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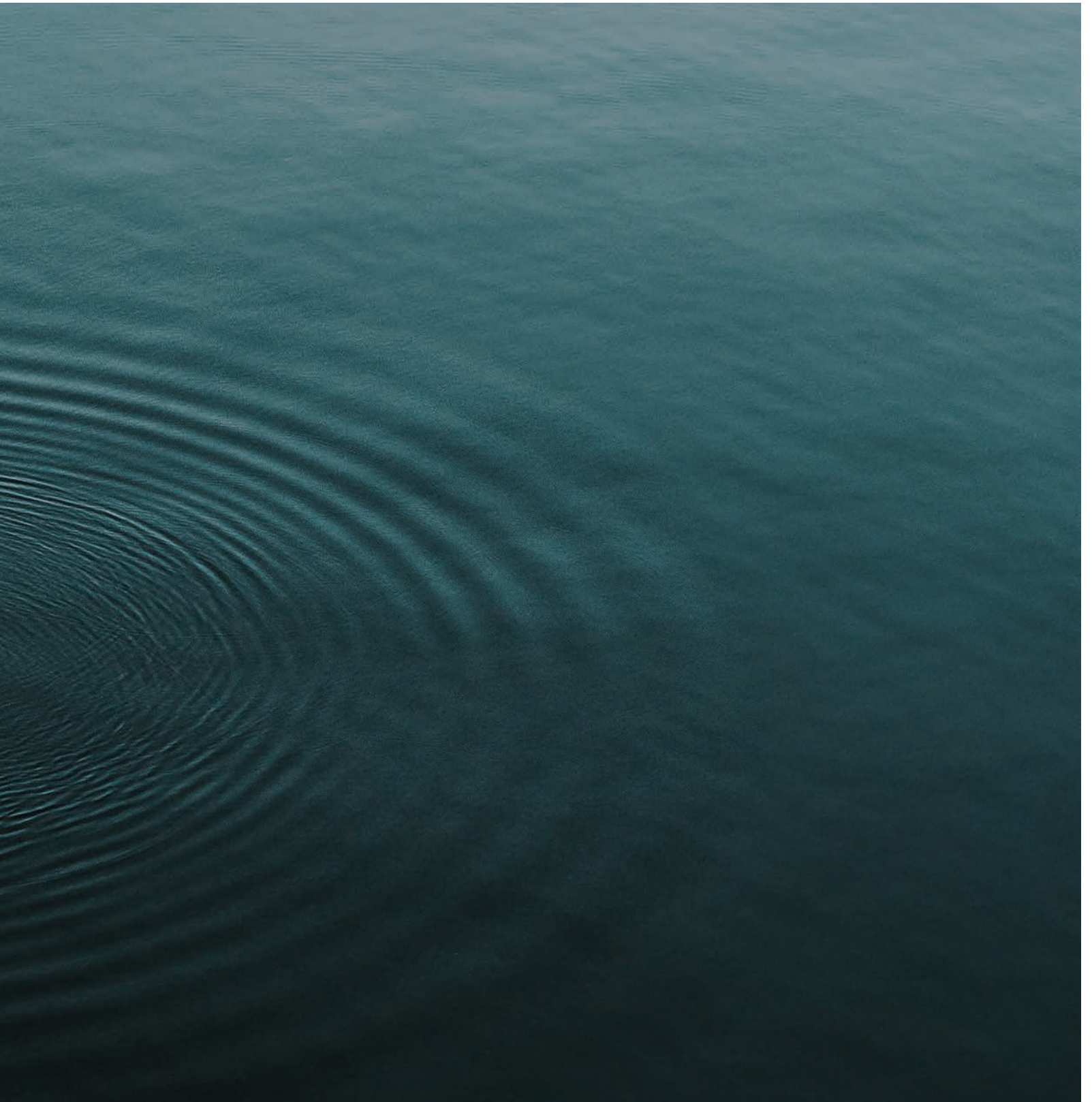
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Johannesburg City Parks and Zoo's greening initiatives, such as planting and maintaining one of the largest man-made forests in the world, establishing parks and developing green ethos in communities, are creating a city where nature, biodiversity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



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The Green Star - Sustainable Precincts tool





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A MESSAGE FROM THE CEO

Today, 54% of the world's population lives in urban areas, a proportion that is expected to increase to 66% by 2050. According to the *United Nations' World Urbanization Prospects The 2014 Revision Report*, further projections show that urbanisation combined with the overall growth of the world's population could add another 2.5 billion people to urban populations by 2050, with close to 90% of the increase concentrated in Asia and Africa.



In terms of the environment, cities continue to consume over two thirds of the world's energy and account for more than 70% of global carbon dioxide emissions, making them critical roleplayers in the race to mitigate climate change. The concentration of people and infrastructure makes cities particularly vulnerable to the negative impacts of climate change.

Throughout history, towns and cities have been the central points of humankind's economic activity, centres of learning, culture and innovation. Yet many who move to urban environments in developing countries in search of greater access to social and economic opportunity to improve the lives of themselves and their families, will on the contrary, experience more hardship due to overpopulation and vulnerabilities to climate change. In the face of these challenges there is, however, a unique opportunity for cities to lead the way in improving and amplifying the well-being of society through initiatives that address poverty, improve infrastructure and tackle environmental issues.

Urban growth is coupled with the rapid development of megacities, almost tripling from only ten in 1990, to 28 in 2014. Most of these cities are in developing countries and suffer from a lack of infrastructure that maintains an acceptable quality of life for all residents. South African cities are already experiencing huge infrastructure challenges due to the increasing urbanisation rate.

Not discounting that most buildings in megacities are newly built and that when urban regeneration happens at large scale it often involves demolishing existing and rebuilding more densely, it is pleasing that the industry as a whole is giving more attention to the issue of regeneration, inner city renewal, and refurbishing and repurposing existing built structures.

Generally, sustainable development is understood by the industry as development that meets present needs



without sacrificing the ability of future generations to meet their own needs.

It is characterised by low ecological footprint, minimum pollution levels, efficient use of land, recycling and re-use of materials, and conversion of waste to energy. In order to be future-resilient, sustainability needs to remain the cornerstone that accelerates innovative building approaches suited to meet the complexities of a changing world; while being cognisant of the fact that if the industry doesn't act and transform decisively, no leader, no country and no government can reduce the rate of carbon and environmental damage the built environment continues to cause.

Cities remain the engines of growth, both in economic and demographic terms. Some 60% of the urban development required by 2030 is yet to be built, and this presents an opportunity to leapfrog outdated approaches by shifting to more sustainable urban planning, green construction and transit-oriented development. Initially, green buildings were intended to reduce damage to the environment and human health caused by the construction industry. It has become clear over time that just doing *less* damage is not enough.

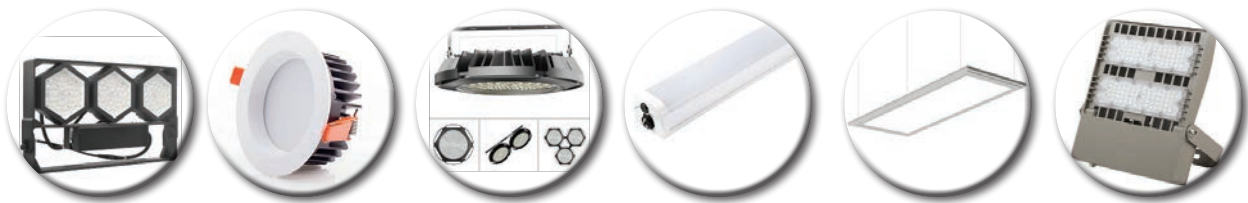
That said, what can the GBCSA and its stakeholders do to secure a sustainable built environment in these urban spaces? Green building is an absolute necessity but cannot be viewed in isolation – there are multiple layers to securing a sustainable built environment for future generations.

In this issue we explore the concept of regenerative buildings and cities and we look at innovation that encourages the integration of buildings with living systems, with the aim of contributing to the long-term renewal of resources and life. At GBCSA we are already seeing market leaders transition from reducing environmental impact to neutral, and in some cases, positive impact!

Achieving true sustainability requires a new approach to creating and caring for the built environment.

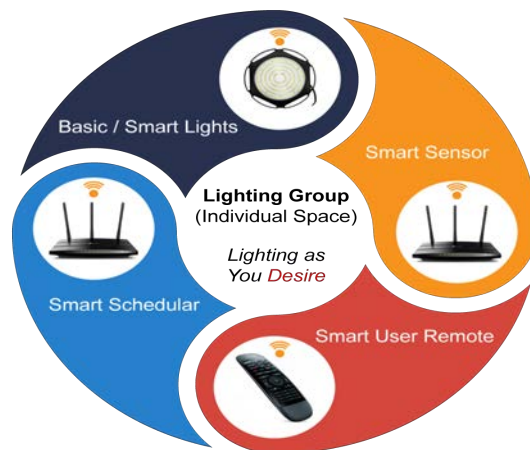
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GREEN BUILDING PROGRAMMES 2019

The GBCSA offers Accredited Professional training that introduces green-building thinking and outlines the structure and application of various rating tools for the certification of precincts and buildings through various stages of the property cycle.

**GREEN STAR NEW BUILDINGS WORKSHOP
(JHB 21 May 2019 & CPT 04 June 2019)**

An overview of the GBCSA Green Star rating system for Design and As Built tools for the objective measurement and rating of the environmental performance of the design and construction of new buildings and major refurbishments. The workshop offers the participant the opportunity to experience a South African Green Star Tool for new buildings and major refurbishments in action.

**GREEN STAR EXISTING BUILDING PERFORMANCE WORKSHOP
(JHB 23 May 2019 & CPT 6 June 2019)**

The workshop offers the participant the opportunity to experience a South African Green Star Tool for existing buildings in action. It provides a comprehensive overview of the GBCSA Green Star rating system for Existing Building Performance for the objective measurement and rating of the on-going environmental performance of existing buildings.

**GREEN STAR SUSTAINABLE PRECINCTS WORKSHOP
(JHB 11 June 2019 & CPT 3 April 2019)**

The Green Star – Sustainable Precincts Workshop focuses on the fundamentals of the Green Star - Sustainable Precincts rating tool, including the business case for sustainable communities, the categories and credits within the Green Star -Sustainable Precincts rating tool, and the steps to register and certify a Green Star - Sustainable Precincts project. An intensive full-day course, the format consists of a lecture, Q&A, case studies and small group activities, which provide an understanding of the application of the rating tool.

**NET ZERO WORKSHOP
(JHB 14 June 2019 & CPT 24 April 2019)**

What does it mean for a building to be net zero or better still, net positive or regenerative? This workshop will have a strong focus on systems thinking and integrative design and is aimed at built environment professionals, particularly architects, engineers and sustainability practitioners.

**GREEN STAR INTERIORS WORKSHOP
(JHB 22 May 2019 & CPT 05 June 2019)**

The workshop offers the participant the opportunity to experience a South African Green Star Tool for interiors in action. It provides an overview of the Green Star rating system for Interiors tools for the objective measurement and rating of the environmental performance of the design and construction of interior fit-outs.


To qualify as an Accredited Professional for any of the three Green Star buildings-focussed certification tools, candidates must complete a three-part programme including attendance of a one-day workshop, completion of two-week online course, and passing an online exam.

**EDGE EXPERT WORKSHOP
(JHB 17 April & CPT 27 June)**

EDGE (Excellence in Design for Greater Efficiencies) is a simple user-friendly green rating system in the form of an online software platform. EDGE determines the financial viability of a project's green potential. Smart, fast, affordable, EDGE makes sure green homes are available to all. EDGE Expert workshop gives you a bite-size introduction to how EDGE for residential developments can kick-start your business sense and technical know-how without having to become a fully qualified EDGE AP. Whether you are a consultant or part of a team, you can improve your skills, gain a deeper understanding of the EDGE software for residential developments, and help decision-makers to choose the most cost-effective green options.

To qualify as an Accredited Professional for Green Star precinct-focussed certification tool or Net Zero, candidates must complete a two-part programme including attendance of a one-day workshop and passing an online exam.

Please note these dates are subject to change. For the most up to date information and to book, visit: gbcса.org.za

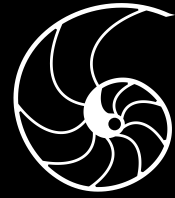


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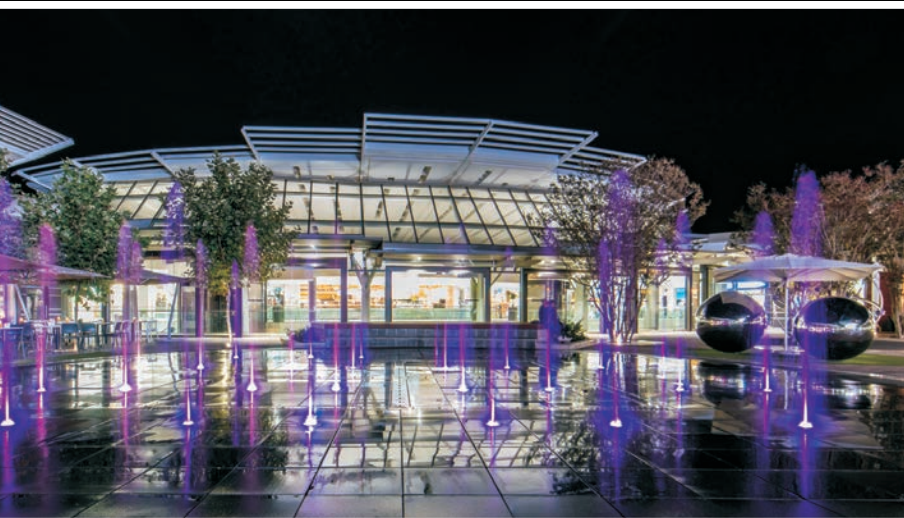
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AND THE WINNERS ARE...

During the gala dinner of the 11th annual Green Building Convention held at Century City Conference Centre in Cape Town in October last year, the 2018 GBCSA Awards winners were announced...



HIGHEST RATED BUILDING

Winner: 78 Corlett Drive, Johannesburg

(Project Owner: Legaro Properties / AP: Solid Green)

This is the first office development in Africa to be awarded a 6-star rating and a net zero carbon accreditation. It includes electric car charging stations, full cyclist facilities, passive solar shading and a full photovoltaic array.

Runner up: Watershed, Cape Town

(Project Owner: V&A Waterfront / AP: Sow & Reap)



BEST QUALITY SUBMISSION

Joint-winner: Liberty Umhlanga, Durban

(Project Owner: Liberty Group / AP: Mispion Consulting)

Grey water and rainwater collection plants to reduce municipal water demand and increase internal recycling and water usage, are just one example of efficiencies in this building.

Joint-winner: Menlyn Reconfiguration Phase 1, Tshwane

(Project Owner: Public Investment Corporation / AP: Aurecon)

In Phase 1, approximately 38 000m² of gross floor area and 37000m² of parking area were added to the existing centre, with sustainable building features throughout.

Runner-up: GBCSA Offices, Rosebank, Johannesburg

(Project Owner: GBCSA / AP: Ecocentric, Terramanzi)

ESTABLISHED GREEN STAR

Winner: Sally Mispion, Mispion Consulting

As the founder of Mispion Green Building Consulting, Sally Mispion is passionate about the built environment and sustainability, and has developed an extensive knowledge-base of building operations, management and leasing, especially in the commercial and industrial sector.

Runner-up: Annelide Sherratt, Solid Green

RISING GREEN STAR

Winner: Jessé Hamman, Solid Green

Working as one of the first Green Star Accredited Interior Professionals in the design industry, Jessé has a background in furniture design and product development, and is excited by the challenge of changing the way people perceive "green design."

Runner-up: Daniel Grewan, LTM Energy

EDGE INNOVATIVE HOUSING PROJECT

Winner: Belhar Gardens Rental Estate, Cape Town

(Project Owner: Madulammoho Housing Association)

This affordable housing project close to the University of the Western Cape comprises 630 one and two-bedroom rental units, and is the first such project to achieve an EDGE certification from GBCSA.

Runner-up: Ravenswood (Candlewood Crescent), Boksburg, Johannesburg (Property Owner: IHS Investments)

NET ZERO INNOVATIVE PROJECT

Winner: Two Dam Sustainable, Montagu, Western Cape

Two Dam Sustainable is an off-grid, responsibly operated trout farm that runs almost entirely on renewable energy. The farm is home to a hyper-efficient Recirculating Aquaculture System - which is the first of its kind in Africa.

Runner-up: Linden Vleihuis Residential Development, Johannesburg





The Quest for Greener Environments

Because most people spend as much as 90% of their time indoors, maintaining healthy indoor air quality is essential. Indoor air quality can be impacted by emissions of volatile organic compounds (VOCs) from surfaces and finishes. As a result architects, designers and purchasers are taking active measures to improve the standard of the building products and finished materials they use.

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regenerate

(v.) to heal and grow again after damage has been caused

Of sustainability buzzwords, few are conceptually more powerful than the idea of regeneration. Living things have an innate ability to heal and regenerate themselves, to live again after damage has taken place and sometimes, to even come back stronger. This is the miracle of life. And one that is wholly taken for granted, at that.

Following the 2018 GBCSA Green Building Convention which unpacked anything and everything to do with “net zero”, under the title *The Race to Zero*, I was struck by how over the last 10+ years, the GBCSA’s contribution to the green economy and development of the Green Star rating tools, has transformed the landscape (greened it, if you will) of the property development industry in South Africa. The concept of a “green building” seemed to be something that previously belonged only to the early adopters - the risk-takers and the eccentrics. But today, as green-premiums are decreasing and building operating costs are rising in the face of impending infrastructure failure (read: load-shedding, or the alternative narrative: Day Zero) and the future is uncertain, slowly but surely green building is becoming more mainstream. Such that several major property developers are including star-rated green buildings in their new-build portfolios as a minimum standard. So where does net zero and regeneration fit into this space?

In simple terms, “net zero” is a balance point at which the calculation of inputs versus outputs in the environmental bank account reaches equilibrium. In the green building space, it’s indicative of a conceptual shift in thinking and a new way of doing business. Not just a new realm for the risk-takers, but a realm for the resilient-future-thinkers, and quite frankly, a sensible way to do business if you want to save money on building operating costs in the long term (see infrastructure failure in paragraph 2). Convention keynote speaker, Paul Hawken’s message was that achieving net zero is “a threshold and not an endpoint”. It felt to me like net zero is the moment where we stop to pause, take our foot off the gas, and rethink before taking our next move.



So I asked myself, and now I ask you. The threshold to what? What comes after net zero? What can we do to create a positive balance in the environmental bank account? How can we regenerate?

More now than ever, built environment professionals have a key role to play in leading regenerative approaches to design for cities, landscapes, buildings, technologies and materials. Cities, as the nuclei of human civilisations, have always concurrently presented both the greatest human challenges and also been the breeding ground for the greatest inventive solutions to those. So, it is in cities where we can find new ways to recreate and nurture our connection to our greatest long-forgotten ally – the natural world; in cities where we will learn to build new life and new hope in degenerated decaying urban areas; and it is in cities where we will make new strides towards a resilient sustainable future.

In the pages to follow, we explore...

Mary Anne Constable

Editor

www.thepaperarchitect.com



Regeneration







Top Glass

The Rosebank skyline boasts an impressive new icon. Towering 15 storeys high, Rosebank Link is a certified 4-star Green Star building; an architectural feat standing tall in this fast-developing cosmopolitan precinct in Gauteng. One cannot but marvel at the striking use of glass in the design, used to enhance its beauty, light and energy efficiencies.

WORDS Nicole Cameron **IMAGES** Infrastructure Photos



At night time, Rosebank Link is lit up by 226 metres of “smart lighting” – strip video displays which stretch across 15 floors of the building. The exterior also features a full-colour LED video screen – one of the largest in South Africa.



Boasting two basement parking levels, a pedestrian walkway and ground floor retail space, a five-level parkade, and eight storeys of rentable office space, the new Rosebank Link building is strategically located next to the Gautrain station, The Zone and Rosebank Mall in Gauteng.

“With such a prominent position, the client [Redefine Properties] wanted a new and exciting design which serves both the needs of the tenants, the public, and the neighbouring amenities, in an exciting way. Glass was used extensively to express the conceptual geometry by contrasting other more solid cladding materials,” says Paragon’s senior project architectural technologist, Warren Wesson.

