+IMPACT

Official publication of the Green Building Council of South Africa

GREEN BUILDING COUNCIL SOUTH AFRICA

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DESIGN

Sustainability starts at first principles

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CALLING ALL THOUGHT LEADERS*

Positive Impact, 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.

Are you a thought leader in your relevant field? 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*

*Please note, for submitted content that is advertorial or promotional in nature, we may suggest that you consider sponsored content.

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Advertising rates are discounted for GBCSA members and further discounts are available for booking multiple editions in 2020.

GBCSA

START AS YOU MEAN TO CONTINUE

The GBCSA has Green Star rated many retrofitted commercial buildings, but that is merely a case of playing catch up. The sustainable design that we desire (and need) for our local built environment starts with a blank canvas. It starts with a big-picture view of how our choices affect more than the present; that we are building the future, not just a structure.

The connection between humans and nature is undebatable, and designs that enhance rather than disrupt this relationship are seeing immense benefits.

Does it have a long life? Does it save energy? Does it add durability? Does it contribute to the waste stream? Is it renewable and recyclable? These are the basic questions that determine whether a design is sustainable. And yet, beyond these physical aspects, there is the process by which green buildings are created – an opportunity to not only save energy, water and carbon emissions but to educate, create jobs, strengthen communities, improve health and wellbeing, and much, much more.

OUR BUILDINGS SHAPE US

According to the World Green Building Trends 2018 (SmartMarket Report), healthier buildings and improved occupant health and well-being are the top two social reasons for building green in South Africa. We design and build for human beings, after all, and it is in our best interest to ensure that human beings are in their optimum state while they use these buildings. The connection between humans and nature is undebatable, and designs that enhance rather than disrupt this relationship are seeing immense benefits. Take the Bullitt Center in Seattle for example, the 'world's greenest commercial building', with 'spectacular views, ample natural light and almost distracting quiet' – due in part to the exposed, 13-foot high ceilings and 10-foot-high windows that contribute to an airy loftlike feel and maximise on daylight.

Closer to home, the vast majority of the buildings belonging to GBCSA members display biophilic design – increasing occupant connectivity to the natural environment through the use of direct nature, indirect nature, and space and place conditions. 144 Oxford, featured in this issue, boasts a landscaped stair that incorporates indigenous planting, custom landscape lighting and water features; all serving to soften the transition between public and private space. This is also an example of design reflecting our unique South African ecosystems and characteristics, rather than merely emulating ideas from other countries.

MORE GIVE, LESS TAKE

Achieving these sustainable design goals demands integrated teams and an attention to detail that is continuous – from design to construction and right through to operation and even deconstruction. Added to that is the fact that buildings must be designed in a way that ensures they are resilient and adaptable in the face of changing global climate. This is critically important in developing countries, many of which will be particularly susceptible to these effects. The standard of zero impact, and indeed, positive impact has been set: South Africa's green buildings must be designed to give more than they take from the environment. It is a tough task, fraught with challenges, but our architects and planners, along with their multidisciplinary teams and stakeholders, hold the key towards transforming our cities towards a truly sustainable future.

Dorah Modise

Green Building Council of South Africa

GREEN BUILDING COUNCIL SOUTH AFRICA

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The official publication of GBCSA

WINNER SAPOA KNOWLEDGE AWARDS FOR EXCELLENCE PROPERTY PUBLICATION OF THE YEAR 2019

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Cover image: Standard Bank headquarters, Namibia; photo by Creative Lab

It's mid-December and the lights have just gone out (#load-shedding). I'm sitting in the garden enjoying the silence. As the early-evening sky fades, it's the darkness that is getting louder. Life has stopped for these two hours and we've returned to our roots – lighting candles and wondering what else there possibly is to do without the internet.

There's something about the darkness that causes one to get a little contemplative. I've been thinking about the fact that by the time you'll be reading this page, it will be the '20s again (despite not having lived in it, the 1920s is a decade I am quite fond of). A century ago, the First World War had just ended, and the 1920s began with celebration, great optimism and above all, hope. I am wondering how the 2020s will begin.

In the closing talk at the GBCSA Green Building Convention in October 2019, keynote speaker, Jason F. McLennan, explained how the development of electric cars will reach its tipping point in the 2020s, towards the latest models being faster, safer, cooler, and more affordable than their predecessors – a balance which has long been out of sync. So, due to widespread uptake of electric cars which will signal the end of the combustion engine, and the growth in renewable power generation, McLennan suggests that the coal industry will decline enormously during this decade. This means the cities of the (perhaps not too distant?) future will be much quieter and the air quality will be much cleaner than today. But... we will have trashed the oceans, and caused mass irreversible extinction of our biodiversity. An eerily quiet future, indeed. And a potentially dark one, too, if Eskom continues load-shedding at this rate.

Sustainable features are so often considered an 'add-on' or 'nice to have', but what happens if they become part of the core design of a building from the very beginning?

McClennan suggested that 2020 will be the year of 'perfect vision'. A year of awakening and gaining clarity (seeing the light, so to speak), and moving forward despite the damage of the past and the uncertainty of the future. Spoiler alert: the 1920s didn't end well with Wall Street's 1929 stock market crash spiralling the industrialised world into the Great Depression, but with 100 years of hindsight we have an opportunity to do better. What does that mean for you and your business in the property industry?

I would suggest to you that sustainable thinking starts at the design phase; at first principles. This is where a transformation of the industry begins. Sustainable features are so often considered an 'add-on' or 'nice to have', but what happens if they become part of the core design of a building from the very beginning? Despite the latter being smart in practice, it is also an essential driver through which the property industry will reinvent itself. There is no doubt that the ripple effect will influence business and society on social, economic and environmental levels. Our homes, our places of work, and our cities will function like connected sustainable ecosystems.

We explore some intriguing design concepts in this issue, such as 'biophilia', 'deep green', and 'living buildings'. We ask: Who's doing these well and what can they teach the green building industry as a whole? We're excited to feature McLennan's thought leadership on biophilia in this, and future, issues of *Positive Impact*, and we gain insight from sustainability expert, Michelle Ludwig, about the importance of building materials as components of green design. We move on to the latest technologies that are advancing and supporting sustainable design. And, as always, we showcase green materials and technologies from those who are doing it well.

It is my goal that through our vision to encourage responsible sustainable design, we inspire hope in the possibilities that this new decade holds, one building at a time. Turn the page, and see how.

Mary Anne Constable

Editor
www.thepaperarchitect.com

GREEN STARS REWARDED

South Africa's green building game changers were honoured at the 12th annual Green Building Convention held at Century City Conference Centre in Cape Town in October 2019. The gala dinner theme, 'Trashion', saw outfits created from upcycled trash.

HIGHEST RATED BUILDING

WINNER: Hotel Verde, Cape Town

Project Owner: Verde Hotels | AP: Andre Harms, Ecolution

Operating since 2013 and touted as the 'greenest hotel in Africa', Hotel Verde Cape Town received a 6-Star Green Star Existing Building Performance rating in June 2019, achieving the highest score in South Africa to date. Hotel Verde lives up to its name by being approximately 70% more environmentally-efficient than a standard Cape Town hotel.

From left to right: Outgoing GBCSA Chairman, Nkosinathi Manzana, Kyle Dewar of Verde Hotels, Andre Harms from Ecolution, AP for Hotel Verde, and GBCSA CEO, Dorah Modise.

RUNNER-UP: Collingwood Building, Black River Park, Cape Town

Project Owner: Redefine Properties | AP: Sally Misplon

South Africa's green office precinct, Black River Park, is home to several Green Star rated buildings. The Collingwood building, which was one of the first buildings to be renovated at Black River Park in 2000, achieved an exemplary 6-Star Green Star Existing Building Performance rating in December 2018.

BEST QUALITY SUBMISSION

WINNER: Lakeside Offices, Pretoria

Project Owner: Growthpoint | AP: Louwna Joubert, Aurecon

The Lakeside Offices consolidate Exxaro's current offices in Pretoria and Johannesburg into a single thriving workspace, located at an accessible location for its staff and business partners. The building is custom-designed to support Exxaro's business goals, ethos, values and vision, and achieved a 5-Star Green Star Office Design rating in October 2018.

RUNNER-UP: Clearwater Office Park, Building 3, Johannesburg

Project Owner: Redefine Properties | AP: Sally Misplon

The Clearwater Office Park in Roodepoort consists of six buildings. Building 3 scored well in the transport, indoor environmental quality, and land use and ecology categories, achieving a solid 4-Star Existing Building Performance rating in July 2019.

ESTABLISHED GREEN STAR

WINNER: Jutta Berns-Mumbi, Ecocentric

Sustainable building consultant, Jutta Berns-Mumbi (below), is the founder and director of Ecocentric, established in 2007. She has a strong academic and professional background in environmental and development economics and green building strategies, and also won the Women's Property Network 2019 SA Women in Property Gauteng Entrepreneur of the Year award.

RUNNER-UP: Andre Harms, Ecolution

RISING GREEN STAR

WINNER: Claire Holton, Ecocentric

Claire Holton gained two years' experience at Terramanzi Group before joining the ranks at Ecocentric in late 2019. She is a certified Green Star Accredited Professional and EDGE expert with a passion for changing the built environment, contributing to a healthier planet, and creating more productive environments for people.

RUNNER-UP: Sesona Myosana, WSP +

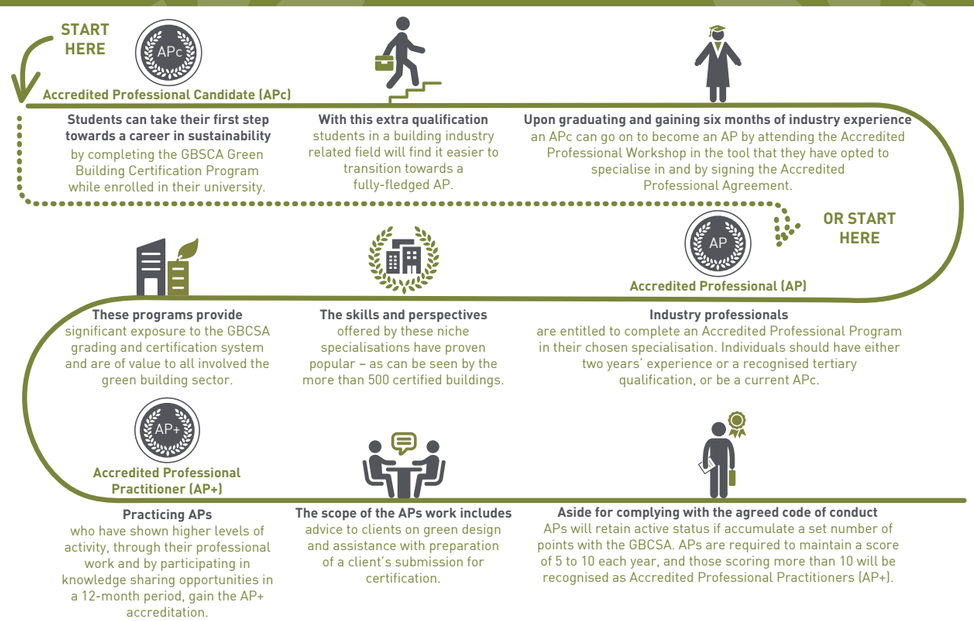
2020 CONVENTION

In 2020, the GBCSA awards are going beyond certification. New awards categories for green building and sustainability in the built environment are being launched. Learn more about the 2020 convention, *Near Possible: Mapping the path to a sustainable future*: **gbcsaconvention.org.za**

GBCSA's Accredited Professional Pathways

Here's what you need to know

The GBCSA's Accredited Professional (AP) qualification has over time become one of our key value offerings for professionals in the industry. To keep up with industry growth and change, our AP qualification system has grown too and is now arranged into three distinct tiers. These tiers are based on qualification, experience, and level of activity and engagement in the industry.



As the green building industry matures the GBCSA makes it increasingly convenient for professionals to keep pace. Which category is relevant to you right now?
For more information, visit **www.gbcsa.org.za/train**. +

The shape of things to come

Located on the arterial Oxford Road, in a prime position at the gateway to Rosebank, 144 Oxford is a nine-storey, 35 000m² office development that is eye-catching and innovative, featuring a spectacular glass façade across two interlinked towers, each standing with prow-like prominence and presenting occupants with exceptional views across the city of Johannesburg. The building achieved a 5-Star Green Star rating upon completion in October 2019.

