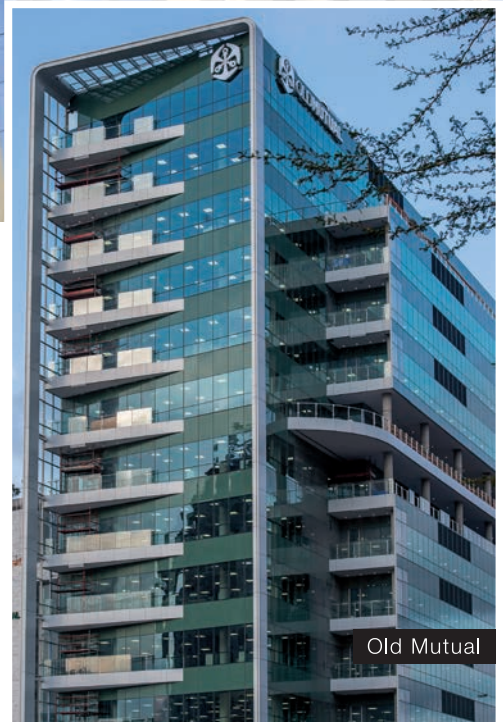
129 Rivonia Road



PwC



Sasol



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STARTING AT ZERO

By Christy Borman

The new development at 78 Corlett Drive puts environmental sustainability at its heart from the start.

AIMING for the sustainability stars, 78 Corlett Drive – the new multi-tenant office space in Johannesburg, has already achieved two ambitious green building certifications, and has two more Green Star and Net Zero certifications in sight. These remarkable certifications (6 Star Office Design v1.1, aiming for 6 Star Office As Built v1.1, Net Zero carbon modelled Design, and aiming for Net Zero carbon modelled As Built) show that every effort was made, right from the start, to ensure that this building is extraordinary. As the building owner, project manager and main contractor, Legaro Properties is looking to position itself as a specialist in providing green buildings, and thus aimed high with 78 Corlett.

The two-storey gem, designed by Daffonchio & Associates Architects comprises an upper ground floor with a mix of cellular offices, co-working spaces and social and formal meeting spaces, centred around a coffee bar within a naturally lit, triple volume atrium. The first floor is home to more co-working spaces and larger formal offices for a variety of clients. Legaro itself will be headquartered here.

Walking the talk

“We congratulate Legaro on the clear demonstration of their commitment to environmental sustainability, and the fact that as a developer they want their own office space to have a small carbon footprint. It is an excellent example of how commercial office buildings can be incredibly energy efficient and include renewable energy to the point that their net carbon impact is neutralised. The combination of a 6 Star rating and a Net Zero Carbon rating illustrates how important integrated design is, and how this results in better buildings all round. It would be wonderful if the team is able to also then consider and pursue the Net Zero Carbon rating during operation. Congratulations to all involved on the project!” enthused Manfred Braune, GBCSA Managing Executive: Sector Development & Transformation.

The accredited professional on the project, Annelidé Sherratt from Solid Green Consulting says that the excitement around the project has been truly encouraging. Working with a client whose ambition from the outset was to strive for the highest green ratings possible, has led to an impressive result. She explains that striving for both Green Star and Net Zero ratings was tough, but ultimately brought out the best in both tools, benefitting the project, and will greatly benefit the tenants who will occupy the

building. “A Net Zero certification is more challenging in terms of technical knowledge, but definitely more rewarding for the project, in my experience. You can almost get full points for the energy category in Green Star when targeting a Net Zero carbon certification,” Sherratt explains.

Targeting innovation

Roger Brookes, projects director at Legaro Properties says that while design of a green building is relatively easy on paper, actual execution of the design and making it a reality was the highlight of the project for him. “From a technical point of view there weren’t too many hurdles to overcome but from the admin and design point of view we had to consult with our professional team to guide us in the right direction,” he adds.

At 78 Corlett, the team was also able to target certain innovation points under the Green Star rating, thanks to some of the pioneering initiatives aimed at achieving Net Zero carbon certification. The project achieved innovation points for: targeting both the Green Star and Net Zero certification; completing the financial transparency template to calculate the “green building cost premium” of the project; choosing a site that is well located and within walking distance of eight amenities; for producing more energy with renewables than is required for daily energy usage; and for promoting active staff and building users by positioning the stairwell in a prominent location to encourage the use of stairs rather than the lift which uses energy.

Efficiency first

The ‘preferred pathways’ associated with reaching net zero always start with efficiency. The first port of call was making sure the office building had the lowest possible peak electrical demand.

Detailed energy modelling of the building generated in the design stages helped to ensure this maximum level of energy efficiency.

The very first impression of the building engages the onlooker with its aesthetic that also serves a strong green purpose. The shading louvres act as a dynamic facade element and passive shading device. They allow for natural light to pervade the building, without the associated heat and glare, which have a negative impact on working environments. “The modelling really informs everything, and it guides the team on how to build. It showed what kind of louvres we should have on each side of the building and what the glass specs should be,” explains Sherratt. The north facade features external fixed shading, while the east and west sides of the building have movable shading blinds, and mesh allows vegetation to grow as shading on the south side of the building. The atrium also optimises natural light.

Once natural light was optimised through building design, efficient lights and sensors were prioritised. When compared to a notional building model’s SANS 10400 energy requirements, 78 Corlett’s design showed an improvement of 100%. Energy is saved by ensuring

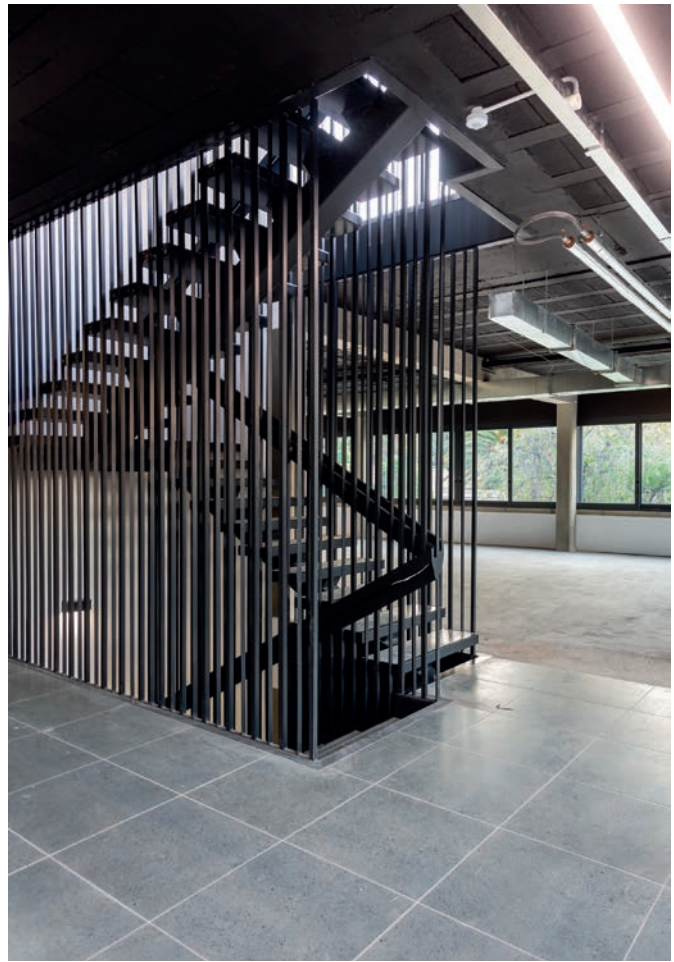


lighting is not over-designed and providing individual switches for all individual or enclosed spaces for greater flexibility.

As a word of advice, Brookes cautions teams to ensure that designs are approved before starting with the project to avoid any design changes during construction.

Efficient HVAC and fans, air-cooled chillers and hideaway fan coil units enabled a 25% energy efficiency saving when compared with a notional building. Hot water is provided through small high performance electric under-counter geysers installed in each bathroom, which also mitigate the need for long stretches of insulated hot water pipes. The project was also designed to accommodate solar, and a 55kWp photovoltaic rooftop installation provides enough renewable energy for the project to meet its everyday needs. It has an annual output of 92 000kWh. Major energy consuming systems are monitored through sub-metering. This information gathering is vital for understanding and properly managing the building systems, and also for the submission of data required for achieving the measured Net Zero certification.

With so much focus on achieving the highest possible sustainability goals with this development, it is anticipated that not only the building, but the occupants working there, will flourish as they settle into this inspired new space.



FUTURE CITIES

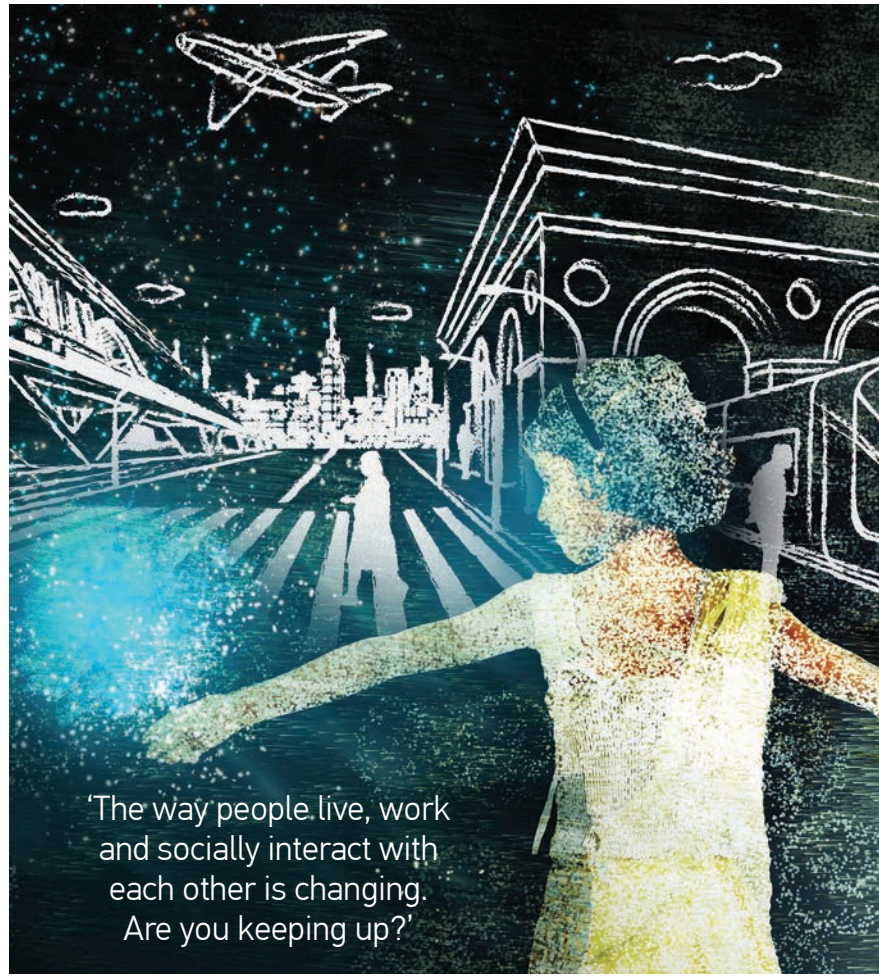
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'The way people live, work and socially interact with each other is changing. Are you keeping up?'

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DISCOVERING THE NEW WAVE OF DESIGN FOR WELL-BEING

By Linda Doke

Discovery's global headquarters, 1 Discovery Place, was designed to personify the essence of what the South African financial services giant stands for, epitomising the importance of well-being achieved through a balanced lifestyle.

COVERING 120 000m² in the heart of Sandton, 1 Discovery Place is the largest single-tenanted commercial building in the southern hemisphere, and brings together close to 7 000 employees into a workspace that is designed to reflect and embody a thriving, healthy internal environment.

The building comprises three linked office towers, each with a ground floor and eight office floors, with an activated roof level spanning the entire structure.

Imagined from the inside out

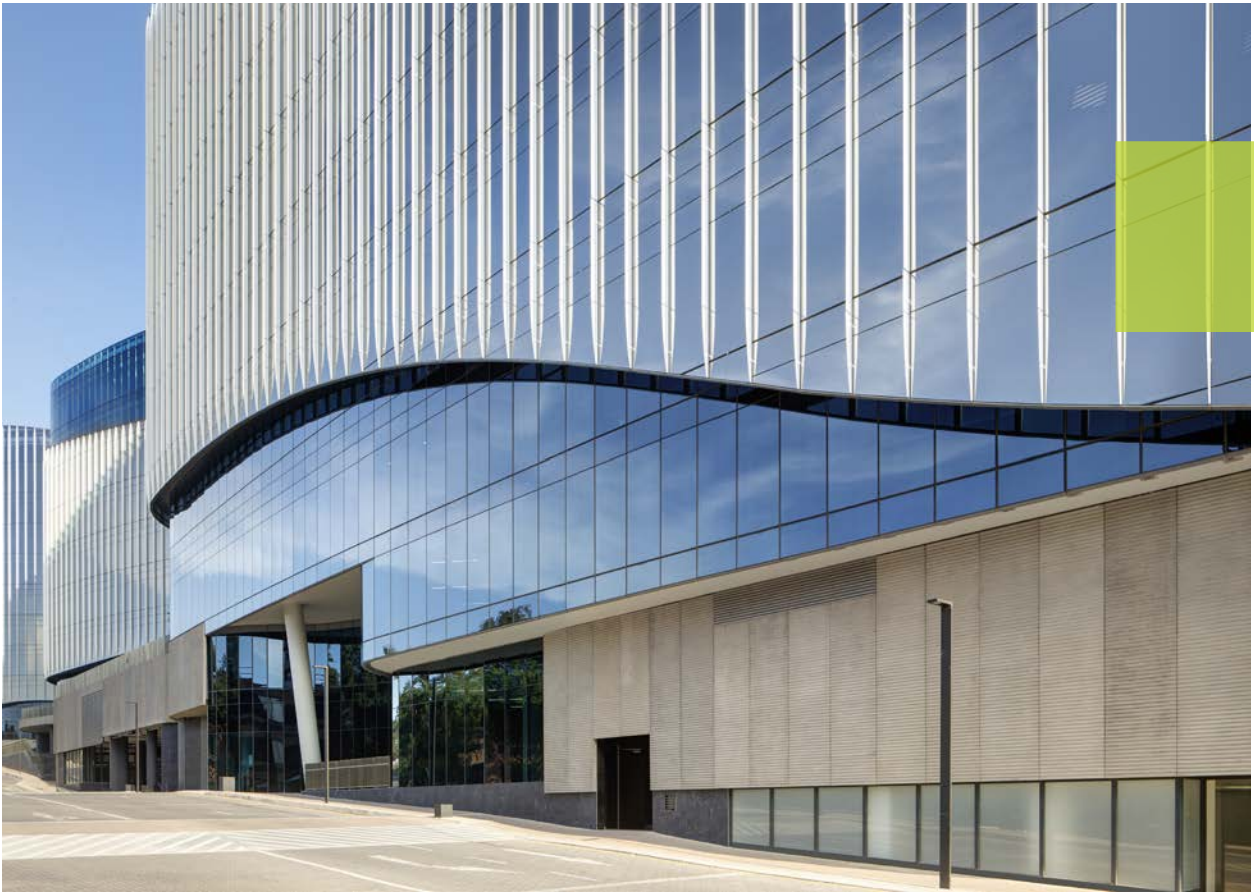
The building achieved its GBCSA 5-star Green Star design rating shortly after completion in 2017.

Project architect Alasdair Forsyth of Boogertman +Partners describes how the building was imagined from the inside out, creating a dynamic free-flowing internal space that promotes collaboration, innovation and business efficiency.

“For us, the architectural expression of wellness was through access to natural light, sunlight and to the blue sky, so the interior of the building shows there's a world beyond the office. We used this concept as the planning driver for the design of the rest of the building, wrapping the office space around a core central area, allowing the importance of access to light and vistas to define the form,” explains Forsyth.

Essentially consisting of two large atria joined by a large central concourse, the design typifies an interchange between the company and its clients, topped by a 2 800m² glazed glass roof allowing an abundance of natural light and a sense of openness to the building's interior.

Described as a spaceship set to sail, the roof has been landscaped, or xeriscaped, using indigenous



drought-resistant plants, and is home to a running track, fully equipped Vitality Gym, yoga deck and various multipurpose courts for use by employees.

“The building was designed as a physical manifestation of the company’s core purpose, emphasising the importance of a healthy and active lifestyle. It has been quite surprising to see how well used the roof is on a day-to-day basis, with employees not only using it for exercise, but also as a safe and pleasant environment to meander during lunchbreak, as people do in a park. The idea that you can integrate a walk into your working day was a concept we were keen on, and it has been far more successful than we even anticipated,” says Forsyth.