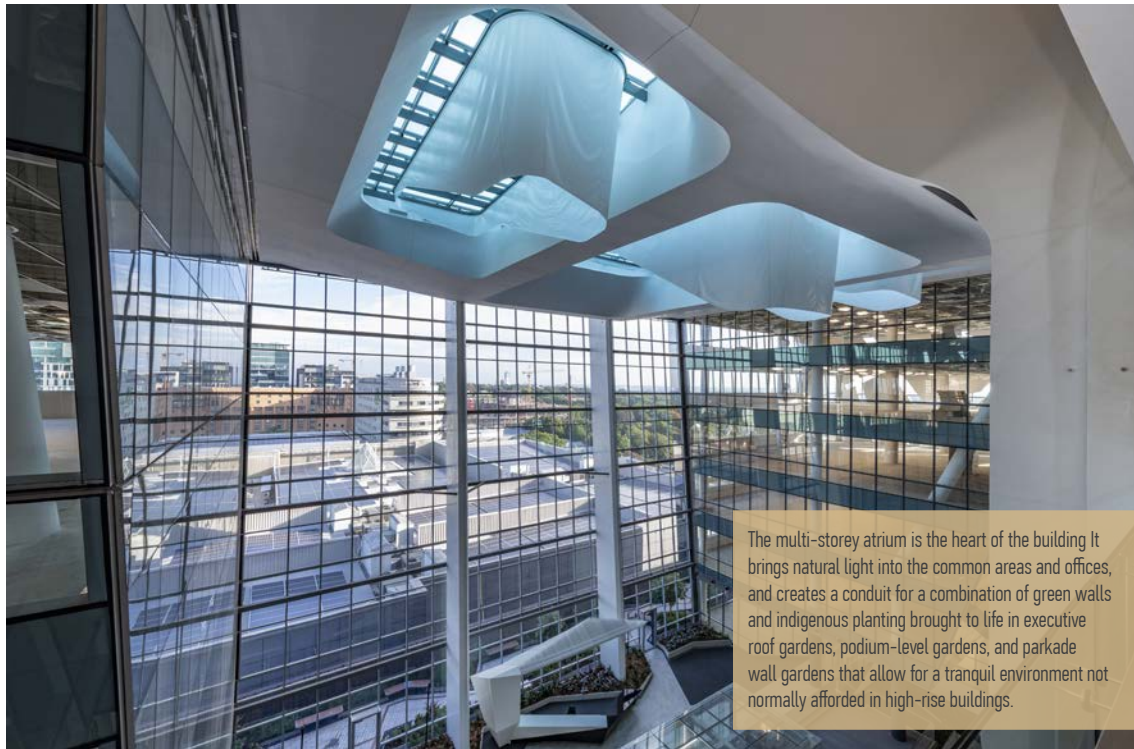
Indeed, the use of glass in Rosebank Link is what gives this building its edge. The east and west facades consist of a composite aluminium-clad shell with articulated strip windows to allow light and views to filter into every office module. These faceted facades have a visual quality emphasised by the articulated strip windows, which transform from day to night. The flush-glazed north and south facades allow for uninterrupted views over the greater urban area of Rosebank. The facades have a smooth and glossy flat finish that flows seamlessly into the underbelly of the building. It is easy to see why, as sustainability consultant Alison Groves of WSP says, “everyone wants a beautiful glass box”. Rosebank Link is aesthetically pleasing, and yet, there is more to the use of glass in the building than meets the eye.

BRINGING THE OUTSIDE IN

“Natural light and vibrant views have been proven to positively affect a person’s mood; people innately need a relationship with their outside world,” explains Wesson. “Glass is the best transparent weather-lining material available which can offer architects both good light transmission and thermal performance in a variety of colours and shapes.”

Facade engineer Greg Borman of Sutherland Engineers agrees that people want a feeling of connection to the outside world, along with comfortable shelter. “Performance glass technology is advancing at a staggering pace. We have products at our disposal that allow us to be very spectrally selective. Meaning we have more options as to how much of the good light we let in versus the unwanted light (UV, infrared) we keep out. We try to make the inside space as comfortable as possible, especially for the people working next to the windows. On Rosebank Link we used four different types of double glazing with a performance and low-E coating, and one type of single-glazed performance-coated glass on the building.” Borman makes the point that it’s important to know that the glass that you need for a comfortable shelter changes as the environment changes. “For example, a building in Durban needs very different glass to a building in Joburg to attain the same comfort inside.”

The key considerations on the Rosebank Link facade were the same as for any other building, explains Borman. “We look to balance natural light and radiant energy coming into the building, air-conditioning,



The multi-storey atrium is the heart of the building. It brings natural light into the common areas and offices, and creates a conduit for a combination of green walls and indigenous planting brought to life in executive roof gardens, podium-level gardens, and parkade wall gardens that allow for a tranquil environment not normally afforded in high-rise buildings.

views, cost, and use of blinds in a way that provides the optimal solution for the project. The experience of the person in the building is important to us so we do our best to achieve the most comfortable space for the occupants.”

A PERFECT GLAZE

Wesson says that when initially designing buildings and facades acoustics are not always considered, but they should be. “Glass is typically a terrible insulator to noise unless you use expensive systems to counter it. Rosebank Link is located in a very busy transport and retail hub, so limiting the amount of glazing on those faces played a big part in creating a more acoustically comfortable environment.”

Another delicate balance to achieve came with the glazing choice for the atrium and the skylights, says Borman. “We had to introduce a new variable into our glazing selection parameters. The glass needed to have enough solar control to keep the space pleasant for people, but also allow enough of the UV and infrared light in to allow the plants to keep growing.”

The north-facing, multi-storey, enclosed atrium is at the heart of the building and has been fashioned to capture the sunlight filtering down into a unique fluid underbelly of the ground-floor thoroughfare. It brings effective natural light into all of the common areas and most of the offices, and creates a conduit for a combination of green walls and indigenous planting brought to life in executive roof gardens, podium-level gardens, and parkade wall gardens that allow for a tranquil environment not normally afforded in high-rise buildings. These green spaces also complement the installed energy- and resource-efficient HVAC systems. Contributing further to Rosebank Link’s green credentials include smart metering throughout, motion sensor-based internal lighting, backup water and full back up on-site power generation.



CEO of Redefine Properties, Andrew Konig, says that the future demand for premium and A-grade office space in Rosebank is anticipated to rise significantly. As the older office node undergoes a facelift to become a mixed-used precinct, tenants will look to move out of their outdated and inefficient office spaces, to more modern and Green Star-rated properties. And Rosebank Link will surely tick every box. Including being that highly sought after “glass box”, of course. +



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Our clad-to-frame structures are designed to accommodate:

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- Limited transport pollution: Our structures are transported in compact kit-form, greatly reducing transport volumes to site
- Low energy use: Muscle power and battery operated power tools take care of all Tenthouse® construction requirements
- Low on-site waste generation: All our systems are pre-fabricated reducing to a minimum any onsite wastage
- Ensuring our structures and componentry are fully Demountable, Repurposable, & Recyclable.
- Processing reject/old membranes into shade structures for community schools via our Tenthouse® OurShade program.

“Architectural fabric technology and design is a highly specialised field, and each Tenthouse® project is subjected to a “course-of-life” test to ensure it meets all project requirements related to client, budget, natural environment, local communities, and end-user experience. We continue to advance our understanding and application of innovation in this field through post graduate masters programs, scientific testing, and by continually challenging existing design paradigms.” ends O'Molony.



Rebuilding biodiversity



Considering the catastrophic decline of biodiversity in urban landscapes world-wide, it's essential that custodians of the built environment take stock and begin to rethink what we can do to support and nurture the natural world so that it can continue to support us.

WORDS Mary Anne Constable



An overarching pattern in our post-industrial, post-modern world is a fundamental disconnect between human beings and nature. As mankind's ability to harvest the land and extract resources from it has grown over the centuries, the natural world simply hasn't been able to keep pace to a point at which, if we don't find a new way of doing business-as-usual, it may eventually disappear, and then what? This is a frightening prospect and perhaps one of which the consequences are not quite fully understood.

John Masson, founder and CEO of the Local Biodiversity Council, a non-profit environmental organisation which focuses on global biodiversity standards, explains: "Our disconnect with the natural world is the underlying cause driving climate change. We live in an anthropogenic world that provides for our day-to-day consumptive and lifestyle needs by transforming natural resources in such a manner that it obscures the source to irrelevance. Unfortunately, we have been conditioned by living in an artificial world, with a mentality that is unaware of our consumptive demands having an impact on biodiversity. There is a primary lack of understanding of our blue green planet and its network of interconnected biomes that makes life on earth possible". We need to foster a sustainable environmental awareness related to our dependency on and our need to be connected to the natural world, as well as treating nature as having equal rights to human beings.

Sustainability architect, Marc Sherratt concurs: "To talk about nature as being separate to human beings is a very western attitude. I find the African approach more accurate. We are part of nature in every aspect, physically, mentally, emotionally and spiritually. We have been designed by the same architect as it were.

It is only in very recent times that we have separated ourselves severely from nature in the urban realm." The solution of course is finding a way to bring back and nurture a positive relationship between mankind and nature. And in doing so, there is hope for regeneration of damaged landscapes. "Nature has a great ability to heal itself but people have a significant role to play in this healing. The perfect world is not the removal of human beings from nature but the integration of human beings into it in a sustainable manner. The biggest mistake we can make is to remove ourselves from the process of this healing," adds Sherratt.



Since 1970, the world has lost 60% of wildlife due to habitat and ecosystem destruction. Over and above biodiversity loss due to a shrinking natural world, poor land-usage practices in the anthropogenic world, caused primarily by agriculture and to a growing extent urban sprawl, continues to exert pressure on remnant pockets of natural spaces and wildlife. In Europe, bird life has declined by 30% over the last 25 years in the anthropogenic landscapes. Simply put, we are in the throes of the Sixth Extinction - that includes us if we don't act now. *John Masson*



Recycled Island Foundation



LEFT: The Recycled Park in Rotterdam, Netherlands, is constructed from floating islands moulded from plastic litter retrieved from the New Meuse River. The islands are filled with soil and plants, thus attracting local biodiversity, and creating a shelter for fish at their bases.
 RIGHT: Bosco Verticale (Vertical Forest) by Stefano Boeri Architetti in Milan, Italy, is a pair of residential towers that incorporate actual trees and shrubs in the architectural design – attracting local urban biodiversity.



BIODIVERSITY AND CITIES – THE TRAGEDY OF THE COMMONS

In cities, natural spaces are usually found as parks or open spaces that are shared publicly and by default collectively-owned. These are often fated to the “tragedy of the commons” says landscape architect from Urban Choreography, Donovan Gillman, referring to the tendency for individuals to value their own property over that which is shared, and also to exploit - usually for personal gain - what is not necessarily “owned” by one single entity. An example of this would be people dumping waste on common property. Because these landscapes are not intrinsically valued as being

essential to the functioning of the urban environment, they become “somebody else’s problem” to look after, very often falling into disrepair and degeneration.

“Biodiversity is the backbone to sustainability – without it we have a crisis,” says Masson. Therefore biodiversity has to be the foundation upon which we develop our cities. Human beings have the ability to adapt relatively quickly to almost any environment on the planet but other species have a hard time relocating to new suitable habitats. “They are unable to migrate ahead of current rapid ecological changes, or are hampered by artificial barriers such as roadways, cityscapes, and suburban sprawl, which increase discontinuity between viable habitats throughout the

SETTING SUSTAINABILITY STANDARDS

The GBCSA plays an essential role in providing objective assessments for sustainable buildings in the built environment, but there is not yet a specific standard for South African sustainable land-use practices. International precedents can, however, act as a guide for local developers.

Sherratt emphasises that it’s important to have objective certification systems because “without this, sustainability is left as a subjective set of ethical values which cannot be measured”. Ratings encourage developers to implement change but Masson suggests that biodiversity needs to become an integral part of the GBCSA’s philosophy.

The Local Biodiversity Council developed the Biodiversity Area Standard Certification

in collaboration with EcoCert, in 2016. The global standard provides objective measures for determining a site’s ecological biodiversity status and enables assessment of biodiversity from the macro down to the micro level on a site. “The standard has been applied to industrial sites, residential estates, commercial multi-storey facilities, large-scale restoration projects for urban riverine systems, and reverting of highly-impacted transformed landscapes to local biodiversity,” explains Masson.

The American Society of Landscape Architects’ Sustainable Sites Initiative (SITES) is another framework for the rating of sustainable ecological process that is used widely internationally.

To read the standard: localbiodiversity.org



The Vodafone Site Solutions Innovation Centre achieved a Net Positive Ecology pilot certification in 2018, for its brownfield transformation of a vacant parking lot into a lush indigenous garden surrounding the building.

Gill Architects

After



Buildings hold huge ecological potential if designed as fully integrated biodiversity systems functioning as self-sustainable ecological entities delivering ecosystem services.

John Masson



Before

world,” Gillman notes. And as a result biodiversity is being sacrificed for other forms of land use or simply being exposed to destructive impacts within our urban edges leading to what Masson calls a “bleaching out effect”. “This is despite our dependence on ecosystem services, with benefits to every single form of land-use and resource supply, be it sustenance, water, energy, communication and transportation, clothing and shelter, commerce and industry, defence and security, medical, recreation and vacation, or culture – in essence it is what enables the establishment of our global civilisations,” Masson adds. We need to have an understanding of biodiversity’s significance from a macro level right down to where we live, if we are to survive as a species.

BIODIVERSITY AND THE BUILT ENVIRONMENT

Biodiversity in cities has suffered greatly under destructive (and usually unregulated) land-use practices which conventionally consider human development to be superior to nature, as opposed to an integral part of it. Sherratt says that in post-industrial Africa the built environment has been driven by “top down” modernist city planning which “sees nature as some kind of tameable garden” and secondly (an agenda which is often viewed in opposition to this), the human

need for shelter which has seen the “bottom up” growth of informal settlement. “Unfortunately both are based on an anthropogenic, consumerist approach to nature as a resource for human pleasure.”

Professionals within the built environment still work largely in isolation within their specific portfolios, often considering sustainability to be an (optional) add-on, but Gillman calls on the building industry to practise “systemic design” which is interdisciplinary and holistic, integrating the environment from the very start of a project. “Instead of building, designing or thinking in terms of objects we should instead think in terms of flows,” he explains. These flows are guided by what is already existing on site, such as natural water systems, natural habitats (flora and fauna), and the micro climate (sun, wind, rain). He suggests an ecological planning approach called “urban harvest”, which assesses the potential of a site to generate and harvest its own resources in terms of energy and water; the creation of a sustainable “urban metabolism” that reuses and recycles waste produced – essentially a circular versus a linear set of processes. The conventional approach to landscape planning is to first decide what you want and then modify the conditions of the landscape to suit the design, but the premise with systemic design is that landscape comes first and its existing set of constraints determines the flows. It is only after this process has taken place that one decides where to build. Humans’

tendency to try to mechanise the natural flows also usually results in (negative) disruption, and further contributes to degeneration of landscapes. Instead, flexibility and an experimental approach is required – one that mimics the tendency of nature to be fairly unpredictable. “Systemic design requires choreography of all the flows,” Gillman says. “The process is not one of grand design. It’s one of tinkering, small trials, disruptive technologies, and accepting things that already work.”

Sherratt’s architecture reflects the symbiotic relationship between landscape and building. “Buildings are landscape. What do you think a speckled pigeon thinks when it sees a high-rise building? I will tell you, it sees a cliff face. The starting point [when building on both greenfield and brownfield sites] is to understand what life exists or did exist in these places and how, like a tree, a building can support and benefit from the indigenous ecological system. Future architecture will include buildings as alive as we are, buildings that move, communicate, excrete, breathe, heal and reproduce,” he says. Sherratt’s sensitively-designed Vleihuis residential development in Linden, Johannesburg, received three GBCSA Net Zero pilot certifications for carbon, water and ecology, and was runner-up Net Zero Innovative Project at the 2018 GBCSA awards. The project involved a lengthy and rigorous research process to understand the indigenous natural environment on the brownfield site. The existing site was a well-maintained residential property with “manicured exotic gardens” - a man-made landscape which required lots of water and maintenance. It was

decided to create a “natural” wetland on the site that mimicked the natural flows of the landscape in the area. The buildings were then sensitively “nested” into this context. The wetland works in symbiotic relationship with the building to aid in cooling the building and purifying water on site, while providing a sanctuary for native wetland biodiversity.

Masson says it helps to think of a building as “a topographical ecological structure from the perspective of enabling successful ecological habitat colonisation, in a sense much like decommissioned ships are used to function as reefs supporting marine life.” Yet it’s important to look at buildings within their context from a master plan level as topographical forms that can simulate an entire biodiversity landscape. “For example, one could design a city using the built environment to form the topographical support structures to provide for the establishment of distinct ecosystem zones fully integrated with all the typical mixed land-use needs.”

A RESILIENT FUTURE

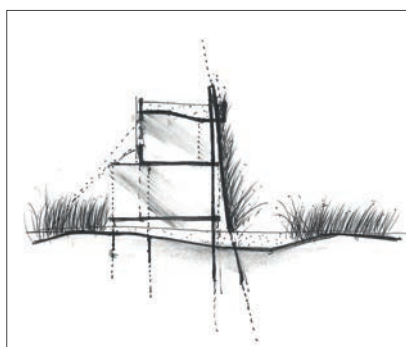
It’s clear that re-framing our understanding of the relationship between human beings and nature, and buildings and the landscape, is an essential starting point for regeneration and restoration of the natural world and local biodiversity in cities. It’s essential to our survival as a species, and to the creation of a resilient sustainable future.

From this starting point we can begin to approach design of buildings in a more systemic and integral way that puts the landscape first. The beauty of it all is



Marc Sherratt Sustainability Architects

The Vleihuis development in Linden, Johannesburg, by Marc Sherratt Sustainability Architects, comprises five residential units on a long 2500m² site. The buildings are nested into a restored indigenous wetland landscape. Besides using renewable energy and storing and purifying water on site, the timber screens are made from a natural African reed which could be grown on site. **BOTTOM RIGHT:** Elephant Highway is an elephant migration route connecting Madikwe Game Reserve in the north west to Kruger National Park through the city of Johannesburg. This was presented by Marc Sherratt Sustainability Architects to the City of Johannesburg in 2018.





that when nature's innate tendency to want to restore and regenerate is harnessed and incorporated into a design, the resulting flows often seem to simply “just work”. “I honestly believe that some of the greatest environmental achievements are some of the simplest. Imagine hearing larks singing in our city centres,

or mongooses foraging for grubs amongst a bed of autumn leaves in a city centre woodland coppice. The presence of such species serves as a bio-indicator of an environmentally healthy city, because if the air is healthy enough for butterflies, then it's healthy enough for our children,” ends Masson. +



One of John Masson's projects, the Royal Canin Eco-Industrial Park in Kya Sands, Johannesburg, is an internationally-acclaimed sustainable ecological icon completed in 2003. It served as the blue print for sustainable environmental development by establishing standards for biodiversity integration with primary land-use and self-sustainable ecological ecosystems with zero natural resource inputs including water, chemical-free, and fully restored 100% local biodiversity with close to 200 hundred birds recorded on the site.



HYBRID LANDSCAPES & ADAPTIVE REUSE

Gillman highlights the fact that “net zero” with regards to waste is in many senses an anomaly, as even the natural cycle of life produces a certain amount of waste; for example, compost from decaying organic matter. This waste is cycled back into the system thus stimulating regeneration of life. While it's clear that human beings need to drastically reduce

their waste outputs, an appropriate amount of (the right kind of) waste can be used for fuel or some other kind of useful function, while also providing economic value.

In this sense it's useful to think about “adaptive reuse” of degenerated landscapes in urban spaces. Professor of urban design at MIT, Alan Berger, coined the term *drosscapes* - urban landscapes which are seen as a waste product of redundant economic and industrial processes. These spaces can be regenerated and transformed into useful spaces which enhance the urban environment. These might also be considered “hybrid” landscapes because they support human use but are not necessarily indigenous or “natural”. The New York City High Line is an example of one such hybrid landscape - a 2.3km elevated linear public park created on top of an old industrial railway line.

Other examples of adaptive reuse of wastelands include the US Environmental Protection Agency Superfund programme, which funds the restoration and regeneration of previously contaminated waste sites from manufacturing, landfills and mining. Sites are cleaned up and returned to productive use for communities. Many other such programmes exist world-wide.





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Finding the road to Urban Sustainability

Sustainable communities must start from the ground up, with town planning that puts sustainable infrastructure in place - infrastructure that is designed for people rather than for cars, and which encourages diversity of use and focuses on connection and inclusion. We take a look at the urban sustainability of South African cities, outline some of the ideals, and indicate how we might get there in order to help our urban spaces regenerate in a meaningful and lasting way.

WORDS Christy Borman





“South Africa is already at the brink of climate change impacts that are being felt in the form of droughts, heat waves and flash floods, so prioritising equitable economic and social growth through sustainable urban development, pinned by long-term climate risk mitigation, adaptation and resilience building is absolutely critical,” emphasises Shabari Shaily, architect and sustainability consultant at Ecocentric.

Daily news of service delivery protests in South Africa tells us there is much work to be done before every person has a well-governed, liveable, economically prosperous and environmentally sustainable place to call home. The overwhelming scale of what needs to be done in terms of social equality at the city-level often means that climate and environmental concerns are lost in conversation. Sustainable precincts must address so many issues simultaneously. But where do we start? First and foremost with town planning that gets sustainable infrastructure in place.