WORDS Nicole Cameron IMAGES Paragon Architects

Location:	Melrose, Johannesburg
Type of building:	Premium grade office development
Green Star rating:	5-Star Green Star - Office Design v1.1
Project dates:	March 2018 - October 2019

The building at 144 Oxford represents another iconic development for Growthpoint, who have responded to the increased pressure in this node for premium office space. "Rosebank is attracting even more leading businesses and demand for space than nearby Sandton and Melrose; as can be seen in its P-grade rental levels," says Paul Kollenberg, Growthpoint office division asset manager. With a larger floor plate than most other developments in the area, the building takes advantage of the size and shape of the property on which it is located (equivalent to six football fields), and presents a uniquely elastic design that supports modern business, with flexible spaces that can be adapted according to how a company thrives and evolves.

A VIBRANT STREETSCAPE

Situated directly opposite the landmark hotel, Hyatt Regency, and a short walk from the Rosebank Gautrain station and other public transport, the concept of urban integration was important for 144 Oxford. To optimise this link, Paragon Architects challenged themselves and the construction industry to create a better streetscape environment. They came up with a landscaped stair that incorporates indigenous planting, custom landscape lighting and water features; all serving to soften the transition between public and private space.

The façade goes one step further in that it is also modular in design and can be completely dismantled and reassembled elsewhere.

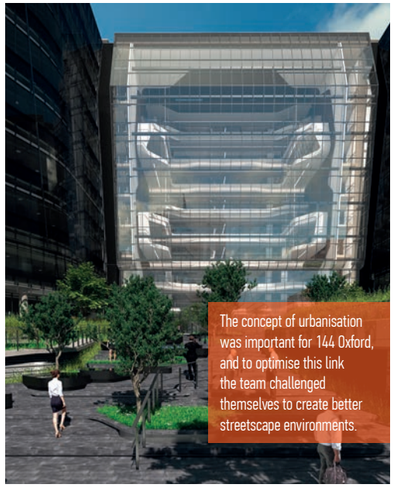
The ground floor podium level extends this landscaping, with low planter-walls rising and falling into the floor to create winding seats and private spaces. All spaces are designed for the people who work in the building to enjoy their lunch breaks and use pause areas. They are envisioned as ideal places to rest and reset; while taking a step out the front doors will connect occupants to the vibrant restaurants, lifestyle, shopping, hospitality and entertainment features of the quarter.

Describing the building's iconic design, Paragon project architect, Laura Strydom, says: "The west façades are shaped towards a curved glass pinnacle which cantilevers outwards towards the road. The main façade consists of double-glazed unitised façades, incorporating a dark grey glass. The outermost façade of the northern building features a secondary offset glazed 'skin' with raking sides – a nod to the fast-paced vehicular movement on Oxford Road." Every part of the building features performance glass of different types, based on the internal layouts and requirements. The entire building is double glazed, even incorporating acoustic glazing in some instances.

And what of all the glass? Why is it used so extensively, in 144 Oxford and indeed many modern commercial buildings; and is it sustainable? "Glass is indeed a popular aesthetic for both owners and tenants, especially for high-end developments where the look is associated with prestige," says Aurecon's Tiffany de Klerk, sustainability consultant on the project. "But, the use of glass is not just for aesthetics. Extensive façades allow maximum light to penetrate the building and create a bridge between the interior and exterior. Internal spaces feel bigger and well lit and create an overall better working environment with views to the exterior," she says. 144 Oxford has a high-performance glazed façade that allows maximum light while reducing excess solar heat gain. The design

The nine-storey building is eye-catching and innovative, with its spectacular glass façade extending across the two interlinked towers, which stand with prow-like prominence and present exceptional views across the city.

The construction of 144 Oxford meant particular challenges, given the fact that the Gautrain servitude cuts through the site, and that it is located next to a residential suburb.



The concept of urbanisation was important for 144 Oxford, and to optimise this link the team challenged themselves to create better streetscape environments.

The reinforcing steel used in the project has a recycled content of more than 90%.

allows for a superior interior environment by mitigating against the potential increase in energy consumption. This is coupled with the fact that blinds have been installed throughout the building's office areas, in order to reduce discomfort from glare and/or natural daylight. The façade goes one step further in that it is also modular in design and can be completely dismantled and reassembled elsewhere.

KEEPING IN SYNC

Occupant comfort is emphasised in many ways in the building, with the most unique feature perhaps being the use of circadian lighting design. "This innovative lighting design helps the body maintain its natural internal 'clock' – known as its circadian rhythm, by mimicking the light intensity and colour of natural daylight," says Rob Gravette, development manager at Growthpoint Properties. "The lights have two different coloured LED fittings installed, providing both warm and cool light, which are tuneable in order to provide the required light output to match the natural daylight conditions."

Further to taking occupant wellbeing to the next level, 144 Oxford hits all its sustainability goals out

An internal view of 144 Oxford focusing on the high-performance glazed façade.

the ballpark, De Klerk says, "by simply focusing on fundamental principles: reduce energy, reduce water use, and provide the best indoor environment possible." The building has a no-smoking allowed policy, and mechanically-ventilated spaces regulate thermal comfort. Paint, adhesives, sealants and carpets were required to meet maximum total VOC (volatile organic compound) levels as per the Green Star specifications. There is a formalised waste management system and recycling, and along with cyclist facilities (lockers, showers and changing rooms), moped/scooter and fuel-efficient vehicle parking bays have been provided. Renewable electricity is generated through photovoltaic panels on the roof, and the reinforcing steel used in the project has a recycled content of more than 90%.

Getting the basics right with water-reduction methods meant low-flow fittings, rainwater capture (rainwater from the roof is collected in a 200 000-litre storage tank to be used for flushing of toilets and urinals), a comprehensive water metering strategy (38 meters in total) connected to the building management system, air-cooled chillers and drip irrigation and moisture sensors and automatic controllers for landscaping, resulting in a 62% water saving. The indigenous plants used in the landscaping play their role in reducing water requirements. Water from routine fire protection tests is captured, stored and recirculated to facilitate the reuse of potable water.

OVERCOMING OBSTACLES

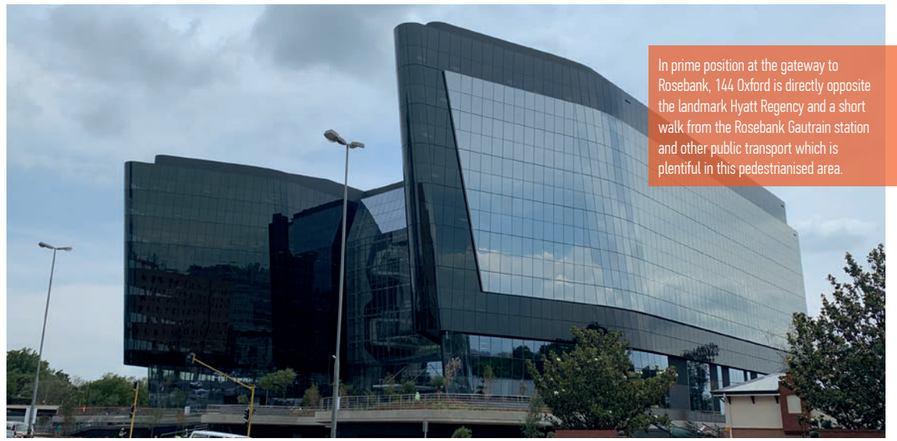
A development of this magnitude does not come about without its tribulations. Strydom explains that the site's location posed construction challenges, with the Gautrain servitude cutting through the site and restricting the allowable construction methodology to

The use of glass is not just for aesthetics. Extensive façades allow maximum light to penetrate the building and create a bridge between the interior and exterior. Internal spaces feel bigger and well lit and create an overall better working environment with views to the exterior.

be used. "Further to this, logistics were challenging as no lay-down area was available on site. This meant all façades were pre-fabricated off-site and installed on delivery."

Gravette points out the fact that the site is also located next to a residential suburb, with two schools and three hotels in very close proximity, which required a high level of community liaison, especially in terms of access to the site and noise levels. "Fortunately, Growthpoint was able to establish and maintain good working relationships with the local residential association and hotels," he says.

Strydom adds that ongoing interaction with all members of the professional team was of the highest level, and that resolving issues together was very satisfying. Gravette agrees, saying that the consultants and contractors were highly competent and committed. "Together they were more than capable of rising to the challenge of delivery a class-leading development that is set to be a landmark building for years to come." +



In prime position at the gateway to Rosebank, 144 Oxford is directly opposite the landmark Hyatt Regency and a short walk from the Rosebank Gautrain station and other public transport which is plentiful in this pedestrianised area.

GREEN BUILDING COUNCIL SOUTH AFRICA

DID YOU KNOW?

Building owners report that green buildings – whether new or renovated – command a 7% increase in asset value over traditional buildings.

Sustain able design blossoms

76 Corlett Drive, currently being developed in Johannesburg's leafy northern suburbs, will combine structural simplicity and intrinsic green design with trailblazing sustainable technology. This will create the 'most sustainable building in Africa', as measured by the *Living Building Challenge* – a deep bionomic system developed by Canadian architect Jason F. McLennan – and will set a new standard for green buildings in Africa. Such a project requires deep ecological thinking and a resourceful team.

WORDS Gillian Gernetzky IMAGES Daffonchio & Associates Architects

Location:	Melrose North, Johannesburg
Type of building:	Commercial
Green Star rating:	Targeting 6-Star Green Star Office Design v1.1
Project dates:	November 2019 – Late 2020

Anyone who has visited the northern suburbs of Johannesburg, after being away for some time, will be astonished by how quickly the cityscape has changed. Statuesque and striking new buildings now stand where dated 80s-style corporate offices and faded old houses used to be. Many of these buildings boast the green credentials that their corporate tenants and the customers of those tenants' demand, but none can aspire to the eco-friendly heights that 76 Corlett Drive will achieve when it's completed in late 2020.

"The decision to aim for the most sustainable building in Africa was driven by the directors of Legaro Properties, who wanted to improve on the outstanding achievement of 78 Corlett Drive [76's next-door neighbour], which achieved a 6-Star Green Star Office Design rating with 78 points, making it South Africa's highest Green Star-rated new build for 2018," says lead architect on the project, Enrico Daffonchio from Daffonchio & Associates Architects.

"We suggested to Legaro that our starting point be a theoretical maximum sum of Green Star points, achieved by editing out mutually-exclusive features. We then used the resulting 'wish list', prepared with the assistance of Solid Green Consulting [Green Star accredited professionals], as our initial design brief."

The resulting building concept was, by that point, eligible for Net Zero ratings in water and carbon.

"Solid Green then proposed that the design be tested against the *Living Building Challenge* (LBC) criteria, and by doing so, we realised that we were close enough to push the design still further and create a regenerative building," says Daffonchio. With their vision being to provide the best working environment, which is also sustainable, Legaro's directors were enthusiastically supportive of this, and the process towards delivering a regenerative building began.

While at first glance the three-storey office block seems unassuming, Daffonchio says that the bold sustainability objectives were the starting point of the design. "The shape and feel of the building are very much driven by the ambitious technical requirements and the reality of making the project work financially, hence the structural simplicity and certain choices of finishes."

Annelide Sherratt, senior sustainable building consultant at Solid Green agrees: "We started this project completely differently, with the architects spending a lot of time in workshops with us to fully understand the various sustainability requirements first, before embarking on the design development. This meant that the architects were able to incorporate all specifications right from conception."

Daffonchio says that creating a building with this level of sustainability credentials does not necessarily mean equipping it with the latest and most expensive green technology. "The 'deep green' is both in the skin of this building – with its considered passive

'Living buildings' are healthy, beautiful, regenerative spaces that connect occupants to light, air, food, nature and community. They are self-sufficient and remain within the resource limits of their site, producing more energy than they use and collecting and treating all water on site.

The façade cladding system will be designed for disassembly and captured rainwater will be used for irrigation of either xeriscaping or a food garden on the roof.

The *Living Building Challenge* standard uses a flower as a metaphor to illustrate the principle of regenerative buildings like 76 Corlett Drive.

solar design – and in the innovative design of the internal services. There are several innovations that we have developed with the professional team, in particular water and HVAC. Our approach was not to 'throw money' at a solution, but rather to redesign and redesign until we achieved exceptional performance for standard cost. The HVAC, for example, is now in its sixth complete revision, where at each step the team has managed to improve efficiency, while keeping costs in check," he says.

Sherratt adds that the project is targeting the maximum 10 innovation points that form part of the Green Star rating score. "One of these points – exceeding local connectivity requirements by having more than eight amenities within walking distance – was made possible by the site's proximity to Melrose Arch. Other points where we hope to score, are applying for more than one Green Star certification – in this case Net Zero Water and Carbon as well as the *Living Building Challenge* – installing live metering and going over-and-above by achieving 90-100 Green Star points."

Amazingly, the team says that there were no lightbulb moments or strokes of genius. "Goethe said that genius is one percent inspiration and 99 percent perspiration. The project is a shining example of this: every member of the client and professional teams worked tirelessly and in perfect synergy to achieve an outstanding technical result," says Daffonchio.