Integrating both energising and peaceful environments

The building’s interior features were designed by Paragon Interface, under director Claire D’Adorante, in close collaboration with the project design, to achieve conceptual integration of the exterior and interior with the organisation’s cultural values of lifestyle health and wellness.

D’Adorante explains how the building was designed so that people can keep active at work. The movement of people through the building was carefully considered, and there are multiple opportunities to circulate vertically between floors using open-aspect stairs, escalators and elevators.

“The design of the two atria followed the concept of wellness and holistic living. The two different sized atria are designed to create two different experiences: the larger atrium aims to create an active, energising space, while the smaller atrium a calming, peaceful kind of environment,” says D’Adorante.

“The concourse in the centre can be seen as the connective tissue between them, representing the importance of creating balance in our lives through the connection between active and calming elements.”

The interior fit-out, also at the hand of Paragon Interiors, has a strong emphasis on acoustic quality throughout the office space and across the building’s floor space, using Class A ceiling tiles, furnishings and soft edges to the atria using foliage. A trellis wall of greenery provides an abundant backdrop to the main reception, and the Discovery logo is integrated amidst the greenery, conceptually integrating the brand with nature and wellness.

Full – yet not crowded

Despite being fairly close to its maximum capacity of about 10 000 occupants, the way the 12 000m² of floorspace is planned presents the feeling that the building is only ever half-full.

Forsyth considers this aspect to be one of the great successes of the design – the building never feels

crowded. There are public spaces across the ground floor, centralised meeting rooms, and numerous coffee shops throughout the building. “I believe [the] scale of the project gave us the opportunity to create ‘breathing room’ around the typical work space. Make no mistake, the workspaces are quite efficiently planned, but they don’t feel squashed. The wins we had were the large atria, which allow in natural light; and the 3m high ceilings throughout. You have a visual of an atrium from wherever you are, which creates a sense of space and openness. This achieves a clever balance, so that you never feel you’re in an enormous place, nor do you feel cooped up,” says Forsyth.

Innovation, sustainability, performance, and well-being drove design and construction

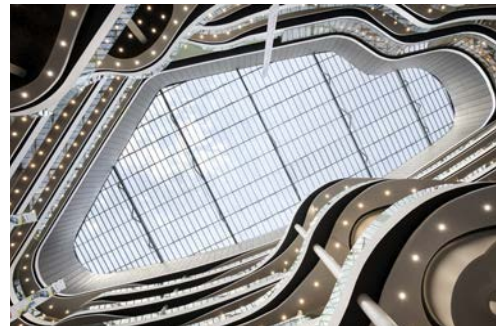
“Since inception of the project, the intent of developers Growthpoint and Zenprop, with Discovery as tenant, was to design and construct a building that holds the highest sustainability credentials, and that demonstrates leadership in the transformation of the South African real estate industry,” says Yovka Raytcheva-Schaap, associate from Aurecon’s Building Unit and the GCSA accredited professional involved in the project.

Aurecon was responsible for the design and construction supervision of the heating, ventilation and air-conditioning (HVAC) installations, as well environmentally sustainable design (ESD) consulting.

Raytcheva-Schaap adds that innovation, sustainability, optimal performance and the occupants’ well-being were the core principles driving design and construction decisions.

The project team’s remarkable journey commenced with learning from the best building examples in Australia. More than 20 buildings were visited to gain deep understanding of the emerging trends in sustainability, innovations and well-being, the result of which were some of the building’s major design features, such as the extensive atria with skylights, activity based and multifunctional workspaces, and fully activated roof areas.

The design of the HVAC services was also aligned with the same fundamental principles. Air-conditioning is provided by a large central plant that incorporates full air side economy cycles and CO₂ demand control of fresh air. The plant has a mix of air-cooled and water-cooled chillers, allowing the building to operate

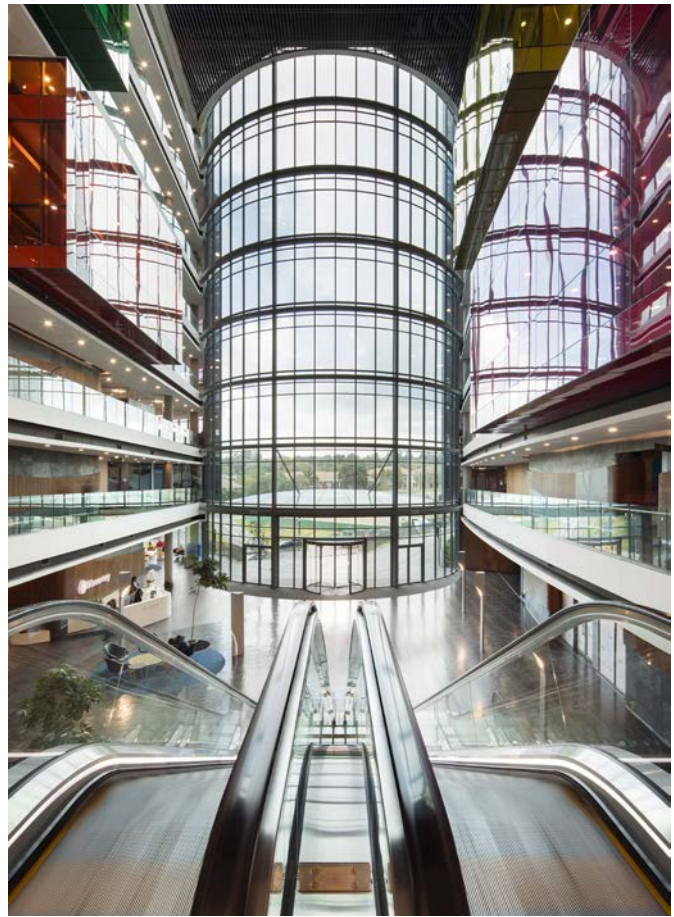


in either an energy-saving mode or a water-saving mode. The basement parking extraction is equipped with CO₂ demand control, allowing it to operate very efficiently.

Other significant innovations implemented in the project include:

- An extensive computational fluid dynamics (CFD) analysis to gain insight into the performance of the building envelope under peak conditions, and to inform the selection of suitable glazing and shading elements for optimal occupants' thermal comfort, access to daylight and minimisation of glare;
- Strategic involvement from Discovery's facilities management team throughout the project;
- Innovative mechanism for detection of refrigerant leak from the chillers;
- Study of building integrated photovoltaics by the University of Johannesburg; and
- Implementation of learning resources for building occupants and visitors.

"1 Discovery Place is both a South African and a global landmark of sustainable development, occupants' well-being and seamless integration to the wider urban areas," concludes Raytcheva-Schaap.





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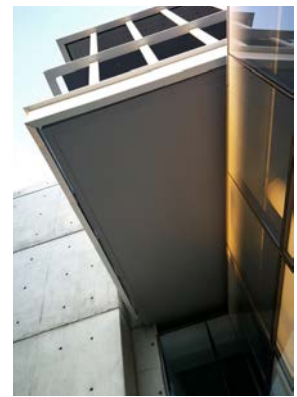
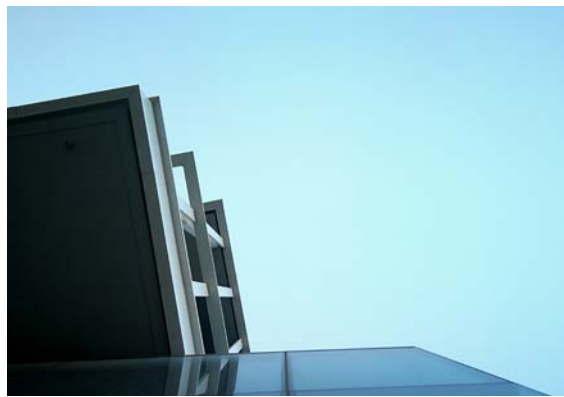
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PHOTOS: Dave Southwood and Lucienne Myburgh

INSPIRING COLLABORATION, CREATIVITY AND WELL-BEING

By Gill Gernetzky

Discovery Limited is the poster child for health and wellness in South Africa, so it makes sense that their new green offices in Century City would create an environment that is centred on occupants' health and well-being.

IN May this year, the company moved their Cape Town employees to the new Sable Park development, which was certified a 5-star Green Star building by the GBCSA in March. Discovery is the main tenant of one of the two new office blocks, housing roughly 900 employees.

An improved working environment

Like 1 Discovery Place in Sandton, Johannesburg, these offices were designed to provide optimal space for collaboration, creativity and wellbeing, and inspire innovation, uniting all employees under one roof. The Cape Town employees were moved from two offices across Cape Town into this one work space as part of the company's commitment to keeping all their people together and to creating open spaces that closer align to their values.

David Pierre-Eugene, Head of Discovery's Group Facilities says that, apart from the positive impact that this building has on the environment – ultimately using

less water and energy, producing less waste and having a lower carbon footprint – the building has substantially improved the working environment for its occupants. “The floor-to-ceiling glazing creates an abundance of natural light throughout the day which contributes to a sense of well-being amongst employees.”

A focus on water, energy and waste

Among the green building design measures incorporated into the building, there was a key focus on saving water, given the constraints on this critical resource particularly in the Western Cape. The water conservation features include:

- Rainwater harvesting for flushing toilets
- Water-efficient fittings for taps, urinals and toilets
- Recapturing fire test water and water from the HVAC cooling towers, to supplement rainwater for flushing toilets
- Landscaping with local indigenous plants with reduced irrigation requirements
- Using treated effluent from a wastewater facility for landscape irrigation and cooling towers

With a similar focus on energy consumption and waste management, various features have been incorporated into the building that are helping to achieve efficiency. In addition to optimising daylight, the lighting uses a combination of daylight sensor controlled dimmers and efficient fittings. The HVAC (air conditioning) system is run by efficient water-cooled chillers, serving intelligent air handling units designed to monitor the outside and indoor air temperatures and maximise opportunities presented by the differences in the temperatures. To promote recycling, additional space has been provided for central collection, sorting and storage of recyclables alongside the normal refuse storage.

As part of Discovery’s environmental sustainability focus, the new office promotes a paperless workspace. Interestingly, going paperless allowed Discovery to recycle 31 tons of paper and donate items to 16 schools, four Meals on Wheels branches, and three underprivileged crèches.

Healthier, happier staff are more productive

According to the World Green Building Council’s Building the Business Case: Health, Well-being and Productivity in Green Offices report, released in October 2016, occupying green office space keeps staff healthier and happier, improving productivity and



PHOTO: Dave Southwood

boosting businesses' bottom line. Research conducted among 15 case studies revealed some astounding findings, such as a two-thirds reduction in sick days among employees and a 200% increase on productivity in a call centre. This is backed up by a 2014 study published in the Journal of Labour Economics, which showed as much as a 20% increase in productivity when people were happy. Internal research conducted at Discovery has shown that fit, healthy and happy employees are almost 16% more productive.

Discovery was closely involved with the design and space planning of the interiors of their new Cape Town office, introducing many agile areas to facilitate collaboration across teams.

“Our employees have reported walking more, and this was an important principle for us to achieve through the design of the building – to ensure movement in line with our goal to encourage healthier living. Everyone is enjoying using the pause areas, prayer facilities and other on-site lifestyle services,” says Pierre-Eugene.

Encouraging alternative, and healthier, modes of transport to and from the building was equally important to Discovery, and for many who wish to cycle to work there are 180 bicycle racks provided on the first level of parking. There are also 16 bays reserved for those using fuel hybrid or alternative fuel vehicles.

The new building includes a state-of-the-art client centre that offers wellness assessments and personal online assistance with the suite of Discovery's products, from medical aid to investments, life insurance and Vitality.

Living out Discovery's core values

“Building on the success of 1 Discovery Place, uniting all of our Cape Town employees at Sable Park has been instrumental in achieving a single culture across the Group. Our commitment to healthier living, and excellence in sustainability, is now evidenced by our business being tenanted in two 5-star Green Star rated buildings,” added Pierre-Eugene.



PHOTOS: Dave Southwood



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HOW THE V&A IS UNLOCKING BENEFITS THROUGH THE EBP TOOL

By Liesl Hattingh

Understanding how people experience The Watershed has been essential in delivering meaningful interventions.

IT is appropriate that The Watershed in Cape Town’s V&A Waterfront houses a fair number of tenants who trade in products that are made from upcycled waste. “It symbolises that waste is a commodity,” says Petro Myburgh, operations manager for cleaning, waste and landscaping at the V&A. Consider then, that the building itself is a fine example of the preservation of heritage with the original structure – including timber floor and roof – having been retained during the redevelopment of what was known as The Blue Shed in 2014.

At the time, the project aimed at a Green Star Interiors rating, but the tool was still in development. Today though, it boasts a world-leading 6-star Green Star Existing Building Performance (EBP) rating.

Francois Retief, sustainability consultant at Sow & Reap and Accredited Professional (AP) on the project, explains EBP’s value, and why it is a good fit here: “Why do I want to have a green building? Save money on water and energy, be more marketable to tenants and reduce churn, be more marketable to both the public and to investors as a quality asset. How do you know whether you are getting any of this? EBP tells you... This tool gives insight into how the building works that you don’t get in other ways.”

Understanding how people experience a building

EBP helps to close the gap between benefits targeted during design and construction, and actual operation. It also puts the people back into the building. “Designing on paper is one thing, but people are so complex – you need to get on the ground to see how they use a building.”

Extensive surveying forms an important source of information in the EBP tool, highlighting how users experience the building as well as its operational efficiency. This allows the landlord and operations team to come up with meaningful interventions to both deliver targeted benefits and prioritise work in a way that keeps tenants happy. In the case of The Watershed, this means 243 sub-leasing tenants along with 94 sub-leasing tenants in Workshop 17’s collaborative space. Surveys often focus on thermal and acoustic comfort, says Mareli Cloete, Safety, Health & Environmental Manager as well as head of sustainability at the V&A Waterfront. “Often we get positive feedback; often it’s perception, for example thermal comfort.”

Managing expectations, weighing trade-offs

James du Plessis, project architect and associate at Wolff Architects, says that The Watershed was designed as an “indoor street” akin to international markets. Removing the openings at both ends and adding rows of skylights established a clear visual direction through the building to connect the aquarium and rest of the Waterfront. It also allows most of the building to be naturally ventilated. “Investment in severely conditioned spaces were concentrated to

meeting areas and office space such as for Workshop 17,” he explains. Spaces in between are under the roof but treated as outdoor space.

From the outset, the developer and architect were clear that an exterior environment would never have the comfort levels of a regular interior environment, and that people would need to adapt their expectations. “It’s often a trade-off between original features retained in design and operational efficiency,” adds Cloete. “We wanted to maintain as much of the original feeling and structure and façade of the building as possible.” Seen through the EBP tool, the question becomes: “It is amazing that this retail space is naturally ventilated, but does that clash with thermal comfort?”

Retief unpacks the process: “Through extensive surveying, we understood that users were feeling cold at certain times. As part of the tool, you measure, which is when we could see that the temperature was not so low, but that it was more of a draft issue as a result of air moving from cold to warm in some parts of the building.” On some days, driving rain also penetrated up to 10m into the building. A sensible intervention then was to install louvres of fireproof glass on the side of the building where air is drawn in. Infrared heaters were also added for good measure. The glass louvres retain the daylight penetration and smoke ventilation, but assist in reducing the draft.

Similarly, the building was expected to perform well in energy use, thanks to natural ventilation and a 300 kW rooftop solar plant. However, applying the EBP tool highlighted that the solar power generated fed directly into the precinct grid instead of reducing The Watershed’s energy requirements. Some rewriting was





needed, Retief says, and the building now consumes less than half of the energy used by a similar retail centre.

Surveys reveal growing success in engagement

“Speaking to people also helps you understand whether they actually use the public transport and how they engage with recycling, for example,” he adds. A staggering 98% of The Watershed’s tenants use transport other than single occupant cars according to the surveys, says Cloete. Aside from the MyCiti bus stop right outside the centre, the precinct also prioritises cycling, walking and charging of electric vehicles.

There has been reasonable success on the waste side, which is managed at an on-site waste processing and recycling facility that services the whole precinct. Myburgh points out that having the refuse collection area outside of The Watershed can be challenging in getting good cooperation from tenants. Efforts to improve recycling rates through training and awareness campaigns are ongoing, she adds. In particular, the efficient separation of organic waste from restaurants in order to reduce mixed waste to landfill is receiving attention.

Another particularly successful aspect of The Watershed is its socio-economic impact. Every tenant is an SMME, mostly women-owned, with

a large number offering local African products. Workshop 17 is also an SMME incubator. “These small businesses contribute 1% of the Waterfront’s total turnover,” Cloete says. The project contributes public infrastructure to the precinct such as the adjacent open play area, which earned credits for going beyond the tenants’ needs. As for all Green Star rated buildings in the precinct, it, in turn, relies heavily on green infrastructure supplied by the precinct for baseline credits.