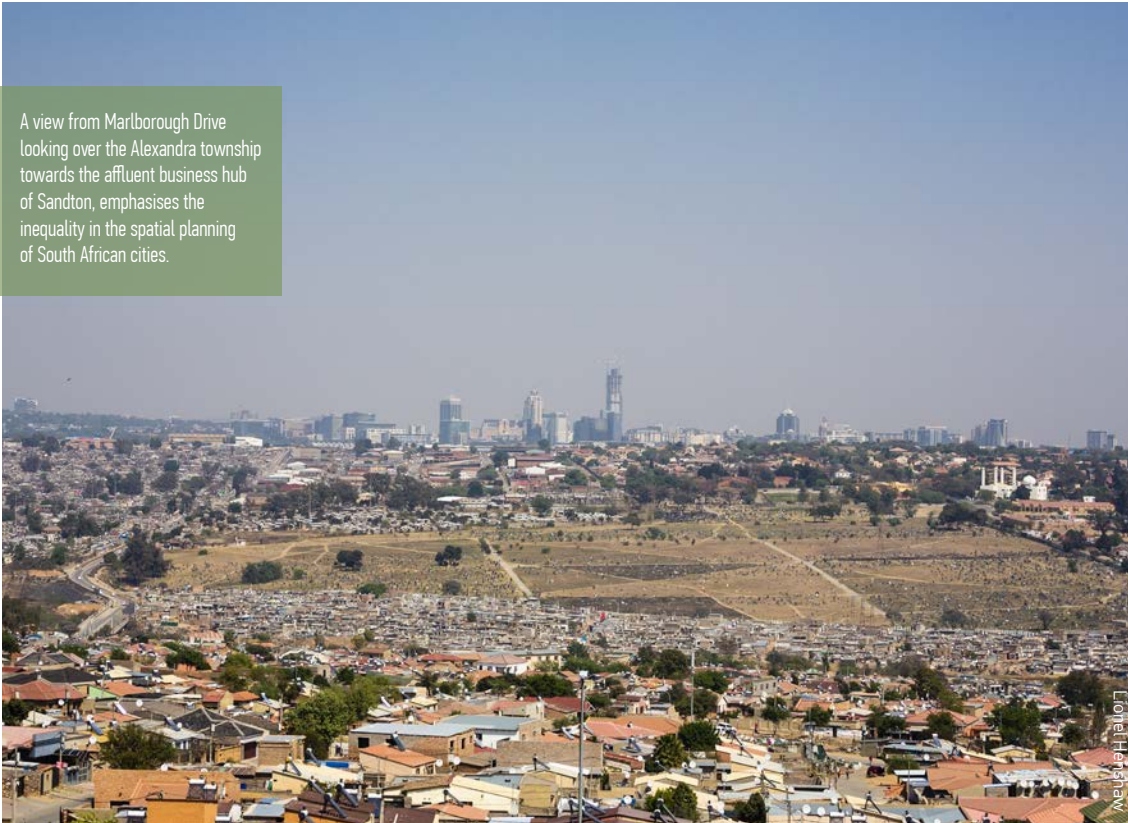
WHERE WE’RE COMING FROM – THE GREAT DISCONNECT

South African cities were historically designed with the logic of prosperity for some, at the exclusion of the majority of the population who were forced to reside on the periphery, needing a special pass to access economic opportunity.

“We inherit a geography of Apartheid legacy, which in sustainable development terms means mono-use. There is a machine for living in and a machine for working in, and we spend our time commuting between the two,” says Eric Noir from Design for Abundance. There is no diversity factor in the way in which infrastructure is planned and used. Roads are jam packed during peak hours and under-utilised at all other times. And food comes from an entirely different and disconnected machine. As does energy; as does water.

For South Africans, it seems to be culturally accepted to travel long distances between work and home, and

A view from Marlborough Drive looking over the Alexandra township towards the affluent business hub of Sandton, emphasises the inequality in the spatial planning of South African cities.





Mary Anne Constable

South African cities have some of the highest levels of inequality in the world which are exacerbated by sprawled out urban planning. Despite its spectacular scenery, Cape Town is no exception.

the aspiration is to be able to do this in a private car – largely because public transport alternatives are unsafe and unreliable. According to *eNatis*, just over 12 million vehicles were registered in South Africa in 2017. This means that less than one quarter of the population has a car, yet roads, which take up more than 30% of space in the average city, cater almost exclusively for them.

University of Pretoria’s head of the Architecture Department and co-author of the book *Designing for Hope: Pathways to regenerative sustainability*, Chrisna du Plessis, expands on this disconnect:

“The biggest problem is that our cities are built to create a disconnected society. Individual buildings hide behind fences and do not come together to create vibrant public space; most ‘public space’ is actually private space designed to exclude those members of society deemed to ‘not belong’. The obsession of both the rich and the poor with a fenced-in one-house-one-plot housing model disconnects people from their community, creates sprawl that disconnects the various functions of the city from each other, and forces the perpetuation of the Apartheid city’s racial and class disconnections.

“With so much paved-over land and less and less space given to wild nature (not manicured lawns, succulents in a planter and trees throttled by paving), our cities are also disconnecting us from nature.”

To talk about sustainable precincts or cities, one needs to focus on infrastructure at scale, and town planning. Many consultants want to get into the cities space (as opposed to focusing on single buildings) because it is felt that this is where better results can be achieved, but this needs a broad view. It’s not just about a single building – the building may be an entry point but the system must be looked at holistically.

Du Plessis reiterates that the biggest challenge to changing the status quo is: “Perceptions, politics and profit-driven development. All of these lead to the

development of precincts that exclude large sectors of society, which is ultimately not sustainable.”

“Overcoming fixed mindsets is the greatest challenge,” agrees Noir. Most environmentally sustainable initiatives, if implemented from the start, are cheaper. For those that are more expensive, one could envisage that they become their own business, financed off the land developer’s balance sheet, he adds.

WHERE WE WANT TO BE – INCLUSIVE CITY PLANNING

“My ideal city from a sustainability point of view is complex and diverse, compact, interesting, less space is taken up by roads and less are relying on individual motorised transport,” says Noir.

“Safe and clean, with rich biodiversity, social diversity and economic diversity offering a dignified life for all,” says du Plessis when asked what her ideal city looks like.

So how do we start encouraging social and environmental regeneration? “By starting with the potential of the place, and co-creating solutions with the users of those areas that will build opportunities for them and establish local ownership and civic pride, which in turn results in safer environments,” du Plessis says.

The issue of safety is paramount. Our personal ambitions are linked to safety. South Africans strive to own a car because public transport is unsafe and unreliable. We want a standalone house on a plot of land because the communal parks that exist are not safe for our children. It’s not safe for us to walk on the street so we need roads big enough for motorised transport. The rise of the gated community, which restricts the access of all citizens, has come about because people feel unsafe. When crime is happening on the streets, the buildings and people disconnect themselves from the street. Safety issues can start to be addressed through



RIGHT: Curitiba in southern Brazil, prides itself on being a world-class paradigm of urban sustainability as it is modeled on effective public transport.

LEFT: There should be a greater focus on pedestrian access in South African cities



lighting, visible policing and use of technology such as monitored CCTV. But core issues of inequality, giving rise to crime must be addressed. Perhaps inclusive city planning can start to do this.

“It is VERY important to understand that in South Africa sustainable urban precincts will look very different from what they would look like in Australia, Europe or even wealthy Asian countries. The current model is very much still one of attracting the cultural creatives, instead of empowering those who are already living and working in those areas,” says du Plessis.

Examples of urban regeneration in South Africa that aren't also viewed as gentrification are few and far between.

“Designing vibrant and diverse neighbourhoods without being the cause of gentrification, as its by-product, is an urban design imperative,” emphasises Shaily.

HOW TO GET THERE – BRIDGING THE DIVIDE

In terms of environmental sustainability, cities should strive for a net-positive world through increasing efficient water use, diverting waste from landfills, prioritising energy efficiency, technological advancements, and clean, renewable energy production that reduces greenhouse gas emissions.

Interventions that can make a difference must start

with human-centric design. It sounds simple but in fact, our cities are designed for cars. The new buildings shaping Sandton's skyline all start with massive basements at massive costs, to cater for cars. The entrances of buildings cater for cars, while pedestrians often access through parking booms. The street level is no longer engaging. There should be less focus on vehicle use and more focus on pedestrians. The health benefits of improved air quality and increased walking are solid perks of increased pedestrianisation and public transport.

Keep walking distances top of mind, rather than driving distances. And engage with the community you are providing spaces for – adapt solutions through feedback.

“Design around open and green public spaces and ensure that the spatial configuration and elements such as lighting, views and accessibility are conducive to public safety and impart a sense of belonging within the community. There should also be convenient access to educational infrastructure from crèches, schools and libraries, to decentralised university infrastructure. Active spaces for community engagement and interaction should be encouraged where people can enjoy art, culture and history,” says Shaily.

Electricity demand should be dramatically reduced and offset with alternative sources. Energy provision should come from healthier renewable sources. Waste-

SEVEN PRINCIPLES FOR SUSTAINABLE CITIES & COMMUNITY DESIGN FOCUSED ON HUMAN INTERACTION:

1. Preserve the natural ecologies, agrarian landscapes and cultural heritage sites
2. Create mixed-use, mixed-income and mixed-age neighbourhoods
3. Design walkable streets and human-scale neighbourhoods
4. Prioritise bicycle networks and car-free streets
5. Connect - Increase density of road network, limit block size (a street network that allows many routes instead of singular routes and many kinds of streets instead of just one)
6. Ride - Develop high quality transit and affordable BRT
7. Focus - Match density and mix to transit capacity

Source: Peter Calthorpe - US architect, urban designer and urban planner



Meirinda Hardisty

to-energy solutions also have the ability to generate different kinds of energy, for example energy for heating and cooling. Centralised energy systems should be put in place such as more efficient district systems, which service a group of buildings instead of only one.

Water provision should run off decentralised systems. Greywater and blackwater should be recycled, rainwater collected and investments made into sustainable landscaping. In terms of water, if the hydrogeology allows it, rather than building huge expensive dams which suffer from evaporation, ensure that stormwater is channeled to attenuation ponds. That way cities could rely on rainwater collected in underground water storage. The important caveat is that the groundwater must be adequately replenished, says Noir.

If not contributing to energy generation, organic waste composting in residential projects could work with food-growing nurseries or landscaping projects to contribute towards growing nutritious food close to home.

Regeneration of existing established cities is required, but entirely new sustainable developments are also needed because South Africa has high levels of urbanisation with existing city infrastructure unable to cope with the consistent in-migration experienced. It's an entirely different ballgame when one is starting with a blank canvas for a new city-type development.

“When you start designing from an infrastructure point of view, every building should be able to reach a minimum 4-star Green Star rating without doing

anything, simply by virtue of its location and the sustainable infrastructure (transport, energy, water, waste, etc.) which it is built upon,” says Noir.

When starting afresh, all systems should be intertwined, rather than disconnected. The electrical systems should be designed to work with the water and waste for example, he adds.

“I believe we should be able to build a city with no sewer reticulation. It's a big ask, but working with overseas research institutions, we are developing a modular system, which could be serviced by utility companies under a maintenance contract. This could operate at a suburb size, where the treatment plant could also be used to generate energy, or smaller blocks of flats or at least ten residential houses,” explains Noir.

SIGNS OF LIFE – NEW BEGINNINGS

It is encouraging that city-scale regeneration and entirely new sustainable cities are on the drawing board.

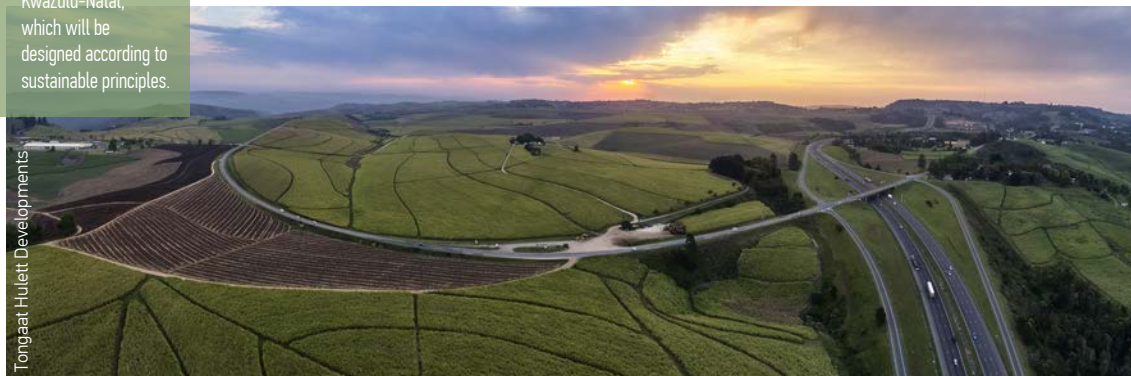
Although the economic climate means there are few large-scale projects going forward at present, the GBCSA's Green Star - Sustainable Precincts tool saw its first project certified in January 2019, namely Garden Cities' Northridge Coastal Estate in Cape Town. Sandton Gate in Johannesburg is also registered for certification, with several others potentially in the pipeline (See p52).

There is also a 2000ha greenfield project along the N3 between Durban and Pietermaritzburg called Ntshongweni, which is aiming high in terms of sustainability. With sustainability consulting by Design for Abundance and urban planning by GAPP Architects and urban designers, the development aims to target efficient and sustainable infrastructure from the outset. Civil and electrical engineers for Ntshongweni, Bosch Projects, will be on site when civil construction starts in 2019. Phase one begins with mixed-use residential, retail and commercial development and Tongaat Hulett Developments MD Michael Deighton says about 1000ha of open space is allocated throughout the overall development for passive and active recreational use.

In terms of regeneration, the Corridors of Freedom in Johannesburg, instigated by former mayor Parks Tau, is encouraging as it provides an enabling framework from a regulation point of view. The project prioritised funding for infrastructure networks, largely public transport and densified housing and facilities upgrades along prioritised corridors.



The Mall of the West is part of phase one of the greenfield Ntshongweni development in KwaZulu-Natal, which will be designed according to sustainable principles.



Tongaat Hulett Developments



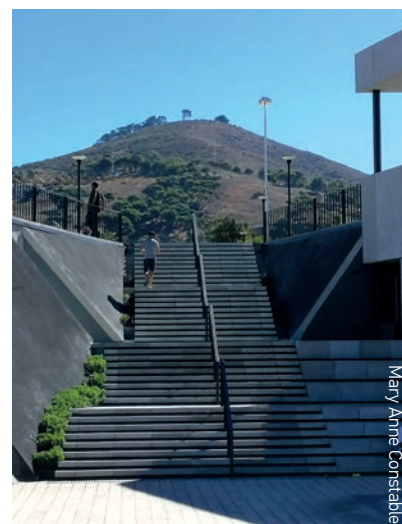
Global examples worth investigating include: Greensburg, Kansas, which after being rebuilt after a tornado in 2007, is now home to the highest number of LEED-certified buildings per capita in the US; Miasteczko Wilanów in Poland; Bishan Park in Singapore; the Melbourne CBD, and numerous US EcoDistrict case studies from Little Haiti in Miami, to Lloyd EcoDistrict in Portland.

Developing country examples include Curitiba in southern Brazil, which prides itself on being a paradigm of urban sustainability as it is modeled on effective public transport.

The Sustainable City (www.thesustainablecity.ae) in Dubai is a new residential development home to some 2 700 people, which is striving to meet environmental

goals. It offset 84% of its operational energy in public areas in the past year (to September 2018) through solar PV. Cars are parked under solar PV in specific areas and the residential clusters are car-free. Central green spaces with bio-domes for food production run along a central spine of the development. Total waste generated was only 1.01kg per person per year and, of the total waste, 84% was sorted and diverted away from landfills.

Of course, with its distinct history and heritage, what works in other countries might not work in South Africa, and experimentation to find appropriate solutions is needed. Rather than perfecting the ideal of the dream city, defining and refining the process of getting there must happen, so that real meaningful change can take place. +





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Thinking **BIG,** acting **small**

Currently the incremental changes of small property entrepreneurs are making a massive impact in Johannesburg's inner city where brownfield residential redevelopment offers significant contributions towards economic development and urban regeneration in the CBD, but red tape radically reduces their potential impact.

WORDS Alan Cameron



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QUANTITY SURVEYORS

Done right, infrastructure and property investment in the Johannesburg CBD can spur economic redevelopment of degraded areas by intensifying their uses. Increased activity enables more business which fuels a broader critical mass of economic activity, accelerating increased investment and urban regeneration.

Providing homes is a particularly effective stimulus to local economic development because increased population densities make areas busier, leap-frogging beyond the ground floor activation stage of the welcoming shop front and café culture, to where people adopt the neighbourhood as their new home.

During the last few decades urban regeneration has transformed some previously decaying parts of the Johannesburg CBD. Although some is due to larger focused property investments like Propertuity’s Maboneng, it is small developments which have had a broader catalytic effect .

SMALL DEVELOPERS LEADING THE WAY TO URBAN REGENERATION

It seems that small property entrepreneurs are more readily taking up investment opportunities in the inner city than larger developers; one reason for this is because the Johannesburg CBD is currently beyond the risk profile of many institutional investors, property economist François Viruly points out. A risk worsened by South Africa’s constrained economic environment. The risk of economic failure is often considered too high for many large-scale institutional investors. Although this view is slowly changing, smaller investors seem to be among those willing to take the leap.

“I am amazed at the number of small players I meet at property entrepreneurship workshops who are active



in the Johannesburg CBD. They are making it more inclusive for residential users, as well as developers and subcontractors,” Viruly says.

Paul Jackson, CEO of TUHF, a commercial property finance company that finances small property entrepreneurs to build homes in decaying urban areas and by doing so upgrade the areas, concurs: “More than two thirds of Johannesburg’s inner city construction is happening because of small property entrepreneurs. And they’re doing this against the odds.”

“In Yeoville and Bellevue [inner city suburbs] there is a proliferation of small developers investing in properties and that’s exactly what we need. People are densifying in the right way. Plan approvals just need to happen faster. Only a very small percentage of residents in the CBD are actually homeowners,” he says.

Viruly adds: “Unfortunately, what is holding up the market is the municipalities’ red tape – if you have to wait six months as a sole proprietor, the risk [of losing



Before



After

Bjala Square in Jeppestown, Johannesburg is one of TUHF’s low-cost residential brownfield developments, contributing to urban regeneration near the city centre.

TUHF





income] is too high and you're out of business. This inertia literally bankrupts small players. Often local government is quick to claim that 'the market did not respond' to the measures it put in place. Currently their red tape threatens to push areas like the CBD out of everyone's risk profile."

CREATING NEW NEIGHBOURHOODS

A considerably bigger player, Divercity Urban Property Fund recently committed R2billion to create inclusive and diverse neighbourhoods on brownfield sites in Johannesburg's inner city by building affordable residential space and commercial properties, namely the ABSA Towers Main building (redevelopment of an existing building) and, four blocks away down Main Street, Jewel City, historically the work space of diamond dealers and manufacturers which stretches across six city blocks. For the first time in decades, Jewel City will be made publicly accessible and a central welcoming, pedestrian-friendly walkway along Fox Street, extending through to Maboneng across the road, will be created.

Carel Kleynhans, acting managing director of Divercity explains: "At their core, these developments are about providing affordable accommodation paired with essential amenities, close-to-work opportunities.

Once redeveloped, ABSA Towers Main will feature 520 affordable apartments, 10 000m² office space, childcare facilities and ground floor retail that opens onto a plaza landscaped for pedestrians. We expect it to be a popular urban park for the neighbourhood to enjoy."

"Jewel City will cater to more than 2 000 households who typically can only afford to live on the urban edge, too far away from work opportunities and amenities. When you consider the spatial history of our cities, these developments will be fundamentally inclusive and spatially transformative," he adds.

Divercity will target a 4-star Green Star Design rating for the office component of ABSA Towers Main, and an EDGE rating for the residential component. The company follows a policy of implementing water- and energy-saving measures which include low-flow taps and shower heads, dual flush toilets, LED lights, heat pumps, and smart water and electricity metering are a standard specification. In addition, sustainable materials are used wherever possible. "Divercity is trying to build precincts that are environmentally and socially sustainable by focusing on affordable housing provision in well located, mixed-use and amenity-rich precincts," says Kleynhans. "Housing people close to where they work is by far the greatest contribution that we are making towards sustainability." The unfortunate reality is that the vast majority of affordable housing delivery in Johannesburg still happens at the urban edge, Kleynhans adds. "The Corridors of Freedom



The ABSA Towers Main building and Jewel City are currently undergoing redevelopment by Divercity in Johannesburg. The development includes residential, commercial and retail space, as well as new pedestrian plazas and linkages in the city centre.

Divercity



Inner-city street art in Maboneng gives life to decaying buildings and tells the story of the city.

transport-orientated development projects and the City of Johannesburg's drive to stimulate investment in the inner city are starting to stimulate some building work in more centrally located areas, but at present this still represents a very small part of overall annual housing delivery."

Stats SA estimates that between 2016 and 2021, 574 people will move to Gauteng each day, and most will seek work in or nearby Johannesburg. The demand for well-located housing in the inner city has forced officials and urban designers to adapt to ever increasing population pressures. "In township areas, our failing to plan proper urban environments and effectively implement them has borne the bitter fruit of areas characterised by the 40 x 40 x 40 x 40 rule where residents live in a 40m² home, 40km from economic opportunity, spend 40% of their income on transport, and whose community is 40% unemployed. We should reduce these numbers to the twenties," says Viruly.

"If households are expected to live in smaller homes, to bring them closer to work and leisure, municipalities must ensure that the precincts and the public spaces in close vicinity to these homes are improved. The delivery of affordable inner city housing has an important role to play in improving the quality of the housing environment for households and significantly reducing commuting costs," he adds.