Sherratt wholeheartedly agrees, saying that the project would not be possible without the client, who is dedicated to sustainability and practising what they believe in. "I also highly commend the architects for being willing to learn and committed to incorporating sustainability into their design from the get go. In fact, the entire project team went the extra mile to make this project a success by thinking outside of the box, not taking the conventional route and always seeking new technologies."

Georgina Smit, head of sector development and market transformation at the GBCSA says that the GBCSA applauds Legaro and the professional team for their commitment to such incredible sustainability targets. "We've yet to have a project achieve the full 100 Green Star points, which would only be possible if the complete spectrum of sustainability and net zero is considered according to integrated, holistic design principles."

"The shape and feel of the building are very much driven by the ambitious technical requirements and the reality of making the project work financially, hence the structural simplicity and certain choices of finishes.

Smit adds that the GBCSA developed the Net Zero accreditation to reward regenerative design, within the African property sector, and encourage projects to move beyond simply reducing their impact and instead positively redress their impact. "We need more projects like this to strive for net zero in order to drive change now," she says.

Of course, no project is without its challenges, and this one – with its lofty sustainability ambitions – has had its share, even before breaking ground.

For Daffonchio, the main challenge has been to develop a water regenerative building in an arid climate like Johannesburg, with extremely seasonal rains and polluted groundwater.

For Sherratt, targeting the highest Green Star rating in the history of Solid Green was a major challenge, and complying with the requirements for the LBC, which has not yet been implemented in Africa, was a steep learning curve for the whole team. However, she adds that the learning curve was also a blessing, as the LBC is the way forward for sustainable building and cities.

Cyclist routes and dedicated walkable pedestrian routes lead to the entrance of the building.

According to its website, the LBC's regenerative design framework is used to create spaces that give more than they take; creating a positive impact on the human and natural systems that interact with them. 'Living buildings' are healthy, beautiful, regenerative spaces that connect occupants to light, air, food, nature and community. They are self-sufficient and remain within the resource limits of their site, producing more energy than they use and collecting and treating all water on site.

"Regenerative design is about thinking ahead, where professionals must design with the future in mind every step of the way. As opposed to sustainably designed buildings, which are based on the concept of only using the minimum resources required, regenerative buildings are designed and operated to actually reverse damage and have a net-positive impact on the environment," says Sherratt.

Sustainable design – as admirable as it is – is founded upon the concept of 'do no additional harm' or 'use only what you need, and no more.' It is built on the notion that we merely seek to sustain our own existence, our own individual environments and leave enough for future generations. However, no matter how sparingly we use resources – especially the 7.7 billion of us across the world and counting – the fact is that those resources will eventually be depleted. Regenerative design allows us to use the resources we need, and then restore those resources.

"Now imagine if every building was a regenerative building: a healthy, efficient, ecologically-restorative space for their community. Imagine if every city preserved their architectural heritage while expanding only in a regenerative way. This is my take on regenerative architecture and, I believe, it must be our vision," concludes Daffonchio. +

THE LIVING BUILDING CHALLENGE IN SOUTH AFRICA

The *Living Building Challenge* (LBC) was developed by the International Living Future Institute (ILFI) with the mandate of leading transformation toward a civilisation that is socially just, culturally rich, and ecologically restorative. The core principle of the LBC is that buildings should mimic nature and natural systems. The standard uses a flower as a metaphor to illustrate this principle because a flower is rooted in its place and harvests all its water from the rain and all its energy from the sun. Comprised of integrated systems, a flower is also perfectly adapted to its climate and operates pollution-free. Above all, it is beautiful.

When these principles are applied to a building, the building is required to operate perfectly within the climate where it is located; to harvest sufficient rainwater to provide for the needs of its occupants, and to collect sufficient energy from solar panels and other renewable energy systems to provide the building with all its energy needs. It is also required to provide a healthy indoor environment by using no harmful chemicals in the manufacture of the building materials and furniture while being beautiful and acting as an inspiration to others.

But is the LBC a reality for South Africa? As a seasoned green building practitioner, Marloes Reinink of Solid Green Consulting believes that the LBC can, and should, be implemented in local projects. In 2016, Reinink signed up to become South Africa's first ambassador for the Living Building Challenge. "The role of an ambassador is to spread the word about the challenge in your country. This work keeps me motivated and realistic that there is still a long way to go, in terms of greening the built environment. But it is really motivating to experience positive feedback from attendees. We all want to make a difference and this standard pushes the boundaries towards being truly restorative," she says.

Currently, there are three projects in South Africa registered for LBC certification – two residential projects in Cape Town and a commercial project, 76 Corlett Drive, in Johannesburg.

To assist with spreading the message and sharing knowledge around the restorative principles of the LBC, Reinink has started a Living Future Collaborative in South Africa. The intention is also to identify regulatory barriers to implementing an LBC project and to lobby the government to bring about policy change. As green design becomes the new business-as-usual, this move effectively takes sustainability in the built environment to the next level.

For more information please email
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A catalyst for change

“Sustainable architecture” is a term that is used often, but for renowned social justice architect Nadia Tromp, founder of Ntsika Architects, it encompasses everything that buildings can do to become catalysts for lasting change in a community. And the Westbury Transformation Development Centre is an example of just this, with the newly completed multi-purpose public building standing tall as the gateway to this gang-ridden, impoverished suburb – and inviting a positive, transformed experience.

The Johannesburg Development Agency (JDA) is a wholly-owned area-based development agency of the City of Johannesburg with an emphasis on the development of resilient, sustainable and liveable urban areas in identified transit nodes and corridors.

We are more than just a project management agency or an economic development agency. The JDA is mandated as an area-based development agency, unique in that, unlike traditional development agency models, it straddles both a market and citizen-facing approach (not fully combusted in either direction). The JDA combines a social, economic and environmental mandate. Johannesburg cannot afford to only consider economic factors but requires developmental approaches attuned to complexity.

The JDA deals with the renovation, innovation and re-imagination of Johannesburg’s built environment and urban communities through a reinforced programme of placemaking and area-based development. In the past, it has undertaken and delivered projects and programmes that have been located spatially across the city, precinct and neighbourhood scale especially along the development corridors, such as the Empire-Perth Corridor along which the Westbury Transformation Development Centre lies.

Westbury was identified as one of the priority precincts along this corridor on the basis of its potential to elicit short- to medium-term growth and intensification within the corridor. A project identified within this precinct was the redevelopment of what was initially the existing Westbury Transformation Development Centre (WTDC), which the JDA is the implementing agency on behalf of the City of Johannesburg’s Department of Social Development.

The JDA appointed Ntsika Architects to design the Centre and Tromp says that six of the seven buildings from the existing centre were demolished; with the St Barnabus school building retained due to its social importance within the community and used an anchor for the new development. Described as a “breath-taking inspiration” by JDA, Ntsika Architect’s brief was to design a space to facilitate an early childhood development centre (ECD); a daycare for senior citizens where they would be provided with hearty meals and varied activities; sports and recreation for the youth and broader community to encourage fitness and healthy living; vegetable gardens; and retail opportunities including a bakery and a sewing room.

DESIGN ELEMENTS

Located on a busy, somewhat harsh corner, at the intersection of Main and Harmony street, the innovative, hybrid structure constructed from a local palette of materials (concrete, indigenous timber, clay bricks and steel) invites those entering and exiting the suburb via the BRT routes to traverse through what is now a bright and engaging public space around the building. This immediately draws people in, and those who enter the doors of the building are met with further delight with a colourful courtyard and an ECD designed to capture the imagination of a young child. One also cannot help but notice the large, green wall along the northern facade, planted with succulents as a community effort. “We have incorporated greening in an intentional way, using indigenous plants and trees that are green in summer and lose their leaves in winter, so as to allow for deep light to penetrate into the floor plate,” says Tromp.

Attention has also been paid to passive heating and ventilation throughout the building, and sustainable features include double glazing, the incorporation of solar panels and facilities for rainwater harvesting. To highlight the importance of being able to grow one’s own produce, Ntsika included the design of a greenhouse, which is to be used to teach urban farming methods through the Department of Social Development’s food security programme.

The collaborative effort to bring this state-of-the-art centre to life was recognised when the WTDC emerged as the winner in Architectural Design: Mixed Use Architecture at the 2019 Architecture MasterPrize (AMP) awards.

LOCAL LABOUR, LOCAL LEARNING

Over the years, the JDA has established processes and practices to support job creation and enterprise and skills development for previously disadvantaged groups, including black people, women, youth and people with disabilities, as well as military veterans.

The agency has also recognised the need to consolidate and extend these practices by designing and implementing a programme that will drive the achievement of empowerment objectives, and align projects and approaches, to address the challenges facing previously disadvantaged enterprises.

With all efforts directed towards benefitting the community, it made sense that 40% of labour use came from Westbury locals and SMMEs. As the main contractor, Motheo Construction Group hired and trained 42 local, previously unskilled labourers and utilised seven small businesses in the area as part of the SMME agreement, harnessing available local specialist skills. Training of unskilled labour was a critical part of shared learning and the sustainability of the project.

Absolutely key to a sustainable beneficial outcome, explained Tromp, was the idea of local ownership, and this is why the community were drawn into the building’s development right from the initial concept through to final design and implementation. “As a practice, we are extensively involved with projects that aim to create social change, and research shows that meaningfully engaging with the people who will use the space and including them as part of the process and part of the outcome is critical for successfully setting the building up for a sustainable future,” she says.

AFFECTING POSITIVE CHANGE

A key development practice of the JDA is the co-production of solutions in partnership with local communities and stakeholders, which allows for development programmes to meet local needs. This is an essential component of development interventions in cities. A more responsible and effective approach is to work with local stakeholders to produce solutions, drawing on their knowledge of the development context.

“In South Africa, we are really fortunate to be in an emerging market where we get to build new buildings where previously there was nothing. This privilege is a responsibility that I don’t take lightly – if we are going to leave a footprint, we need to be considerate of what it will be. I see it as an opportunity to affect change in a concrete way,” Tromp attests.

Now that the TDC has been launched, has it been embraced by the community? “Yes, it has been very positively accepted,” says Tromp. “While enrollments for the ECD are still taking place, the senior citizens love their private space which includes a lounge, built-in kitchen and eating space, as well as a courtyard with their own personal outdoor gym.” Perhaps what is most telling is the fact that, during the notorious Westbury protests of late 2018, not a single window of the under-construction TDC was broken – signalling that it is not viewed as a public building, but rather as a community-owned resource. And that is what is at the heart of sustainable success.

“When people take ownership of their spaces, they start to take better care of their facilities and this is where the societal improvement that we all hope for starts to happen,” says Tromp. “Ultimately, we want the perceptions of Westbury to change. Not so much for those looking in, but rather, for the people who live and work within the area. If they can be proud of where they come from, their self-esteem is boosted and the wheels of positive change are set in motion.”

Biophilia: Nature immersion and the city

In Part One of a series about biophilia and its relationship to the built environment, Canadian architect and founder of the *Living Building Challenge*, Jason F. McLennan, shares some insights around the central concept and specifically how it to relates to city planning and urban environments.

WORDS Jason F. McLennan

The New York City Highline - Shutterstock

JHB City Parks and Zoo

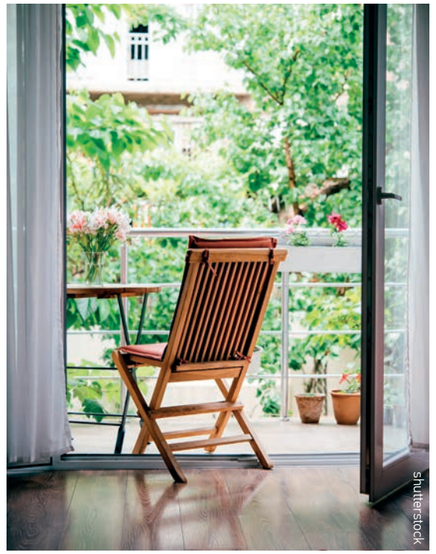
An inspiring South African example: Once a crime hotspot, The Wilds in Houghton, Johannesburg, was transformed into an indigenous park, which now benefits the city's residents.

EO Wilson described biophilia in his 1984 book by that name as "the innate tendency to focus on life and life-like processes". I wrote about the importance of biophilia in 2004 in my first book, *The Philosophy of Sustainable Design*. I included biophilia as a guiding principle in version 2.0 of the *Living Building Challenge* (LBC) that came out in 2009; making LBC the first green building programme in the world to focus on the subject. Since then, I have watched the field of biophilic design evolve, gaining shape, definition, and serious consideration on projects all over the globe.