EBP helps to determine where budgets are best spent

Retief concludes that EBP’s greatest advantage is that it can be applied at any time of an existing building’s lifespan, and it will deliver benefits. “The cost discussion is also very different to new builds. Just assessing it is much lower than for a new build, and the money is not spent blindly, but is directly linked to understanding and improving the building’s performance.

On the other hand, on some projects EBP may struggle for budget as operational budgets are usually considerably smaller than for construction. However, the tool helps to paint the picture of where the budget would be best spent.” Sow & Reap has developed dashboards that are modelled on the same metrics that EBP uses to track and better manage a building on an ongoing basis, which also eases the process of recertification in future.



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LOOKS AND PERFORMANCE AT NO. 5 SILO

By Liesl Hattingh

As only the fourth building in SA to have achieved 6-star Green Star As Built rating (for Office), No. 5 Silo in Cape Town is proof of what V&A Waterfront Development Director Mark Noble sets out as the clear focus of the property owners.

“THE Design rating is a powerful tool to both change the conversation about sustainability and also as a check during the design process, but the As Built rating is where you get true benefit. It not only pushes your design team to deliver but also the contractor and sub-contractors,” Noble explains. He says that No. 5 Silo as well as No.1 Silo are great examples of where, even though the V&A was only contracted to

deliver 4-star Green Star buildings, “through focusing every design decision on sustainable best practice and end-user satisfaction we ended up achieving 6-star – and at a very similar cost”.

A passive start

Noble and Arup façade engineer Tessa Brunette agree that using passive design as the starting point is crucial in achieving successful sustainable building design. Then committing upfront to both an air-tightness test and extensive commissioning and tuning focuses everyone involved in the project on delivery. “Taking into account the various external factors that affect the façade and then focusing both capital and design attention on that façade to achieve maximum passive design benefits, is often overlooked,” Noble explains.

No. 5 Silo's façade design is a direct and rational response to the building's orientation, says Brunette, which is evident in the different wall-to-window ratios of each orientation to best balance harvesting natural light with limiting heat gain. Each orientation has a specific design response that supports the climatic response, such as high performance double glazing, insulation, and blinds to allow occupant control throughout, and shading to the northern facade in the form of specifically designed fritted horizontal glass louvres to reduce solar gain and control heat.

Brunette points out that all façade elements are tested off-site for air tightness, and are required to achieve performance much higher than those required by Green Star. The façade is only one element of a sealed envelope though, so all ducts and building interfaces form part of the test. "This is particularly important at Silo 5, where there are no openable windows, so the internal conditioning and quality is entirely reliant on active ventilation," she says.

Commissioning and tuning

Extensive commissioning and tuning (C&T) was done on No. 5 Silo during the development and construction stage by independent commissioning agents (ICA)

Matrix Consulting Services. The same applies to all new buildings in the Silo district, says consulting engineers and sustainability consultants Arup's Georgina Smit. Key to C&T is that it is built into the project timeline but staggered as services come online. While it is not unusual for contractors and sub-contractors to be on board for up to a year after building completion as part of the maintenance contract, Smit points out that Green Star requires monthly monitoring and quarterly reporting. "After a year the building must be fully recommissioned and that really does speak to closing the performance gap between how a building was designed to operate and the reality."

Richard Murphy, CEO of Matrix, explains that the role of the ICA becomes imperative the moment services become complex: "The ICA does peer review of the designs across all disciplines, including electrical, electronic, water (plumbing), fire and more on behalf of the client to see if it's accessible and maintainable... We are not part of the professional team. We are the client's proxy and look after their interest in building for the future." Importantly, the ICA also identifies knowledge gaps and ensures relevant training is undertaken to ensure the building and all its services are operated in the way that it was designed – and commissioned – to do.



Heating, cooling and air quality

“As the project grows and services are installed we create and form the commissioning committee, which includes the main contractor, projects manager, consultants and sub-contractors,” notes Mark Lassen, technical manager at Matrix. The innovative seawater cooling plant for the district provides a good example. “Initially, there were separate project meetings, and we insisted on a joint one,” Murphy explains. This helped resolve and prioritise potentially conflicting user needs. As the buildings include a hotel, offices, residential and a museum, the control system is extremely intricate but the plant does bring about a 65% energy saving compared to other buildings. The plant supplies pre-cooling by utilising seawater from the harbour, and in turn uses rejection of aircon systems to provide hot water at 45 degrees. Each building then only has to take it up to 55 degrees, explains Lassen.

The building’s cooling requirements are met through a centralized HVAC. While the general design of the VAV system is well established and widely used, this example is one of only two in the Western Cape utilising pre-cooling. A drawback of the VAV design is that it does not lend itself to cellular offices and meeting rooms,

Murphy points out. “But you can take that design and manipulate it with today’s technology, thereby gaining control of the air supply with electronic devices.”

Indoor air quality is further enhanced through CO₂ sensors which manage the natural flow of fresh air. This further eliminates energy waste associated with HVAC and resulted in fresh air rates of over 200% of SANS10400-O required levels to improve the quality of the indoor environment.

Technical review

Once completed, No. 5 Silo was handed over to the V&A Waterfront’s operational team, whose various technical departments also review all design plans for new buildings in terms of maintenance in addition to the ICA.

Noble says: “We have seen great benefit in having an ICA. It provides a good check and balance for the design team. Commissioning and handover can be chaotic, so it eases the process to have someone whose sole role is to oversee it.” He adds: “You get a superior product at the end of the day; the building is so much more robust.”



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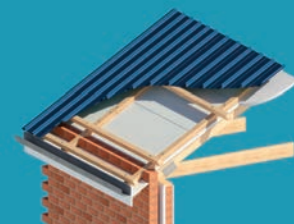
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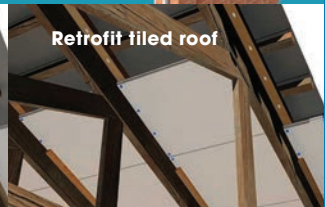
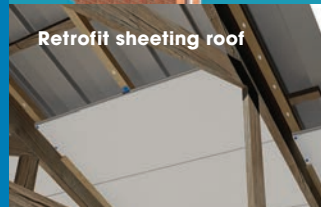
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NO.6 SILO: A BOLD STATEMENT

By Liesl Hattingh

Housing the new Radisson Red Hotel in the V&A Waterfront’s Silo District, this building is a trendsetter for efficient design.

NO.6 Silo is also as much about the location – bang in the middle of a fully functional harbour and rubbing shoulders with the world-class Zeitz Museum of Contemporary Art Africa (MOCAA) and other tourist attractions – as it is about the experience, both in terms of the building and how it functions.

Most of the individual elements that deliver this blend into the background for most hotel guests, but they

all contributed to the building’s 5-star Green Star – Custom Hotel Design rating. Strategies to deliver an efficient building are interconnected and incorporate sound passive design – paying particular attention to the façade, dematerialisation of the structure, and high functioning water and energy solutions combined with an intelligent building management system (BMS) that is integrated with the reservation system.

Dematerialisation

No. 6 Silo achieved dematerialisation in a number of ways. Installing V-columns to redistribute the structural grid from the basement to the rest of the building allowed for transfer beams to be eliminated, while post-tensioned floor slabs resulted in thinner slabs (and therefore less concrete).

Polished exposed concrete floors on the ground floor and in the guest rooms means no floor coverings were required. Light-weight St Gobain drywall partitions were used through throughout the guest room floors, cutting down on construction materials and speeding up construction time.

Energy saving and thermal comfort

One of the key requirements of the tenant was big floor-to-ceiling and wall-to-wall windows, says Arup senior façade designer Tessa Brunette. Combined with this was the need to mitigate the sound of the syncrolifts operating in the dockyard next to the hotel. “The best way to do this was through sealed windows,” she explains. The windows were thus consciously designed for acoustics and to limit solar gain through specifying high-performance glass and installing expressed aluminium frames to reduce sun exposure on the east and west orientations. Double interior blinds provide additional controls. The window frames were designed to be airtight but allow for quick glass replacement to help the maintenance team.

Importantly, the hotel is also connected to the district’s central seawater cooling and heating plant (see No. 5 Silo), which has been proven to deliver massive energy savings. The building HVAC features 250 individual air-conditioning units in the guest rooms that can be set to the occupant’s preference, notes Armand Ferreira, Radisson Red’s lead engineer responsible for building management at the hotel. Check-in is digitised and interfaces with the BMS, so the room aircon as well as the lighting goes on standby as soon as the guest leaves the room and is activated upon arrival.

Independent commissioning agents (ICA) Matrix Consulting Services are involved with all the new builds in the Silo District (see No. 5 Silo) and highlights this BMS system as an important contributor to building efficiency. “The commissioning included a points list that showed what the BMS will control. The office area and meeting rooms are separate from the guest rooms, for example, which have individual sensors,” explains Richard Murphy, Matrix CEO. Ferreira adds: “The HVAC system was the most complicated of the new



building in terms of understanding how to manage it, but we received training by the installers.”

African standards’ water storage

Water management, and how many litres of water is really needed per guest, was the topic of many meetings and discussions, ICA Murphy adds. As an international brand, the hotel required double the volume of water storage compared to SANS to take it to “African standards” and redundancy is 100%. No baths were installed, and showers have a 9l/min flow rate compared to the 15l/min that is more standard for

hospitality. “We noticed an immediate 20-30% water saving just from installing flow restrictors in showers, taking usage down to 600m³/month from 900m³/month,” Ferreira says.

Ferreira testifies as to the efficiency of the management systems, interventions and policies. No. 6 Silo has 250 guest rooms, but uses the same amount of electricity and water as the 120-room establishment elsewhere in Cape Town where he was previously based. “We also need the same number of team members to manage the building – six – as for the smaller building,” he adds as further proof.

V&A WATERFRONT: THE GREENEST PRECINCT IN AFRICA

THE V&A Waterfront is mandated by its shareholders to develop and manage the precinct responsibly, adding value and saving on operational costs, says Mareli Cloete, safety, health and environmental manager as well as head of sustainability. Since 2008, the property company has invested R45 million into energy efficiency, water savings and waste recycling across the precinct, resulting in 23% saving in energy consumption despite more tenants, 52% reduction in water use and up to 50% waste recycling rates.

It has consistently worked closely with and in support of the Green Building Council of SA, and with 12 of its buildings Green Star rated, it is already the greenest precinct in Africa. It is about to step up the pace, too: “If all goes according to plan also in terms of

financial permissions, we will start rating the V&A Waterfront’s 600 000m² from mid-2019 in order to become the first entity in Africa and the first [fully functioning] waterfront development in the world to apply for a customised sustainable precinct rating,” says Cloete. “Usually the focus is on the buildings, but here it will be on the spaces between. This rating usually only applies to new developments, but would be customised for existing development with a five-year forward development plan.”

“A precinct rating will have a huge impact on our operating procedures, from what materials we use to clean the pavements, to streetlights” adds Petro Myburgh, operations manager: cleaning, waste and landscaping. “It’s a company-wide effort with every department involved.”





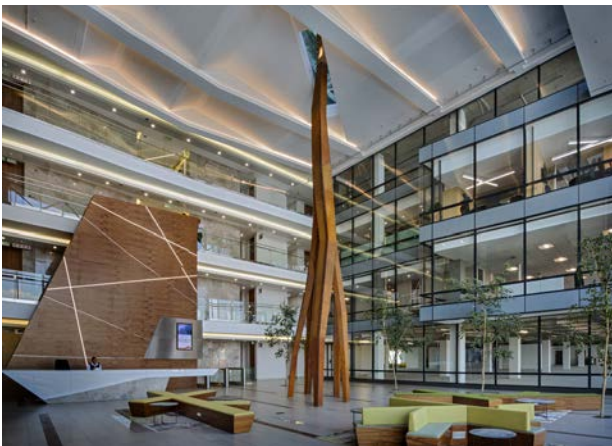
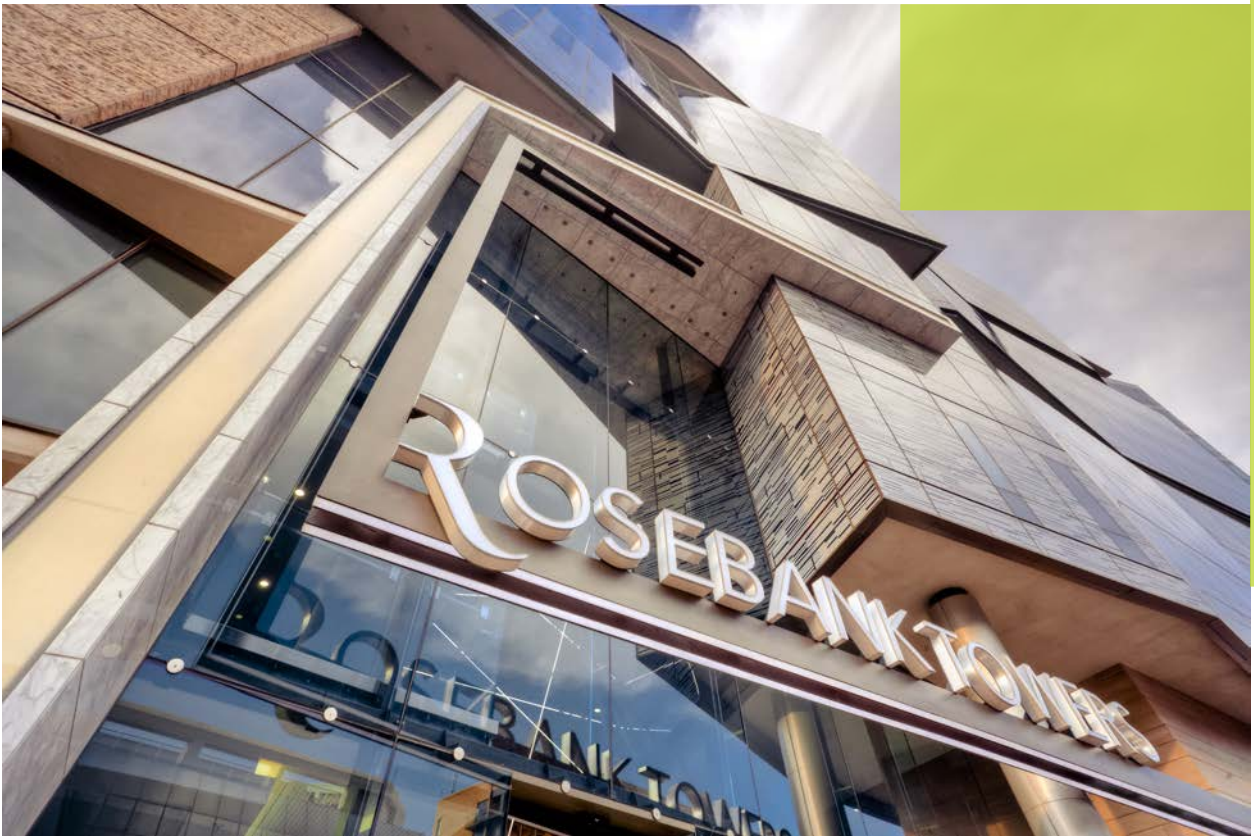
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TOWERING ABOVE THE REST IS BIG, BETTER, BEST

By Linda Doke

Rosebank Towers lends a graceful, stylish air to the ever-growing business district of Rosebank in Gauteng, presenting a fine blend of architectural design and environmental sustainability in a dynamic example of how a green approach to design integrates every aspect, from a building's design through to its completion.

THE building was developed by Abland in a joint venture with Redefine Properties and Ellwain Investments.

Achieving its 4-star Green Star Office Design rating in January 2016, Rosebank Towers features a number of environmental attributes, including water efficiency, effective energy usage, the utilisation of finishing products with low volatile organic compounds, and water-wise landscaping. The highest construction in the area, the building's 16 storeys comprise one level

of basement parking, seven levels of above-ground parking, ground level retail and seven levels of offices, including two multi-level atriums.

Sustainable, cost-saving HVAC system

One of the building's most prominent sustainable building features is its heating, ventilation and air-conditioning (HVAC) system, which maximises thermal storage to reduce peak energy demand by 36%.

Designed and implemented by Sutherland Engineers, the system provides variable air volume (VAV) air-conditioning to the seven office levels by means of a central chilled water process that uses air-cooled chillers and an ice storage system. The facility generates ice at night, which is melted during daytime hours, reducing the maximum demand on the chillers.

Noel de Villiers, mechanical engineer responsible for the project, explains how the system affords the client significant cost savings as a result.

“The ice storage system is used to supplement the cooling provided by the chillers during the day. With half the cooling done by ice, we were able to reduce the chiller size by 50%. This meant that what would have been 2 000kW worth of chiller installed was able to be reduced to 1 000kW, and that cost saving could be used on the ice tanks,” says de Villiers.