BARRIERS TO PROGRESS

Jackson points out that serious barriers blocking effective government action are rooted in many policy makers' mistaken belief that small-scale property entrepreneurs - "ordinary" people - cannot change their environment and bring accommodation at scale. "This means that clumsy broad-brush policy meant for larger developers hamstring small players. "As a fund that does infill residential projects in degraded downtown areas, TUHF have funded nearly 35 000 units and since 2003 have loaned R5billion to their clients, two-thirds of which are black." Consider Cosmo

City, the green field residential development of 11 000 units. TUHF have enabled triple that number of developments, on infill sites. "Densifying areas with existing infrastructure links to public transport is exactly the type of development the South African economy needs. There are huge knock-on effects if we get this right," says Jackson.

"We need the very small and very big developers. There is national, regional, municipal policy confluence on these efforts but so few programmes of support and action. South Africa's inner-city context means that state efforts must be multi-year, programmed and properly-resourced - and then the private sector will come to the party in a big way.

"The efficiencies unlocked by densification stimulate local growth and, along with various other economic sectors, South Africa's national economic growth is the aggregation of local growth. Small-scale projects spread the project capital out far more evenly among the whole development value chain."

And the cycle is self-perpetuating, one development brings another.

Tebogo Mogashoa, Chairman of Talis Property Fund, a founding partner of Divercity, agrees: "Our vision is to fix every broken window where Divercity are involved in the Johannesburg CBD, one window at a time, and so encourage other investors to do the same - to join the drive to rejuvenate our city. Our goal is to successfully motivate for and develop a second fund that will further increase the affordable housing units in the inner city. We want to challenge apartheid-era planning which has driven most of our people out of the city and condemned them to live far away from work. We're going to create facilities such as schools, hospitals and clinics, and offices to reignite the energy of the city."

Excitingly, big and small entrepreneurial approaches in the residential property sector are slowly combining to quicken the pulse of Johannesburg's inner city, building the case for a safer, busier downtown and encouraging development at the heart of South Africa's economy. ►►



The Oxford Parks precinct in Johannesburg will transform 50 single suburban existing family homes, currently occupied by about 200 people, into a denser vibrant mixed-use community accommodating between 3 000 and 4 000 people. The recently completed BP building (below right) is targeting a 5-star Green Star Office Design rating.



Solid Green Consulting

BEYOND THE BUILDING SCALE TO SUSTAINABLE PRECINCTS

“The challenge is finding ways to disincentivise sprawl while making it easier to develop affordable housing at scale within the urban core, so as to not decrease the already low rate of housing delivery,” explains Marloes Reinink, owner of Solid Green Consulting, green building consultants on a new sustainable precinct area called Oxford Parks. Oxford Parks is designed to be a sustainable medium-density urban environment that has brought 300 000m² of development rights to Johannesburg’s Dunkeld residential area, which links Illovo to Rosebank along Oxford Road. Although Oxford Parks is not yet registered for certification under the Green Star – Sustainable Precincts tool, it exemplifies many of the requirements.

“For cities to grow in a sustainable manner, developments must take the opportunity to move green design beyond the building scale into the public realm,” she says.

Oxford Parks is planned to blend in with the surrounding area by transforming 50 single suburban existing family homes, currently occupied by about 200 people, into a denser vibrant mixed-use community accommodating between 3 000 and 4 000 people. It will offer 10 000 to 13 000 work opportunities. The existing public transport links will also be strengthened through intensified usage.

Characterised by no boundary walls or fencing, smaller block sizes, wide pavements and clear walking routes between public squares with street furniture and good lighting, “we looked at creating complete streets and encouraging pedestrianisation which increases sustainability as well as security through passive surveillance,” Reinink adds.

The precinct includes many different landowners guided by a Property Owners Association and an established Precinct Development Manual which directs any rezoning applications. +



A BIG GREEN CITY

“When people fly over the city of Johannesburg in a few years time, we want them to see a city that is not just big, but a city that is green,” explains Senzo Nyembe, GM: Ecosystems Enhancement and OSM. That is the continued mandate and vision of JCPZ, who have already earned the city the title of the world’s largest man-made forest, boasting over 10million planted trees.

“In a city built on a grassland biome, a growing population and increasing urban sprawl has resulted in a negative impact on the quality of both the air and water, which has detrimental effects on people, plants and animals. Trees are natural air conditioners; they reduce carbon and are like green lungs that contribute to the healthy functioning of river systems, flora and fauna and the wellness of the people in the space,” explains Nyembe. “The critical services that trees provide simply cannot be quantified – suffice to say, if removed, we may no longer even have life.”

FOR THE PEOPLE, BY THE PEOPLE

Nyembe says that in addition to their focus on new parks and the maintenance of existing ones, JCPZ is working to encourage greening throughout the CBD by appealing to business owners to green their buildings. This has been met with success in many areas, with the introduction of rooftop and vertical gardens gaining momentum. “We look to plant trees in heavily-cemented areas, in parking lots, etc, with the main intention being to encourage people living and working in the city to do the same.”

In fact, community participation across the board is what Nyembe cites as the key ingredient for lasting regeneration. When JCPZ identifies a space in which to build a new park, their first port of call is to engage with the community. “We look at what the community wants and needs and consult with them throughout the process, from design through to construction. It is essential that the park becomes an asset that belongs to the community, because when we have their buy-in we can be assured that they will take ownership over its care, in addition to the routine cleaning and maintenance that we provide.”

End Street Park in Doornfontein has been a shining example of the power of a proactive, involved group of community stakeholders. The park, which had been occupied by homeless people, was being used as a site for separating waste and had become a crime “hot-spot” at night, has undergone a massive transformation in recent years and today provides a clean and safe recreational space for inner city kids to play. “The community will open and close the park, keep an eye on who is frequenting the park, and remove someone who is not using the facility in a productive way,” says Nyembe.

The work of JCPZ is of course fraught with challenges, across the spectrum of social (land use), environmental (climate change) and financial (not seen as key priority), but Nyembe and his team refuse to give up on the dream. “Imagine Johannesburg boasting something like Central Park,” he muses. Indeed; but for now, it’s one tree at a time, continuing to breathe new life into what was previously called the concrete jungle... +

Public Works Green Building Policy

Launched by The Department
of Public Works

As the custodian of state properties, the Department of Public Works is the largest South African player in the property sector. As such, we have the responsibility to provide leadership in relation to green buildings and greening the economy. It is our responsibility to take decisive steps to ensure that our portfolio of state buildings reduces its environmental impact, is energy efficient, resource efficient and environmentally responsible.

The Department has implemented policy activities to minimise the environmental impact of its buildings, including steps to reduce energy and water usage within state properties, the introduction of renewable energy technologies, as well as the design and construction of best practice green buildings. Buildings such as the new offices of the Department of Environmental Affairs in Pretoria, the new Sisonke District Office in KwaZulu-Natal and others demonstrate our commitment to green buildings.

The policy is a milestone in government's trajectory of green buildings and a green built environment. The Green Building Policy is also a demonstration of South Africa's support to ongoing local and international commitments, including the Green Economy Accord, the South African National Climate Change Response White Paper and the National Energy Efficiency Strategy.

The Green Building Policy sets out the principles by which the Department of Public Works will develop, maintain and operate our portfolio of buildings and reduce its impact on the environment. Furthermore, the Policy also lays the basis for the creation of green jobs, for up-skilling and training of participants, and the development of improved working and living conditions.

This Policy is a collaborative effort between my Department of Public Works and all the provincial Public Works Departments. It is my vision that this Green Building Policy will also be adopted by all provincial Public Works Departments as well as other government institutions. Working together, we continue to strive for a sustainable built environment.

HON. THEMBELANI THULAS NXESI
MINISTER OF PUBLIC WORKS



Minister of Public Works,
Thembelani Thulas Nxesi



Deputy Minister of Public Works,
Jeremy Cronin



SOME BACKGROUND TO THE POLICY

South Africa has come a long way in putting in place legislation and programmes aimed at addressing the impact of our economic activity on the environment. A number of studies, including research by the United Nations Environment Programme's Sustainable Buildings and Climate Initiative (UNEP-SBCI) found that the built environment is responsible for 40% of annual energy consumption and up to 30% of all energy related greenhouse gas (GHG) emissions, whilst the same sector is responsible for 12% of fresh water use and 40% of annual solid waste. Research has however shown that this sector also has the highest potential to cut emissions.

The Department of Public Works (DPW) has a portfolio of over a hundred thousand buildings at national level, including more buildings in the custodianship of provinces. In this regard, the Public Works as a family also needed to provide strategic leadership in support of the National Energy Efficiency Strategy (NEES), the National Water Act 36 of 1998 – currently under review, and the National Environmental Management: Waste Act 108 of 2008, amended in 2014. The DPW in partnership with the Council for Scientific and Industrial Research (CSIR) then introduced a Green Building Framework, launched in 2011 during COP17 in Durban. After a number of processes after that, the Public Works Green Building Policy was approved and launched in October 2018.

AIMS AND OBJECTIVES

The Green Building Policy is presented on the basis that the built environment sector has a direct influence on greenhouse gas emissions. Lights, heating and cooling systems contribute to carbon emissions. Therefore, through this policy, DPW will mitigate carbon emissions and adapt the sector to a green built environment by providing a base for development of the green building programme to ensure existing and new government buildings are environmentally responsible. DPW is the largest South African player in the property and construction sectors, and therefore has the responsibility to provide leadership in relation to green buildings and the green economy.

The Public Works Green Building Policy is aligned to a number of legislations including:

- The National Water Act (1998)
- The National Climate Change Response White Paper (2001)
- The National Energy Efficiency Strategy (2005, 2012)
- The South African Long Term Mitigation Scenarios (LTMS) (2007)
- The Government Immovable Asset Management Act (GIAMA) (2007)
- The National Framework for Sustainable Development in South Africa (2008)
- The DPW National Framework for Green Building (2011)
- The National Water Resource Strategy (2013)
- The National Immovable Asset Maintenance Management (NIAMM) Framework (2015)

The overall objective of the Green Building Policy is to ensure that activities of the construction and property industries actively support the green economy and improve the quality of the natural environments by improving the performance of the asset in terms of energy and water usage, application of green procurement, enhancing social well-being, creating new and decent green jobs and facilitating the reuse of materials and elements at the asset's end-of-life stage.

THE POLICY SPECIFICALLY AIMS TO:

- Provide guidelines on the implementation of green building programmes
- Provide steps that will enable government to transition to a low carbon economy
- Contribute to the implementation of energy efficiency programmes
- Provide parameters for the integrated planning and design of green building programmes, thus promoting sustainable development
- Contribute towards initiatives aimed at transitioning to a climate resilient and low-carbon economy
- Contribute to the global effort to stabilise and reduce greenhouse gas emissions by applying appropriate mitigation actions to climate change
- Contribute to dematerialising the economy and promotion of air quality
- Provide for institutional arrangements to enable the implementation of the DPW Green Building Programme through establishing a Green Building Project management Office (PMO)
- Strengthen intergovernmental cooperation in all spheres of government through advocating for the establishment of Green Building PMO counterparts in provincial Public Works Departments
- Promote social-equity through weaving principles of Indigenous Knowledge Systems (IKS) into green building, with a focus on African historic, contemporary, scientific and cultural built epistemologies
- Contribute to the National Development Plan (NDP) Vision 2030 and achievement of local designation and support to black industrialists as championed by the Department of Trade and Industry (DTI).

The Green Building Policy will be applied by all custodians and users in line with the Government Immovable Asset Management Act (GIAMA), with a view to developing initiatives that seek to strike a balance between the construction and property functions and principles that promote creation of suitable development. The scope will, inter alia, include the promotion of a uniform, integrated sustainable planning approach; identification of relevant techniques that promote use of natural resources in the achievement of green building principles (e.g. locally available natural materials); and ensure the achievement of excellent energy, water, and waste management in government buildings/structures.



The role players

Green buildings are impacted on by many role players, both internationally and within South Africa. A summary of key role players within the South African context include:



1.1. Department of Public Works

As the custodian of all immovable assets vested in the national government, which are not otherwise vested in the custodianship of other departments through legislation, DPW is central to providing leadership and practice with regard to green buildings in both the public and private sectors. DPW is the custodian of the Green Building Policy.

1.2. Department of Energy

As the custodian of the National Energy Efficiency Strategy, the Department (as well as its South African National Energy Development Institute, SANEDI) has a key role in influencing energy efficiency in buildings in South Africa.

1.3. Department of Environmental Affairs

The Department of Environmental Affairs is the custodian of South African climate change and sustainable development policies which impact on the built environment.

1.4. National Treasury

National Treasury is the custodian of the Carbon Tax Policy Paper which seeks to introduce a tax on Scope I carbon emissions (i.e. source emissions) in support of reducing climate change. It is estimated that the carbon tax could result in an increase of around 5c/kWh for electricity, and the intent is that this tax will encourage energy efficiency in, amongst others, buildings.

1.5. Department of Trade and Industry

The DTI is the custodian of the National Building Regulations and Building Standards Act, which provides for the establishment of the National Building Regulations (the NBRs). The NBRs are supported by a number of South African National Standards, including SANS 10400XA; Environmental Sustainability.

The DTI is also custodian of the Industrial Policy Action Plan (IPAP) which seeks to upscale productivity and industrial diversification of our economy. It has a strong focus on the green economy, including investment in waste management and recycling.

1.6. Department of Water and Sanitation

As custodian of the National Water Act and the National Water Resource Strategy, the Department of Water and Sanitation has a key role in influencing water efficiency in buildings and water quality of effluents.

1.7. Provincial and Local Government

Several provincial and local government institutions, and related institutions, have and are playing a key role in furthering green buildings through local initiatives – including initiatives at the Gauteng Department of Infrastructure Development, City of Cape Town, and others. Many of these initiatives focus on specific interventions such as solar water heaters, solar energy and renewable energies.

1.8. Agrément South Africa, CBE and the CIDB

Agrément South Africa (ASA), the Council for the Built Environment (CBE) and the Construction Industry Development Board (CIDB) all play an important role with respect to green buildings in terms of the certification of non-standardised building products and systems; promoting and maintaining a sustainable built environment and natural environment, and promoting ongoing human resource development in the built environment.

1.9. Academic Institutions and the CSIR

Academic institutions and the CSIR have played a significant role in research and development that has supported the development of green buildings in South Africa and internationally. Substantial expertise exists at the CSIR and at several academic institutions in energy efficiency and green buildings in general.

1.10. Green Building Council of South Africa

The Green Building Council of South Africa (GBCSA) was established in 2007 with the aim of promoting, encouraging and facilitating green building in the South African property and construction industry, by focusing on advocacy and promotion of green buildings, the development and implementation of green building rating tools, education and training and by providing green building resources including access to technical manuals, guides, research, news and case studies.

1.11. Property Sector and Green Building Industry

The property sector and green building industry, including property developers, facilities managers and products, equipments and materials manufacturers and suppliers are key stakeholders in the provision of green buildings.



Policy outcomes and benefits

The fundamental benefit of the Green Building Policy is to integrate the concept of sustainability into immovable asset management in public buildings. The main outcomes and benefits of the policy are that it:

- Pro-actively informs the development of plans and programmes
- Identifies the opportunities and constraints which the environment places on development
- Identifies key strategic areas of green building interventions
- Provides integration of the principles of green building across the entire property portfolio under the custodianship of DPW
- Improves the way in which cumulative effects can be realised, for example, climate change adaptation and mitigation strategies and Black Economic Empowerment
- Focuses on the maintenance and enhancement of a chosen level of environmental and social quality, rather than on minimising individual impacts
- Utilises the immovable asset-backed mandate of DPW to ensure that the green building trajectory is a catalyst for sustainable development equity, job creation, technology transfer, and the broader economic empowerment

Furthermore, the Green Building Policy communicates DPW's expectations of, and commitments to, the South African property sector in general and specifically with regard to buildings which DPW leases from the private sector.

Stakeholder relations will be guided by signed Service Level Agreements (SLAs) or Protocols in accordance with the Inter- Government Relations Act No 13 of 2005.





The Sarah Bartmann Centre of Remembrance



The Sarah Bartmann Centre of Remembrance is situated next to the grave of Sarah Bartmann in Hankey in the Eastern Cape. The grave is also part of the project. The project has, among other features, a museum next to the grave, a story telling place and a symbolic garden. Indigenous species will be used in the garden with a significant proportion of planting to be sourced from plants rescued from site. The expected completion date is in 2019. The project uses a natural air conditioning and cooling system, instead of mechanical ventilation. The design uses plenty of natural light and most lights will be controlled by occupancy and motion sensors. The project boasts two boreholes and a 260kℓ capacity of storm water harvesting for toilets and irrigation.

ENERGY EFFICIENCY, RENEWABLE ENERGY AND COMFORT

Night-time cooling strategy

Classrooms have been designed to use a passive night-time cooling strategy based on an exposed high thermal mass structure and ventilation design. Ceilings have been dropped to expose thermal mass to night airflow and fenestration is designed to allow airflow at night, while maintaining security.

Rock bed and stack effect

Passive environmental control strategies include a rock bed combined with a stack effect system, designed to maintain thermal comfort and ventilation within the auditorium in a highly efficient manner.

Breeze paths

Breeze paths have been designed between and through spaces to enable natural air flow to enhance cooling, and thermal comfort within internal and external occupied spaces.

Renewable energy and back-up power

A 30kW photovoltaic panel system will provide ongoing power for between 20 to 40% of the power requirements of the building. A UPS system will provide backup power for 2-3 hours in key areas.

Energy efficient lighting

Low-level LED lighting linked to motion sensors is used to light external paths. This will be off when paths are not in use, avoiding light pollution. Energy efficient LED and CFL lamps are used internally.

Energy efficient water heating

Solar water heating is used to heat water in dormitories and kitchens.

Solar shading

The roof, wattle lathe shades, and landscaping design have been designed to shade glazing and reduce unwanted heat gain. Pathways and external seating are selectively shaded with wattle lathes and vegetation.

WATER EFFICIENCY AND RAINWATER HARVESTING

Rainwater harvesting

Surface run-off and roof water is captured and directed to an 180kℓ underground sump and stored for uses such as cleaning and irrigation. Landscaping, berms and swales are used to maximise on-site retention of storm water and avoid erosion. Dual flush WCs and water efficient taps and shower fittings are used.

ENVIRONMENTAL IMPACTS

Landscaping

Indigenous species will be used with a significant proportion of planting to be sourced from plants rescued from site. The design, material and component selection will minimise the effects of corrosion, specifically in relation to windows, structural frames, ironmongery, fixings, PV and solar water heater structures.

Natural, locally-available materials and components have been selected. Materials with harmful chemicals or other impacts have been avoided. Selection of timber products, paints, adhesives and carpets, in particular, avoid formaldehyde and Volatile Organic Compound content. +

National English Literary Museum (NELM)

NELM is located in Makhanda and houses extensive archival material relating to Southern African English Literature. The project design brief called for the building to be a landmark, fitting the site context and building typology, as well as a functional space with cultural and educational significance, informative organisation and design, social upliftment and community acceptance. Chosen as a pilot for the GBCSA Green Star Public and Educational Buildings rating tool, the project also had to have very limited environmental impact, and green principles were top-of-mind from the outset.

NELM's facilities include exhibition venues, archives, libraries, an auditorium, offices, flexible conference and classroom facilities, an open-air public amphitheatre, a storytelling area and leisure walkways. The building is specifically orientated on an east-west axis, with large stone gabions on the north and west facades that act as a heat sink, keeping indoor temperatures cooler by day and releasing some of the embodied heat back into the structure by night. A valuable passive design feature is the large roof garden above the archives, which faces the adjacent residential properties, enhancing the building's picturesque setting. Local materials and labour was specified where available, to provide the community with a sense of ownership and generate economic upliftment.

EFFECTIVE ENERGY AND WATER SAVINGS

The air is pre-conditioned by the building, meaning the dual HVAC system does not need to operate at full capacity. It simply controls the indoor temperature within very fine tolerances. This reduces mechanical heating and cooling costs. Additional energy strategies were targeted to reduce the building's overall energy consumption, such as high-frequency ballasts, occupancy lighting sensors, LED lighting, heat pumps and a Building Management System (BMS) that

monitors consumption and optimises the effectiveness of service systems.

The environmental wellbeing of occupants is enhanced through uninterrupted external views and accompanying natural light, individual climate control and lower noise levels, and the reduction of materials emitting volatile organic compounds (VOC).

The water saving strategies employed in the facility include rainwater used for dual flush toilets (using only 3.6ℓ per flush) and low-flow taps reduce water consumption. The urinals are waterless and touchless sensor taps are self-charging, meaning that the flowing water generates sufficient power to recharge the sensor. Externally, the 100% xeriscaped landscaping was irrigated with rainwater for the first 12 months only.

REUSED AND RECYCLED

Care has been taken to use recycled content where possible, with 90% of steel reinforcing and structural steel having been recycled, rubber flooring made from recycled car tyres, carpets produced largely from recycled plastic bottles and cocomosaic acoustic tiles.

Other green initiatives have been included where possible, from locally manufactured clay bricks and a 40% reduction of the quantity of Portland cement as an average across concrete mixes, through to Forest Stewardship Council (FSC) Certified timber, and safe and convenient cycling and pedestrian routes, along with storage and shower facilities for employees who cycle to work.

For more information on the Public Works Green Building Programme, contact:

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Piloting Sustainable Precincts

Garden Cities' Sunningdale, Cape Town, is the location for the new Northridge Coastal Estate. Photo by Andrew Brown, Camera Ready.