However, as easily happens, a checklist mentality around biophilic design has emerged within the design industry, while simultaneously nearly anything and everything is being described as 'biophilic' in order to satisfy this newfound interest. As has happened in other areas of green building, the essence and scientific basis of biophilia is being lost in point tallying – right now, a design need only include superficial applications and check the right boxes to call itself biophilic.

It is my hope that clearly naming what is essential to biophilia, will engender a more nuanced understanding and ultimately, a more successful application of biophilic patterns and attributes to design. Frameworks and checklists will always benefit designers, but it's time to dig in deeper to what we mean when we talk about biophilia and biophilic design. We need to focus on design strategies that actually have positive impacts and do more than merely justify a design through yet another trendy lens.

Science is only recently corroborating the long-standing, instinctual wisdom we've carried as humans for millennia – that we thrive in close connection to nature. I believe nature immersion is the single most important element of biophilia; if we only allow ourselves adequate time in nature, we can reap bountiful biophilia-associated wellness benefits.



Shutterstock

As the populations of our cities grow, it is important that the number of natural public places for city-dwellers, keeps pace. Everyone should have walking distance access to a beautiful public park.

INSIDE OUT

Estimates place 70% of the world's populations in urban environments by 2050. With this migration, our connection to nature has dwindled and our feelings of isolation, loneliness and depression have filled the vacancy. Harvard School of Public Health Professor John Spangler puts a number to Americans' disconnection from nature, and it's shocking: we now spend 95% of our time indoors. At the same time, a growing body of evidence suggests that if we reconnect to nature, we will become whole again.

Therefore, a key principle to establish under the framework of nature immersion is that any design that can get people outside, for as long as possible – using porches, covered walkways, courtyards, balconies, etc. – will always greatly outdistance anything that can be done inside a building. These types of design features prolong our exposure to nature, drawing down that 95%. The task isn't the architect's alone, but also the landscape architect's, the urban planner's, and that of each individual that occupies a building.

IMMERSIVE EXPERIENCE

Given so much of us live in, or are moving to, urban environments, we must, at a city planning scale, do the work of the biophilic designer to draw people outside through design. What do our cities look like? City parks provide immense opportunities for immersive experiences to urban dwellers and we should urgently create more, even on a small, pocket park scale. How many parks do we have now and how equitably are they dispersed? One recent, powerful study showed significant decreases in self-reported feelings of depression in test groups tasked with restoring vacant lots in economically-depressed urban areas. This study illuminates the social justice aspect inherent in any discussion about urban planning and access to nature: "Neighbourhood physical conditions, including vacant or dilapidated spaces, trash, and lack of quality infrastructure such as sidewalks and parks, are associated with depression and are factors that may explain the persistent prevalence of mental illness in resource-limited communities."[1] As the populations of our cities grow, it is important that the number of natural public places for city-dwellers, keeps pace. It is my belief that everyone should have walking distance access to a beautiful public park.

NATIVE ECOLOGY

Also, as the world's population continues to move into towns and mid-size cities grow into large cities; cities should strategically plan for and conserve sizable tracts of land as highly accessible urban wildlands. Stanley Park in Vancouver, Forest Park in Portland, and Central Park in New York City provide crucial, substantive outlets for high-quality nature immersion for their urban areas and highlight what's possible when the conditions for wildness are fostered rather than subdued by design within city limits. These conserved parks connect people with place in a powerful way, often providing them with an experience of what their place once looked like while simultaneously creating opportunities for the native ecology of that place to thrive. Living in close proximity to this kind of life has amazing potential to foster the stewardship mentality crucial to the conservation of our wild places.

A 'vertical forest' in Milan incorporates actual trees and shrubs in the architectural design – attracting local urban biodiversity.

CREATING CONNECTIONS

What further opportunities can we identify to foster nature connections in cities? Do trails winding through untamed places connect us to the modern and convenient amenities that spurred our move, as a species, to cities? If not, can they? What is the state of our urban canopy and how can we revitalise it, and reap the associated biophilic benefits, alongside all the others, that make trees so essential to city landscapes? What is our relationship to water in our cities? Can we utilise design to daylight streams and storm water, creating visual and auditory connections with our life-source at every opportunity? Are our cities walkable and bikeable, with amenities spaced for pedestrian and biker access?

I believe one of the reasons Americans flocked to the suburbs in the post-World War II era was for these kinds of natural connections that had been choked out of industrialised cities. As our urban populations rise, it is critical that we invite nature back into city centres, creating nature-pedestrian connections that get us walking and interacting with our surrounding natural and human communities, immersing us more often and more completely within biophilic settings.

South Africa's population sits at nearly 59million today and is projected to increase to 64million by 2030. 65% of that population resides in urban areas.

Frameworks and checklists will always benefit designers, but it's time to dig in deeper to what we mean when we talk about biophilia and biophilic design. We need to focus on design strategies that actually have positive impacts and do more than merely justify a design through yet another trendy lens.

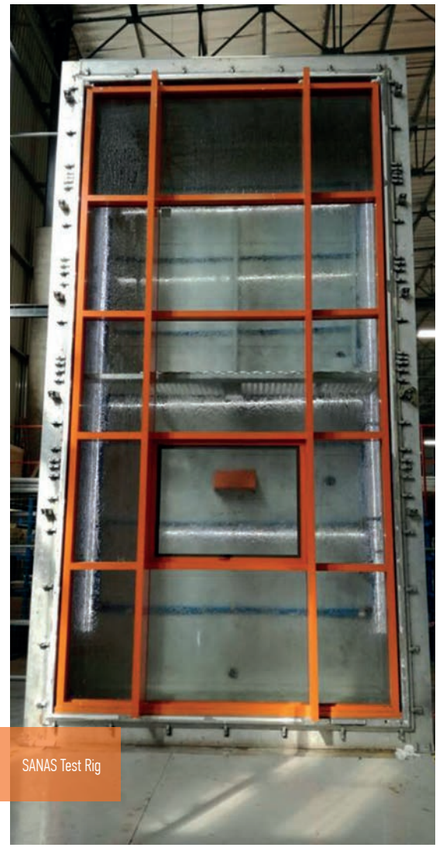
As this urban growth and development continues, the opportunity exists to avoid the mistakes and leapfrog ahead of much of the world, investing in the creation and nurturing of distinctly South African cities that utilise the most appropriate technologies and planning principles, to introduce life back into urban environments. +

[1] South EC, Hohl BC, Kondo MC, MacDonald JM, Branas CC. *Effect of Greening Vacant Land on Mental Health of Community-dwelling Adults: A Cluster Randomized Trial*. JAMA Netw Open. 2018;1(3):e180298. doi:10.1001/jamanetworkopen.2018.0298

Jason F. McLennan is one of the world's most influential individuals in the field of architecture and green building. He is a highly sought-after thought leader and recipient of the prestigious Buckminster Fuller Prize – the planet's top award for socially responsible design. He created the *Living Building Challenge* and has authored six books on sustainability and design.
www.mclennan-design.com

Sustainable, structural success

Designed to meet A-grade corporate office standards, the first phase of the Namibian Standard Bank head office was completed in October 2019. The multi-storey building comprises 11 800m² of semi-basement parking over three levels; 600m² dedicated to a service village; and 10 100m2 of office space over another three levels, including a client meeting centre, executive and multi-functional areas, a canteen and banking section. Standard Bank's brief was for the building to be designed in a sustainable way so that the materials and services minimise the liability for long-term maintenance, replacement and energy costs. In keeping with Standard Bank's determination to seek an ever-higher standard of excellence, the building achieved a 5-star Green Star Design rating.



SANAS Test Rig

THE STRONGEST CURTAIN WALL SYSTEM

The Advantage Curtain Wall system is the strongest curtain wall in South Africa, and likely in the world, according to Rodney Vercellotti, Technical Manager of HBS Aluminium Systems. It was included in the design of the building, using the flush glazed curtain version with 152mm mullions to meet structural requirements. The curtain wall system has been tested to destruction on the only SANAS accredited test rig in South Africa.

Some of the many benefits of the Advantage curtain wall are:

- Mullions from 100mm to 450mm.
- Available in structurally flush glazed and pressure glazed grid type façades.
- All junctions and joints are telescopic in nature to allow for thermal and dynamic loads to be taken up inside the curtain wall system while retaining all of the system's excellent weatherproofing capabilities.
- The system offers top hung openers and project outside hung sashes in both flush glazed and pressure glazed formats.
- All machining is effected on the transoms to allow for site adjustment of the transom levels as well as to minimise handling of oversize lengths in the workshop.
- All gaskets are manufactured from EPDM to ISO 3302 Class e1 tolerances to ensure a perfect fit every time.
- All profiles are extruded from 6063 T6 grade aluminium to ensure longevity and structural integrity.

OTHER PRODUCTS AVAILABLE

The Advantage Curtain Wall is one of the many unique products offered by HBS, some of the other products include:

- The first waterproof shopfront in South Africa with a pneumatic punching tool – Window Wall
- A fully integrated inside glazed system that includes doors, tilt and turn, side hung, top hung windows and sliding doors, with pneumatic punching tool – Explorer
- Sliding doors and windows with pneumatic punching tools – Coastal
- The oldest cladding product in South Africa – HulaBond
- The first estimating package in South Africa that has a fully integrated u-value module and generates shop drawings – Quick Quote

For further information visit www.hbs.co.za +

Standard Bank Namibia's new head office in Windhoek, with its clean-cut lines, bold bespoke design and environmentally sustainable operations, reflects a level of excellence that assures quality and high standards.

WORDS Linda Doke IMAGES Creative Lab

Location:	Windhoek, Namibia
Type of building:	Premium grade office development
Green Star rating:	5-Star Green Star – Office Design v1.1
Project dates:	Early 2017 – October 2019

Banking on Sustain ability

Striking a stylish pose in the fast-emerging hub of Kleine Kuppe in Chassie Street, Windhoek, the first phase of the Standard Bank head office was completed in October 2019, 30 months after construction on the project began. Designed to meet A-grade corporate office standards, the multi-storey building comprises 11 800m^2 of semi-basement parking over three levels; 600m^2 dedicated to a service village; and 10 100m^2 of office space over another three levels, including a client meeting centre, executive and multi-functional areas, a canteen and banking section.

Standard Bank's brief to architects Chamberlain & Associates was for the building to be designed in a sustainable way, so that the materials and services minimise the liability for long-term maintenance, replacement and energy costs. The brief required that all relevant life cycle costings of materials, equipment and finishes be carefully considered and where necessary, suitable alternatives be sourced.

The sustainability bar was set high. In keeping with Standard Bank's determination to seek an ever-higher standard of excellence, its Namibian head office achieved a 5-Star Green Star Design rating.

BRAND PHILOSOPHY

Mike Cawse, head of real estate development and project management – group real estate services – Standard Bank South Africa, explains the new head office was conceptualised as a physical realisation of the company's philosophical ambitions and their functional purpose. "Standard Bank strives to be a bedrock of sustainability and a symbol of certainty and integrity. This new head office is a representation of technological advancement, with a sustainably responsible design. It also needed to be an uplifting and conducive working environment for its staff, and to represent Namibia through its design elements and building fabric – a bespoke design that is unique, long-lasting and tailored for its environment," says Cawse.

"The benefits of green building also go well beyond economics and the environment and have a positive effect on the health and wellbeing of staff. It's no secret that workers in bright, well-ventilated, foliaged offices show an increase in cognitive scores, a happy work balance, and are generally healthier, happier people. Research suggests that better indoor air quality, with low concentrations of CO_2 and pollutants, and with high ventilation rates, can lead to improvements in performance. For all these reasons, Standard Bank is focusing on creating buildings which are not only good for the environment but also support healthier, happier and more productive lives."

ENVIRONMENTAL ROLE MODEL

Cawse believes it is fundamental for large institutions like banks to set an example where going green is concerned. "Standard Bank knows the benefits green buildings have for the climate and the natural environment.

Environmental sustainability is regarded by the company as an important risk management issue. Banks themselves do not have a large direct impact on the environment, but through the provision of finance to companies and organisations that do have significant impact, they indirectly affect the environment. As a result, banks have the sway to ensure a greater environmental efficacy among their customers. But to do so, they need to follow their own convictions, and set an example through their actions by going green with their own buildings," he says.

Standard Bank's new headquarters in Windhoek, Namibia, achieved a 5-Star Green Star Design rating.

The sleek internal finishes were chosen to minimise the liability for long-term maintenance, replacement and energy costs, while not compromising on quality and professionalism.

The Green Star application was made through the Green Building Council of Namibia, and the evaluation was conducted by the Green Building Council of South Africa. Standard Bank followed the procedures and guidelines of the GBCSA. The company hired the services of Emcon as sustainability consultants to guide the process. Emcon director Derrick Langford explains that meeting the requirements of the GBCSA, and the availability of materials in Namibia was very similar to South Africa.