“Effectively, the capital outlay on this project was no more to have the ice storage, and yet we achieved the benefit of huge cost savings in electricity. Interestingly, the main component of those savings is in the maximum demand charge by the council monthly, based on maximum power drawn. The ice

storage system enables the maximum demand for the building to be reduced by 270kVA, with most of the chiller energy being consumed during off-peak hours when the electricity tariffs are much lower. This has resulted in significant cost savings for the client, and these cost savings will continue to increase for the life of the building as electricity tariffs go up.”

Nightly air flush cools and clears

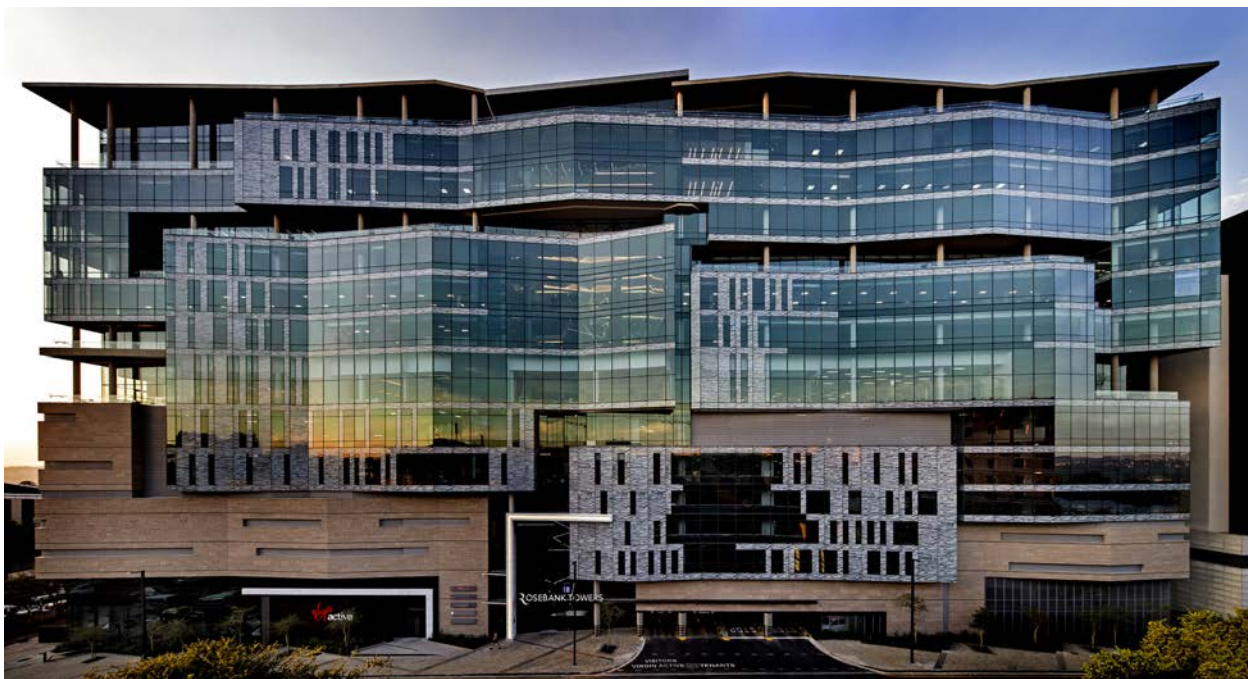
The air cooling design of the HVAC system also incorporates an economy cycle that allows 100% outside air to be used when temperatures outside are cool. The building's air is flushed at night, which allows the whole structure to cool, reducing the cooling load during the day and significantly reducing energy demand.

“The system at Rosebank Towers is designed to allow 150% more fresh air than what South African regulations require. A one or two hour night flush not only cools the structure for the coming day, but also gets rid of air-borne toxins that accumulate in air-conditioned buildings, often causing sick building syndrome.”

Positioning of the ice thermal storage was the greatest challenge

De Villiers says the greatest challenge of the HVAC project was neither its scope or its complexity; it was the positioning of the 12 ice tanks and two chillers in the limited space available on the roof of the building, which was already congested with the various extraction systems and ducting for the air conditioning units.

“With the addition of another office level halfway through the project's implementation, roof space was already limited, and the challenge was to find enough



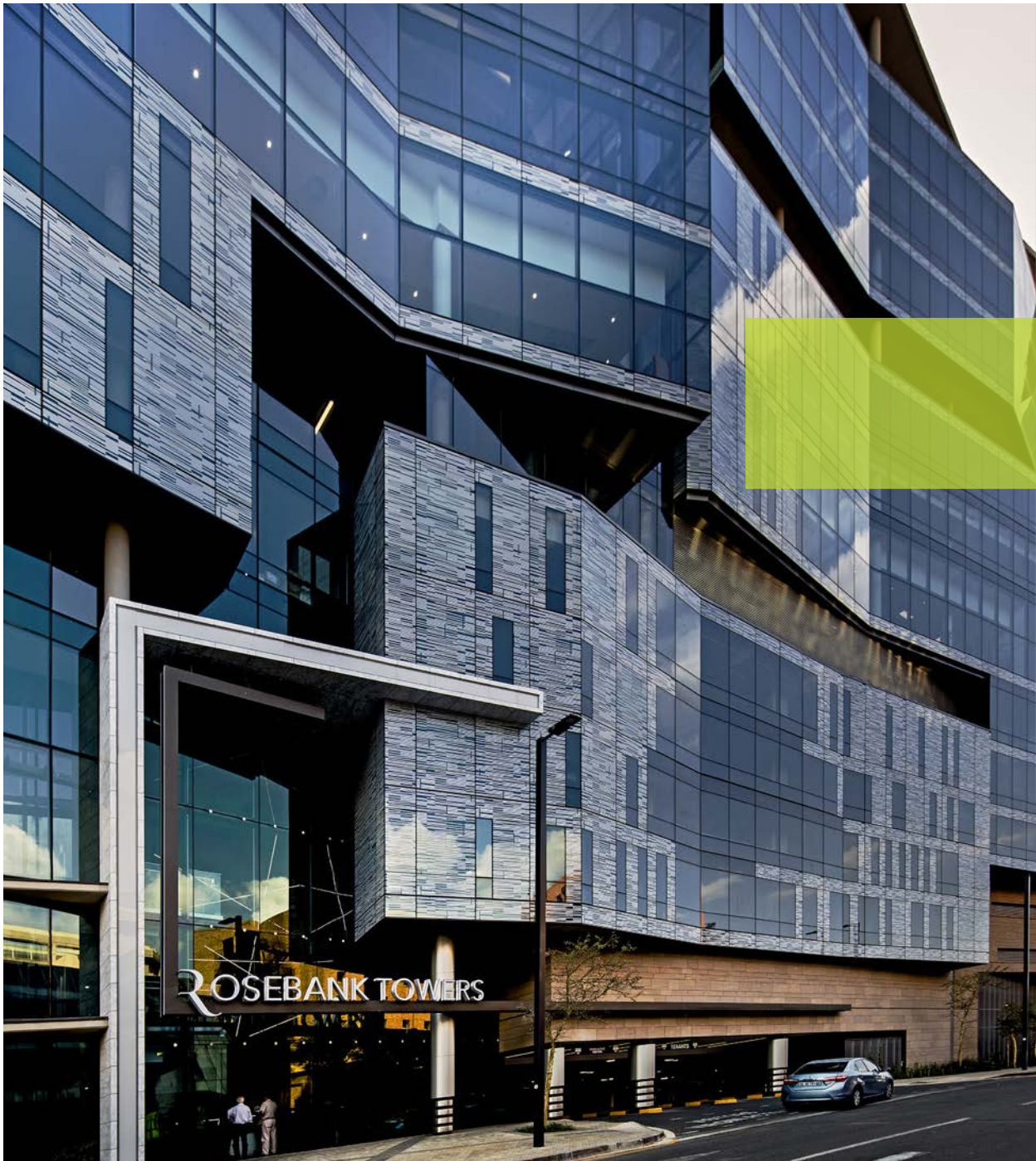
room on the roof to position 12 large ice tanks. This also meant that from a structural perspective, the engineers had to ensure the roof was able to accommodate an additional 60 tonnes of tanks on the roof, together with two air-cooled chillers and all the necessary piping that link them. The tanks needed to be inconspicuously positioned, completely out of sight.

WSP Building Services sustainability consultant Roxanne Dovey adds that the ice thermal storage is environmentally friendly as it reduces greenhouse gas emissions and stress on the electrical grid. It also lowers the refrigerant charge by allowing for smaller chillers, thereby reducing the use of ODP/GWP refrigerants and minimising its overall impact on the environment.

With the chillers not needing to be switched on during office hours, there is also less of an impact on the acoustic quality of the interior of the building, significantly reducing the sound contribution of the HVAC equipment.

Incorporating nature, inside and out

Dovey says her favourite design aspect of Rosebank Towers are the natural elements that were incorporated into the building. The landscaped areas on the terraces increase biodiversity, as well as the connection to nature for the building's occupants, which could prove to reduce perceived stress levels by providing access to beauty and views. This truly is a remarkable green-rated building.





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THE EDGE, ROOTED IN ITS ENVIRONMENT

By Alan Cameron

Occupying the final vacant slice of the Tyger Waterfront, this green-rated building uses the adjacent water superbly...

“I dropped a temperature profiler, borrowed from my old oceanography department at the University of Cape Town, into the Tyger Waterfront lake. When we saw the results, we knew we could do it,” said Richard Duckitt of Goal Zero Consulting, the sustainability consultant for The Edge building. “It’s North-South axis requires it to have an excellent aircon system.”

The simple elegance of using the adjacent water to cool the building in summer and to heat it in winter, a first for South Africa, gives the 5-star Green Star SA Office Design v1 building its edge.

“Just how to do it was the question,” agrees David Lombard, MD of Lombard Consulting Engineers. “The engineering wasn’t the hard part, rather it was all the unknowns, like ramifications of the water’s condition and how best to work outside the building.”

And the results of the system speak for itself. “The building can sometimes receive all its cooling from the lake water, and on average uses between 40% to 70% less energy than conventional systems,” Lombard confirms.

The profile for the The Edge building was formed after Omnigro was approached by a global engineering firm for a regional office in a green, upmarket building in the northern suburbs of Cape Town. And now, on what was a narrow and triangular plot, the final vacant slice of the Tyger Waterfront, stands “one of the best, if not the best, green rated buildings in the northern suburbs,” suggests consultant Riaan Spence who represented Omnigro throughout the project.

The volume of nuanced green initiatives reflect the value of including a sustainability consultant early in the process. “We save on electricity using movement sensors in the office areas, common facilities and parking areas; save on HVAC costs with double glazing throughout; use green insulation materials; encourage general fitness among tenants employees through bicycle racks and cycle lanes, and showers; use green compliant building materials, and; use about 90 000 litres of rain water harvested in tanks for ablution purposes,” Spence ticks off.

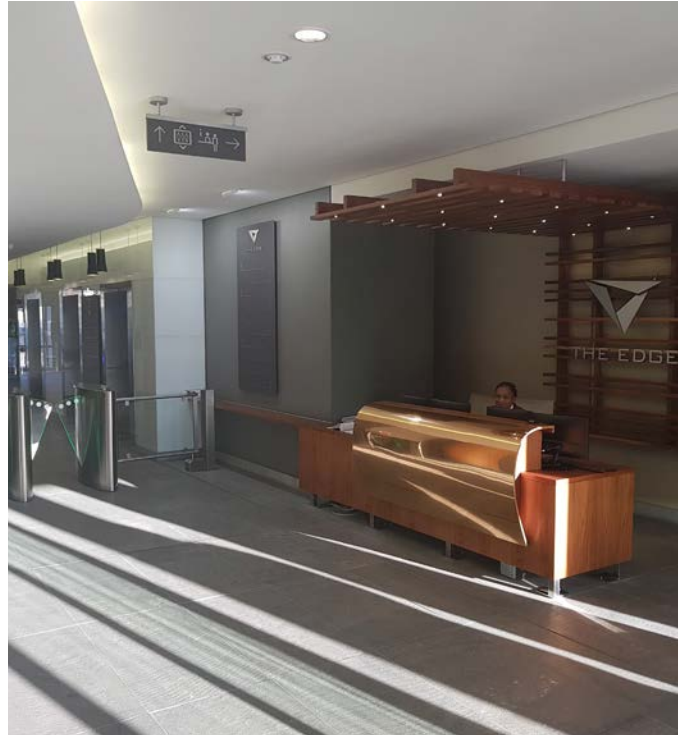
However it is the crowning achievement of being able to share the temperature of the adjacent water with that of the air inside the building during summer and winter, vastly reducing operational costs, that tops the list.

The building’s HVAC system pulls non-potable water from three different levels of lake water through a filtration and heat exchange system before returning it cleaner into the lake. Internal building water is either heated or cooled before passing on its temperature difference to the air conditioning system.

“Every green building asks how the surroundings can tie into its design and function. We had a large, stable water body, and decided to use it for heat rejection and retention,” said Lombard. The artificial lake is a flooded quarry which acts as a retention pond for the area, “so even during the final hot months of the drought, earlier in 2018, it only dropped one metre,” said Lombard.

A 9-metre pipe with inlets and outlets just below the surface, in the middle, and at the bottom of the lake records data and allows the system to decide what temperature of water to use. In winter the warmer surface water is used and in summer the cooler, deeper water is used. The water is brought into the building and after circulating through a plate heat exchanger





is returned to the lake, where its temperature profile is matched to the appropriate level, causing the least ecological disturbance.

Before the heat is harvested the water is filtered, which is primarily required due to the high *ecoli* count, especially near the bottom inlet which lies within a one metre band of suspended muck.

In summer, the heat transfer cools water inside a closed internal system reticulating to large air-handling units on the roof. These units are separated into zones – east, west and internal – allowing the HVAC software to choose the coolest air. The cooled building water then pre-treats the air before it is cooled right down to the desired temperature using a conventional chilled water system and distributed through the building. The building water then returns to cool the condensers of

the conventional cooling plant, further enhancing the overall efficiency of the system, explains Lombard.

Common to notable green solutions, this HVAC system is context-specific and exceptionally beneficial. “In 2015 we estimated that a saving of about R10/m² could be achieved in operating costs, which then further helps tenants with operating lease costs,” said Spence.

Tenants have continued the green journey by facilitating sustainable interior fit-outs and managing and maintaining the GBCSA-certified building. Their wellbeing is also encouraged, not just with the far-off views or ample natural lighting, but with a healthy-food trolley, a Virgin Active gym within walking distance and the peace of mind to enjoy working in a building so appropriate to its location.

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STRENGTH BEYOND



@PARKSIDE: THE FIRST 5-STAR GREEN STAR BUILDING IN NAMIBIA

By Gill Gernetzky

In September last year, FNB Namibia Holdings' @Parkside building became the first 5-star Green Star Africa rated building in Namibia and, indeed, outside South Africa. All 5-star Green Star buildings are considered to exhibit 'African excellence' in terms of environmental sustainability, but in the case of this project, its commitment to community development and integration makes it particularly special.

A key property on the Freedom Plaza precinct

FNB @Parkside is one of the key properties in the N\$3.5 billion, 80 000m² Freedom Plaza precinct development in the heart of the Windhoek CBD. The mixed-use development, which offers retail, residential, hotels, entertainment and offices interlinked in a single energised location, was born in early 2009.

Upon completion, the plaza will boast four premium-grade office towers – of which FNB @Parkside is one – spanning some 35 000m², two hotels, three residential apartment blocks including 180 airy lofts

and penthouses, 8 000m² of retail space and 2 000 parking bays.

Developed by United Africa Group, the award-winning Freedom Plaza represents the largest private property investment in Namibian history. United Africa Group's vision for the precinct is to create a liveable urban development characterised by parks, open public spaces, views and quality mixed-use real estate. Freedom Plaza is also key to the City of Windhoek's programme to revitalise the CBD.

Revitalising the Windhoek CBD

Philip Young, United Africa Group's general manager for real estate and property development believes that Freedom Square will go a long way to encouraging economic and social development in the Windhoek CBD. "By creating an inviting space which serves the public needs of Windhoek, a sustainable city for all can be ensured," Young says.

The vision for the precinct was the inspiration behind two community integration innovations implemented at the FNB @Parkside development, which scored Green Star innovation credits for the project and contributed to attaining the 5-star rating.

As part of the project development, community trader stalls and amenities have been installed on the active

street network along Independence Avenue, adjacent to Freedom Plaza and FNB @Parkside, which has helped to revitalise the central business district and bring tourists close to the commercial zone of Windhoek.

In addition, community accessible bicycle racks have been installed for use by building visitors and community members, and to encourage commuters to cycle rather than use motorised transport. This is in line with the City of Windhoek's Urban Transport Masterplan, which promotes non-motorised transport and pedestrian and bicycle movement.