GBCSA's Green Star - Sustainable Precincts rating tool focuses on connections between buildings and how to ensure that sustainability permeates these public spaces where so much of life happens. Its first pilot project made headlines when it received certification in January 2019.

WORDS Christy Borman



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Making the leap from certifying individual stand-alone green buildings, to certifying precincts, has been a complex process in South Africa. One that mirrors the multitude of challenges that urban planners face in trying to create liveable, well-governed, economically prosperous and environmentally sustainable places for people to thrive.

In 2016 the GBCSA led a stakeholder engagement programme to pilot the Green Star - Sustainable Precincts rating tool, founded on the GBC Australia's Green Star Communities rating tool. At that time, about nine projects had indicated willingness to be a part of the pilot programme. Garden Cities' Northridge Coastal Estate was the first project in South Africa to receive certification in January 2019 and Sandton Gate in Gauteng is currently the only other project registered, between round 1 and round 2 of the assessment process. Several others are also on the drawing board.

CATEGORICAL MIND-SHIFT

Instead of the usual categories of water, energy, transport, indoor environmental quality, materials and so on, the precinct tool focuses on four principles: governance, liveability, economic prosperity, and environment.

Within each category, certain credits can be targeted. The "governance" category has a lot to do with planning and management and requires that a Green Star - Sustainable Precincts accredited professional be appointed. It also gives guidelines on interventions such as a design review, stakeholder engagement and community participation and governance, adaptation and resilience plans, corporate responsibility within management structures, sustainability awareness, and the required environmental management plans and permits.

"Liveability" calls for ways to promote healthy and active living, community development, sustainable buildings, prioritisation of culture, heritage and identity, walkable access to amenities, and access to fresh food and safe places, which could include a crime risk assessment, for example.

"Economic prosperity" puts the focus on community investment and affordability, opportunities for employment and economic resilience, education and skills development (including tertiary education), incentive programmes, digital infrastructure, and peak electrical demand reduction.

The "environment" category calls attention to materials, greenhouse gas emissions, integrated water cycles, sustainable transport and movement, sustainable sites, ecological value, waste management, heat island effect, and light pollution, among other things.

THE GREEN STAR - SUSTAINABLE PRECINCTS TOOL AIMS TO:

- Provide diverse, affordable, inclusive, well connected and healthy places to live, work and play
- Protect, maintain and restore the natural environment by reducing the ecological footprint of developments
- Receive recognition for demonstrated leadership and commitment to sustainability
- Achieve real value for money through demonstrated whole-of-life cost savings;
- Encourage opportunities for business diversity, efficiency, innovation, and economic development



Sustainable precincts focus on four tenets: Governance, Liveability, Economic prosperity, and Environment.



cndv Landscape architects Industrial & product design

Garden Cities' Northridge Coastal Estate recently became the first project in Africa to achieve a 4-star Green Star – Sustainable Precincts rating. The precinct forms part of the larger-scale Sunningdale development in Cape Town.

Various green building consultants that participated in the stakeholder engagement process and localisation of the rating tool for South Africa, including Fabio Venturi from Terramanzi Group, Shabari Shaily from Ecocentric, Annelidé Sherratt and Nomamfengu Mbele from Solid Green, and André Harms from Ecolution, agree that it is a robust tool. Solid Green and Terramanzi are the first to submit projects to the GBCSA, and have put it through the paces and submitted many credit interpretation requests and technical clarifications to ensure local appropriateness.

GARDEN CITIES' NORTHRIDGE COASTAL ESTATE (SUNNINGDALE PHASE 13A)

LOCATION: Tableview, Cape Town
TIMELINE: Design 2014, Bulk infrastructure 2019
 Construction of buildings 2020, Completion 2022
RATING: 4-star Green Star - Sustainable Precincts
CERTIFICATION DATE: January 2019
AREA: 56.5ha
BUILDINGS: 429 residential units, community facility, 7ha conservation area

DEVELOPER AND ARCHITECT: Garden Cities
TOWN PLANNER: MLH Architects and Planners
SUSTAINABILITY CONSULTANT: Terramanzi Group
LANDSCAPE ARCHITECTS: CNDV Landscape Architects

Sustainability consultancy Terramanzi Group has been working with residential property owner and developer Garden Cities on phase 13A of the Sunningdale development, which achieved a 4-star Green Star - Sustainable Precincts rating in January 2019, making it the first project on the continent to be certified so far. Known as the Northridge Coastal Estate, the area is striving to be the “eco-village” portion of the greater Sunningdale region. It borders the Blouberg conservation area near Cape Town and 7ha of the eco-village has been dedicated to conservation area, through which cycle, running and walking trails will wind.



Rob Dickie

The residential units are located surrounding the community facility, which will host events and houses a boardroom and administration facilities. Northridge Coastal Estate is also within close proximity to Berkshire Boulevard, which will accommodate sports facilities, a school or college, offices, retail outlets and general business development, and the Leadville dog park.

While much of the focus for the precinct rating is on the infrastructure and amenities such as a community sports centre and garden where food can be grown, digital fibre infrastructure, LED street lighting, and adequately-sized pavements, the design of the homes also follows sustainable building principles and will include solar water heating and rainwater harvesting tanks, for example. Homeowners will also be provided with a manual on how to green their homes.

Achievement of the precinct certification is heavily focused on the town planning aspects of a project, and Claire Holton from Terramanzi Group emphasises that it is imperative to get involved in precinct projects from very early on in the planning and design phase. This certification is almost impossible to target retrospectively. Sustainability consultants are required to advise professional team members of the requirements of the precinct rating tool and encourage them to come up with innovative solutions to meet the requirements from the start.

“This tool is definitely focused on the connections between places. It is much more integrated and means you have a much wider scope of influence because it is inclusive of so many more members of a community,” says Holton.

Garden Cities’ group manager: engineering and planning, Renier Smith, explains that Garden Cities is a non-profit company committed to providing quality residential developments in the Western Cape, and was founded 100 years ago. “About six or seven years ago we developed a Garden Cities green approach and policy. On average we build between 250 and 400 houses a year, and we felt that we must do this with as little impact on the environment as possible,” says Smith.

Because so many green principles and policies have already been in place at Garden Cities, the board was convinced to take up the challenge of aiming for a Green Star - Precincts certification. “It will set the tone and reinforce that we are doing the right thing. Achieving the certification will also push us to keep making each next development phase even better,” Smith says, mentioning that the ultimate goal will be to send zero waste to landfill from the green precinct.

“The scale that we work at means that we really can make a substantial difference,” he affirms.

The Sandton Gate precinct in Johannesburg has an emphasis on walkability. Solid Green sustainable building consultant Nomamfengu Mbele explains that implementing this concept in design means both the basics of developing movement networks such as comfortable foot and cycle paths, and secondly providing amenities in proximity to habitable buildings in order to encourage individuals to walk around instead of relying on cars.

Mbele says physical interventions for walkability include: footpath provisions throughout the development, with wider sidewalks (2m on both sides) exceeding South African minimum guidelines; diverse amenities and land uses (including retail, business and community uses) within the project boundary and within walking distance (400-800m) of the project; and pedestrian-friendly design. This includes practical implementation like: street lighting a little higher than average pedestrian height to improve safety of pedestrians; and trees and street furniture for pedestrian comfort.

Crime Prevention Through Environmental Design Principles have also been employed. The building design and surrounding environment will promote security by activity, public presence and ownership of the public realm, opposing the conventional notion of security by isolation and separation. This will happen through community engagement and ownership, and inclusive design, improved surveillance and visibility, and a positive image emphasising beauty, aesthetics and human comfort. Good urban management and monitoring will also be important.

Liveability has also been a strong focus for Sandton Gate. The key elements, notes Mbele, are an active pedestrian movement network and facilities throughout the development - cycle lanes and footpaths linking to diverse amenities, a gym, a park, and a fresh food garden.

Location is crucial to the development’s aims for economic prosperity. Its proximity to Sandton means a source of diverse employment opportunities and higher education facilities. The precinct has also made internal adjustments for users and occupants to experience economic prosperity through digital

SANDTON GATE

LOCATION: William Nicol Drive, Johannesburg

TIMELINE: 10 years through seven phases. Bulk infrastructure April 2018, Construction of buildings July 2018.

RATING: 4-star Green Star - Sustainable Precincts, 4-star Green Star for offices

CERTIFICATION DATE: Still to be certified

AREA: Phase 1 will include all necessary infrastructure, 12 800sqm of P-grade office space, 140 residential units, a gym and recreational spaces.

DEVELOPERS: Abland, Tiber and Craft Homes

URBAN PLANNER & ARCHITECT: Boogertman & Partners

SUSTAINABILITY CONSULTANT (GSAP): Solid Green



The new Sandton Gate precinct in Johannesburg, is currently registered under the Green Star – Sustainable Precincts tool, and has a focus on walkability.

Boogertman and Partners



Office buildings in the Sandton Gate sustainable precinct will target a minimum 4-star Green Star rating.



infrastructure installations and investment into community infrastructure such as the rehabilitation of the park, artistic water features and cycle path landscapes.

In terms of environment, 75% of the development was previously-developed land, limiting its contribution to urban sprawl which contributes to environmental degradation. Its location along the major road of William Nicol Drive meant sustainable transport was a crucial element, as it was not desired to add more private cars to the daily rush hour traffic.

Governance has been the most challenging category to address on this project, notes Mbele. Community participation and engagement have been key elements for Sandton Gate. Abland and Tiber focused on ensuring that their community was informed and involved throughout the development process, and committed to gathering the relevant resident associations. By setting up a stakeholder engagement strategy, the owners ensured that nearby residents' associations were informed, consulted with, and were collaborative partners on the development of the masterplan. This



The precinct rating tool forces professional teams to work with an urban environment as opposed to within the confines of a building and to make a sustainable difference at a much bigger scale. There is a definite need for planning that challenges the South African status quo that revolves around the car and to make the most of shared services. *Claire Holton*

was done through continuous public participation meetings over a period of nine months.

Community is still a focal point within the development. Developers have made commitments for community-led associations to have the authority to manage the operation and maintenance of the park and other monthly cleaning-the-city programmes. This ensures that the community stays involved throughout the lifespan of the development.

THE BIGGER PICTURE

“Working with the tool in the pilot phase has definitely been a complicated challenge. There have been a few things which needed tweaking for the local South African context and credit interpretation requests and technical clarifications, which we have had to work through with the GBCSA and also the GBC in Australia. But it has been a fantastic learning opportunity,” says Holton.

Annelide Sherratt from Solid Green and AP for Sandton Gate, has also been involved in the development of the precinct certification system. She says: “Although the tool is in the pilot phase and this can be daunting in the beginning, let the joy and excitement of embarking on uncharted territory and making a difference on a large scale get the better of you. Keep your head down and get stuck into the manual and you will soon see the fruit of your work.”

Manfred Braune, managing executive: sector development and transformation and executive director at the GBCSA adds: “The GBCSA is thrilled to have real projects testing the Green Star - Sustainable Precincts tool, and especially a diversity of projects in different places and different contexts by different professional teams. This helps to grow the understanding and uptake of the rating tool, and will ultimately increase its impact. There are a number of other exciting projects in the pipeline, not yet registered, that will further benefit from this tool and contribute to the lessons learnt. The GBCSA congratulates and thanks all those professionals who have committed to using the tool on their projects.” +

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Net Zero Carbon and the Energy-efficiency Gap

WORDS Courtesy of Solid Green Consulting: Chilufya Lombe and Jessé Hamman

“
For years in the green building industry, we have been striving to make achievements in helping to create buildings that have less impact on the environment than ‘normal’ buildings. This has always led to debate around how to define a ‘normal’ building, and whether we should even be basing comparisons on buildings that have led to 40% of the world’s carbon emissions. Or should we have loftier goals?

Chilufya Lombe

Lionel Henshaw

The GBCSA’s 11th Annual Green Building Convention took place in October 2018 under the theme *Race to Zero*. Having attended the very first conference ten years before, Chilufya Lombe, director at Solid Green Consulting, admits that attending the event had become something of a habit. However, the inspirational 2018 edition, which centred around net zero, was different.

“Net zero looks at buildings that have zero impact on carbon emissions, water, waste and ecology. Net zero carbon buildings aim to offset their entire annual carbon emissions which means that, over the course of a year, their overall energy use is zero,” explains Lombe.

With South Africa’s continued reliance on fossil fuel (coal) for energy production, this is a particularly important consideration for the country. Energy generation leads to carbon emissions, therefore less energy use results in fewer carbon emissions.

Despite being a leader in green buildings on the continent, South Africa also has one of the dirtiest grids in Africa so the argument can be made that there is a significant need for more energy-efficient buildings as a first step towards reducing reliance on coal-produced energy.

Jessé Hamman, sustainability consultant at Solid Green, says: “South Africa has committed to reducing its carbon emissions through the Net Zero Carbon Programme launched in 2015 in partnership with the C40 Cities Climate Leadership Group and Sustainable Energy Africa (SEA). The policy aims to have only zero-carbon buildings in development by 2050, in the country’s main metros.

“According to ‘Aiming for Zero-Carbon New Buildings in South African metros’ (Cilliers, Z. and Euston-Brown, M. 2018. www.sustainable.org.za/uploads/resources/resource_59.pdf), the Net Zero Carbon Programme proposes the following framework for evaluation and monitoring: clearer national regulations on building

design and construction; strict non-compliance penalties; local efficiency requirement production increases; and renewable sources to be used for energy deficits. As the C40 2050 deadline is fast approaching, this means that new public-private construction projects will have to work in partnership with the GBCSA to ensure that both energy and water targets are met.”

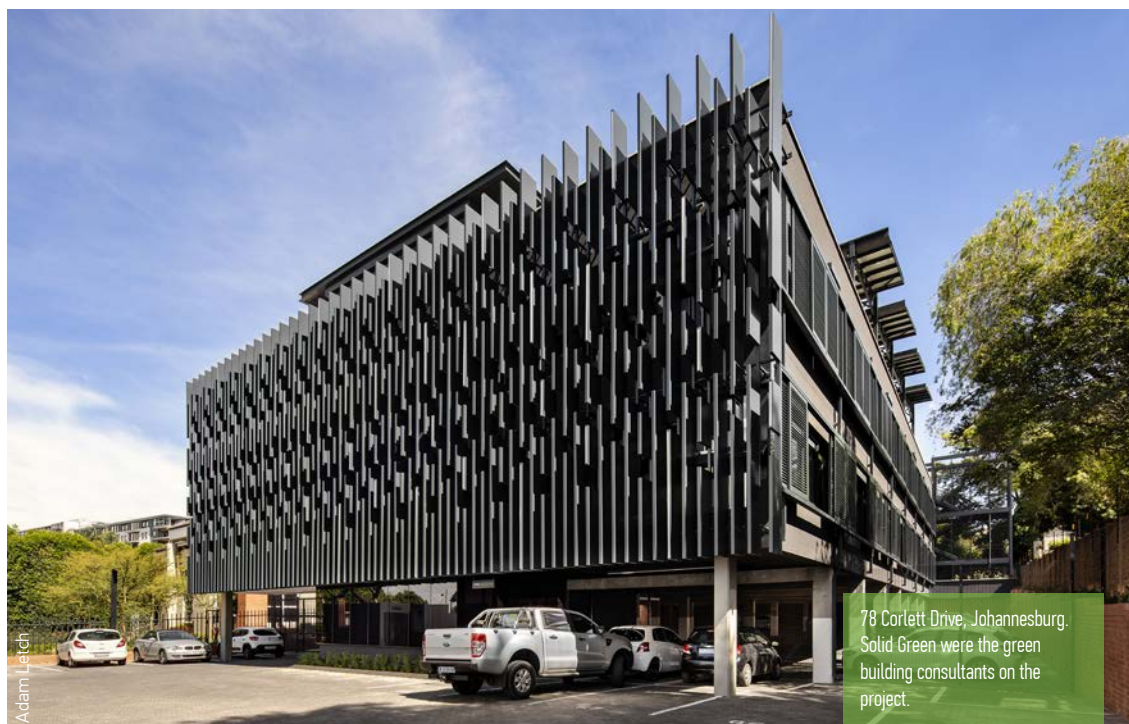
So, what does net zero carbon mean for a building? The idea of net zero carbon often conjures up images of large solar power installations. However, Lombe says that before one can even look at providing renewable energy on a project, it is necessary to implement a level of energy efficiency that is considerably higher than has been achieved to date.

“To achieve the necessary target for net zero, benchmarks for energy efficiency need to be much more aggressive than they have been to date,” he says. “As a starting point to achieve net zero, buildings must use three to four times less electricity than the average green building.

The difference between the energy efficiency required for net zero and what is typically implemented in green buildings is what we call the energy efficiency gap. Solving the energy efficiency gap is where the business case for energy efficiency lies.

“Before pricing in the renewables required to make a project net zero, the need for, and quantity of, renewables must be decreased as much as possible – which is achieved by reducing a building’s energy use. This is what will lead to significant financial savings.”

How can buildings reduce energy use by four times over the average green building? Lombe explains that the main elements in an office building’s energy use are lighting, computer equipment and air-conditioning. Over the years, lighting and computer equipment have undergone significant changes in technology, which has led to drastically reduced energy use. Light bulbs today use as much as 80% less energy than the light bulbs of 15 or 20 years ago.



78 Corlett Drive, Johannesburg. Solid Green were the green building consultants on the project.



Air-conditioning, however, can be argued to have remained the same. While there have been small improvements in the efficiency of HVAC equipment over the years, the underlying technologies have not changed much in the last two decades.

Coupled with the fact that buildings are increasingly difficult to keep comfortable due to the type of facades and aesthetics that have become popular in South Africa over time, the energy use by HVAC systems has not reduced over the years.

In South Africa, despite the very harsh solar conditions, the overall climate in most cities is still very mild. Lombe says: “In Johannesburg, for example, hot days (above 27°C) account for only 4 - 7% of annual office hours. Yet most buildings require almost constant air-conditioning to achieve comfort. A term we are using now to help solve the energy efficiency gap is Comfort Without Air-conditioning (CWA). If a building is designed to have significant periods of the year where occupants can be comfortable without the need for air-conditioning, then net zero is possible.

“The first net zero carbon office building for which Solid Green completed certification is 78 Corlett Drive in Johannesburg. This building breaks the first rule of energy-efficient design in that its east/west orientation is technically wrong. However, this design decision was seen as an opportunity because, if the high solar loads in the morning and late afternoon can be mitigated, then the bulk of the day is spent with very low loads. This mitigation was achieved by simply providing movable external shading. Occupants will only need to close the windows and turn on the air-conditioning on very hot days.”

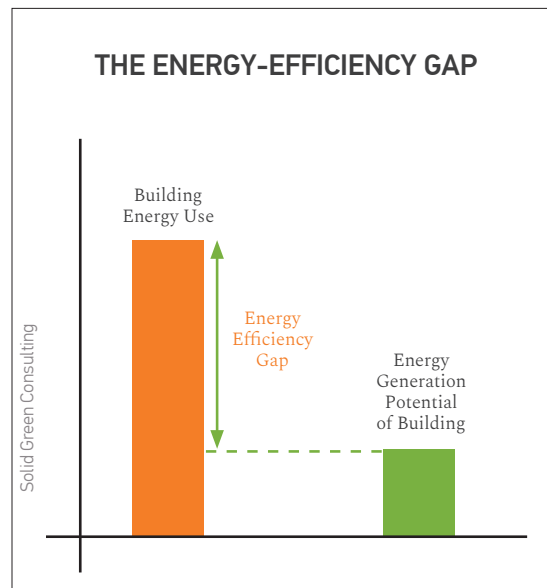
For new buildings, solving the energy efficiency gap also means capital cost savings. If a building’s energy use is reduced by three to four times (more than the average green building), then the corresponding infrastructure cost will also be greatly reduced, including the size of the HVAC plant.

“Last year we embarked on a project that demonstrates the financial opportunity of solving the energy-efficiency gap in real terms. A 20 000m² existing building campus was about to embark on a R12m solar project. We were required to write an energy conservation strategy that included the planned renewable energy project. The report indicated that solving the energy-efficiency gap amounted to R4m a year saving, which could cover the costs of the solar plant within three years. Without these energy-efficiency measures, however, the same solar plant would have minimal impact despite a significant additional capital cost.”



78 Corlett Drive, a new contemporary office development in Johannesburg, achieved a 6-star Green Star Office Design rating in 2018, and was one of the first buildings in Africa to receive net zero carbon pilot certification in late 2017. The building also won Highest Rated Building at the 2018 GBCSA Awards.

Net zero carbon presents both a challenge and an opportunity. It comes at a time when we have realised that the current pace of our efforts is not enough to offset the negative impact of buildings on the environment. African cities are developing rapidly, and it is clear that the goal should be to drastically reduce energy use and allow our cheapest (free) and most abundant resource – the sun – to power buildings. +



JESSÉ HAMMAN

Jessé is a sustainability consultant with a background in furniture design and product development. She was one of the first Green Star Accredited Interior Professionals in the South African design sector.



CHILUFYA LOMBE

Chilufya is a director at Solid Green Consulting. He is a mechanical engineer specialising in Sustainable Building Simulation. He is part of the GBCSA’s education faculty and assessors’ pool.