HARNESSING ENERGY

Project architect Jurie Swart of Chamberlain & Associates describes the main challenges involved in designing and constructing a green building, irrespective of where it is situated. "A good design is one based on site-specific information, such as climate, context, views, social interaction and connectivity. Securing these fundamentals, together with building a fully functional office block that has large and bulky services, is a massive challenge. All services need to be concealed and well designed around a building with no space or yard behind it, resulting in a services-free and architecturally-clean façade."

As a result of our requirement for low volatile organic compound (VOC) paint, we have seen a transformation in the Namibian paint industry as suppliers have started producing and certifying these environmentally aware paints.

With Namibia being such a water-scarce environment, it was imperative that the design of the building reduce – or even eliminate – unnecessary water consumption. Similarly, Namibia has a high number of sunlight hours in a day – approximately 3 610 hours annually, so designing the building to generate its own energy via solar would have a positive impact on the environment and, of course, save on energy costs. The building is equipped with a 150kWp solar photovoltaic power plant on the roof, which meets about 33% of the head office's energy requirements. The lighting

A double-volume canopy and landscaped stair, signify a grand entrance to the building.

installation is 100% LED, allowing an extremely low lighting power density.

"A daylight harvesting system implemented along the main section of the building provides a lighting control system that dims the lighting that is closer to the windows when enough natural light is available, resulting in even greater energy savings," says Langford.

The building is also equipped with a full building management system (BMS) which, among other functions, measures the energy and water consolidation of the building per type and area, and provides an accurate picture of how these valuable resources are being used and managed. The BMS also enables information displays throughout the building, informing the occupants of their impact on these resources, in real time.

"With full BMS and daylight harvesting being in its infancy in Namibia, it has been a steep learning curve for us and the contractors. We worked together as a closely-knit team through the entire project, resulting in a well-polished and integrated system," explains Langford.

GREEN BUILDING COUNCIL SOUTH AFRICA

DID YOU KNOW?

3.9% is the average capex premium for projects implementing initiatives to achieve a Green Star rating.

With Namibia being such a water-scarce environment, it was imperative that the design of the building reduce – or even eliminate – unnecessary water consumption.

The positive effect of Standard Bank's green requirements on the project had a ripple effect into other sectors, most specifically the paint industry. "As a result of our requirement for low volatile organic compound (VOC) paint, we have seen a transformation in the Namibian paint industry as suppliers have started producing and certifying these environmentally aware paints," adds Langford.

WITH SECOND PHASE IN MIND

The brief from Standard Bank to the architects required design planning and coordination for a future extension of an additional 5 000m² for a second phase office component that will, once built, plug seamlessly into the newly completed structure. The services and green building requirements for this future project had to be planned and incorporated beforehand into the already completed first phase design. This will allow the future expansion to take place seamlessly without additional services or add-ons to the overall design, resulting in two buildings designed as one.

"Considering the building sector has the largest potential for significantly reducing greenhouse gas emissions compared to other sectors with sizable emissions, it is important that banks and large institutions ensure that their real estate portfolios follow a green philosophy. Going green should be the norm, not the exception," concludes Cawse. +

Material aspirations

Specifying responsible building materials is an important component of green building design. Environmental claims about materials or products vary from borderline greenwashing to legitimate data, leaving decision-makers to navigate through a 'green fog' of information. The antidote, according to green building consultant Michelle Ludwig, is product certification and transparency.

WORDS Michelle Ludwig

To filter the green hype, a base understanding of the criteria involved in evaluating materials for improved environmental impacts, is useful. The familiar 'Three Rs' of environmental initiatives – reduce, reuse, and recycle – is just the beginning. First, reduce the use of everything, wherever possible, thus less material, less energy, less water. These things can be measured and optimised. Second, is a design challenge to enable repair and reuse of what we already have brought into this world. Third, consider the end-of-life options and ways to deal with what we have created. The conventional 'recycle' part, however, puts a great burden and high expectations on the recycling industry. An important Fourth R – Rethink or Redesign – should inform our processes and occur at the very beginning of every process.

What are we making and choosing to put out into the world? Is this our intention or rather lack of attention? A product lifespan might be two days or 22 years but at the inevitable end of its useful life, what options exist? If we start with the end in mind, could we be cleverer about what we make in the first place?

Circular thinking, and closing the loop, should be considered just another parameter for product design in order to evolve to a true circular economy, "that is restorative and regenerative by design and aims to keep products, components, and materials at their highest utility and value at all times, distinguishing between technical and biological cycles. (Ellen MacArthur Foundation)" Biological cycle product 'ingredients' are designed to work with nature's cycles of biodegradation. Technical cycle materials should be designed to re-enter the technical loop repeatedly, thus downcycling is not a long-term sustainable solution.

VERIFYING PROGRESS

For companies that are leading by evolving and innovating, how do they communicate their achievements and get recognition in the market? Some manufacturers do not readily know how or where to start improving their processes for reduced environmental impact. Meanwhile, built environment professionals are trying to find information, make comparisons, and determine credibility. Enter product certification or ecolabels, which can be considered a mark that designates compliance with third party certification schemes. They are useful to all parties as they define a framework for measurement and comparison, independent verification, and credibility.

EcoStandard and *Global GreenTag* are two useful and robust product certifications currently available in South Africa. While there are some minor variations, they both assess a life-cycle scope of impacts of building materials, encompassing: resources and raw materials, ecotoxicity, manufacturing and production process (e.g. energy, water and waste), product use phase and emissions, packaging and distribution, social impacts, and end-of-life scenarios such as recyclability. The result is more holistic than many pass/fail standards with a score for overall performance. It is useful for benchmarking and provides a verification mark to communicate this success to the market. The GBCSA recognises and has pre-approved these product certification programmes, along with a few others, which significantly facilitate certified products contributing to Green Star Interiors points. ►►

GLOBAL GREENTAG

Global GreenTag is an Australian and USA Regulator approved Certification Mark and ISO 14024 (Type 1 Third Party) Ecolabel that provides the required evidence for products seeking engagement in green building rating tools and for manufacturers wanting to differentiate their products, based on the health and sustainability benefits or characteristics, and communicate this simply and effectively to end users and green professionals. They can also assist in creating compliant Product Health Declarations.
www.globalgreentag.co.za

ECOSTANDARD

EcoStandard South Africa, established in 2010 as a registered NPO, designed and launched the very first South African criteria and assessment tool that is third party audited and verified to assess the legitimacy of green claims. EcoStandard's aim is to promote the development of a sustainable building and building product industry within South Africa and set a credible South African standard by providing an independent eco-labelling system. The EcoProduct Assessment Tool is based on international best practices, customised for South Africa's context, which seek to assess products using the principles of Life Cycle Analysis and ISO 14024 (Type 1) and provides a rating indicating the environmental performance of a product.
www.ecostandard.co.za

The GBCSA recognises and has pre-approved these product certification programmes, along with a few others, which significantly facilitates certified products contributing to Green Star Interiors points.

ECOASA LABEL

At the 2019 GBCSA convention, the Department of Public Works announced that Agrément South Africa has been tasked with developing and overseeing the establishment, and operation, of a government-endorsed eco-labelling system for building materials and products, provisionally known as the EcoASA label. The label is still in the development stages.

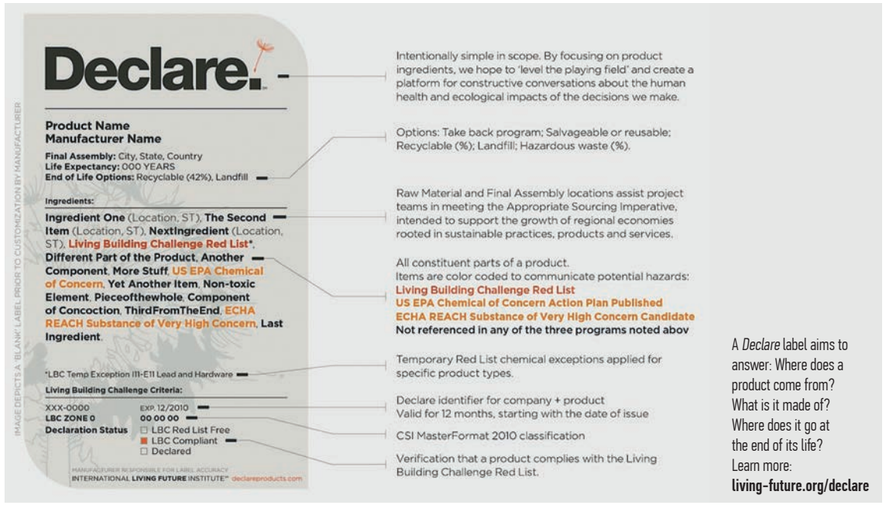
HEALTH TAKES CENTRE STAGE

Health and well-being issues are now firmly part of the design consciousness. The potential health impacts from products is particularly important for interiors where there are numerous types of materials and where people spend a significant portion of their day. Internationally, progressive architects and designers are looking beyond the legislated generic safety assurances from Material Safety Data Sheets (MSDS) and asking for more specific information on what is *in* the products, particularly with a lens on impacts to human health. This means information disclosure and transparency, which will seem intimidating to manufacturers. However, consumers now place increased value on transparency as an element of brand trust and building rating tools require product transparency information to meet material credit criteria.

To encourage greater disclosure of building product ingredients, a consortium of organisations in the green building movement came together to create the *Health Product Declaration* (HPD) format. It is an open standard – composed of a format and instructions – to be issued voluntarily by manufacturers for the accurate, reliable and consistent reporting of product contents and associated health information, for products used in the built environment. The result is a growing library of over 7 000 HPDs from 650 manufacturing companies that inform and influence the selection process of decision-makers such as architects and designers.

With a similar intent, *Declare*, is a disclosure label, which assists those pursuing *The Living Building Challenge* criteria in avoiding *Red List* building materials. A *Declare* label aims to answer: Where does a product come from? What is it made of? Where does it go at the end of its life? It aims to function like a nutrition label for products. The *Red List* comprises the worst in class materials prevalent in the building industry that should be phased out of production due to health concerns. The commonly used chemicals on the *Red List* are polluting the environment; bio-accumulating up the food chain until they reach toxic concentrations; harming construction and factory workers; as well as impacting building occupants. All products are eligible for inclusion, regardless of their composition; the key to *Declare* is honest information sharing.

The *Health Product Declaration* and *Declare* label are not full product certifications but rather a format for comprehensively presenting key information. They are aligned, with and recognised by, many building ratings tools that have established high criteria for material selection such as the *Living Building Challenge*, LEED, and the *WELL Building Standard*. They enable manufacturers of ecologically sound products to demonstrate market leadership in the growing movement toward product transparency.



A *Declare* label aims to answer: Where does a product come from? What is it made of? Where does it go at the end of its life? Learn more: **living-future.org/declare**

THE JOURNEY TOWARDS CIRCULAR ECONOMY

Circular-Vision is a South African sustainability consultancy focused on assisting companies and organisations transition to a circular economy. The intention is to understand the core business and the value chain to assess where the most appropriate point of entry is to start making the transition to circularity.
www.circular-vision.com

ASK FOR CHANGE

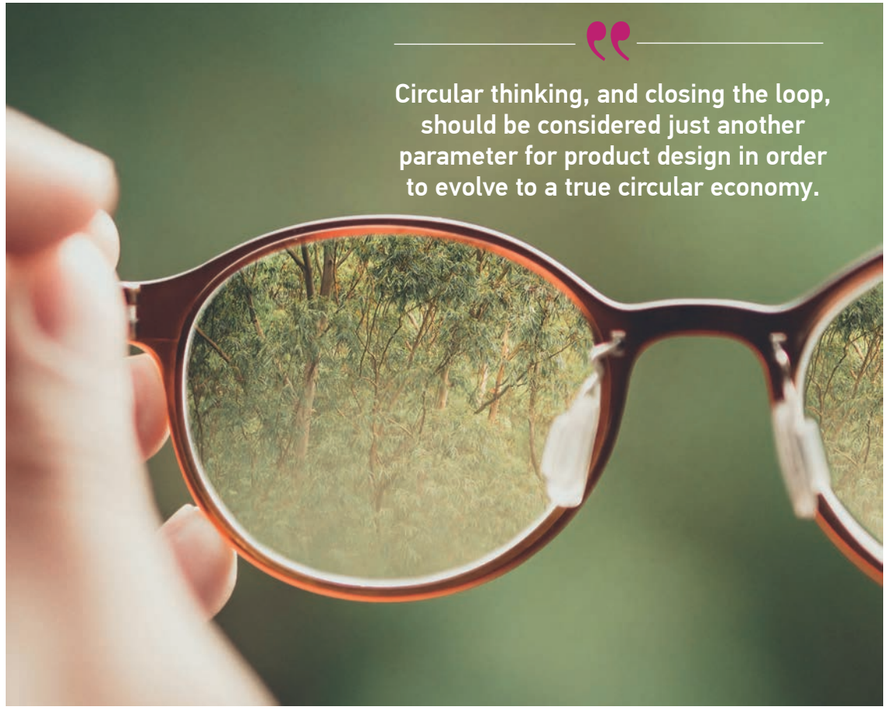
As decision-makers and influencers in the built environment, we should choose to reward manufacturers who are walking the talk and moving the needle. Wherever possible we need to raise our expectations, and our voices, for what we want to select for our buildings. Quality information and contextual clarity is paramount to being able to make these informed decisions and requests. By asking the hard questions and seeking deeper technical understanding, our market demand will drive the business as usual towards innovation. We are a clever species, and we can do this. +

WANT TO KNOW MORE?