Creating a sense of place

Young says that the development of Freedom Plaza and in particular, FNB @Parkside, has had a significant positive impact on the urban landscape of Freedom Plaza and the Windhoek CBD. "The generous retail spaces leading onto the main street, urban café's and well-designed public furniture have proven to significantly increase pedestrian engagement with the surrounding buildings, and has brought a sense of place and culture to the inner city, while adjacent residential developments are returning life to the CBD."

According to the Project for Public Spaces, designing and creating public places like Freedom Plaza has the potential to truly transform the hearts of local communities. They are locations where community



comes alive, where bonds among neighbours are strengthened and where a sense of belonging is fostered. They are locations that spark economic development and drive environmental sustainability.

Young agrees and says that the sensitive development of a building or precinct can help to integrate and enhance the needs and spirit of the surrounding community. “The inclusion of sustainable urban and social improvements such as the integration of traders, alternative mobility via e-bikes, and cultural events such as public dance and art offers a significantly improved social relevance to the urban realm. In addition, the development of the urban street as a meeting place for diverse community participants and activities enables the artisanal local traders’ stalls to enjoy access to the CBD ‘market’ which integrates sustainable economic practices within the urban fabric.”

Forging strong partnerships

Freedom Plaza has been developed in partnership with the City of Windhoek, which has been a key stakeholder and role player in the sustainable development of the CBD from the outset. The City itself has ambitious plans for the future growth and development of Windhoek, chief amongst these being smart public transport systems and continued development through public-private partnerships. Windhoek’s mayor, Muesee Kazapua, noted that these public-private partnerships have resulted in significant development over the past few years, including the construction of the FNB development and the 5-star Hilton Hotel, also on Freedom Plaza. Addressing a business forum in September last year, he said: “These mixed developments are clear testimony that our

business community is positively responding to the City’s call to revitalise the CBD area.”

Dacre Hattingh, development manager for Eris Property Group which developed the FNB building, says that the revitalisation of the site is in part as a result of the urban design as specified by the master developer responsible for the precinct plan, but also due to Eris’ professional team’s interpretation of the requirements and their ultimate design of the space, undertaken with the assistance of WSP, the green building consultant on the project. “It’s also interesting and encouraging for us that these innovations have inspired other building owners in the area to consider including similar facilities due to the positive impacts they are seeing from our project.”

Growing significance of community-focused public spaces

Cities are expected to grow exponentially to accommodate our ever-burgeoning population – in fact, by 2030, urban areas are expected to expand to an area nearly the size of Mongolia, in order to meet the needs of the 1.47 billion or more people living in urban areas. With this in mind, the role of community-focused public spaces will become more and more significant. Urban public areas are dynamic spaces that play a vital role in the social, economic and physical well-being of urban areas, their residents and visitors. They provide respite from urban intensity for residents and bring people together across social, economic and racial divides. With the help of FNB Namibia, Freedom Plaza looks set to become a catalyst for all of these things among the communities in Windhoek.





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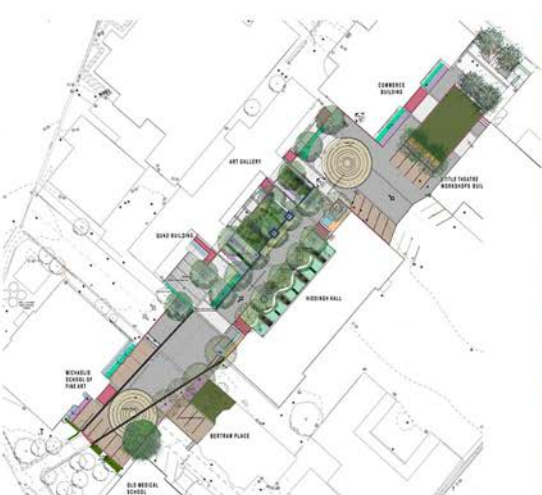
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REDEFINING AND RAISING THE BAR ON GREEN BUILDING FIT-OUT

By Linda Doke

Green building is about far more than just construction. It's about the application of processes that are environmentally responsible and resource efficient, from planning, design and construction, through to operation, maintenance, renovation and, eventually, demolition.

A building's fit-out – or equipping of the interior space in an ecologically sustainable manner for occupation – is a fundamental criterion of any green rating. Conservation of energy, the reuse of resources and astute use of materials that focus on sustainability, all make up an effective green fit-out.

When Redefine Properties moved its head office into the 5th and 6th floors of the newly built Rosebank Towers, the company saw the opportunity to demonstrate its commitment to a green and ever-improving environment for its employees and tenants. The move allowed Redefine Properties not only to showcase how an interiors fit-out can and should be done, but also to go through the ramifications of a high level fit-out so as to be able to better advise future tenants and clients.

A focus on creating relationships and connections

Interior architect Kirstin Cavanagh of Paragon Interface explains how the planning philosophy of the 5-star Green Star fit-out was to focus on creating

relationships and connections between Redefine and the public, and to enhance communication, engagement and collaboration within all the company's business units and staff.

"A number of the points within the Green Star Interior rating tool relate to the well-being of the occupants of the building. Enriching well-being and improving employee engagement was one of the main directives that Redefine outlined for their new offices right from the start, and the rating tool gave us something to measure how successful we were at achieving this," says Cavanagh.

From a structural perspective, the two floors that comprise Redefine's new 6 000m² home consist of a triple-volume atrium, a meeting suite with two multi-functional training rooms, a 30-seater boardroom with executive bar and lounge area, two cafés – a Client Café for informal meetings and a Work Café as an open-plan office space with a number of collaboration areas and focus areas – and two large outdoor terraces overlooking the leafy suburb of Rosebank.

Careful thought, considerable energy

Alison Groves, WSP regional director and Green Star accredited professional on the project, tells how Redefine and interior architects Paragon Interface put considerable energy into carefully selecting

the furniture and finishes for the project, carefully investigating suppliers and always opting for sustainable materials from dependable sources.

"Ensuring a high-level green fit-out was firmly embedded in the design phase of the project. Redefine gave a lot more care to ensuring that than most organisations do. They raised the bar: for them it wasn't simply the aesthetics that mattered, it was also the sustainability credentials of every material and product used in the building that were important," says Groves.

Implementing green design principles

Green design principles of the project included the importance of connecting with nature, with internal planter boxes acting as screens between circulation routes and desks; an open-plan office space with desks located away from windows, helping to minimise glare and exposure to direct sunlight; blinds on all windows to allow occupants to adjust the amount of sunlight entering the office space; monitoring of electricity and water consumption; recycling bins in the print hubs and kitchen areas; and finishes that comply with Green Star SA requirements.

Groves says the interior lighting throughout the offices is particularly impressive. "Often the energy efficiency of LED interior lighting is cancelled out by architects planning an excessive amount of lighting,





which simply undermines the energy efficiency. Kirsten Cavanagh used lighting very judiciously in this project, recognising that it's not simply about aesthetics, it's about achieving the fine balance between aesthetics and energy efficiency."

Key ingredients for success

Project manager Jocelyn Rhodes of Form Space Content Architects maintains the three aspects that made the Redefine fit-out successful were time, the client, and the team involved.

Redefine Properties appointed Rhodes in 2013 to analyse the critical requirements of the company from the perspective of staff, company growth patterns, spatial requirements, and potential green possibilities. Over the course of two years, Rhodes developed a deep understanding of what was needed in a new 'home' for the company, so was able to put together a very specific request for proposals document calling for tenders. Paragon was appointed to the project in 2015, and Redefine was able to move into its new offices in November 2017.

"It's unusual in our profession to be given the luxury of four years for a project. It allowed for thorough research and preparation, and time to investigate all varieties of green possibilities, the needs of the client, and to explore numerous design options, source furniture and select materials and fittings," says Rhodes.

The client's clear vision gave the project great definition. "The brief was absolute right from the start. Redefine wanted to set an example to all developers and landlords, showing the importance of making responsible corporate spaces that are friendly both for people and the environment."

"It helped that the company's EXCO was keenly involved – they made themselves available, were always interested in new ideas and happy to test furniture and materials, and were prompt at making decisions. Importantly, they were keen to debate all aspects of the process, from inception to the actual construction time. The EXCO was also participative – site visits happened often. Critically, they gave me the space to appoint the right team for the project, covering all aspects of the fit-out."

Concluding her description of the project, Cavanagh says the Redefine head office fit-out was a fantastic collaboration between the various consultants within the professional team. "Alison Groves, the Green Star consultant, was on board from the beginning, ensuring that we were incorporating green principles and good decisions from the conceptual stage of the project. This, along with the fact that the building itself is Green Star accredited, meant that the process was seamless, so obtaining a Green Star rating for the interior fit-out was easier and less costly than people may expect."



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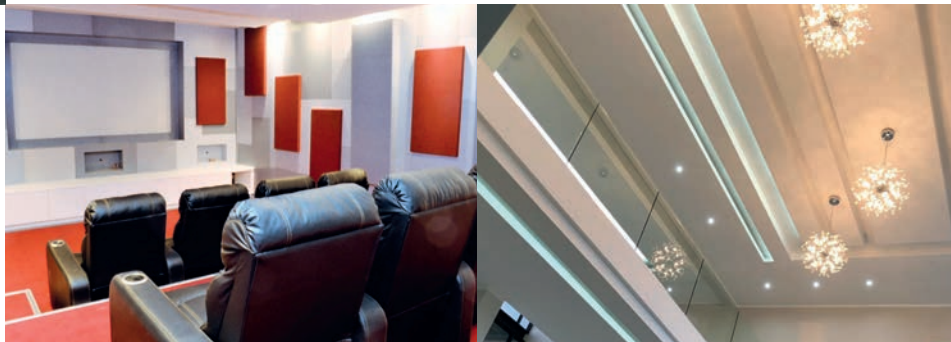


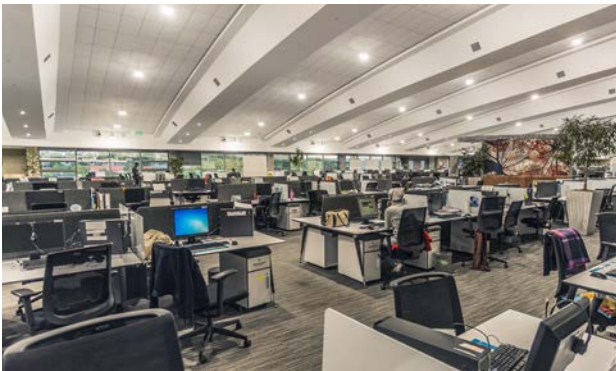
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GREEN STARS, AT YOUR SERVICE

By Alan Cameron

The FNB Contact Centre, 34 Oxford Road, Ferndale, Johannesburg is the banking sector's first 5-star Green Star call centre building...

IMAGINE picking up the phone to ask “How can we help you?” while sitting surrounded by 799 other call-answering colleagues, under a sheeted metal roof the size of a football field, during a Highveld hailstorm. The same question was first applied to the staff before a single telephone rang.

The tenant-commissioned design, construction and fit-out exercise at the FNB Ferndale contact centre for 800 employees pivoted around staff wellness, in part

because their salary bill is by far the highest percentage of operational costs, and in part because it is the right thing to do.

Working optimally in big, open spaces

Turning a large, sloping suburban site in Johannesburg into the first call centre with a 5-star Green Star SA Office Design v1.1 certification, was a task entrusted to JG Afrika, who helped enable a successful handover to FNB shortly over a year and a half after breaking ground.

“The main operation centre is a big and open 100-metre by 68-metre wide area with 35-metre roof trusses bridging the expanse,” describes JG Afrika’s Technical Director, Tim Davidson.

“To achieve the least impact on the landscape, two levels of parking (about half of the structure) is underground, and above ground the roof slopes twice, with a clear storey-high window in between. Big cantilevers were among some serious structural challenges,” said ICM Architecture Director, Graeme Palmer.

“To make sure employees got the most amount of daylight the windows were designed, modelled and redesigned and remodelled before any purchases were made,” said Daniel Randal Grewan, the sustainable building consultant who managed the Green Star certification process on behalf of LDM Facilities Management.

“Besides the natural light, we also went big on views so people could relax and focus on something distant for a while, but with 800 people inside the building – simultaneously talking on the phone – acoustics were also paramount and so layers of roofing, side-walling and a raised floor were incorporated,” noted Palmer.

The main facades face north and south to welcome the daylight in throughout the year. Aluminium louvres combine with a prominent overhang to help keep

direct summer sun rays from heating the glass panes and transmitting this heat load to the interiors. This significantly reduces the air conditioning loads near the windows. In winter, the lower angle of the sunlight is accommodated and allowed to touch the glass below the louvre blades; these processes are further assisted by double-glazed glass panels.

Making the most of fresh air and sunlight

The open-plan, sound-proof call centre also needed to be designed to have the maximum fresh air intake to ensure people were energised with every lungful, not enervated. Return air points were fitted with carbon dioxide sensors and the fresh air rate is supplied at 12.5l per second per person right across the usable area.

“All the paints, adhesives, sealants and carpets have low VOC emissions,” comments Grewan, who explained that FNB’s interior fit-out team worked closely with the professional teams on the job to ensure the required results. “The details, down to the carpet, were all discussed. In fact, during one meeting an alternative carpet was discussed as it came with a better price. After realising it would contribute to respiratory issues we unanimously agreed to sign off on a healthier, albeit



more expensive, alternative. These types of decisions are important, especially as employees are expected to spend a third of the day within the building.”

A focus on substituting wood for glass including, for example, the doors and boardrooms, enables natural lighting to off-set the normal requirement for artificial lighting in such a wide building. Going further and incorporating motion sensors into the majority of light fittings means that the lighting-power density for 95% of the useable area is less than 1.5W/m² per 100 Lux at 720mm. Peak demand is assisted by solar panels, which cover about a third of the roof.

More than just irrigating with grey water, being water-wise meant that an air-cooled heating ventilation and air conditioning system was chosen. The toilets and urinals were fitted with actuators to reduce and control water consumption, and an integrated building management system was incorporated to record and log all energy and water usage – and is even able to display it in real time.

Result of effort in design

FNB are in the process of ensuring that all their staff country-wide benefit from working in at least a 4-star Green Star SA certified building. FNB Ferndale earned its green stars through a design rating process which

typically runs in parallel with the project, from concept phase to the end-of-tender documentation.

JG Afrika then implemented the post-tension structure and the long, shallow pre-cambered roof. In keeping with simple sustainability practices, they took care to source local products, and reduce the amount of concrete required by the design through the creation of a post-tensioned deck supplemented by blastfurnace slag, containing a 93% average of recycled steel.

“The decision to design large sections of the building with post-tensioned decks had the benefits of accelerating the construction procedure as formwork could be stripped earlier than in the case of conventional reinforced concrete. Post-tensioned slabs are also thinner than conventional slabs, saving concrete volume and weight, and the addition of blast furnace slag into the concrete mix not only reduced the carbon footprint of the structure but also increased the density, and hence durability, of the concrete structure” explained Davidson.

Being a responsible corporate citizen means more than simply asking for input from banking clients – or professional sustainability consultants for that matter – but following through on best practice, even when this means building the sector’s first 5-star Green Star call centre building.



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ROAD AGENCY DRIVES FIVE-STAR SUSTAINABILITY

By Linda Doke

The southern region office of the South African National Road Agency SOC Ltd (SANRAL) is a proud example of a GBCSA 5-star Green Star building, achieved in 2017 for its numerous sustainable building features.

SANRAL is a South African parastatal responsible for the management, maintenance and development of the country's national road network, which includes many national and some provincial route segments. The southern region office oversees the organisation's operations throughout the Eastern Cape.

The 8 000m² building, which forms part of the newly developed Baywest City, a state-of-the-art mixed-use retail, business and lifestyle precinct in the western suburbs of Port Elizabeth, comprises four levels – basement parking; a ground floor with auditorium, reception area, offices, boardrooms, kitchen serveries, storerooms, library and gym; and two floors of office space.

A focus on energy efficiency

One of the most notable of the building's green qualities is its focus on energy efficiency. SANRAL's brief to building designers Activate Architecture focused on reducing energy costs wherever possible, as is standard across all the organisation's offices across the country.

Architect Edward Brooks, who worked on the project, says initially the project had a 4-star Green Star requirement, but as the design progressed, the team realised a 5-star rating was achievable without much additional cost. Energy saving would be the main thrust.

From the architectural side, the structural design of the building played a fundamental role in its passive energy efficiency. “The building is oriented north to south, which helps to keep the building cool in summer and warm in winter. This is ideal for the north side of the building – when the sun is low in winter, the orientation allows lots of heat energy into the building, and when the sun is high in the sky during the summer months, the large overhangs on the north side of the structure are designed to protect the building from direct sunlight,” explains Brooks. “The building also has double-glazed low-energy glass throughout, which together with a highly-insulated roof and walls, provides a very energy-efficient envelope.”