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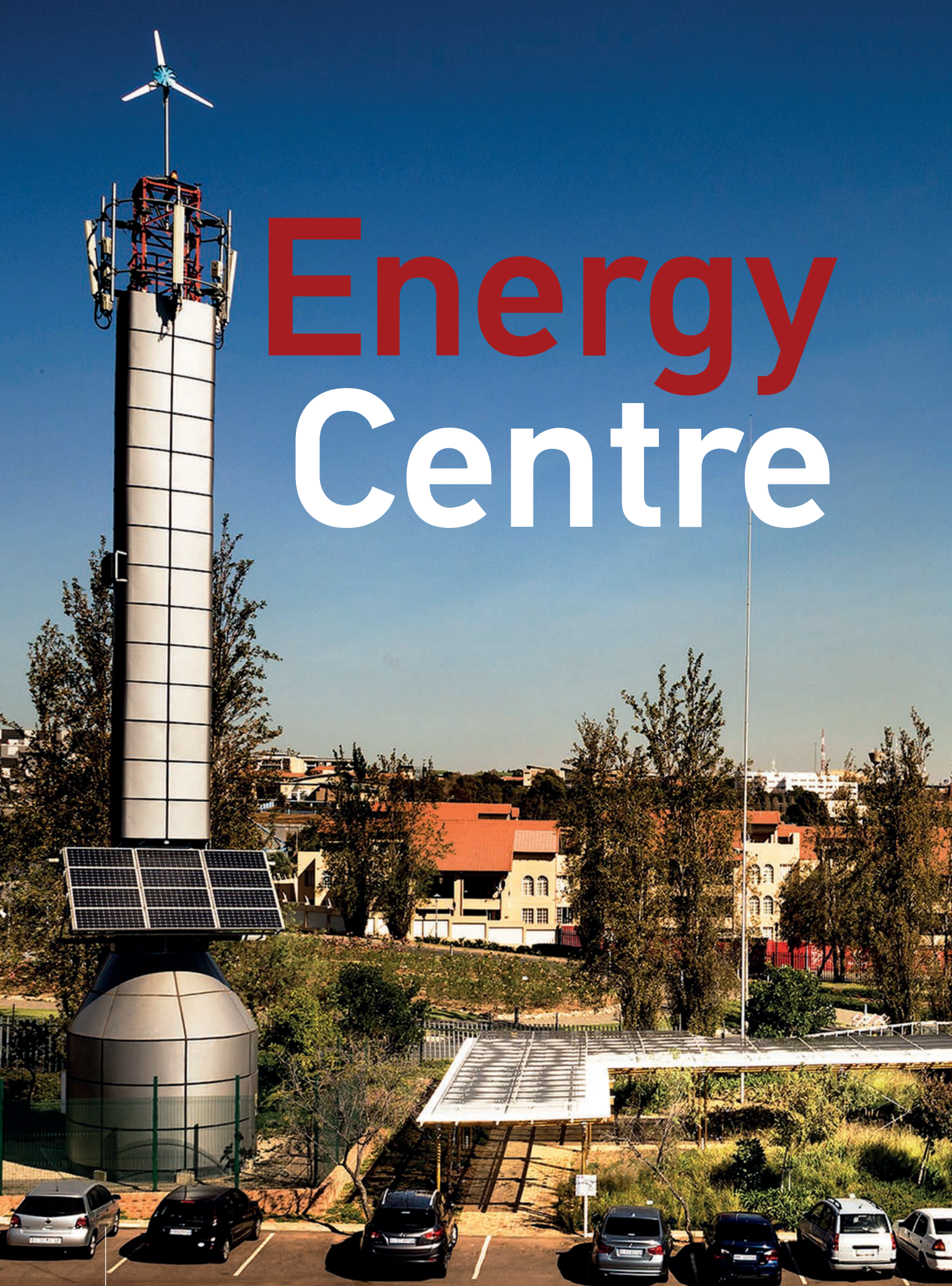


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Energy Centre



Vodacom SA's Site Solutions Innovation Centre (SSIC) in Midrand was certified net zero carbon (pilot) by the GBCSA in October 2017. The building is so energy-efficient that it generates excess energy that is used to fuel the buildings on the surrounding Vodacom SA Midrand campus. How does the building go about being a small-scale power generation hub?

WORDS Linda Doke **IMAGES** GLH Architects





Winner of numerous energy conservation accolades, including Highest Scoring Green Star Project 2008-2012 by the GBCSA, and the Mail & Guardian Greening the Future Award for innovations in renewables, the Vodafone SSIC was recognised in 2012 as the greenest building on the African continent.

The project, which was completed in 2011 and awarded its 6-star GBCSA Green Star SA rating that same year, is situated at Vodacom SA's head office in Midrand. Sanctioned by Vodacom, designed by GLH Architects and engineered by WSP, the building is located within its own green space on the property.

The design aesthetics of the building present a harmonious and seamless integration between the physical building and the surrounding landscape. Essentially a transparent glass box with a roof, the innovative design counters solar heat gains, allows for cooling, and features rich textured timber materials. The building is open to visitors to view the low energy, sustainable design and construction solutions.

In October 2017, the Vodafone SSIC became the first commercial building in an urban scenario to achieve net zero carbon status, certified by the GBCSA. The green space surrounding the building, which was originally a vacant tarred parking lot that has now been transformed into a lush indigenous garden, certified with a net positive ecology rating in the same submission in 2017.

The GBCSA loosely defines a net positive carbon building as being of a high enough energy efficiency that the energy produced from its renewable energy efforts result in more energy being produced than that which is consumed by the building. Although the Vodafone SSIC received its certification for net zero carbon, the building does in fact produce more energy than it consumes and is therefore able to supply the surrounding Vodacom SA Midrand campus as well.

WSP sustainability consultant Alison Groves says the premise from the client, Vodacom SA, was that the building should be as resilient and as off-grid as

possible. "Even before the concept 'net zero' existed, that was the motivation behind the building's design," explains Groves.

The practicality of achieving a net zero building requires careful planning and a non-traditional approach.

"From the outset, the concept design was shaped not by a financial budget, as is traditionally the case when planning a building, but instead by an energy budget. First we calculated how much roof space we could make, and how much energy that would give us, and then we designed all the systems and equipment to fit within that budget framework. It was a case of 'this is how much energy we've got, we cannot exceed it, so we have to make it work!'"

The building forms a strategic part of the greater Vodacom SA campus' energy network. The principle behind the workings of the Vodacom grid it supplies is simple: essentially the entire building acts as an energy centre. As a grid-tied system, it has no battery storage – instead excess energy is fed into the campus which serves as an energy bank. During the night, the building draws on the energy credit to satisfy night-time energy requirements. The building has a 55kW photovoltaic installation on its roof and covered walkways, generating some 92 467kWh per annum.

GRID-TIED SYSTEMS VS BATTERIES

At the time the building was designed, the ability to feed excess energy into the national grid was not permitted. However, innovation sparks innovation, and nothing fuels change faster than urgent need. With South Africa's worsening power situation, there have been ongoing efforts to find alternative ways to achieve reliable, safe, and continuous energy sources.

Batteries have long been thought of as the way forward, but their environmental impact should never be overlooked.



The design aesthetics of the building present a harmonious and seamless integration between the physical building and the surrounding landscape. Essentially a transparent glass box with a roof, the innovative design counters solar heat gains, allows for cooling, and features rich textured timber materials.



“If there is no other infrastructure, then batteries are a good idea. But the negatives far outweigh their advantages: they are environmentally harmful, they must be kept stable, and they only last five years. Admittedly, with advancements in technology they’re becoming smaller, less toxic and have an extended lifespan. Tesla’s 100% self-powered Powerwall was the first foray into compact battery-tied systems, but there is still a very long way to go,” says Groves.

The Vodafone SSIC is tied to its campus grid in such a way that its surrounding buildings act as a battery which stores the energy, thus the excess energy goes unwasted.

The process of feeding excess electricity generated back into the national grid still faces some challenges in many South African cities. Gauteng (where the Vodafone SSIC is located) is no exception. The City of Cape Town (CoCT) is working hard to set an example and lead the charge towards change by developing new rules and regulations that work towards allowing small-scale power generators to connect to the grid legally and safely.

CoCT’s manager for energy efficiency and renewable facilitation, Mary Haw, says CoCT is very supportive of small-scale generation, and that several municipalities around the country have adopted CoCT’s processes to allow the same.

“It is important to point out that generating electricity is potentially dangerous; it needs to be done safely. At all times the grid operator has to know what generation equipment is linked to the grid, which is why all systems need to be authorised and meet all requirements in terms of safety and legality.”

Haw says the City recognises that the regulations need to keep up with ongoing technological innovations and ownership models of generation.

“The current regulations are designed for a single-generator, multiple-buyers model, but we see the future leaning towards a dynamic trading environment between consumers and generators of electricity. We’re carefully navigating how we get there, and looking at what rules and regulations will need to be in place from a safety and an equity perspective, as well as the technology and communication networks and infrastructure that will need to be in place to allow for that.

“Any new generation model must have the infrastructure to be able to handle fluctuations in



energy flow safely. It’s not straightforward – there needs to be strategic design and engineering in place. As the local grid operator for the Cape Town metro, CoCT is legally bound by rules and regulations set by National Government. Ultimately our primary responsibility is the provision of safe, equitable, high quality electricity to our consumers, so we need to make sure that whatever we’re allowing to happen on our grid, does exactly that,” says Haw.

Groves explains that when the Vodafone SSIC team decided to pursue a net zero approach to energy in the building, it was considered a grandiose plan.

“However, it is buildings like this one that demonstrate that the path to net zero is indeed possible. If the building industry is to make any contribution to limiting the conditions that drive climate change, it will be to ensure that net zero buildings move from being the exception, to becoming the norm,” she concludes. ▶▶



SOLA Future Energy

BLACK RIVER PARK – A STAR EXAMPLE

Tucked firmly between the Table Bay foreshore, the N1 highway and the base of Devil's Peak, Black River Park in Observatory, Cape Town, is home to what, at the time of construction, was the largest integrated roof-mounted photovoltaic (PV) system on the African continent.

In 2014, with the approval of the City of Cape Town, the project became the first of its type in South Africa to sell energy to a local municipality to feed back into the local power grid.

Owned by Redefine Properties, the 75 000m² eco-focused business park was also, in 2015, the first office precinct in South Africa to achieve a GBCSA-certified Green Star 6-star rating for several of its office buildings.

The rooftop solar installation comprises close to 6 000 panels over a roof space of 9 000m², generating 1.56MW of power, and ranking it at that time amongst the top 20 biggest rooftop solar installations on the planet.

Designed, constructed, operated and maintained by SOLA Future Energy, the turnkey installation took place over three phases – the first in 2013 with 700kW, the second the following year with an additional 500kW, and the final phase of 360kW in 2015.

SOLA Future Energy CEO Dom Wills explains how, being reliant on sunlight to generate power, the PV system's full production capability conveniently coincides with peak electricity hours, producing approximately 40% of the power required by the 3 500 people working at the office park.

"Being a business park, the property's highest consumption period is during working hours which,

being daylight, is when the panels are generating energy," says Wills. During Saturdays and Sundays, when consumption is negligible because offices are closed, the solar panels generate excess energy. This energy is then fed back into the City of Cape Town's electrical power grid. Although not a considerable amount, the nominal buy-back value is off set against Black River Park's monthly electricity bill."

Wills added that although this was the first such request of a municipality in South Africa, the City of Cape Town was very open to the idea and supportive of the innovation. The necessary council approvals documentation took only slightly longer than any normal construction project, and the innovation championed the way for several other buildings and business parks to achieve permission to feed their excess renewable energy back into the power grid, not only in the Western Cape but in Gauteng and other provinces. +



SOLA Future Energy

The Mega Sky City Development



Residents in and around Palm Ridge, Katlehong and Sky City can soon expect to visit an exciting new retail venture in the South of Johannesburg. GMI Property Group (GMI), in association with Cosmopolitan Projects are pleased to announce the opening of Sky City Mall, April 2019. The retail site, located at the intersection of the R550 (Heidelberg Road) and the K91 Vereeniging, forms part of the mega R10 billion retail and residential development. The entire development will consist of 16 schools, 16 000 new households as well as a phase 1 convenience centre of 12 500m², growing into a regional centre of 32 000m² in the near future.

Anchored by Shoprite and Cashbuild, supported with an excellent tenant mix including OBC, Pep, Tekkie Town, Ackermans, KFC, McDonalds, Debonairs and an Engen filling station, the centre will service 182 000 people in the catchment area, providing a variety of substantial retail options to customers.

Glass and wooden panels allow for ample natural light within the mall, whilst the furniture

and tile finishes are stylish and modern. All these design features have been carefully considered to enhance the contemporary architecture of the centre. The food court provides a magnificent view over the striking water fountain, creating an inviting and friendly environment for the community to enjoy.

Looking into the future, new and additional phases of 10 365m² will expand the project to a total of 44 000m² GLA. Sky City Precinct will provide education, sport, health services, retail, public and industrial opportunities to customers. The Precinct is ideal for big box retail, food courts and a gym, in return complementing the convenience centre.

Sky City Mall and Precinct are GMI's first projects in Gauteng, and we would like to share news and progress on these projects with you. Follow Sky City Mall on Facebook or visit www.gmigroup.co.za for updated images and video footage. For any information or enquiries please contact GMI on 012 345 2997.

For any enquiries please contact GMI at 012 3452997





TAPPING INTO NET ZERO

Growthpoint's The District building in Cape Town is one of the first buildings in the country to be certified by the GBCSA as a net zero water pilot project, due to its innovative on-site water treatment facility.

WORDS Linda Doke

IMAGES Mary Anne Constable

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South Africans tend to take water for granted. We turn on the taps and expect crystal clear drinking water to flow out. Our taps have always provided us with potable water and people expect that. But with growing demands on urban centres, and climatic changes that hold uncertainty for the future, South Africa is fast becoming a water-scarce country, and in 2014 was ranked the 30th driest country in the world.

Cape Town's recent drought (in the summer of 2017/2018) highlighted how efforts from all sectors of society can avert a major water crisis. Calls to industry, the commercial sector and the general public to dramatically reduce water consumption to avoid an impending "Day Zero" saw the Western Cape's use of water drop by more than 50% in a few months. This was achieved not only through restricted use and liberal reuse of the precious resource, but through channelling existing sources in inventive ways and putting them to better use.

SHIFTING OFF THE GRID

The District building in Woodstock, Cape Town, is a shining example of a commercial property that is determined to reduce its water impact on the environment. Through innovation and determination, it became the first commercial property in its area (on the edge of the Cape Town CBD) to shift off the municipal water grid and receive net zero water certification from the GBCSA in December 2018.

Owned by Growthpoint Properties, The District is a mixed-use development that incorporates four conjoined buildings, and is located on the periphery of Woodstock, an urban regeneration area in Cape Town. Originally constructed about 50 years ago, the buildings have been renovated and redesigned several times over the past few decades, with their most recent refurbishment on Growthpoint's watch, completed in 2008. The property, with its five basement levels and seven floors, which total 18 721m² of office space accommodating 25 businesses, has installed a system to treat groundwater and reuse it in the building, in order to take it completely off the municipal water grid.

GBCSA defines a net zero water building as one designed, constructed and operated to greatly reduce its total water consumption, and to use recycled and reused water so that the amount of water consumed is the same as that produced (as waste water).

The District is achieving one step further – the amount of water it recycles is greater than the water it consumes. This means that the building is in fact net positive.

Growthpoint's in-house sustainability specialist Nardo Snyman explains how the initiative came about: "Three years ago we were experiencing flooding in the basement of the building. On further investigation we found a number of sumps designed to pump excess groundwater seepage into the city's stormwater drainage system. No one had ever taken much notice of these sumps until then, when one stopped functioning. That's how we learned of the abundant water source that flows directly under the building.

"In order to put this sustainable water source to good use, we initially hoped we could use it specifically for our air conditioning and for flushing toilets, but the complicated structural configuration of the four buildings would not have made it feasible. The only other alternative would be to filter it and make it fully potable to supply the whole building."

AN ABUNDANT SOURCE

The process was not quite as simple as that – by law, Growthpoint would not be allowed to sell potable water to its tenants, because the City of Cape Town (CoCT), being the water services authority, has the sole mandate to provide water to its citizens.

"So we worked together with the CoCT, and found a piece of legislation that had been written to enable mining companies in small mining towns whose municipalities were unable for any reason to provide water, to supply the town with its own water. Our circumstance was, in principle, no different – because of the drought situation, CoCT was not able to assure The District of the provision of reliable water," Snyman explains. "In February 2018 the draft legislation was agreed, we put in the filtration plant, and successfully moved the building off the municipal water grid."

Analysis of the flow of the groundwater has shown the source to be abundant and reliable. The filtration plant is capable of producing 145 000litres/day, and the sump is yielding about 300 000litres/day at the moment. With water-saving interventions in place, the building only consumes 45 000litres/day, 31% of the sump's inherent potential.



The basement water purification plant is capable of producing 145 000litres of potable water per day. The building currently only consumes 45 000litres per day.





“That means the remainder of the groundwater is still being diverted to the normal stormwater course that it has been for years, and ultimately into the ocean. But by offsetting potable water use from council, we’re happily doing our part for saving water,” adds Snyman.

WATER EFFICIENCY

Ecolution sustainability consultant André Harms points out that extensive efficiency measures were implemented in the building in order to reduce potable water demand before the installation of the alternative water system. This ensured more responsible water consumption, as well as a reduced-capacity plant able to cover the demand, and less energy required to pump and treat the water.

The District’s main tenant, global advertising giant Ogilvy, is fully supportive of Growthpoint’s initiative.

“Achieving net zero water is the right thing to do from both a moral and a commercial imperative. Water scarcity is not a temporary phenomenon, but the new normal, and being net zero water means we are doing what we have to do to contribute to the community we are part of. It also means we can guarantee to our staff and to our clients that we are able to keep working and delivering whatever the external water realities,” says Ogilvy South Africa managing director, Vicki Buys.

“Being off the water grid not only demonstrates to our clients that we are walking the walk on this critical social issue, but also reassures our staff that the leadership of the agency is committed to an environmentally conscious working environment.” +



Water scarcity is not a temporary phenomenon, but the new normal, and being net zero water means we are doing what we have to do to contribute to the community we are part of. *Vicki Buys, Ogilvy South Africa*



A car wash in the basement collects rainwater in tanks to use for washing of the cars. The resulting grey water is also filtered and reused.

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Innovation within the sustainability sector is what separates us from others in the industry. In fact, we are hugely invested in green building innovation because it directly impacts the future. We have an outstanding sustainability team that works continuously on the latest technologies involving future proofing our water resources, creating water net-positive buildings, finding ways of repurposing organic waste and producing green electricity. While we remain on the pulse of new technologies and innovation, we also support our future green leaders through our annual Greenovate Property and Engineering Awards (in partnership with the GBCSA), where university students are awarded for outstanding leadership in environmentally innovative thinking.

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Holistic HOSP



itality

Following in the footsteps of the highly-acclaimed 6-star Green Star-rated Hotel Verde in Cape Town South Africa, Verde Hotels' second offering in Zanzibar debunks the misconception that luxury and sustainability are in conflict with each other – or even mutually exclusive – in the hospitality industry. The new establishment is targeting a 5-star Green Star custom hotel rating.

WORDS Melinda Hardisty





LOCATION: Zanzibar (5km from Stonetown), Tanzania
DATE OF COMPLETION: Mid 2019 ("soft" opening March 2018)
FACILITIES: Hotel, Conferencing Centre, Spa
SIZE: Hotel - 9000m², 106 new rooms (including five 2-bedroom suites), and 28 rooms in an existing building. Entire complex (including a water park and marina) - 178 000m²

Verde Hotels selected their name to epitomise their vision for hotels that pursue a holistic approach to sustainability. The Italian word *verde* directly translates as "green" in English. Verde Hotels aim to integrate green principles and practices into every level of design, construction, and operation of their hotels, and this is evident in the newest addition to this hotel family, the Hotel Verde Azam Luxury Resort and Spa in Zanzibar, Tanzania.

The hotel industry in Africa often faces a unique set of challenges, particularly in the design and construction phases, but also in terms of on-going maintenance. Sites are often in remote locations, materials and equipment can be scarce, and there is often a lack of the necessary skills and technology to design and build cutting-edge green establishments. While Zanzibar isn't too disconnected in terms of transport and technology, services such as water supply and electricity can be unreliable and diesel generators can provide an unpleasant soundtrack to island holidays.

The team behind the design and construction of the Zanzibar hotel, a team of specialists, mostly from South Africa, paired with local Tanzanian

professionals, needed to consider all of the potential pitfalls of working in this setting, both in terms of installation and future maintenance. The end result is a seamless network of systems that produce renewable electricity and use it wisely, reduce water usage, and reduce and/or recycle waste at every level of the hotel's operation.

Once complete, this 106-room, five-star hotel will also incorporate conference facilities, a gym and spa, a marina, and water park on the 178 000m² site. "The design brief was to create a hotel that Zanzibar had yet to experience - green, sustainable, and Zanzibari", says Jehan-Ara Poonawala, the Mumbai-based interior design architect on the project. Once the designers understood the vision for the highly sustainable development, they set about researching and sourcing sustainable materials, especially the timber used throughout the hotel. They also engaged with local artists to create unique pieces and contribute to economic and cultural sustainability on the island.