GreenED offers in-depth technical information in their online on-demand accredited courses (Category 1 Continuing Professional Development credit) as listed below:

- Material selection and ecolabels
- Green interiors
- WELL Building Standard
- The Living Building Challenge
- SANS 10400 XA
- Solar basics: understanding the sun

www.greened.co.za



Michelle Ludwig is a senior green building consultant at Ludwig Design Consulting and co-founder of GreenED, a resource of online green education and training. Her 20-year career in the United States and South Africa, comprises sustainable architecture, interiors, green building rating tools technical development, and built environment education. She has previously worked with international architecture firm HOK, green pioneers William McDonough + Partners, and MBDC – the founders of the *Cradle to Cradle™* protocol. She has contributed in numerous ways to GBCSA, Green Star tools and is currently focusing on coordinating and sharing green knowledge.

R220m Upgrade allows Sonae Arauco to introduce Innovus range

Wood-based panel manufacturer Sonae Arauco has invested R220 million in upgrading its White River, Mpumalanga facility to include an integrated press system from a leading German supplier. This state-of-the-art technology means that Sonae Arauco now boasts the most advanced facility on the continent.

The significant investment is testament to Sonae Arauco's commitment to South Africa, where the company has had a local presence since 2000. The upgrade will allow the company to introduce exclusive and innovative new materials to the local market from its latest Innovus collection.

2020 will see the Novolam brand evolve into Innovus.

The facility will also give Sonae Arauco the flexibility to be able to press niche products on-demand, in accordance with specific customer requirements. This technology allows Sonae Arauco to better service its diverse customer base.

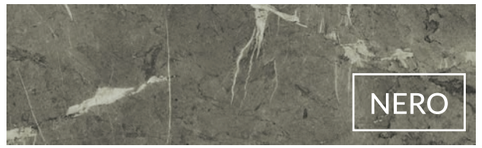
Pressing on-demand translates into reduced lead times for customers.

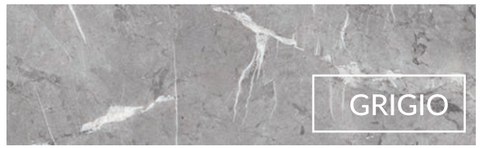
"Local customers will now have access to additional decorative melamine-faced finishes only available in the European market to date." - Sonae Arauco Chief Sales and Marketing Officer Robin Kuriakose

Local Economic Development
The official opening ceremony was conducted by the MEC for Finance, Economic Development and Tourism, Mr Pat Ngomane.

Mr Pat Ngomane endorsed the official opening of the expanded Sonae Arauco South Africa factory in white river, city of Mbombela local municipality.

Notable attendees: Ambassador of Portugal to South Africa, His Excellency, Dr. Manuel Carvalho; CEO of Sonae Arauco, Senhor (Mr) Rui Correia, and his management team.





SONAE ARAUCO

Taking wood further

www.sonaearauco.co.za

Sonae Arauco's melamine faced particleboard is E1 Certified, Sonae Arauco are proud members of the Green Building Council and The Forestry Stewardship Council.

Building the Future

Technological advancements associated with human development have often been perceived as contributing negatively to the depletion of resources and the gradual destruction of our planet. But how are modern technologies now being harnessed to design more sustainable human environments that will reverse the environmental impact of our built environments?

WORDS Melinda Hardisty

The building industry, and the operation of buildings in general, is now recognised as being one of the largest contributors to carbon emissions, resource depletion and waste products. Great strides are being taken to make these sectors more environmentally sustainable worldwide. Several modern technologies are now available to assist in the design stages of more responsive buildings. Others can assist in reducing the impact during design and construction phases by, for example, enabling global collaboration without air travel and the associated emissions. We look at a few examples of technologies that are changing the shape of the industry.

BUILDING INFORMATION MODELLING (BIM)

Building Information Modelling (BIM) is a process developed to improve the digital delivery of building construction project information. It may harness a variety of software packages but always operates in a 3D environment. Dewlene Africa, BIM manager at architecture firm, SVA International, explains that BIM has been gaining more traction locally. At the start of a BIM project, consultants will outline the goals and principles for the process. By applying these, Africa explains, "one will ideally improve project collaboration, coordination, analysis, visualisation and efficiencies".

There are currently three levels of BIM, defined by the type of information included in the models. South Africa mostly operates between level 1 and 2, when BIM is utilised. Locally, its usage is usually consultant driven, while internationally, level 2 is often the minimum and is mandated by clients. The efficiencies and analysis potential are particularly useful to the process of designing more sustainable buildings. There are also the advantages of going largely 'paperless' and being able to collaborate without being in the same place.

www.svarchitects.com

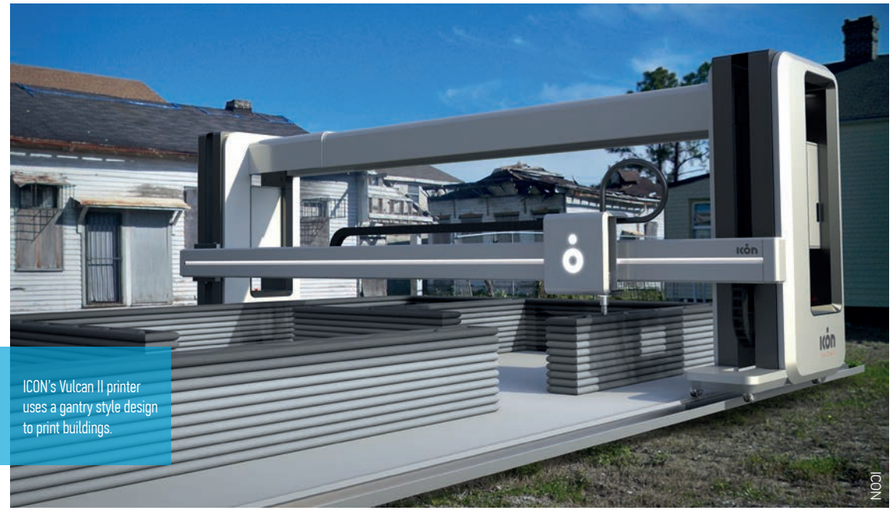
COLLABORATION AND CLASH DETECTION

Advances in software and cloud sharing technologies allow collaboration on projects from nearly anywhere in the world, saving on time and money and reducing the carbon footprint attributed to travel. *Autodesk BIM 360™* is one such platform that has started to be used more locally. This cloud-based Common Data Environment (CDE), not only allows staff in different offices to work on the same model, but it handles document management, design collaboration, model coordination, project insight, site tools, and more.

Clash Detection software, such as *Autodesk Navisworks™*, enables all the consultants' models to be linked into a common environment where clashes between services are highlighted automatically. This ultimately aids design and avoids costly changes on site. Dewlene Africa feels South Africa lags slightly in this arena as many of the consultant disciplines are not yet operating at this level of BIM.

BUILDING PERFORMANCE ANALYSIS

Advances in software have allowed energy analyses and building performance calculations that would once have taken days, to now be calculated in minutes, often with a multitude of different options factored in. *Autodesk Insight™* is one such tool. Its advanced simulation engines harness the power of machine learning to infer information not provided. It can be used at all stages of design, from concept to detailed models. Using cloud computing capabilities, it can generate building performance analyses, even with various design options, in a fraction of the time a desktop computer can.



ICON's Vulcan II printer uses a gantry style design to print buildings.

PARAMETRIC DESIGN ANALYSIS

Climetric, a Cape Town-based company, offering consultation on sustainable design strategies, is one of many specialist companies who assist in developing sustainable building design. They explain that traditional 'Simulation Analysis' would look at one aspect of a design at a time, like the window overhang, for example. If any aspects of the design changed, the entire analysis would need to be redone.

Conversely, 'Parametric Design Analysis' can adapt quickly to changes in design input and can run many designs simultaneously, offering results that can be compared to select the best options. This is extremely time- and cost-effective and produces complex graphs that can easily be filtered to highlight specific information. Insight into temperature comfort levels, energy costs and optimum passive design elements is quickly available, enabling the ability to adjust designs accordingly.

www.climetric.design

Advances in software have allowed energy analyses and building performance calculations that would once have taken days, to now be calculated in minutes.

VISUALISATION PACKAGES

Visualisation software is becoming more and more accessible and easy to use. While there are still some very specialist programmes for photorealistic renders and videos, there are now several programmes that can produce realistic images and walk-throughs in a relatively short time and with no specialist knowledge.

Now that many projects are already authored in 3D packages, loading them into a rendering package and defining finishes, sunlight, landscape, and other environmental factors is much easier. Apart from being easier for clients to understand, it enables a better 'experience' of a space and can inform environmental design decisions.

ENVIRONMENTAL SOFTWARE

There are also various software plug-ins that work with parametric modelling packages and calculate environmental factors and how they relate to building designs. It is now much easier to design more comfortable and environmentally responsive buildings. Some of these are only beginning to be used locally. *Ladybug™*, for example, can bring in sun paths, climatic data, radiation studies and various other calculations into your model in order to analyse a design. *Honeybee™*, a sister product, runs radiance, thermic, and energy model analyses to aid in sustainable design.

www.ladybug.tools

IMMERSIVE TECHNOLOGY

Paragon Group is known to push the boundaries when it comes to their buildings and the cutting-edge technologies they use to create them. Emile Maritz, Paragon's 3D visualisation manager, explains that the terms Virtual Reality (VR) and Augmented Reality (AR) are often, erroneously, used interchangeably in the architecture industry. He explains that AR is when digital elements are overlaid in a real world setting through software and hardware such as mobile phones or tablets (think Pokémon Go). VR is when a viewer can be completely immersed in a created three-dimensional environment using software and specific hardware and equipment designed for the purpose.

Paragon use VR extensively throughout the design process. Early on, it allows the designers to interact with the spaces and iron out difficult details without physical mock-ups and costly changes on site. It also allows clients to fully explore their buildings from every angle before anything is built. Created realms can be viewed on a mobile phone with Samsung Gear™ or as a fully interactive walk-through using an HTC VIVE™ headset. Viewing and collaboration can happen from anywhere, provided you have the required hardware.

www.paragon.co.za

This 3D printed house in Texas, USA, is a prototype for a system that ICON plan to roll out as a low-cost housing solution, starting with a community project in Latin America.

3D TOURS

3D Tours, a Johannesburg-based company, use state-of-the-art technology to scan existing spaces in detail and create photorealistic, self-navigation walk-through tours that can be viewed in any internet browser or, for an immersive experience, through VR goggles. While this is not strictly a design tool, it is used by interior designers, the hotel industry, retail industry, construction industry, and galleries to allow potential clients or guests to experience their space without travelling to it.

Information can be embedded in the tour so that a viewer can click on an object and read relevant details or watch an embedded video. This technology can also be used as a valuable building management resource as rooms and spaces, including plant and machinery areas, can be scanned and accessed virtually. Maintenance information for specific elements can be embedded in the virtual space, making it easier to access the right information for each element.

Experience a tour of the GBCSA office by scanning the QR code.

www.3dtours.co.za

3D PRINTING

Locally, 3D printed concept models, display models, and detail mock-ups are already being used to save time, money, and materials by being able to test technical details without physical mock-ups. Special printers are utilised to create three dimensional objects, using a digital diagram, by building up layers of a base material into a required form. The materials, and the level of detail or colouring, can vary, depending on the requirements and the printer available. Objects can be created using plastics, resin, rubber or metal, among other things. Because it is an 'additive' method, there is virtually no material waste in the process.