The design of the structure also bore in mind its geographic location – Port Elizabeth is well renowned for its wind. “In the Eastern Cape, much of the prevailing wind comes from the west, so in an effort to mitigate much of the bad weather during the winter months, we designed a heavy concrete wall with slit windows on the western side.”

Knowing the proven benefits of environmental quality on employee work experience, natural lighting also plays an important role in the building’s passive energy design. A large clear-view central atrium positioned in the centre of the building allows in a lot of natural light, as do large windows overlooking scenic views on the north, south and east of the building.

LED lighting was installed throughout the structure, controlled by a digital addressable lighting interface (DALI) system with fully programmable motion sensors that control the switching on, off or dimming of lights according to space occupancy. This flexibility allows for improved energy efficiency in the building.

Heating, cooling and air quality

On the mechanical engineering side, the building has a highly efficient three-pipe variable refrigerant volume (VRV) heating, ventilation and air conditioning (HVAC). Bernhard Goetz of Design It Green explains that, when conditions allow, the process recovers heat from one part of the system and shifts it to another. “Simply put, if one space needs cooling while another needs heating, then the two could cancel each other out in terms of energy usage. This means the system as a whole will not need to produce extra energy to simultaneously cool and heat, and instead recovers from one space and moves it to another,” says Goetz.



“All the different offices spaces have their own separate air conditioning units. This allows for better control and therefore better energy efficiency – there can never be under-cooling in one space or over-cooling in another, typical of a shared plant. The system also has motion detection so that if an office is unoccupied for a predetermined length of time, the air conditioning is programmed to either switch off completely, or to simply maintain a greater temperature offset.”

Air quality is monitored carefully using the HVAC BMS. In the areas that have large air conditioning demands and where the occupancy load can vary quite considerably, such as the auditorium and the canteen, carbon dioxide is monitored by sensors as a way of gauging the volume of occupants in the space and hence the amount of fresh air required. By minimising the amount of incoming air to only meet demand, and no more, the system reduces energy consumption.

Goetz explains how the HVAC system is also responsible for meeting the building’s hot water requirements.

“The building spends most of its life cooling. When the building cools, the condensers take the heat from inside the building and reject it into the atmosphere. Instead of allowing that heat to go to waste, we’re using it to heat water. This means all the building’s hot water production, from sinks and basins to the kitchen and canteen, is achieved at minimal cost, and all the building’s hot water demands are met as a by-product of the air con system operating.”

Real-time monitoring

Energy and all major water uses are sub-metered and monitored by a computerised building management system (BMS). Daily water and energy usage figures, as well as information on other sustainable initiatives in place, are displayed in the foyer on a dedicated real-time monitor system for everyone in the building to see at any time, in an effort to promote user awareness.



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THE MARKET FOR GREEN BONDS

To satisfy growing demand, new financial instruments such as green bonds and carbon market instruments are being established globally, along with new financial institutions, such as green banks and green funds. South Africa's green finance climate also shows sure signs of solid expansion...

THE green economy offers an important vehicle for achieving the aims of both the 2030 Agenda for Sustainable Development, adopted by South Africa in 2015, and the COP Paris Agreement of the same year. The establishment of the national Green Fund heralded a significant step taken by the country in its commitment as a responsible global player, and by 2016 the Fund had approved a total of 55 projects (both private and public) and disbursed R782 million to help catalyse the growth of local sustainable investment. The Green Fund, which also actively seeks international and local partners from both the private and public sectors; along with the work of non-profit organisations such as GreenCape, has been pivotal in supporting the country's transition to a resilient green investment climate.

Government's role, after all, is not to fully fund, but to enable the climate finance we need. As OECD

Secretary-General Angel Gurría put it: "Government policies can play a central role in influencing how private capital is mobilised and shifted. It will only be green if the investment landscape is supportive. Coherent climate policies and good framework conditions for investment are essential. We need to move from a world where green bonds are a novelty to one in which the entire bond market begins to reflect the transition towards a low-carbon transformation."

Where there is threat; there is opportunity

And climate change is indeed increasingly being viewed as a business opportunity, opening many profitable ways for investors to help protect the planet – with green bonds being one of the most promising opportunities. Almost unknown a decade ago, they now stand as a key private sector solution helping finance the world's path to a sustainable future. Green bonds generate financing for projects in renewable energy, energy efficiency, sustainable housing and other eco-friendly industries; and tap into the vast pools of financing – the trillions of dollars held by institutional investors such as pension funds, insurance companies, and sovereign wealth funds – available in global capital markets.

Globally, the green bond market has seen explosive growth in the past ten years, with new bond issuance growing by 78% in 2017 alone; to more than

\$155 billion worldwide. That number is expected to reach \$250 billion in 2018, according to the Climate Bonds Initiative, an international non-profit with an important certifying role.

But in emerging markets, the green bond era is just beginning. “For investors, green bonds have become one of the main outlets for a growing pool of international capital that comes with environmental or ethical strings attached”, says Ashkar Sewkuran, Bonds Specialist: Capital Markets, JSE. “The Global Sustainable Investment Alliance estimates that \$10.4 trillion in assets worldwide involves some form of ESG measurement; so sustainable finance is being forced into the mainstream,” he says.

The appetite for ESG-focused assets

“We believe there is significant potential for growth in South Africa. The Pension Funds’ Act Regulation 28 requires that investments have to include ESG considerations in their investment portfolios – and a green bond is a product that speaks directly to this requirement.” Sewkuran says that while the local market has just four green bonds listed, the most recent of these – the City of Cape Town’s earlier this year – was five times oversubscribed. This demonstrates that there is appetite for quality long-term environmental, social and governance [ESG]-focused assets, he says. The city raised R1 billion for projects including electric buses, energy efficiency in buildings and water-management initiatives.

The JSE’s own Green Bond Segment, officially launched in September 2017, is seeing increased appetite from investors. These are bond instruments where proceeds will be exclusively applied to finance new or existing eligible green projects, and which are aligned with the four core components of the Green Bond Principles, as defined by the International Capital Market Association.

For issuers, Sewkuran says, the green bond market can offer several important benefits for green investment, including diversification to investors who are increasingly demanding socially responsible investment (SRI) opportunities; possible cost advantages as the market develops more fully; and allowing issuers in less environmentally-friendly sectors to take part in the green bond market by signalling changes to their business model and attracting a new basket of ESG-focused investors. As an example, he cites French energy giant Total, which issues green bonds to help finance a strategic shift toward renewable energy. Today, it is the world’s largest solar farm power developer.

This complements mandatory ‘real economy’ policies that lead to changes in business models, such as carbon pricing, waste reduction and recycling targets. Finally, listing a green bond could enhance the reputation and promote the importance of governance of an issuer. Sewkuran points to positive press coverage of green bond listings by the City of Johannesburg and the City of Cape Town.





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CIRCULAR DESIGN

By Melissa Baird

THE role of the designer has changed considerably in the way they choose and select materials for the creation of consumer products. Upcycling and recycling have created some remarkable products; but the key is how to design out obsolescences from products, and make use of materials that have already been in use in the production supply chain. By understanding the impact of human action, these new products do not have negative effects, but rather give back to the whole cycle. Almost 80% of a product's environmental impact is determined during its design and is determined by the business model that supports it, the materials used in its creation, where it will be made and how much energy is required for its production. These products stand out for their innovative and sustainable applications:

The Flax Chair

Designer Christien Meindertsma and natural fibre specialist Enkev (www.enkev.com) have teamed up

to create ground-breaking material that combines the natural fibres of flax with strong bio-plastic fibres, making a revolutionary material that can be heat-pressed into unbelievable shapes.

The Flax Chair is composed of four layers of woven flax, and five layers of dry-needled felted flax, both containing PLA fibre. It goes into a mould and is heat-pressed. The PLA then melts into everything and makes the composite hard and strong. Christien designed the chair to be made from one sheet of composite measuring roughly 2 feet by 3 feet, with very little waste. The initial run will use straw-coloured natural flax, but it can be dyed, so future offerings could include a rainbow of colours. The chair is biodegradable.

The Flax Chair was the big winner of the Dutch Design Awards 2016 and has been purchased by the Vitra Design Museum.



The Wool & Bio-Based Carpet

Also designed by Christien Meindertsma and Enkev, this sustainable carpet is completely biodegradable. It is warm-pressed to create a dense sheet with meshed lines. Single pieces can adorn separate rooms, or they can be combined to create a room's centrepiece. This carpet can also be used as acoustic isolation on the walls.

The Recycled Carbon Chair

Marleen Kaptein has engaged in perhaps an unlikely partnership for a furniture designer—working together with the Netherlands aerospace centre (NLR). The organisation gave her access to a fibre placement robot capable of printing thin, but strong, carbon tape in all directions. These strips fuse as they cool, forming a strong yet lightweight surface. The machine is normally used for manufacturing structural components for the aerospace industry.

Kaptein employed this innovative fabrication technique on a more intimate scale to create furniture. She first designed the Fibre Placement Chair that was selected by the Stedelijk Museum in 2016.

From this research she created the Recycled Carbon Chair. The machine prints the thin seat and backrest of the chair. The frame is made from recycled carbon fibre from cutting waste of the car and aerospace industry, making the chair 95 % recycled.

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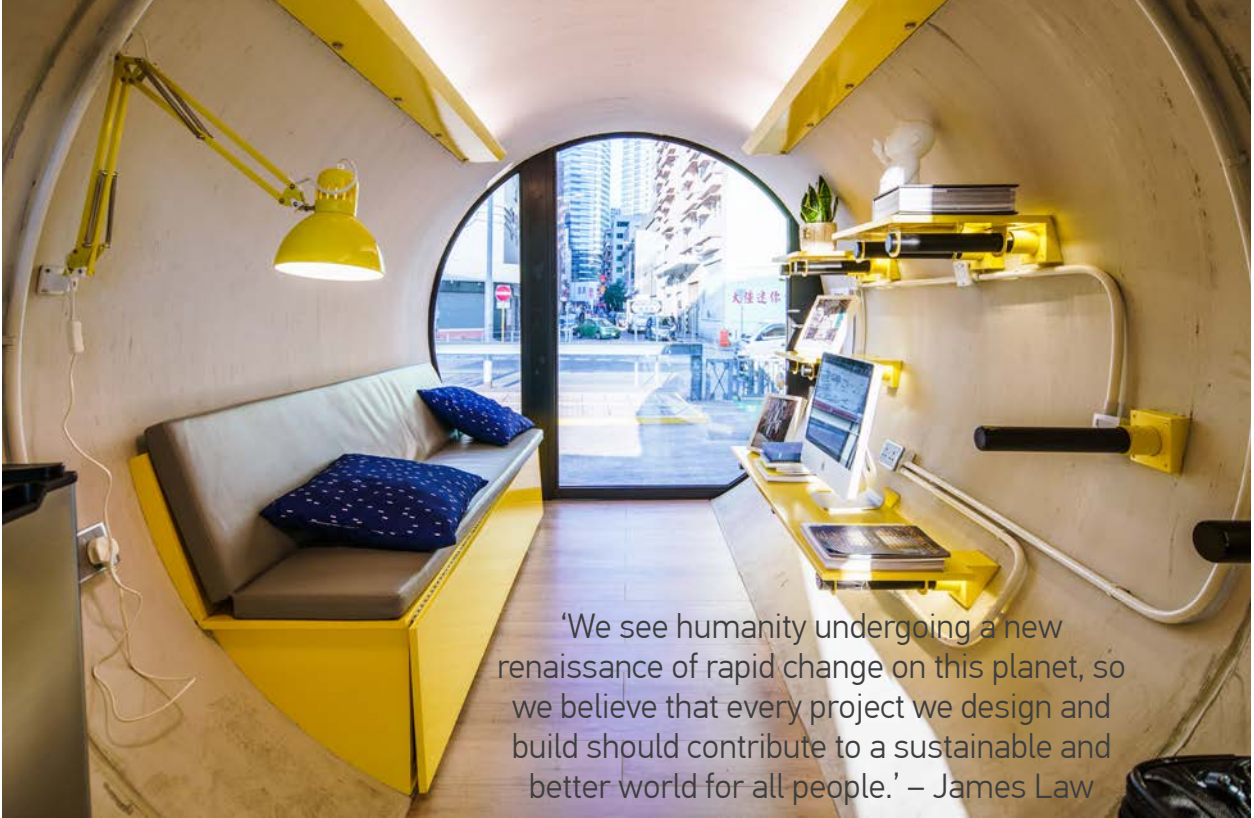
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'We see humanity undergoing a new renaissance of rapid change on this planet, so we believe that every project we design and build should contribute to a sustainable and better world for all people.' – James Law



POD PERFECTION

By Melissa Baird

DENSIFICATION of urban areas means more pressure on real estate prices, not to mention finding the space to build homes. James Law responded to this challenge by creating a philosophy called Cybertecture, a methodology that works with technology to create solutions that improve living conditions. His Opod Tube House concept utilises 2.5 metre diameter concrete water pipes that are reinvented to create affordable micro apartments that can house two people in inner city Hong Kong (which has some of the highest real estate prices in the world). Designed with smart phone locks, each pod has living, cooking and bathroom spaces and minimal furniture. The pods can be stacked up on one another creating modular communities in high density areas.

About James Law:

James is a Justice of the Peace, Young Global Leader of the World Economic Forum; a Council Member of World Economic Forum Global Agenda Council on Design & Innovation; Board Member of the Hong Kong Design Centre, Board Adviser of the Hong Kong Designers Association, and Member of Hong Kong Trade Development Council Real Estate Advisory Board.

Awards include: FT Asian Innovation Award, Edison Award for Innovation, Design for Asia Award, HSBC World Architecture Award.

Photos: James Law Cybertecture

Pods in Peru

Taking the pod concept to another level (literally) is the Skylodge Adventure Suites Hotel in the sacred valley of Cuzco in Peru. Guests reach the lodge by climbing 400 metres or via ziplines. The reward is an experience of a lifetime sleeping in a transparent pod that enables you to be absorbed by the views of one of the world's most mystical valleys.

The pods are made out of aerospace aluminium and weather resistant polycarbonate. Measuring 24 ft. in length and 8 ft. in height and width, the capsule suites have six windows and four ventilation ducts that keep good air flow. The lighting system consists of four interior lamps and a reading light all powered by solar panels that store energy in batteries. Each suite has a private bathroom separated from the bedroom by an insulated wall. Inside is a dry ecological toilet and sink.



'We shape our buildings, thereafter they shape us.' – Winston Churchill

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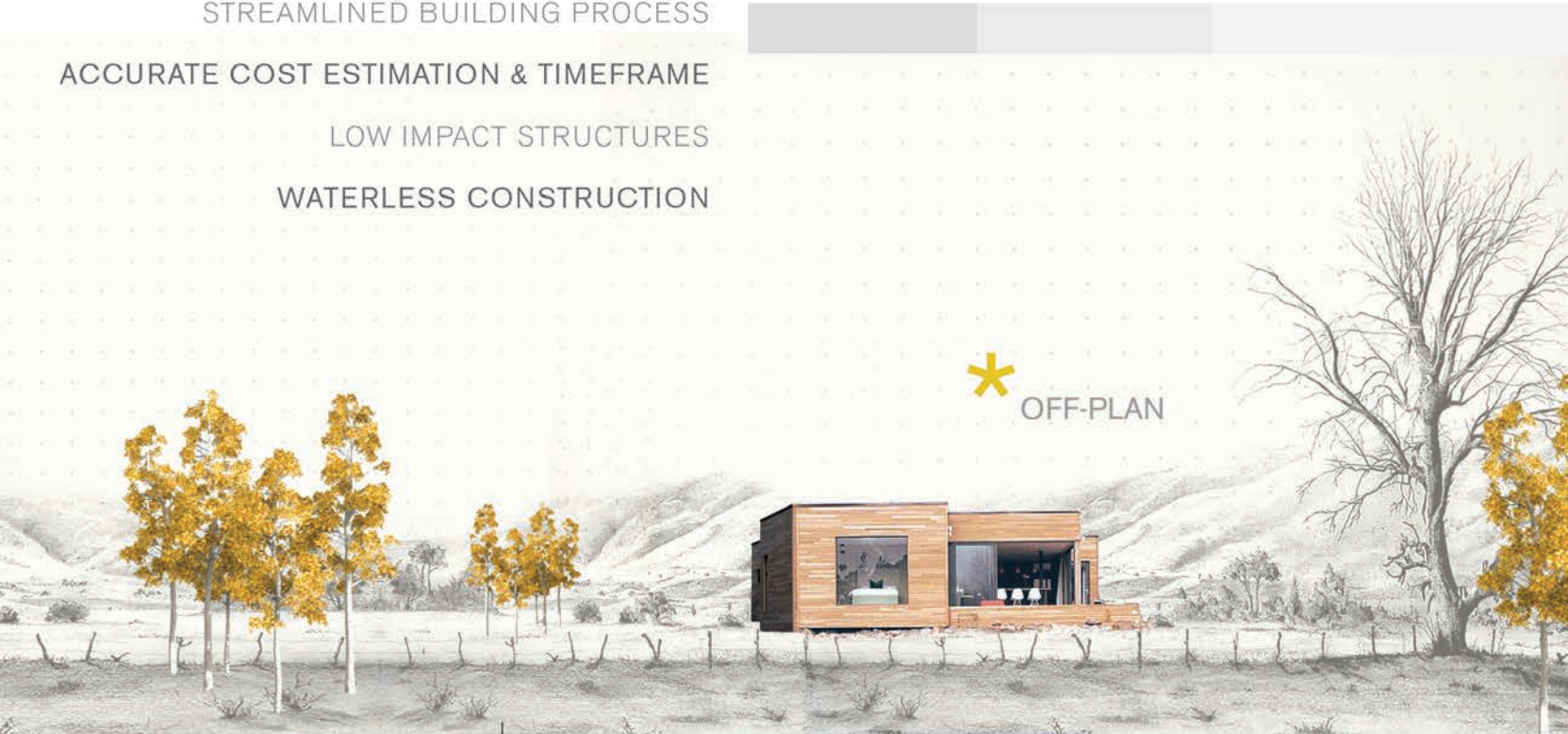
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Fourleaf Estate in Port Elizabeth was the first residential project in Africa to receive EDGE final certification.