GREEN OPERATIONS

Hotels require a complex network of systems and facilities in order to ensure the smooth running of the hotel and customised comfort to guests, in hundreds of private and public spaces. In this case the Building Management System (BMS), installed by Province Smart Solutions, ties together 21 stand-alone systems operating throughout the project. Michael Clark, the specialist responsible for the BMS and lighting control system says that this is where large amounts of energy can be saved. The HVAC, UPS systems, lighting,

Solar photovoltaic panels are arranged in arrays on the main building roof and water treatment plant, and double as shelters over a walkway and parking area. They cover around 1050m² in total and operate just below 200kWp.

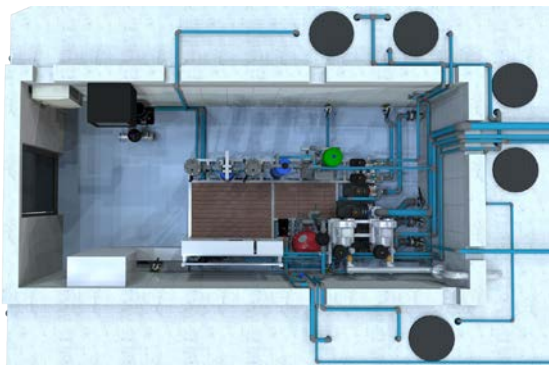


energy-use management, and water management are all run by the BMS. Apart from being able to run all the systems at the highest level of efficiency, the hotel maintenance team is also notified when (or even before) a problem occurs, reducing downtime and streamlining maintenance. Unoccupied rooms are ventilated daily and temperatures can be automatically regulated throughout the building. The BMS controls lighting in a similar way, adjusting “moods” depending on the time of day or use of the room and adjusting for occupancy. All of this is automated with smart software.

Solar photovoltaic panels have been installed throughout the complex, covering around 1050m² and operating just below 200kWp. They have been arranged in arrays on the main building roof and on the water treatment plant, and double as shelters over a main guest walkway and parking area. The spa and gym complex will incorporate power-generating equipment so that guests are actually generating electricity while they are working out.

Air conditioning is often the system responsible for the most energy usage (and waste). For this installation a highly-efficient Variant Refrigerant Flow (VRF) system was used. The system allows up to 48 indoor units to be connected to a single outdoor unit. Marco Ferdinandi, from Mitsubishi, explains that each individual unit can stop or start without the need for additional compressors starting up. This reduces both refrigerant and power consumption. It also reuses absorbed energy from the cooling operation to heat domestic hot water or pools. While there is a premium to be paid for the equipment, the expectation is that the savings in energy for running costs will soon outweigh the capital investment. Ferdinandi says most clients expect at least a five-year investment payback period. This reduces when the system is used to produce hot water, as is the case in Zanzibar.

Fresh water sources are under extreme pressure worldwide and saving and reusing water has become an essential consideration when planning a sustainable development. Zanzibar’s municipal water supply is particularly unreliable and Hotel Verde goes beyond just utilising rainwater or greywater and is actually recycling blackwater (sewage water from toilets and kitchen sinks) as well. The treatment plant is specified to treat 150 000litres of raw sewage per day. This takes care of all the sewage, greywater, and stormwater produced on site, eliminating the need for



The blackwater treatment facility uses oxygen, ozone, and a special mixed oxidant to purify effluent on site, which is reused for irrigation and flushing of toilets.

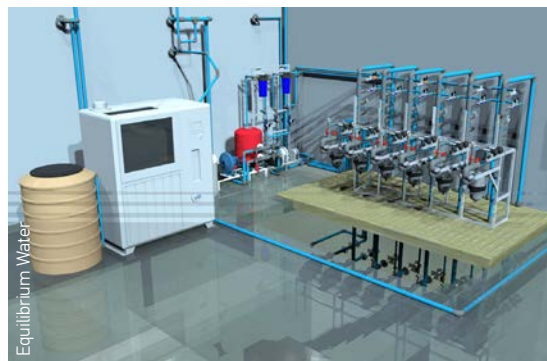


The Hotel Verde Zanzibar is touted to be the “greenest hotel on the island”. While other local hotels are gradually moving towards more sustainable practices, none are yet able to compete.

“honeysucker” sewage collection which is common on the island. 6000litres of the resultant colourless and odourless effluent is safely reused to flush toilets and up to 144000litres goes to the irrigation of gardens. The treatment facility is a partially buried 358m² concrete structure, the flat roof of which houses a solar panel array.

Equilibrium Water, the company responsible for the water treatment and quality management, considered the remote setting and thus designed the entire system to be hard-wearing, low maintenance and continuously operational. Oxygen and ozone are used in the treatment process, with chemicals only added at the end of the process where a small amount of mixed oxidant is introduced. Mixed oxidant is produced on site from salt, through a patented chemical reaction process. It has similar germicidal qualities to chlorine but without the negative chemical impact. Since most of the elements used are produced on site, the cost of operation and maintenance is minimised. Sediment filtration takes place through activated recycled glass media and filter sand. These are to be replaced roughly every two years at low cost. The bag filter cartridges need to be replaced more frequently but are inexpensive items (at about R180 a bag).

Potable water and water used in the adjacent water park and swimming pool are also constantly managed and checked for quality. Water for these uses is made up of borehole water, desalinated sea water, and municipal water (which is generally unreliable as a source of potable water). The sanitation product is the same mixed oxidant solution used for the treatment of blackwater.





David Pollock

ABOVE: The entire complex consists of a 106-room hotel, 28 rooms in an existing building, a water park, and a marina.

BELOW : Unoccupied rooms are ventilated daily rather than leaving air-conditioning running. Reserved rooms can be cooled to a conservative yet comfortable temperature shortly ahead of a guest's arrival. Once the guest enters the room they are given complete control of the environment. Timber used in the design was sustainably and locally-sourced.

5 STARS FOR A 5-STAR ESTABLISHMENT

Hotel Verde Zanzibar's sister hotel in Cape Town has been operational for about five years. It was certified double LEED Platinum for Design and Construction, and also for Operation – the highest level achievable. They received a 6-star Green Star rating from the GBCSA and are continually improving their points when they renew their certification every three years. Hotel Verde Zanzibar plans to follow this example and is currently targeting a 5-star Green Star custom hotel As-built rating and will continue to scrutinise operations and optimise performance and efficiency.

André Harms, sustainability consultant from Ecolution, highlights that buildings account for a huge proportion of the world's resource consumption and carbon emissions. "The building industry provides a phenomenal opportunity to reduce our global environmental impact and live, work, and play in better spaces," he says. Verde state that "when [we build or redesign] hotels in line with green principles, we lower operating costs, water use, energy use and waste to landfill [significantly]". All of this is achieved by viewing sustainable hotel operations holistically and continually assessing how systems can be improved.

Harms highlights that one challenge is the belief that green buildings and in particular hotels, are expensive. "While there might be some premiums in construction, these can mostly be offset against integrated design savings and reduced plant size (due to thorough passive design and less wastage)".

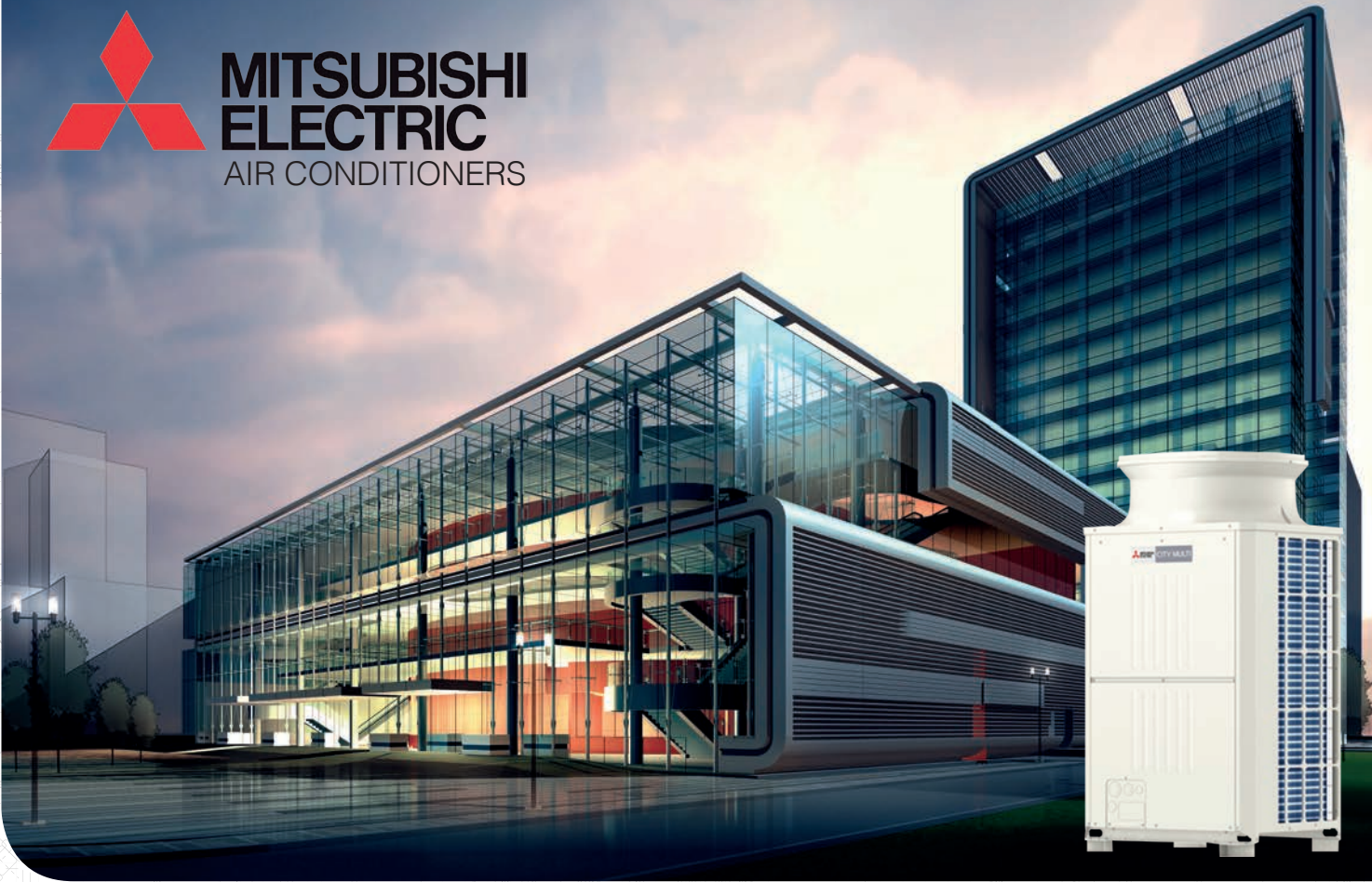
While other local hotels are gradually moving towards more sustainable practices, none are yet able to compete with Hotel Verde Zanzibar's exemplary sustainable example that proves it is indeed possible to enjoy a luxurious lifestyle without damaging our environment in the process. It lives up to its well-earned title: "the greenest hotel on the island". +



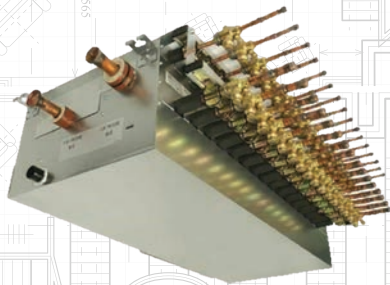
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Making good with plastic waste

As plastic pollution is making headlines with regard to the state of our oceans and the issues with landfill it bodes well to acknowledge, and celebrate, the companies that are using innovative technologies to transform this waste into every day products for the home and building sector. These are some of the items that reflect this circular approach and show how what was once "thrown away" is now another value stream after all.

WORDS Melissa Baird

Vinyl floor off-cut recycling initiative

Polyflor SA launched a recycling initiative for vinyl floor off-cuts in 2016. Since then, the company has recycled more than 7 tonnes of vinyl floor off-cuts, thereby allowing the local PVC industry to move forward with its sustainability goals as set out in SAVA's (Southern African Vinyls Association) Product Stewardship Commitment.

The company's initiative to recycle off-cuts generated during the installation of vinyl floors has been widely-welcomed and well-supported by installers. Diverting these off-cuts from landfill and sending them off to recyclers for use in the manufacture of rigid and flexible products such as pipes, cables, shoe soles and car mats is of great environmental significance. Good quality, clean materials that are void of any glues or substances can now be used to create new products with a useful service life instead of ending up in landfill or polluting the atmosphere. Polyflor contractors receive specially branded bags for the vinyl floor off-cuts that are then returned to the Polyflor head office for weighing and collection by recyclers. www.polyflor.co.za/www.savinyls.co.za



Bedding down

Cycliq's Space Base was the overall winner in the SAPRO Best Recycled Product competition in 2017. Cycliq injection moulds these Space Base bed bases from 100% recycled PP injection grade plastic. Currently servicing a large export market (3500 per month) with orders from Australia and the Dominican Republic the bed base is proving popular because they only take up a quarter of the space that a traditional bed base does and can be re-assembled in a couple of minutes. Cycliq have established good working connections with local PP recyclers that use predominantly end-of-life automotive components as their incoming material stream. The Space Base is sold locally to bed manufacturers and can carry a 1,2tonne top load. The cloth cover is also sourced locally and available in a variety of colours. www.cycliq.co.za



Table for two

This outside table for two is made from recycled plastics. The quaint seating solution for two is smaller than standard two seaters but this means it weighs less and costs less. The lumber is made from a plastics material mix consisting of bottle closures, labels and some rigid packaging. The unique process in which the lumber is extruded can accommodate some "difficult to recycle" packaging mixes that would normally end up in landfill. Given the no-maintenance benefit of the plastic lumber used, the overall strength and durability of the product far overshadows that of any cheap pine set. www.newlifeplastics.co.za





Building Light

Expanded polystyrene (EPS) is a lightweight energy-efficient innovative building material that adds to the design and structural integrity of many building projects but it is as yet unknown in the green-building sector in Southern Africa. Whilst its mainstream use for insulation used in buildings is widely-known, local designers often overlook its potential as a composite structural material. Over the past decades, new applications have been rapidly developing because, combined with mesh steel and structural plaster, it offers the advantages of rapid construction with inbuilt insulation. Doku Green Building Technologies and Ae-xergy were involved in a pilot project project in Harare, Zimbabwe, to showcase to the local authorities and standards body (SAZ), that this is a viable technology for affordable housing that complies with modern green-building codes. EPS offers tangible environmental advantages that can maximise energy efficiency and insulation. Its function as single-use packaging is also a win for being recyclable because technologies that can incorporate both virgin and recycled EPS into composite structural materials is long overdue particularly for developing countries.



Recycled polystyrene transforms building and construction projects

Cape Town based Greenlite Insulated Concrete uses recycled expanded polystyrene (rEPS) coated with a special cement mixture, to produce a lightweight, strong and highly versatile product that is used in a variety of different building applications. This fast, cost-effective building system is ideally suited to meet construction needs on the African continent and has assisted in successfully recycling 6 350 tonnes of polystyrene in 2017. Greenlite Concrete started using rEPS in their building projects after tests showed that the recycled material out-performed the virgin material. Not only was it readily available and vastly cheaper, but the structure and size ensured that the concrete mixture adhered better to the pellets without compromising on any of the properties that make polystyrene ideal for use in building and construction projects. Post-consumer polystyrene is collected for Greenlite from recyclers operating around Cape Town. After being shred and pelletised, the polystyrene beads are coated with special additives which allow the beads to mix correctly with cement and water without separating. The coated, treated beads are packaged in 500litre bags to be used on site as the aggregate for lightweight insulated concrete. Lightweight concrete made from recycled polystyrene offers an environmentally safe, green building alternative that is rapidly increasing in popularity and acceptance by architects and building contractors alike. The rEPS modules comply with all statutory requirements and facilitate the use of unskilled labour. The product is approved by the GBCSA as it contains no VOCs, will not decay and is vermin proof with very low water absorption properties. It is also flame-retardant and has the advantage of excellent thermal insulation and acoustic properties.

The bricks have already been used in various large construction projects, including the Sandton Gautrain Station, Zeitz MOCAA Museum and Table Bay Mall. +



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Green Flooring Solutions

Our connection with the surface on which we walk is important – it has texture, temperature, colour and it puts us in touch with the earth simply by being beneath our feet. In short, it grounds us.

WORDS Linda Doke

These days there are myriad flooring surfaces to choose from and technology has enhanced this variety. The growing awareness of the importance of sustainability and the importance of greener buildings has brought an ever-increasing focus on the need for eco-friendly materials, both for home and industry, and this includes flooring.

Finding the perfect sustainable flooring is not simple, and it's important to know the advantages and disadvantages of what's available. We've taken a look at the problems and solutions of the most popular options on the market.

WOODEN FLOORING

• **Eco-unfriendly problem:**

For hundreds of years hardwood floors cost the environment dearly, with age-old trees chopped down for floorboards without any thought given to the environmental consequences. When evaluating the sustainability of any product, one of the most important factors to consider is whether the material was sourced responsibly.

• **Eco-friendly solutions:**

- Engineered wooden tile / parquet flooring – during the 1960s and 1970s, parquet flooring was very popular, using hardwoods to make each solid tile. Today technology allows the wooden tiles to be engineering in such a way that only the top layer of the tile is made from hardwood, with softer woods like pine, spruce or birch plywood forming the middle layer of the tile.

“The hardwoods we use are sourced from PEFC-certified forests throughout the EU, ensuring responsible forestry through sustainable forest management,” explains Christer Enqvist, sales director at Timberwise in Finland.

“Timberwise was the first factory in Finland to stop using endangered exotic wood species, and rather use colour tones to copy the textured look and design of woods. We were also the first parquet manufacturer in the world to stop using formaldehyde-based adhesives in our products, which are known to be highly toxic. We are certified by the Allergy, Skin and Asthma Federation of Finland.”

- Bamboo flooring – because it grows so rapidly, is waterproof and durable, bamboo provides an excellent option for sustainable wood flooring.

- Artificial wood – recycled wood flooring uses reclaimed wood from multiple sources.

- Cork flooring – cork is harvested from the bark of the cork tree, without causing harm to the wellbeing or growth of the tree.



CARPETING

Carpeting has long been the go-to, particularly in the home. It's warm, cosy, reduces echo and adds a softening touch to any space.

- **Eco-unfriendly problems:**
 - Lacks durability – carpeting is sensitive to the environment, requires high maintenance to keep clean, and with steady foot traffic tends to wear unevenly, resulting in a shorter lifespan than harder, more durable surfaces.
 - Allergens – whether manufactured from synthetic or natural fibre, carpets are highly susceptible to allergens like dust mites, mould and pet dander.
 - **Eco-friendly solutions:**
 - Carpet tiles provide a green option for carpeting choices, allowing replacement of worn sections rather than entire sections of carpet.
- Used carpeting can be recycled or donated to communities for reuse.

HARD TILES

Hard tiles come in many forms – stone, concrete, ceramic – each with its own environmental pros and cons.

CERAMIC TILES

The concept of the ceramic tile – made from natural material and fired in an oven – has been around for thousands of years, and its durability is evident in ancient Greek and Roman architecture still standing today.

- **Eco-unfriendly problem:**

High-impact materials like hard tiles break easily, making them not easily retrievable from demolition.
- **Eco-friendly solutions:**

Sourcing local ceramics wherever possible. Ceramic Industries group sales and marketing manager Dimitri Balidis says environmental awareness plays an increasing role in material sourcing. “To ensure biodiversity, it's important for tile manufacturers to think carefully about topological restoration at quarry sites. While the aluminium silicates that make up most of the raw materials in ceramics are among the most abundant in the earth's crust, we treat their extraction with great care. We source from our own local quarries. All our quarries are concurrently rehabilitated, restoring

the sites' original fauna and flora wherever possible. Once a mine reaches the end of its life, the quarries are turned into wetlands or park areas,” says Balidis.

CONCRETE TILES

Plain concrete floors have been used in utility areas for decades, with not much focus on design or creativity, but over the last few years, this material has upped its game.

- **Eco-unfriendly problem:**
 - If not properly sealed, concrete flooring is extremely dusty.
 - Concrete offers minimal insulation against the cold, leading to poor thermal qualities.
 - Concrete is made from a mixture of cement, sand and stone. The extraction and processing of the raw materials, particularly cement, requires significant energy expenditure. The roasting of limestone during the processing of cement produces considerable amounts of carbon dioxide, making the process one of the world's major contributors to global warming.
- **Eco-friendly solutions:**

If sealed and maintained, the durability of concrete flooring is almost indefinite. Even in high traffic industrial or commercial applications, the longevity of concrete as a flooring surface is good.

LAMINATE FLOORING

Laminates are popular as the eco-friendly flooring solution that incorporates sustainability not only in its manufacture but in its placement.

- **Eco-unfriendly problem:**
 - Some varieties of laminate flooring release formaldehyde gas, used in its adhesives. Formaldehyde is an airborne toxic chemical that causes respiratory conditions like asthma and other lung complications.
- **Eco-friendly solutions:**
 - Certified brands of laminate flooring meet stringent standards for formaldehyde emissions, specifically for wood composite products.
 - Modern laminates are installed using a “click” method, requiring no adhesives or sealants. +



The logo for Timberwise, featuring the brand name in a white, handwritten-style script font.