Internationally, the same technology is being used to create real building elements or moulds for custom objects, and even entire buildings. Several prototypes of 3D printed buildings now exist in different parts of the world. Some use raw soil and rice production by-products as the base materials. Among the companies leading the way in this field is ICON, the first company in the USA to secure a building permit to 3D print a permanent house structure. The house, in Austin Texas, is a prototype for a system that they plan to roll out as a low-cost housing solution, starting with a community project in Latin America.

www.iconbuild.com. +

CASE STUDIES:
GREEN BUILDING SERVICES, MATERIALS & TECHNOLOGIES

CUT THE GREENWASH

Get the facts straight about paper and recycling

"If everyone said no to a receipt just for one month, we would save 45 trees." This is an on-screen message at an ATM of one of South Africa's largest banks and a classic example of *greenwashing*: making unsubstantiated or misleading claims about the environmental benefits of a product, service, technology or company practice.

These green claims often have no scientific basis to them. They are environmental myths that have been communicated so often that they are deemed as 'facts'.

You may have been encouraged to "save the planet" by opting to receive bills or magazines electronically. However this is a cost-saving and practical measure for the service provider, but instead companies 'greenwash' it by saying you're saving trees.

The most common form of greenwashing is that little footer at the bottom of emails: "Think before you print". If you need to print it, print it. And re-use it or recycle it once it's been dealt with. If you're going to be referring to something regularly, print it out and file it. Opening it online every time uses energy – and in South Africa, we haven't quite got the energy mix on the greener side just yet, if we have any electricity at all.

FACTS ABOUT FORESTRY AND FARMED TREES

Firstly, the fibre for locally made paper and wood products is not sourced from indigenous forests or rainforests (we don't have rainforests in South Africa). Paper along with a myriad of wood-, paper- and tissue-based items are made from farmed trees, and recycled paper (which came from trees in the first place).

This makes trees – and anything made from them – a renewable resource. Have you ever been asked to eat less carrots or cabbage to save the vegetable farm? No, you are supporting farmers by eating their produce.

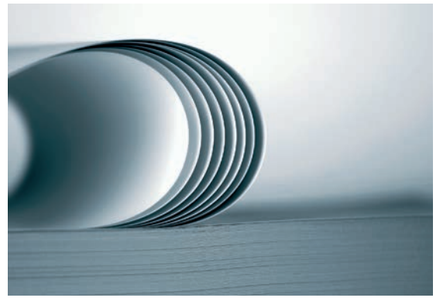
Certain species of trees are planted in crops specifically for the paper and wood industries. A small percentage (6%) is harvested for use each year and the land is replanted within the same year. This is very different to deforestation, which is the denuding of forested land for the likes of urban development and agriculture.

Plantations are also not irrigated – they get their water from rain and groundwater and the sector even pays a "rain tax" – or streamflow reduction levy.

RECYCLING PAPER DOES NOT SAVE TREES

Stating that your company has saved X number of trees because you've implemented a paper recycling programme is also misguided. As trees are farmed for the purpose of making paper, they do not need to be saved.

Paper recycling is important for other reasons. It diverts a useful material from landfill that paper,



packaging and tissue manufacturers recycle to make stuff you use every day.

The recycling of one tonne of paper "does not save 17 pine trees" but it will save around three cubic metres of landfill space and that is something to be mindful of. And it keeps the carbon in the paper fibre (absorbed from the air by the tree) locked up for longer.

ONE PERSON'S WASTE IS ANOTHER'S TREASURE

Paper recycling – from the collection and buy-back centres to the reprocessing and manufacturing into new products – also sustains local jobs.

Recycling reclaimers and waste pickers have helped to increase the collection of hard-to-get post-consumer waste, especially office paper, which is why keeping your paper recycling separate and dry is better for them – they get more for cleaner paper.

In 2018, 71.7% of recoverable paper – 1.285 million tonnes of documents, newspaper, magazines, cardboard boxes of countless kinds, and milk and juice cartons – was diverted from landfills for re-use.

USING RECYCLED PRINTER PAPER IS NOT NECESSARILY GREENER

Recycled copy paper is not made in South Africa – this is imported, carrying an additional carbon footprint. Instead buy local! There are two well-known South African brands, both of which are certified by the Forest Stewardship Council (FSC®) as sustainably produced.

So please consider the environment before you greenwash. Buy locally made paper, packaging and tissue. Support recycling enterprises. And remember that paper is a renewable resource. +

PAPER
MANUFACTURERS ASSOCIATION
OF SOUTH AFRICA (PAMSA)

DESIGN TO BROADEN HORIZONS

The Botha's Halte Primary School has been created as a space that is not just for the benefit of the learners of Botha's Halte Primary, but for the greater community.

Above: The abundance of colour is used to stimulate the creativity of learners.

"The community has possibly the best-equipped school in the country, at government school rates. Learners have access to the world through internet and their horizons have been broadened beyond imagination," says Deon Vermeulen, Director of 2ii Consulting, of the transformation of Botha's Halte Primary School, located on the outskirts of Worcester, Western Cape.

The company was the professional quantity surveyor for the project. This space is not just for the benefit of the learners of Botha's Halte Primary, but for the greater community. An e-learning hub has been formed, which schools in the vicinity can also connect to, learning more about Maths, Afrikaans, and in future, Science and English. With a cutting-edge digital focus, all the classrooms are equipped with the latest technology, such as e-beams that are connected to the internet.

STEEL TREES AND TURBINES

According to Vermeulen, some of the stand-out design features of the school include the ten-metre oversailing wall at the entrance, the conical tower with wind turbine, the pathway over the roof with a garden, the Discovery Centre complete with 'steel trees' as well as how the design has effectively restored what was originally the Anna Zaal School – merging old with the new. Founded in 1920, the school consisted of a single hall that has now been renewed as the new reception area for the school.

Architectural firm Meyer & Associates is responsible for the exquisite design, which Architect Tiaan Meyer says applied ecological and sustainability principles. "These considerations influenced the architectural form of the buildings, but are also made visible throughout the complex and, as such, form part of the teaching and educational processes," he says. The interiors of the building are very light and bright, with an abundance of colour to stimulate the creativity of learners, and the furniture and equipment have intentionally been selected with this design in mind.

From an environmental perspective, the new solar and wind generator capacity allows the buildings to function largely independent of the electrical Eskom grid, while rain and stormwater are harvested for irrigation and kept in a large reservoir under the school buildings. The reservoir is topped up by a borehole and with, treated effluent from a sewerage package plant.

BEHIND THE SCENES

Speaking of challenges that needed to be overcome during the construction process, Vermeulen explains that the school had to stay open during construction. "The design incorporated a footprint that allowed for the new school to be built next to the existing building. Once the new building was completed, the learners could move over, and the old building was then demolished and the landscaping completed," he says.

"There was also an existing borehole and concrete water tank supplying water to the school and the Botha Cellar, which had to be working throughout the project. The concrete water tank was in the middle of the footprint and had to be demolished – so all had to be programmed so as to keep water supply running, especially in the summer when they were harvesting and crushing the grapes." 2ii also had to procure a tent for the duration of the construction period that could serve the community with church services and functions, as the community hall was demolished.

At the inaugural opening in April 2019, Western Cape Minister of Education Debbie Schäfer says the school has changed many lives. "I have witnessed first-hand how schools can change communities' attitudes towards education and decrease learner drop-out and apathy. They give the learners and their communities hope." +

A Growing Solution

Heat island effect, air and water pollution, water wastage from buildings and hard surfaces, limited access to green belts and parks, breakdown of biodiversity... these are just some of the environmental problems our cities are facing, as the number of dwellers in these dense areas continues to rise.

Maboneng precinct living wall.

It is widely recognised that planting a tree or garden is the simplest, most effective and inexpensive method to redress and reverse the effects of climate change. "Afforestation is vital to our very survival, and that is the motivation for what we do," says Sean O'Connor, Director of Living Green Walls. As project plant specialists, the team is passionate about reintroducing plant life into cities across South Africa in the form of living walls and green roofs. The company offers turnkey solutions for living walls and green roofs that renew and transform the built environment.

PLANTS MAKE US HAPPY

The benefits of considering a living wall or green roof are numerous. "Firstly, there is biophilia – the bond between human beings and the natural world. Introducing greenery to a concrete, urbanised space not only enhances the aesthetics of a building or room but also improves the negative psychological effects associated with property demarcation," says O' Connor. Acoustics is another advantage, as plants naturally absorb, deflect, and refract sound, and are used in various landscapes to block high and loud sounds. Then there's also building protection, he explains, with living green walls replacing traditional rain-screening technologies, regulating climate control, and providing natural insulation by retaining heat in winter and cooling the building in the warmer months. "And lastly, but by no means least, green walls and roofs cleanse the air we breathe, filtering approximately 90% of pollutants, lowering carbon dioxide levels and providing us with oxygen."

Living Green Walls make the process of installing a green roof or wall easy; guiding clients through practical considerations. For example, a roof that is to support greenery needs to have been water-proofed using an approved product and then flood-tested to ensure no leaks. The roof needs to be signed off by a structural engineer. "When it comes to living walls, they require regular maintenance by our qualified teams who take on the responsibility of checking things like water nutrients and pH levels. They also check to see that the watering and lighting systems are working correctly and that the plants are receiving appropriate care and input."

In the past five years, Living Green Walls has planted 65 877 plants in 106 projects. When asked to comment on a project that stands out, O' Connor says that the Maboneng precinct Living Wall (with client Hi-Tec) springs to mind – a 13 x 4 metre (approximately 50sqm) space that not only achieved the brief but also introduced greenery and biodiversity within the inner city high-density area of Maboneng. The project was challenging in many ways, he says, but is an example of the powerful impact that these living pieces of art can have – for generations to come. +

THE NEW-AGE WORKPLACE ENVIRONMENT

A growing trend in open-plan offices has been proven to affect the rate of productivity and the general operating order in modern offices.

Research studies prove that the impact of the open-plan office on humans has a significantly positive influence on office function and interaction. The mix of spaces also highlights other amenities such as conference and training areas, private spaces where formal meetings are held; collaborative spaces where informal meetings take place, as well as the need for open workspace in jobs benefiting from teamwork and or knowledge/skills sharing (Kendra Cherry, 2019).

Our client, Rand Mutual Assurance (RMA) has recently turned a notable 186 years, where they have been successfully providing insurance for the South African mining industry. To celebrate their achievement RMA appointed Koen & Associate Architecture to "re-invent" the traditional office space at their new home located at 10 St Andrews Parktown.

Koen and Associates Architects is an award-winning design and build infrastructure development company who pride ourselves on innovative design and the implementation of new typologies. Koen & Associates Architects' aims were to renovate the typical office environment from its previously mundane, separated layout; to one which is open, integrated and where programmes flow effortlessly, encouraging highlights and symbiotic relationship between "WORK – PAUSE – COLLABORATE". This environment is inclusive of all individuals yet collectively represents the client, RMA, as well as all it stands for: "Caring, Compassionate, Compensation."

Eliminating the culture of enclosed offices and cubicles results in enhanced collaboration and relationship-building allowing for future flexibility. Construction costs for the project were reduced by using modern industrial design, exposing all previously hidden services like AC units, lighting and cables. The building is set to be given a "green -facelift". Green systems, such as a monitoring system, will log trends against consumption and alert facilities' management via email if there is an excess in consumption.

The lighting power density achieves an energy use of less than 1.5W/m^2/100lux for 98.1% of the Office Usable Area using the Green Star recommended method of calculation. Amongst other things, water-saving sanitaryware, including sensory low-flush systems, assists in the conservation of water in the building.

Programme: Space allows for freestanding office desks, private meeting areas, collaborative spaces as well as lounge settings. Studies show that it is important for the brain to rest and reload, pause areas allow for this while the lounge settings promote socialising and strengthening amongst the team, illuminating the need for rigid time control and giving the employee a sense of responsibility and empowering them to manage their time in an unconstrained manner.

Material: The use of various floor and wall finishes are applied to define spatial function, doing away with the traditional solid wall. This promotes open space and allows access to natural light and sensory artificial light in occupied spaces. Decorative acoustic panels and bulkheads will serve both an aesthetic and sound buffering purpose.

Furniture: A combination of textures and colours set a mood that is both calm and vigilant, while primarily being connected to the company's corporate identity. Flexible furniture was specified to allow for future changes and reorganisation.

The traditional walled office with its pyramid organogram is outdated. The new open-plan space works for a more modern collaborative workforce who share, like and tweet. The current layout allows a flatter chain of command in new business with spontaneous sharing of information. The new move to a new space is indicative of why RMA as a company has managed to maintain its 186 years of success. Keeping up with the current trends and needs of its workforce and consumers. +

KOEN & ASSOCIATES ARCHITECTURE

SAVINGS THAT GO ROUND AND ROUND

Revolving doors have been manufactured for over one hundred years, and according to the Invent Now Hall of Fame, Theophilus Van Kannel was granted a patent in 1888 for a revolving door that helped alleviate several problems associated with conventional doors. It served as an airlock, preventing the rapid influx of cold air into warm buildings on chilly, windy days. The manual revolving door also kept street noises and fumes out. When skyscrapers made their appearance, it proved useful when the pressure differences created by a large column of warm air inside the building and the outside cold air made conventional doors difficult to open or close. Moving from the small enclosed space of a revolving door into a building's hall entrance area made the space seem large and hence appealed to architects.