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WHILE other residential rating tools exist, EDGE certification is unique in that it is an uncomplicated system that focuses on three key elements of saving: embodied energy of materials used in construction, predicted energy consumption and predicted water usage. Launched in South Africa in November 2015 in a partnership between GBCSA and IFC (International Finance Corporation), its simplicity makes it an ideal fit for emerging markets, and, with 1256 certified local homes – and growing at an increasing rate – it’s clear that the IFC is achieving its purpose of stimulating green investment through this innovative tool.

Where it counts

“All of our certifications have been for affordable, middle-income developments with home values falling between R350 000 and R1.25 million per unit,” says Grahame Cruickshanks, Managing Executive (Market Engagement) of the GBCSA. “This is where EDGE’s key benefit of energy savings reflected in utility bills really counts; with residents enjoying freed up disposable income as a result of efficiencies.” Further to the long-term environmental advantages of building in line with EDGE’s criteria (the certification requires achieving a minimum saving of 20% in the three categories), taking advantage of this measurable way for residential developers to optimise the performance of their building design leads to the “future-proofing”

of an investment. “Home owners know that these benefits are locked in, with green homes performing better, and selling as much as four times faster and at a higher price,” says Cruickshanks.

On a macro level, EDGE helps to build the solid business case for developers, investors and financial institutions to build green buildings at minimal extra cost, and could also enable financial institutions to structure “green mortgage” finance options. The IFC is in talks with various banks and financial institutions to develop a green mortgage bond and possibly preferred interest rates,” says IFC South Africa EDGE programme lead Lenore Cairncross. “Affordability criteria would be greatly improved with the long-term electricity and water cost savings for consumers.”

Shooting high

EDGE also has the positive effect of stimulating improvements in energy consumption across industries. “Currently, EDGE is 20% above South Africa’s regulatory standards; but it also sets a water standard, which doesn’t exist nationally. As the tool becomes more widespread in the market, the hope is that it will continue to be a driving force in creating an upward spiral for attaining higher sustainability goals,” says Cruickshanks.

The fact that EDGE is an online system means that developers can easily test their project through the user-friendly platform to see how they measure up. And, in addition to residential projects, agreements are underway to introduce EDGE for other building types (office, retail, hotels, education, hospitals). Watch this space!



Sustainable Cities and Municipalities



SOUTH AFRICA'S MAJOR METROS ADVANCE TOWARDS NET ZERO

New buildings in Johannesburg, Cape Town, Tshwane and eThekweni are set to be Net Zero Carbon by 2030, and in the next 15 months policy is expected to be finalised to meet this deadline.

THE intention is to accelerate the development and implementation of energy efficiency policies and programmes for all new buildings in SA cities by 2020, and so progress towards a state where all new buildings are Net Zero. The relevant city departments in Johannesburg, Cape Town, Tshwane and Durban are each actively investigating opportunities to increase practices of energy efficiencies and the use of renewable energy, and so encourage buildings to even surpass the mandated requirements on enerAs part of the C40 Cities' South Africa Buildings Programme, the mayors of South Africa's four key urban centres have committed to developing the policy and regulatory environment stipulating that new buildings be Net Zero Carbon buildings by the end of 2020. It is expected that these policies will be implemented by 2030.

From its launch in April the programme is taking place in partnership with Sustainable Energy Africa, where Megan Euston-Brown is the project lead. A technical officer in each C40 city is driving its local implementation, following the practice across the alliance of all 90 C40 cities – which are all pushing

urban action that reduces greenhouse gas emissions and climate risks, while increasing the health, wellbeing and economic opportunities of residents and so deliver action consistent with the objectives of the Paris Agreement.

“Each metro has been engaged with internal and external stakeholders on various aspects of implementation,” said Euston-Brown. “By way of example, this includes presentations at the City of Cape Town's Commercial Water Waste and Energy Forum, the Tshwane Sustainability Week and the Green Building Design Group's Going Green conferences. In eThekweni team regularly submits reports to a multi-disciplinary and cross-departmental team and are engaging with their economic development department around a budget proposal that would involve tax incentives for pioneering green developments. The Johannesburg team are engaging internally with both Building Approval and Spatial Planning departments.”

While each city will develop their own policy they will all work towards the committed implementation deadline of 2030. “They see the value in aligning their initiatives to create as much sector uniformity as possible, to give a single intention, direction and message,” said Euston-Brown.

“At a programme level the most important engagements have been with the custodians of the National Building Act, the Department of Trade and Investment. They noted the critical importance of climate change and their commitment to the Net Zero pathway and the engagement concluded with a strong commitment from both national government and the cities to collaborate around taking this work forward. DTI require support in the training of building approval staff in the new national standards that are to come into effect in the near future, they would also like to see smaller municipalities coming on board and, in all instances, to see that the initiatives ensure as much social and economic inclusion as possible.”

Each of the C40 Cities has committed to a climate action plan before the end of 2020 and so work together to limit the global temperature increase to 1.5 °C above pre-industrial levels.

The amount of energy used to power, heat and operate buildings is understood to account for more than 25% of the greenhouse gas emitted by South Africa’s cities. Efficient buildings are expected to have a marked impact on this statistic, especially as the pressure on urban cores to accommodate increasing numbers and densities of people will not let up. Within 12 years more than 70% of South Africans are expected to live in cities where buildings will be relied on to meet the growing needs of the residential, commercial, industrial, educational and health sectors.

The mountain of challenges expected to reform metro’s existing systems is discovered to be more like a molehill on closer inspection, says Euston-Brown. “Initially

there was a sense that there would be resistance from the construction sector, but the data shows such a strong market case for green buildings and, for the commercial sector, rooftop PV already has an approximate four-year pay back – so there is not much of a barrier there.”

“DTI would like to see that there are no legal challenges relating to local bylaws – and that the mandates are clear in this regard. The indications from legal experts are that there is a strong case for this to fall within local mandates.”

“Within the cities’ themselves – as they have also committed to Net Zero Carbon for the whole city by 2050, this initiative is seen as probably one of the lowest hanging fruits: it does not require public money and can be relatively easily implemented and there is a strong market case. There is also a strong – and growing – sense that the economic driver of the upcoming decades will be low carbon infrastructure development and if our cities want to benefit from such investments they will need to ‘have their own houses in order’ so to speak and this would be an important way to indicate this,” she said.

Of course some challenges remain. “Especially among the smaller business and residential sector where the case for embedded generation is less clear and access to capital not as easy, and mechanisms to achieve this in these sectors requires thought,” said Euston-Brown, “As does whether or not this is an optimal investment in new energy generation – there will be revenue impacts for municipalities’ electricity departments as well as Eskom – but there is no avoiding this.”





EMERGING URBAN TRENDS IN OPEN SPACES

GAUTENG province is witnessing unprecedented loss of biodiversity and a deterioration of the natural systems that support life on Earth. Natural systems and open spaces play a vital role in keeping our air and water clean and providing essential services. Public open spaces are also a major draw card for the recreation and tourism industries, and significant sources of employment for local communities. Along with the economic benefits, pleasant places improve the physical and mental wellbeing for today's sedentary society.

Developed and undeveloped open spaces, nature reserves, protected areas, bird sanctuaries, Joburg Zoo and cemeteries are actively maintained by Johannesburg City Parks and Zoo depending on their ownership status, zoning and functions. In a scientific publication by Balmford et al. (2002) on the economic implications of conserving natural habitats, the benefit-to-cost ratio of conserving these habitats has been conservatively estimated to be 100:1. Such an overwhelming figure, albeit an indicator at a global level, calls for the urgent evaluation of the services rendered by Johannesburg's remaining open spaces, the raising of public awareness of these services and the development of appropriate management strategies.

The above scenario and findings can be attributed to any combination of the following factors:

- a) Communities and decision-makers undervalued open spaces in the past, as the benefits to society had not been clearly defined. As soon as it is understood that open spaces can render a service to society, an economic value can be assigned to it and hence more informed decisions can be made regarding open space management.
- b) The second element is that local government is constantly faced with having to make decisions with limited knowledge without the availability of open space conservation tools; therefore it is also important for local decision makers to understand the ecological benefits behind land conservation.

- c) The third dimension involves the intrinsic and extrinsic aspects of open spaces and protected areas, which are often undervalued during development planning, due to the absence of robust scientific models to evaluate the intrinsic values offered by natural systems.

Looking ahead

There are many policy considerations from a local and international perspective, including Agenda 21, which is the international blueprint for sustainable development; the *Development Facilitation Act* which stipulates general principles around land development along with guidance on regulatory measures, as well as the *Joburg Metropolitan Open Space System*, defined as an inter-connected and managed network of open space, which supports interactions between social, economic and ecological activities, sustaining and enhancing both ecological processes and human settlements.

An appeal by Johannesburg City Parks and Zoo (JCPZ) to all sectors is made to maintain high quality green spaces such as parks, trees along streets, and gardens in key locations, in order to:

- Make cities more liveable and contribute to the visual appeal of the city
- Contribute to the property value in the vicinity of the park
- Enable biodiversity (trees, plants, some animals, birds, fish etc) to co-exist with people in the city
- Contribute to a diminishing 'heat island effect', through breaking up the hard surface of the city.

Through various research and stakeholder engagement with the property development sectors there is a need to identify and determine the green value that open spaces offer in enhancing the new and existing township developments. This will assist Johannesburg City Parks and Zoo to understand the legislative framework pertaining to town planning and environmental legislation in open spaces development.



**Green Building Services
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WOOD IS GOOD

CAN you imagine a 350-metre high skyscraper made mostly from wood? Sumitomo Forestry can. The Japanese company plans to build one in Tokyo to mark its 350th anniversary in 2041. This ambitious undertaking reflects a growing global trend to take wood to new heights in the built environment.

“When you mention timber buildings, most people think of wendy houses or log cabins. They think ‘fire hazard’; they think deforestation,” says Michael Peter, Executive Director for Forestry South Africa (FSA). In fact, as Mr Peter goes on to say, the opposite is true. The consumption of sustainable wood can actually help combat deforestation. Well-managed planted forests (plantations) reduce soil erosion, maintain the water balance in the surrounding areas and provide refuge for an array of species, preserving biodiversity.

Good for the environment

Trees are also nature’s biggest carbon sinks. As they grow, they absorb (sequester) carbon dioxide and store it as carbon in leaves, trunks, roots and soil. “The procurement of renewable, sustainably produced wood by the construction sector holds the greatest potential for climate change mitigation,” Peter notes.

Some 0.9 tons of carbon are sequestered by one cubic metre of wood throughout its lifetime. South Africa has 1.2 million hectares of farmed trees which sequester around 64,8 million tons of carbon. When a harvested tree is made into a solid wood product or pulp for paper, the carbon remains locked up in those products.

Good for building

Timber plantations represent 7% of the planet’s forest areas, yet provide 50% of the wood for industrial purposes. “There is an exciting move by architects as they look to the forest products sector for carbon-neutral and renewable options,” adds Roy Southey at Sawmilling South Africa (SSA).

Timber competes well with concrete and steel, in that it offers strength, can withstand seismic activity (not such a big factor in South Africa), and is much lighter to transport. “Timber structures are often prefabricated off-site, reducing both the construction times and associated costs,” notes Southey. Modern wood-based construction materials are safe if treated and used correctly. They will also maintain their integrity in the majority of fire situations and will not melt, deform or collapse.

Good for the economy

The South African forestry and forest product sector employs 158,000 people, with 690,000 people dependent on it for their livelihoods. The sector currently generates a gross value of R42 billion, of which R29 billion is exported in the form of beneficiated products.

The uptake of timber-based products in the built environment can further improve the prospects of the forestry industry’s lumber producers. It will be as important for the sawmilling industry, as nanocrystalline cellulose, bioplastics and biochemicals are proving to be in countering the decline of traditional paper products.

Good for the brain

According a recent *Workplaces: Wellness+Wood=Productivity Report*, weaving wood into workplace design can be a major driver of wellbeing, job satisfaction and productivity. Biologist and author Edward Wilson first popularised the ‘biophilia’ hypothesis” that “humans have an innate tendency to seek connections with nature and other forms of life”. When we consciously acknowledge that sustainably produced wood provides work for thousands of people from tree nurseries to the housing sector, we truly can see the good in wood.





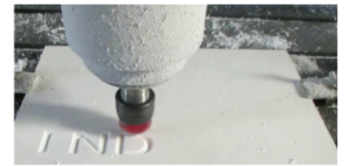
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OutdoorKitchenCompany - Case Study

Spent months researching various materials, with specific requirements in mind." Says Shane Weeden, owner of the Outdoor Kitchen Company. "We required products that offered our clients an Outdoor Kitchen that is UV resistant, 100% moisture resistant, must be able to handle the harsh South African climates and had to be fire retardant with the ability of self-extinguishing. On a manufacturing level, the product had to be easy to machine, must be clean in cut and offer us accuracy for assembly. Our research and development considered light steel frame cladded modules which, we found, was widely used in America but not a good option for us. Europe and parts of North America seemed to be using exterior cupboard and draw units made from PVC Foamboard. The challenge for the Outdoor Kitchen Company was how to build an outdoor kitchen of the highest quality without importing these overseas units.

We decided that our Outdoor Kitchen's would be as South African as possible. From the sourced materials, components, to our various suppliers and finally our team. We decided to build South African Outdoor Kitchens of the highest quality, sourcing and supporting as much as we could from South African SME's.

In month eighteen of our R&D, we came to test PVC Foamboard from PVC Foamboards (Pty) Ltd. Our CNC router cut through the PVC Foamboard just as it would a standard MDF board. Our water absorption test proved it could withstand being outside in the rain. The cross hatch test proved that the PVC Foamboard could be over coated in a variant of gloss, sheen or matt Acrylics or Acrylic Polyols and Urethane coatings for an enhanced decorative nish. The PVC Foamboard has another cost advantage in that the o-cuts and particles left from cutting, can be gathered and sold back to PVC Foamboards (Pty) Ltd for re-cycling. This was important as the majority of the Kitchen is now made from PVC Foamboard and now we have the option of re-cycling an entire kitchen should the client ever wish to upgrade or totally replace it as styles change. In terms of practicality, the obvious advantage of using PVC Foamboard is it's green offering, in terms of it being totally recyclable, as it is locally produced, it's resistance to moisture, rotting and water damage and it's resistance to insects.

The Outdoor Kitchen Company will continue using the range of PVC Foamboard supplied by PVC Foamboards (Pty) Ltd in creating quality bespoke Outdoor Kitchens for our South African clients.



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HIGHLY SPECIALISED WINDOW COVERINGS TO COMPLEMENT PASSIVE DESIGN



PEOPLE are reaching for the stars these days – the green stars. The race towards greener buildings and allied products is reaching a fever pitch, with everyone from architects and manufacturers through to the very occupants of these buildings aiming to reduce their carbon footprints. When it comes to environmentally-friendly building you will find passive design at its foundation. Passive design utilises the sun's energy to provide comfort and daylight as well as to replace traditional, mechanical services such as air-conditioning. The concept includes functions such as solar heating and cooling, thermal mass, natural ventilation and daylight.

To complement the requirements of these buildings and for them to perform optimally throughout all seasons of the year, an integral aspect of the design is the choice of window coverings. Luminos Blinds is at the forefront of the design and implementation of such window coverings, having sponsored both the GBCSA Head Office in Cape Town as well as their provincial offices in Rosebank, Johannesburg.