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Niklas Oriander (Co-founder) and Birger Lundgren (CEO/Founder)

Water-saving the Scandinavian way

Scandinavian Water Saving Products is a company specialising in extreme water-saving products. Founders Birger Lundgren, from Sweden, and Niklas Oriander (Finland), discuss their innovative approach to sustainable living in times of water scarcity. Both reside in Cape Town.

HOW DID THE COMPANY START?

The idea originated during the extreme drought in Cape Town. Living with Level 6B water restrictions was not much fun. I was tired of carrying buckets and wanted a water-efficient long-term solution that would give me back my lifestyle, without compromising on quality and design. And so I decided to import the Westman EcoFlush Toilet that I use in Sweden, which became the start of Scandinavian Water Saving Products (Birger).

DOES THE ECOFLUSH LOOKS DIFFERENT COMPARED TO A STANDARD TOILET?

Yes, when you see it for the first time it is a little different, but after a day or two it feels normal. The toilet has been on the Swedish market for almost 30 years, so it is tested and proven. It looks and works like a normal toilet, but saves over 90% of water compared to standard toilets. With EcoFlush, there is no need to 'yellow mellow'; no need to carry heavy buckets of water to flush, no need to place bottles in the cistern to control flow. You can use the toilet as usual with peace of mind that you're saving water, doing your bit for the environment and maintaining your lifestyle (Niklas).

HOW MUCH WATER CAN YOU SAVE?

If you use the EcoFlush Toilet and flush every time you go to the toilet, you will use less than 6000litres a year for a family of four, compared to the 13 000litres allowed during the 6B water restrictions. Before the restrictions, a family typically used 74 000litres per year; so it's a massive saving. EcoFlush uses only 30ml for a "number 1" flush and 2.5litres for a "number 2" flush.

WHAT IS THE SHOWER YOU ARE SHOWCASING?

The technology of the Nebia shower system took about five years to develop. In the US they market it as a luxury spa shower that saves water, but, actually, it's the tiny amount of water you use that makes it so impressive. It really does feel like standing in the rain and it uses only 2.7 litres of water/minute.

A normal shower uses about 10 litres per minute and, according to the City of Cape Town, you can shower using 15 litres in 1 ½ minutes during the 6B restrictions. But in the Nebia you can shower for almost six minutes with the same amount of water. +



www.swsp.co.za

AECOM Ridgeview office – a flagship of sustainable design

The interior fitout of the AECOM office at the Ridgeview commercial office building at Ridgeside in Umhlanga, Durban, developed and owned by Growthpoint Properties, achieved an official 4-star Green Star Interiors v1 Rating from the Green Building Council South Africa (GBCSA). This is testament to the integrated infrastructure delivery company's commitment to sustainability, according to AECOM Sustainability Practice Area Lead Candice Manning.

Ridgeview is one of two buildings on a shared site, designed with a shared super basement and common facilities to maximise efficiencies in capital costs and operating costs, as well as minimising the environmental impact.

It comprises four basement levels with four levels of offices above. The total Gross Lettable Area (GLA) of the building is 6 650 m², of which 50% is occupied by AECOM.

By locating the core eccentrically on the floorplate, office wings of differing sizes are generated, and the sectional arrangement on the most prominent corner is inversely stepped to promote larger office floors as the building rises, thus promoting enhanced views with increased elevation and creating the iconic quality of the building. A differentiating feature is the fritted glass solar control fins applied to the facades, providing a constantly variable and uniquely functional building skin.

SUSTAINABLE, CONTEMPORARY AND MODERN

The AECOM offices are situated on Levels 3 and 4 of Ridgeview, itself a 5-star Green Star Office Design rated building designed by Elphick Proome Architects (EPA), which won the SAPOA Best Commercial Property award in 2016. "The base building was Green Star rated, whereupon we fitted out the top two floors, which achieved an interior rating as well," Manning explains.

The office fitout was designed by Sphere Architects in line with AECOM's international design guidelines, as well as incorporating the local requirements of the Durban office. Hence the fitout had to take sustainable design into account, while keeping it contemporary and modern.

The most notable feature is the building's unique curved facade, designed to assist in thermal comfort, while emphasising the sea and city views. "We looked carefully at the facade to ensure that the fins and shading were orientated correctly to reduce a lot of the heat impact. This included a lot of upfront modelling in conjunction with EPA," Manning points out.

Assemblies, furniture, wall and floor coverings consisted of reused Oregon timber, FSC-certified timber, recycled rubber and cork flooring, and other sustainable materials. The project team ensured that materials were sourced from ISO 14001-accredited manufacturing facilities. A rainwater harvesting facility



serves the toilets and urinals, while energy-efficient equipment was procured especially for the office space.

PERFORMANCE MONITORING SOLUTIONS

Other sustainability features include alternative transport parking facilities, cyclist facilities with racks and showers for all staff and visitors, full blinds to reduce glare, and the innovative inclusion of a staircase between two floors to reduce elevator use to promote employee health and reduce energy use.

Double glazing has been used throughout, in addition to a highly-efficient HVAC system and motion sensors. Furthermore, the building boasts sub-metering to monitor energy and water consumption, with Growthpoint utilising Remote Monitoring Solutions (RMS) to track the building's performance.

AECOM is able to mine this rich vein of data for future projects. "Hence, in order to determine the performance rating of an existing building, we can input all of this existing data in order to determine what it should be, whereupon we can make any changes accordingly," Manning stresses.

In addition to sustainability, AECOM also incorporates architecture, interior design, and masterplanning, with all of these disciplines collaborating in order to offer a streamlined service for clients. Itself a Silver founding member of the GBCSA, AECOM can undertake building ratings such as Green Star Office, Green Star Interiors, Green Star Existing Building Performance, LEED Design and Construction, and LEED Interior Ratings. +

AECOM

Built to deliver a better world

Building with timber: Boons, bonds and the Carbon Tax Bill

A timber frame structure, whether a primary residence, a holiday home or an extension to an existing dwelling, is a substantial investment. Most people, barring a fortunate few, will need financial backing to realise their timber home dreams. How then does bonding a timber structure differ from other construction types and how will this be impacted by South Africa's impending Carbon Tax Law?

RENEWABLE AND RELIABLE

Timber buildings bring tremendous returns to all players along the value chain, right from the grower through to the homeowner. Experts the world over cite competitive strength-to-weight ratios, design flexibility, quick construction time, longevity and superb insulating properties among the benefits of wood with environmental services as a significant attribute.

It also takes something special to match wood's environmental credentials.

While carbon dioxide (CO₂) is one of the direct by-products of cement manufacturing, timber is a carbon storage machine. When a tree grows, it absorbs CO₂ from the atmosphere, releasing oxygen in return. The carbon remains locked up in the wood, whether it becomes a timber frame, flooring or furniture. Depending on the type of tree and growth conditions, one cubic metre of wood can store between 600kg and one ton of CO₂.

Wood is the only truly renewable building material and if farmed in a sustainable and rotational manner, has endless potential to cater for the world's wood, pulp and paper needs in a truly sustainable way.

As the benefits offered by timber become better known to both trade and public, there remain a few misconceptions that building with timber is far less accessible than it really is. Among these is the perceived notion that accessing finance for timber frame structures is difficult.

ACCESSING FINANCE

According to the Institute for Timber Construction South Africa (ITC-SA), major South African banks have the same approach to financing timber frame homes as they do brick-and-mortar structures; that the applicant qualify for a bond by meeting the basic credit requirements. The structure itself would have to meet all national building standards and regulations by a qualified timber frame builder.

Additional requirements include an ITC-SA membership certificate, denoting the builder's competence in timber frame construction as well as a registered engineer's certificate confirming that the structure has been built to standard.

While local authorities will approve and pass a timber frame home, structures must of course comply with the necessary regulations.



Timber buildings bring tremendous returns to all players along the value chain, right from the grower through to the homeowner, as well as the environment.

PHOTO: Roger Jardine

THE CARBON TAX BILL AND THE GREEN ECONOMY

In November 2018, Finance Minister Tito Mboweni introduced the Carbon Tax Bill to Parliament following eight years of extensive stakeholder consultation. The bill forms part of the country's commitment to meeting the targets set by the Paris Agreement on climate change, one being to reduce greenhouse gas (GHG) emissions by up to 42% by 2025. The bill, which will come into effect from 1 June 2019, will play a role in achieving the objectives set out in the National Climate Change Response Policy of 2011 and contribute towards meeting the commitment to reduce GHG emissions.

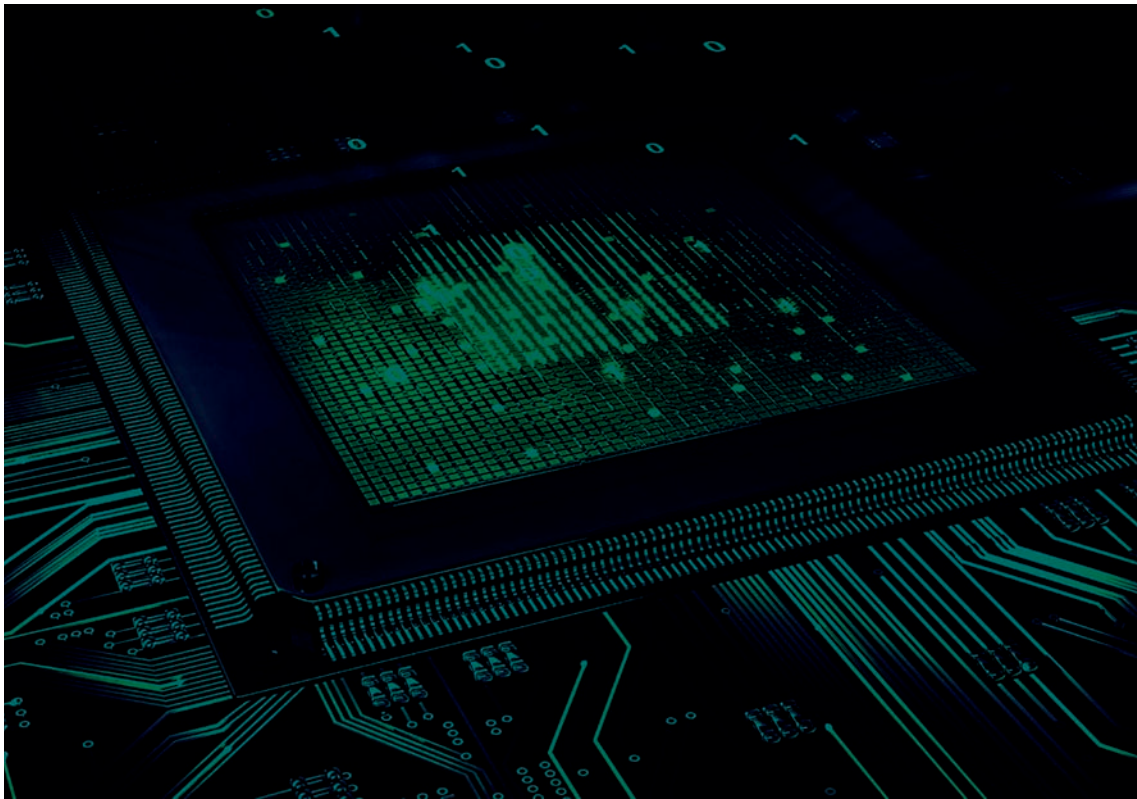
This means that there is a financial incentive to find alternatives to carbon-intensive business practices.

The Paper Manufacturers Association of South Africa and Forestry South Africa lobbied government to take into account the sequestration of carbon (S-factor in carbon tax formulae) by commercial plantations as well as the planting of new trees as a means to offset emissions.

Timber-built staff housing and public buildings are just two such examples of how business and government could offset their GHG emissions – and resultant carbon tax burdens – through essential infrastructure.

The misconceptions around the viability of financing timber construction will slowly but surely be eroded through education, awareness, and, most notably, through legislation, ensuring that greener construction methods are not only a viable prospect, but an essential aspect of sustainable business, government and lifestyle practices. +





The Internet of things (IoT) meets Green Tech

Create efficient work and productive spaces, save energy and never again deal with issues such as short life-cycle, low lighting efficiency, quick light decaying, poor lighting experience and massive maintenance. Improve your overall company efficiency through our LoRa WAN connected industrial lighting solution. Industrial and office space lighting can account up to 80% of energy costs and is often a bane in terms of lighting efficiency and the cost thereof (both energy and maintenance).

REDUCE COSTS

Companies can reduce up to 90% of their energy costs through our LoRa WAN connected smart lighting, which gives you lighting as you require it. Lighting can be remotely managed from a central location through our connected app right in the palm of your hands.

We give you a carbon footprint count and a green tag for our lighting solution for a greener future which fits in very well with your green policy as a client.

ENHANCED EXPERIENCE

Through our lighting portal we provide you with accurate, transparent lighting data; which can show you accurate costs for each and every type of a solution through our tried and tested app management.

Clients can manage all connected lights remotely and in a secure manner. No more energy wastage from 24-hour, unnecessary lighting!

Lights can be adjusted to suitable lux levels, from 10%-100%; hence called "lighting as you require".

ALTERNATIVE FUNDING (TAX EFFICIENT AND MEASUREMENT VERIFICATION PROCESS)

A business could save R260 000 on its annual tax return when spending more efficiently than it would have, and in the process save 1 million kilowatt hours of electricity. We can show you how through our measurement and verification partners by applying for the section 12L allowance. The claim is an equivalent of R0.95c per KW/H over the verifiable energy savings. +



How Luminos aims to improve indoor air quality

Good indoor air quality (IAQ) is a fundamental requirement for the health of buildings and their users, yet manufacturers of furniture and other interiors still use hazardous materials that can release a variety of volatile organic compounds (VOCs), even at ordinary room temperature. Some effects may be exacerbated by an inadequate supply of outdoor air coming indoors or from the heating, cooling or humidity conditions in the building. Understanding and controlling common pollutants indoors can help reduce the risk of indoor health concerns which may be experienced soon after exposure or, possibly, years later.

IMMEDIATE AND LONG-TERM EFFECTS OF VOC EXPOSURE

Some health effects may show up shortly after a single exposure or repeated exposures to a pollutant - irritation of the eyes, nose, and throat, headaches, dizziness, and fatigue. More severe health effects may show up either years after exposure has occurred, or only after long or repeated periods of exposure. These effects, which



include various respiratory diseases, heart disease and even cancer, can be severely debilitating or fatal. That is why it is important to try to improve the indoor air quality of your home and office environments even if symptoms are not immediately noticeable.

HOW CAN LUMINOS IMPROVE IAQ?

Because window coverings are exposed to UV rays, they are generally more likely to emit an elevated amount of VOCs if they are composed of the wrong materials. Luminos, the key brand of The blinds Syndicate, supplies environmentally-friendly, resource-efficient and sustainably-sourced commercial fabrics which are then made into a variety of hand-crafted blinds in our specialised factory in Durban, Kwa-Zulu Natal. Our outstanding quality and workmanship offers architects, interior consultants and Green Building professionals products which boast highly technical qualities to control light, heat, sound and hygiene. Luminos holds the sole distribution rights in the entire SADC region to the world's most highly-specified technical textiles. 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 and air quality of a room.

JM TEXTILES AND THE ENVIRONMENT

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. 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. This exclusive range has also achieved a Gold Certification by SCS Indoor Advantage, an internationally well-known certification for emissions (VOCs). It is recognised by the EPA and GSA and qualifies for many building rating systems including LEED v4, BREEAM, WELL Building and Living Building Challenge. +



Conforto Green Building Solutions



Schools: Achieving savings and cost containment for the Department of Public Works and Education

- Tlotlang-Thuto Secondary School in Bona-Bona, North West Province
- Loretsweng Primary School in Ganyesa, North West Province

The total number of Green Crete Blocks used in the construction of Tlotlang-Thuto Secondary School was 12 000, with 12 tons of recycled polystyrene used in the manufacturing of these blocks, equating to 128 x 5m³ tipper trucks of recycled polystyrene. Beside the benefits the Green Crete walls provide to the buildings and the learners, there was a time-saving element of three months versus conventional brick and mortar construction, as well as a cost saving of close to R20 000 000.00.

Loretsweng Primary School is still in the construction process and will be finished before the end of 2019.

Libraries: Modernisation to achieve greater usage for all visitors

- Stella Public Library
- Derby Public Library

These two libraries have been purposefully designed to open up the spaces for individuals or small groups of people to come together and collaborate on problem solving and decision making, as well as allowing for the integration and provision of technology to the communities.

In terms of the construction details, it takes six months to construct a 530m² library, at a total cost of R12 000 000 per library including professional fees. They are designed to allow for optimal natural light as



well as natural air flow and ventilation, specifically to the requirements of the Department of Culture, Arts and Traditional Affairs.

Luxurious Eco Housing: Conscious design and innovative application to achieve a sustainable, glamorous architectural masterpiece

- Waterlake Eco Estate Home – Pretoria

Designed by +27 Architect’s Riaan Visser (House and Leisure Magazine, 2014 House of the Year winner), the concept brings together open and modern farm style living with ultra-contemporary finishes as well as rammed earth wall, natural cooling and heating water filled chambers, with the aim of providing a true “green”, off-the-grid luxurious residence.

Situated on the prestigious Waterlake Farm Estate outside Pretoria, this magnificent property will be one of a few EDGE-accredited Green Building Council compliant designs, offering potential buyers a one-of-a-kind Green Crete building system experience.



Lightweight concrete walling solutions: For retail, commercial and residential apartments

Green Crete serves as a great solution for an eco-friendly interior walling system. The blocks are lighter in weight, and offer better insulation and fire rating compared to other products and solutions on the market. Their acoustic performance is also similar if not better than their competitors and they provide a range of benefits that give them the edge when compared to other products. The lighter the wall weight, the taller the building, the more cost effective the groundwork, providing a product that can only make sense.

Conforto is currently taking part in the hand-picked Property Point Enterprise Development Initiative developed by Growthpoint, which enables entrepreneurs and individuals the opportunity to exponentially grow their businesses beyond success.



EDITORIAL OVERVIEW FOR 2019 *(subject to change)*

+IMPACT Magazine, the official publication of the GBCSA, presents thought leadership from local and international green building commentators and practitioners, and showcases the excellent work of 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.

ISSUE 0.3 - JUNE 2019

- ✦ Top-rated green buildings and green building interventions
- ✦ Micro-grids, distributed energy, small-scale power generation and the bigger picture
- ✦ Heritage – converting ancient wisdom into the future of modern buildings
- ✦ Retrofitting existing buildings – how, why and when?
- ✦ Construction 4.0; Buildings 4.0 - the tech behind going to zero
- ✦ Exploring the complexities of residential certifications
- ✦ The effect of large-scale utilities on the green agenda (reflections on African Utility Week)
- ✦ Showcase of what major property developers are doing to green their portfolios
- ✦ Interviews with youth in the green sector

CALL FOR CONTENT

GBCSA members are invited to submit stories about projects, design concepts, materials, research, and anything else that promotes a healthy sustainable built environment.

Submit a 200-word description of your content idea with 1-2 images to maryanne@positive-impact.africa

Submission deadline for June 2019 edition: 30 April 2019



FLAX SAVES WATER AND MONEY

The Falcon model Flax is a vitreous china waterless urinal that is hung against a wall. It requires no flush valve or water supply, and plumbs to standard drain connections. The Flax uses a replaceable sealed cartridge with bayonet-locking features and O rings. The cartridge is made of recyclable ABS plastic and uses a 100% biodegradable liquid sealant. Available in standard white. The Flax's dimensions are: 330 (w) x 597 (h) x 356mm (d), and weighs approximately 12.3 kg. The Flax meets ANSI/ASME A1 12.19.19-2006 for vitreous china non-water urinals, as well as ADA guidelines and ANSI A117.1 for accessible and usable buildings and facilities. It also complies with International Plumbing Code, Uniform Plumbing Code and National Standard Plumbing Code standards.

HOUSING

The factory-installed housing is comprised of a bowl with a tailpiece and a mounting flange of 316 stainless steel. It is sealed into the bowl drain opening by a profile gasket made of a synthetic rubber. The housing and gasket are compressed into the drain opening by the installation of a retaining nut and a friction washer.

CARTRIDGE KIT (AVAILABLE FOR PURCHASE)

The patented cartridge is engineered to last about 7000 uses in typical installations. Urine is received through the drain holes and passes through an immiscible layer of biodegradable sealant, which continues through a siphon-trap system, and flows out through a baffle to prevent the loss of sealant. A discharge tube in the housing directs the flow of the urine into the building's drain system. The cartridge is designed as a replaceable component when its function has been exhausted.





12TH GREEN BUILDING
CONVENTION 2019

WE'RE GOING BEYOND.

We're going beyond simple sustainable solutions and low-impact buildings, and envisioning cities that will give back more than they take.

We're going beyond city planning and infrastructure, looking at ways cities can build productive communities that are inclusive and supportive of their citizens.

We're going beyond urban development and zoning, looking at how both rich and poor can live together in a more harmonious, equitable way.

Prepare for Cities of Tomorrow.

EARLY REGISTRATION CLOSES 31 MARCH 2019

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SHAPING CITIES OF TOMORROW

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