Since that time, the basic function of a manual revolving door has remained the same. The general design eliminates drafts and keeps debris from entering a building, providing a more comfortable environment. In warmer climates, such as here in South Africa, it is just as important to keep cool air inside. Frost International is the proud distributor of Boon Edam revolving doors, the acknowledged world market leaders in revolving doors, and has made a number of installations, including at 144 Oxford, featured in this issue. In terms of contributing to a Green Star building, revolving doors keep a separation between the indoor and external climate and have been shown to be eight times more energy efficient than the next best entrance alternative. In fact, an independent study conducted at MIT concluded that the energy savings from the single use of a revolving door over that of a swing door can power a light bulb for 23 minutes. Furthermore, across the faculty that this study was focused on, 14.6 tons of carbon could be saved annually, and $8500 per year.

ALWAYS OPEN, ALWAYS CLOSED

"The separation that the revolving door creates leads to less strain on HVAC systems," says Campbell Frost of Frost International. "Due to the savings in energy costs, Boon Edam revolving doors will often pay for themselves multiple times over during their life span." He goes on to explain that the use of a Boon Edam door not only increases energy efficiency, but also reduces noise, dust and dirt pollution due to the 'always open, always closed' principle.

In addition to the energy savings, the Boon Edam components that make up the door are in line with the European standards of practice. "Green Star buildings are the way forward, and it is becoming a goal for all to achieve these ratings," says Frost. The Standard Bank head office in Windhoek, also an Accredited Green Star building, also features Boon Edam doors.

In terms of security, Fortune 500 corporations and government agencies have been using revolving doors to offer protection to occupants, over the past twenty years. A revolving door therefore has the unique ability to provide both security and energy efficiency in one product, at a lower cost of ownership.

A RANGE OF PRODUCTS

Frost International are able to offer a wide range of Entrance and Security Solutions utilising their distribution agreement with Boon Edam. From 1600mm diameter manual TOURNIKET revolving doors to the impressive 7400mm high capacity automatic TOURNEX revolving doors, and any diameter in between. Doors can be manufactured to suit the clients requirements and are ideal when making a 1st impression at the entrance to a building.
Further to the entrance solutions, the CIRCLELOCK and TOURLOCK are high security "revolving doors", with associated high degree of software to enable secure monitoring and access control to restricted areas, providing excellent Security Solutions while maintaining the always open, always closed principle of a revolving door.

2020- FROST INTERNATIONAL'S 50th YEAR!. +

FROST INTERNATIONAL
Specialist Contractor

ALL THINGS CONSIDERED

Timber ticks the boxes as a sustainable and versatile building material

It is estimated that two billion square metres of new building stock will be required every year between 2019 and 2025 alone to keep up with urban development and population growth. This is according to a report by Arup, Rethinking Timber Buildings: Seven perspectives on the use of timber in building design and construction.

The report states that "space and resource constraints, climate change mitigation and resilience, and a greater focus on human well-being, among other factors, have stimulated new solutions and encouraged innovation."

This 'innovation' has seen us going back to basics – pre-stone and iron age – and looking to wood. Roy Southey, executive director of Sawmilling South Africa, couldn't agree more. "We need to get away from the notion that building with wood is reserved for tool sheds or log cabins. Timber is often overlooked by developers and architects as a viable, low carbon material for the local built environment."

Yet it ticks a number of boxes, not least of which being renewability.

THE CULTIVATION FACTOR

In South Africa, wood for structural timber comes from sustainably cultivated pine or Eucalyptus trees, otherwise known as commercial timber plantations or planted forests. Sustainable forestry sees to it that trees are planted, grown and harvested in line with international certification standards and local legislation. According to Forestry South Africa, only 6% of the country's total plantation area – 1.2 million hectares – is harvested annually. Felled trees are replaced in the same year by saplings, often at a ratio of 2:1. This means there is a constant supply of trees for productive purposes for years to come – all of them are sequestering (absorbing and storing) carbon as they grow.

South Africa's plantations remove a significant amount of carbon dioxide from our atmosphere during their rotations of seven to 20 years. This carbon remains stored in the wood – whether it's made into paper, a roof truss or engineered into cross-laminated timber for high-rise buildings. Credit SAFCOL

THE CONSERVATION FACTOR

South Africa is not a tree-rich country like Sweden or Canada. There are only half a million hectares of indigenous forests scattered throughout South Africa or roughly 0.4% of the total land area in the country. "If it wasn't for the commercial planting of trees in the early 1900s, the country's indigenous forests would have been eliminated many years ago for our fuel, furniture and fibre needs," notes Southey.

When wood is sourced from a certified plantation, there will be a chain-of-custody. This provides a link between the buyers and sellers (from the forest to the point-of-sale), providing assurance that the product is sustainably sourced.

THE CARBON FACTOR

Trees are nature's best carbon captors. South Africa's plantations remove a significant amount of carbon dioxide from our atmosphere during their rotations of seven to 20 years. This carbon remains stored in the wood – whether it's made into paper, a roof truss or engineered into cross-laminated timber for high-rise buildings.

THE COOL FACTOR

With its excellent thermal insulation value, wood can act as a humidity regulator, absorbing moisture in wet conditions and releasing it when the air is dry. Wood and natural materials deliver a certain degree of wellbeing, happiness and comfort that other materials can't match. "One only needs to think how good you feel in a wooded area, green space or a timber building," Southey says, alluding to the psychological hypothesis of 'biophilia'.

THE LOCAL FACTOR

The forestry value chain contributes R69 billion to the local economy annually with sawmilling supports approximately 30 000 people in predominantly rural communities. "Timber as a mainstream construction material is gaining momentum globally however perceptions need to be changed in South Africa," says Southey. "Wood is versatile and lightweight making it ideal for modular volumetric prefabrication of low-income housing as well as larger homes and multi-storey buildings."

All factors considered, wood brings something special, but it can have a greater purpose – to reduce carbon emissions and provide us with durable built environments. +

SAWMILLING South Africa

ENERGY AND WATER-EFFICIENT INSULATION: WHY THERMGUARD IS THE BEST!

The world is moving towards a low carbon economy and Thermguard is committed to doing its part for the South African market. By manufacturing insulation that consumes 10 to 14 times less energy than equivalent fibreglass and polyester products, we are offering a more sustainable product to all South Africans. Thermguard doesn't use any heat in the manufacturing process, since their raw materials don't need to be melted in a furnace, as is the case with the above two products.

A SUSTAINABLE PRODUCT

Further to that, no water is used in the manufacturing process either. There isn't another product on the market that is more energy and water efficient to make than Thermguard. Their cellulose fibre insulation is easily blown over pipes and wiring, filling all the nooks and crannies in a roof space, and sealing off the movement of air, heat and sound.

Thermguard has insulated South African homes since the '80s and is an expert in insulation technology. It now also offers an affordable installation machine which is available to anyone who wants to install a more effective and sustainable insulation – Thermguard.

Combined with a passion to look after our planet, they aim to offer the most eco-friendly roof insulation available. Remember, Thermguard is Recycled for Your Future.

For more information about products and services, or if you wish to find out more about their locally made installation machines, get in touch with the team at Thermguard today. +

PLANNING FOR PRODUCTIVITY

If you could increase your staff productivity by making a simple improvement to the building they work in, would you?

One of the improvements that can lead to better productivity is indoor temperature and staff thermal comfort. Greenplan recently undertook an analysis of an office in Somerset West that has an air-conditioning system but, to save money, the staff prefer not to use it. One of the purposes of the study was to determine the effect of thermal insulation above the ceiling on temperature and staff productivity. Currently it is uninsulated.

A 3D model of the office and surrounding building was created in DesignBuilder, and simulations were undertaken with hourly weather data. A sample temperature colour plot on a hot January day is shown in Figure 1 for the case without ceiling insulation. No artificial heating or air conditioning was simulated – only natural ventilation by means of open windows.

The loss of productivity related to temperature and thermal discomfort can be predicted from a number of mathematical correlations, noting that such correlations are based on averages and are dependent on a number of objective and subjective factors. Bearing this in mind, the addition of thermal insulation on the ceiling was predicted to increase the annual productivity of staff by 3-4 % due to improved conditions in hot weather. For this office, the insulation material cost would amount to only 10-30 % of the increase in productivity in one year. In other words, a favourable return on investment could be obtained with a payback period of less than a year – it would only take a few months to profit from the benefit of the insulation!

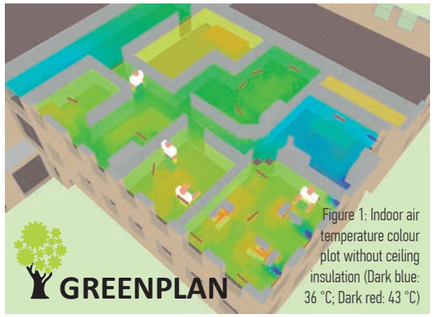


Figure 1: Indoor air temperature colour plot without ceiling insulation (Dark blue: 36 °C; Dark red: 43 °C)

With the building in its current state without insulation, if air-conditioning were used to control the temperature between 19-25°C, heating and cooling would consume 90 % more electrical energy than if ceiling insulation were installed.

Temperature and thermal comfort are one of several factors that can affect employee productivity. There are others such as daylight levels and outdoor air supply. Don't underestimate the possible impact of these on your employees. +

AFRISAM DRIVES ENVIRONMENTAL STEWARDSHIP AND SUSTAINABILITY

Today, the organisation has a comprehensive sustainability roadmap which covers a broad range of focus areas.

AfriSam is a leader in environmentally responsible cement and concrete manufacturing in southern Africa.

AfriSam has set itself stringent targets aimed at reducing energy consumption as well as converting to alternative fuel and alternative energy sources.

AfriSam signalled its seriousness about its environmental stewardship over 25 years ago with the introduction of its first environmental policy in 1994. AfriSam operates this drive towards 'greening' the industry at several different levels simultaneously, making it a leader in environmentally responsible cement and concrete manufacturing in southern Africa.

Significantly, AfriSam was the first cement, aggregate and readymix producer in southern Africa to publish an environmental policy in 1994. Today, the organisation has a comprehensive sustainability roadmap which covers a broad range of focus areas, including waste management, water conservation, biodiversity conservation, emissions reduction and energy management. The company has established performance indicators that continuously monitor and track compliance to the company's sustainability roadmap targets.

Perhaps one of the least known and exceptional examples of AfriSam's commitment to environmental stewardship is that of the significant archaeological and paleontological finds at its Sterkfontein quarry near the Cradle of Mankind. In this exceptional case, when AfriSam discovered the find it took a business decision to cease all mining operations in the interest of preserving this human heritage site. It has rehabilitated the area and is in the process of donating it to the University of Witwatersrand for further promotion of education.

The current water crisis has featured prominently in headlines recently, but conserving water is not something new for AfriSam. AfriSam has long been implementing measures to reduce water consumption. All operations have water balances in place which allow for optimisation of the resource, and we practice recycling of grey water, which reduces reliance on fresh water.

An important part of sustainability is the need to reduce energy consumption and this is an imperative for AfriSam. AfriSam has set itself stringent targets aimed at reducing energy consumption as well as converting to alternative fuel and alternative energy sources. +

AfriSam

AFRISAM SAIA SUSTAINABLE DESIGN AWARD

ARE YOU A LEADER IN SUSTAINABILITY?

Enter the AfriSam-SAIA Sustainable Design Award 2020

To mark a decade of the Award programme, all practitioners of sustainable design are invited to enter projects that respond to innovative architectural and design thinking in the field of sustainability into the **AfriSam-SAIA Sustainable Design Award 2020.**

The AfriSam-SAIA Sustainable Design Award recognises contributions that bring sustainable innovation to both urban and rural living environments through an integrated approach to communities, planning, research, architecture, building practice, natural systems and technology.

Entries should demonstrate how they embody sound practices, that bear the hallmarks of great architectural, social design and innovative thinking in the field of sustainability, to achieve a better future for all.

The Award recognises design excellence in the following four categories:

A) Sustainable Architecture
B) Research in Sustainability
C) Sustainable Products and Technology
D) Sustainable Social Programmes

How to enter:
Entries can be submitted online at **www.sustainabledesign.co.za** by 31 March 2020, Midnight (GMT+2)

If you are experiencing any difficulty in entering online, mail hello@sustainabledesign.co.za

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