Luminos is the key brand of The Blinds Syndicate, a world class-manufacturer based in Durban, Kwa-Zulu Natal that specialises in highly technical coverings for doors and windows. Their blinds are locally manufactured, handmade, and prized for their outstanding quality and workmanship; offering architects, interior consultants and Green Building professionals products which boast technical qualities to control light, heat, sound and hygiene. Luminos is currently in the process of having multiple products eco-certified, which will help elevate the desirability of their products even further.

Sole distribution rights

Additionally, Luminos holds the sole distribution rights in the entire SADC region to the most highly-specified technical textiles in the world. These textile companies include Junkers & Müllers Technical Textiles, which are produced in Mönchengladbach, Germany. The special properties of their sun protection products help to positively influence the energy balance of a room.



Upon consultation with the GBCSA building's architects and decorators, it was decided that roller blinds with Junkers & Müllers Silkshade (JM) Effect ALU FR would be produced and installed. The aluminium backed, fire resistant, PVC-free fabric was the perfect choice for thermal comfort and glare reduction, while simultaneously making the most of natural daylight. The fabric has an extremely defined mesh structure that offers excellent transparency despite a rather small openness factor of 3%. The aluminium coating on the back provides effective protection against harsh light and the compact structure of the weave ensures that the coating is virtually invisible from the inside. JM Silkshade Effect is available in a range of colours, and even the lightest colours still offer transmittance values as low as 5 - 8%.

Junkers & Müllers

When it comes to their environmental policy, sustainability is at the heart of every production process and all end products. Continuous new investments aim to save energy, thereby reducing harmful emissions of carbon dioxide. Formaldehyde, CFC, solvents and lead, cadmium and mercury compounds are also completely avoided during production. All JM products are PVC-free and certified in accordance with the Oeko-Tex® Standard 100, product class IV. These products also satisfy the requirements of the REACH directive.



the Blinds Syndicate



ISOBOARD XPS INVERTED ROOF THERMAL INSULATION APPLICATION

AN “inverted roof” is broadly described as a concrete deck where thermal insulation is placed above the water-proofing system. The chief benefits are that the waterproofing system is protected from weathering and thermal shock events, and the entire thermal mass of the slab /screed is available to moderate internal temperature below the roof slab. This can be very useful if the upper storey is a data or communications centre, operating theatre or accommodation.

Concrete buildings have a long design life, so one expects the thermal insulation specified should last the life of the building, with minimal drop off in performance, irrespective of weather events. IsoBoard thermal insulation is ideal for use in exposed-to-weather applications, as it is proven to be minimally affected by moisture, as well as freeze-thaw conditions. While we only have the international track record of extruded polystyrene to rely upon for longer time periods, we have tested IsoBoard XPS installed as inverted roof since our South African operations commenced in 1995.

IsoBoard in practice

IsoBoard recommend a long term design thermal transmission or k value of $0.03 \text{ W/m}^2 \text{ } ^\circ\text{C}$. This is the value we believe can be reliably employed by thermal designers when calculating heat flows in and out of an insulated system using IsoBoard XPS. The thickness of IsoBoard to be employed in the inverted roof is determined by the amount of thermal resistance required.

If we focus on hospitals, for instance, the passive cooled Letsholathebe II Memorial Hospital in Maun, Botswana, uses 150mm of IsoBoard in the roof application, to avoid the use of air conditioning. Wynberg Military hospital uses 80mm high density XPS under paving to allow parking on the roof space, as does the Chris Hani Academic Hospital in Pretoria, where 30mm high density IsoBoard has been installed for nearly 20 years. The compressive strength of IsoBoard allows the construction of trafficable roof space.

We were recently able to test the properties of 50mm IsoBoard panels which are installed in the inverted roof application under gravel and paving ballast. This central Cape Town location has been exposed to weather for the past 15 years, and is still within design specification. We look forward to testing another sample from this location in 35 years’ time, where we expect a similar outcome.

IsoBoard Thermal Insulation provides excellent payback through additional savings on waterproofing maintenance, not just through our proven thermal design optimisation and durable energy efficiency.



GLOBAL ROOFING SOLUTIONS FOR SHOPRITE'S CLIMOR DISTRIBUTION CENTRE

THE new distribution centre for Shoprite Checkers in Climor consists of over twenty buildings, of which the largest buildings are three warehouses within the development. The Dry Goods warehouse is 76,000m², the Refrigerated building is 18,000m² and the Returns Centre is 12,000m². Together, these buildings form the core of the new national distribution centre.

The distribution park can be seen from a nearby freeway and surrounding communities, so aesthetics was a core part of the architect's brief. Shoprite Checkers also wanted to maximise their investment, which led the architects and structural team to work closely together to see how they could produce a highly functional distribution centre that was also aesthetically pleasing to passers-by on the freeway and people from adjacent neighbourhoods.

The curved architectural features and large open span roof structures necessitated a flexible and versatile construction material, which is why steel was chosen. Structural steel enabled the project team to not only cost-effectively construct the large open span roof structures, but it also enabled the team to meet tight construction deadlines.

The ambient warehouse required a 32x32m internal grid and the refrigerated warehouse required a 24m x 24m internal grid. A large cantilevering concrete tilt-up column stabilises the buildings and this structure made the erection of the long span steel girders and trusses safer.

A curved roof structure

Close to 3000 tons of structural steel was supplied for the project. A curved roof structure was chosen for

the Dry Goods building due to the size of the building and the resulting rainwater run-off lengths. The angle of the roof increases with increasing run-off length, thereby improving run-off performance, due to the curve of the roof.

GRS' KLIP-TITE, from Global Roofing Solutions, was the product of choice for the roof. The concealed fix profile roof offers superior wind uplift resistance and the fact that the rib runs perpendicular (as opposed to the conventional method of running parallel with the sheet in the pan) changes the dynamics of the sheet and provides a one-of-a-kind solution for projects such as this.

To avoid a large flat zone on the roof, a jointless sheet transition from -0.5° to 0.5° was incorporated at the apex of the roof. A watertight installation was ensured thanks to typical step lap detailing. The effects of temperature strain was also minimised thanks to the step laps with the first sheeting laps occurring at slopes of more than 2°.

Scheltema deployed safe erection of the roof sheeting and GRS as well as Safal worked closely together to ensure a world-class installation for Shoprite Checkers. The project was completed within the deadline and budget, and the client is pleased with the aesthetics.





WE TREAD SOFTLY

At Belgotex, our eco-pillars drive our multi-dimensional, long-term operational plans and they challenge us to ask more of ourselves and less of the planet in all that we do.

Water management and conservation

Water scarcity is increasingly pressurised by severe drought conditions. The reality of the deepening water crisis has given rise to serious water saving initiatives. Embracing change in our traditional manufacturing processes and repurposing harvested rainwater has reduced water consumption by 35 - 45% since 2015.

Water-intensive dyeing practices have been eliminated and replaced by a revolutionary water-less dyeing process, saving millions of kilolitres (kL). The adoption of a dry-manufacturing process and complete switch in production and product development to only solution-dyed (SDX) ranges resulted in a 100% reduction in water consumption for yarn processing, as well as reductions in chemical and energy inputs. Moving away from wet space-dyed product manufacturing also means we now produce a superior colour-fast and fade-resistant carpet thanks to the improved stainproof characteristics of SDX.

Waste management

We have a 'Zero Waste' strategy. It has unleashed our potential to integrate sustainability into the very fibre of our DNA. We have placed waste management high on our agenda, with investments in excess of R5 million that have enabled Belgotex to reduce material waste rates to almost zero. Waste minimisation is part of our Environmental Management System (ISO14001). Waste is monitored and measured continuously to ensure our progress targets are met. We have a 93% waste recycling and landfill diversion rate. Our Green Underlay is the environmentally friendly option of underlay made from 100% recycled post-industrial waste.

Energy conservation

We seek to do more with less, seeking out ecologically

sustainable manufacturing methods that minimise our impact on the environment. Clean production is made real through our significant investment of capital expenditure into plant upgrades and adopting eco-innovative raw material input strategies. As a nature-led manufacturer we engage the science of nature as the backbone of innovation and this has seen the step-wise evolution of our processes and procedures. Belgotex has invested over R20 million to date in solar power, resource efficiency and plant upgrades in an active drive to offset CO² emissions and save energy.

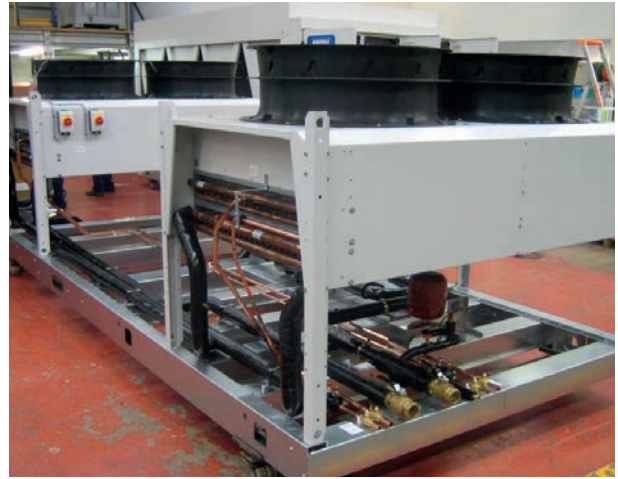
A first for South Africa

Belgotex was proud to receive South Africa's first Custom Industrial 6 Green Star rating - this certification recognises "World Leadership" at our Pietermaritzburg-based factory for our sustainability practices in all aspects of plant and carpet manufacturing operations.

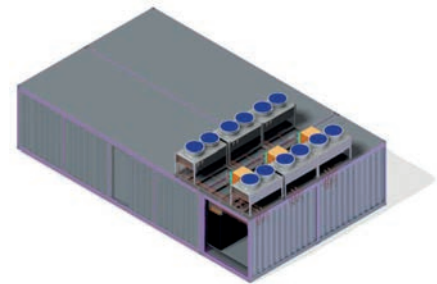
As the first South African flooring manufacturer to earn the coveted Global GreenTag eco-label certification, we have achieved another significant sustainability milestone. This internationally recognised "Level A" Global GreenTag certification - called GreenRate™ - maximises our products' eligibility to achieve 100% of the available credit points across all South Africa's Green Building Council (GBCSA) rating tools. The stringent assessment process has equipped us to develop holistically and entrench sustainability across our value chain.

Belgotex is constantly pushing the limits for operational efficiency, seeking out ecologically sustainable manufacturing methods and developing eco-friendly products.

Belgotex™



CUTTING EDGE AIR-CONDITIONING DESIGN



AIREDALE was approached by Vodacom to find a solution for its increased demand in data centre applications, which maximised energy savings through advanced technologies and exploiting free cooling opportunities. They devised the innovative, hybrid data centre cooling plant.

Smart cooling

Each modular data centre consists of either a single 64m² module equipped with 2 x 40, 65, 75 or 92kW free cooling SmartCool™ downflow PAC units, or two 128m² modules containing 3 x 95kW SmartCool™ units deployed in a N+1 configuration. The smaller module houses a secure, fully dual redundant energy centre accessed via its own entrance. Larger, separate fully dual redundant energy centre modules with power output capacities of 1600 and 3200 Amps per phase can also be attached to the data/GSM network modules allowing up to 1000m² of 'white' space to be constructed as required.

The SmartCool™ units have dual DX air cooled refrigeration circuits providing four stages of cooling, superior part-load efficiency and N+1 redundancy. To capitalise on free cooling opportunities, the SmartCool™ units are supplemented by an indirect air free cooling circuit connected to a roof-mounted hybrid condenser and dry cooler system. Inverter driven run/standby pumps are positioned in weather-proof housing with individual isolation valves and isolators on fans and pumps and a differential pressure sensor for each pump, thereby delivering the precise capacity match. Under low temperature ambient conditions the pumps and fans run in isolation. As the ambient temperature increases, the three-way valve opens more fully, the pump speed increases, followed by the outdoor fan. If cooling demands cannot be met by free cooling alone, the first stage of DX cooling starts. The compressors then stage sequentially to meet the demand.

Boosted energy savings

In order to achieve free cooling in the heat of Southern Africa, air temperatures are elevated to 25°C and 38°C for supply and return respectively; raising the supply temperature by 1°C from a more standard return air temperature of 24°C. This brings annual energy savings of 110% using an air cooled system alone and 138% from a free cooling system. By running the cooling at the lower return air temperature of 24°C, the units would deliver 22kW less cooling duty, increasing capital costs and floor space requirements.

The solution was developed in conjunction with Airedale's technical team in the UK and manufactured locally by Johannesburg-based, Airedale International South Africa, with installation and commissioning achieved within just 15 working days. "Airedale delivered with speed and urgency, and the quality of their plant designs will make a major contribution to Vodacom's strategy," says Fred R Weber, Senior Specialist at Vodacom Technical Facilities Division. "The energy efficiency of the modular data facilities fully complements Vodacom's programme to reduce the Group's overall carbon footprint."





BRINGING PROVINCIAL SERVICES DEPARTMENTS UNDER ONE ROOF

THE Shared Services Office Building (SSOB) located in Khayelitsha, Cape Town is the second in an initiative pioneered by the Western Province Government to bring numerous provincial services departments 'under one roof'. Through centralisation and rationalisation of services, greater success is achieved in terms of convenience and efficient management when servicing clients.

The Shared Services Office building is located within the CBD on the corner of Steve Biko and Walter Sisulu roads. It shares a site with the Khayelitsha Hospital at the head of the main street defining the commercial node.

The key features of this building are the initiatives implemented through the design of the building to improve energy conservation, reduce energy consumption and reduce the overall Carbon footprint of the building. The building design was aimed at creating a significant medium rise

building in accordance with the latest Khayelitsha urban design framework. It is the first public building in the Western Cape to attain a Five Star Green Star Rating in terms of criteria developed by the Green Building Council of South Africa.

The SSOB is equipped with the latest technology in Green Systems, utilising the Thermally Activated Building System or TABS system, Rainwater harvesting for toilet flushing; a Tenant exhaust riser removing printer fumes and a Water sub-metering & monitoring strategy.



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+ IMPACT

EDITIONS AND EDITORIAL OVERVIEW FOR 2019 (SUBJECT TO CHANGE)

GBCSA's official publication provides thought leadership by leading local and international green building commentators and practitioners, and showcases excellent work by GBCSA members. +Impact is provided at no charge to all senior executives and officials of GBCSA member companies and organisations, and to municipalities and related government departments.

FEBRUARY 2019 EDITION

Thought leadership under the following themes:

- + Green buildings within the context of broader urban and social sustainability - Going beyond "Zero"! The move toward regenerative positive impact built environments, creating spaces and places that facilitate and catalyse liveable precincts and cities that are safe, clean, productive, and convenient for work and leisure
- + Infrastructure and property investment as a catalyst for growth - why government should use the green economy as a key strategy to trigger large-scale public private partnerships
- + Green buildings and green building interventions - if, when, why, what, how much have you got?
- + Construction 4.0; Buildings 4.0 - the tech behind going to Zero
- + Smart green homes and strategies to make the Edge Tool the standard for all new homes across the spectrum

JUNE 2019 EDITION

Thought leadership under the following themes:

- + The relationship between smart green buildings and smart sustainable cities
- + Self-sufficiency is a key driver of sustainable best practice - but when is it better to be plugged into the matrix?
- + Green buildings and green building interventions - if, when, why, what, how much have you got?
- + Small embedded generation - the art of going to Zero
- + Heritage - converting ancient wisdom into the future of modern buildings

OCTOBER 2019 EDITION

Thought leadership under the following themes:

- + Regenerative architecture - turning decay into prosperity in SA city precincts
- + Interview with key Green Building Council Convention speakers along the themes of the conference
- + Green buildings and green building interventions - if, when, why, what, how much have you got?
- + Living walls and roofs
- + Modular Construction as a key strategy to low impact construction



For advertising and sponsorship opportunities please contact Thandiswa Mbijane at thandiswa.mbijane@alive2green.com.



Advertising rates are discounted for GBCSA members and prices will remain unchanged in 2019. Further discounts are available for booking multiple editions in 2019.



Introducing South Africa's first GreenTag Certified Luxury Vinyl Tile (LVT)

Evaluation Flooring is leading the way in luxury vinyl flooring. Our Amtico Spacia, Amtico Spacia Acoustic & Amtico First are the first, and currently the only vinyl flooring products to achieve Global GreenTag certification in South Africa.

We are the supplier of choice for companies looking to Go Green or invest in Green Building to do their bit to save the planet.

Think flooring... Think *Evaluation*.



amtico
makes it
possible



Question today
Imagine tomorrow
Create for the future

As a founding member of the Green Building Council of South Africa and the sustainability consultants behind the development of Green Star rating tools for Namibia and Rwanda as well as Mixed Use Developments in South Africa, WSP has focused on ensuring that the projects we work on are low impact and sustainable.

Since beginning our journey towards driving the uptake of green building, we have maintained a 100% success rate in achieving Green Star Certification for our clients.

We are proud to have reached
1 Million Square metres of certified urban green space in Africa!

wsp.com