+IMPACT

Official publication of the Green Building Council of South Africa

GREEN BUILDING COUNCIL SOUTH AFRICA

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FUTURE CITIES

How can we lay foundations for the sustainable cities of tomorrow?

Laying a strong foundation for a sustainable society

NEDBANK IS A PURPOSE-LED BUSINESS THAT UNDERSTANDS ITS PART IN HELPING TO IMPROVE SOCIETY

Guided by the United Nations Sustainable Development Goals (SDGs), a set of common goals to create a better world and society, Nedbank is using its financial expertise to create value, building sustainable cities and communities through lending in the residential sector and investments in resilient built environment technologies. With 3,5 billion people already living in cities worldwide, the success of our future economies will depend on sustainable development solutions within the built environment.

Affordable housing

Nedbank's product enhancements focus on making housing more affordable for clients. Last year Nedbank provided R943m in home loans to clients in the affordable-housing market, and continued to waive upfront bond initiation fees for qualifying clients with a monthly household income of less than R22 000, resulting in R20m in savings for clients. In 2018 the offering was further enhanced with a 50% discount on attorney bond registration fees.

In 2018 Nedbank also disbursed R1,2bn towards 2 860 affordable-housing units and provided capital for more than 2 700 social-housing units, offering access to quality rental housing below market prices to households earning R1 500 to R15 000 a month.

This social-housing initiative will enable residents to live closer to work, schools and healthcare and other facilities, thereby reducing transport cost and boosting socioeconomic mobility.

Green affordable housing

Communities continue to reap the rewards of the bank's funding and support for affordable-housing developments that incorporate energy- and water-efficient technology. In 2018 water savings at the Belhar Gardens social-housing rental development ranged from 15% to 25%, with the monthly usage of each unit averaging below 6 kℓ, in compliance with extreme water restrictions in Cape Town. This has shielded lower-income residents from steep tariff hikes associated with the drought.

Green buildings

In 2018 Nedbank provided funding of R4,8bn for the construction of buildings that conform to green building standards, which will further increase energy and water efficiencies achieved by green buildings in the country. Nedbank's l ong-term green building strategy is focused primarily on the Green Star Existing Building certification, which will see all Nedbank buildings certified by 2030.

Led by our purpose to use our financial expertise to do good for individuals, families, businesses and society, Nedbank will continue to develop innovative products and services as well as finance and investment solutions that enable a prospering society and thriving business.

see money differently

Putting our own house in order first

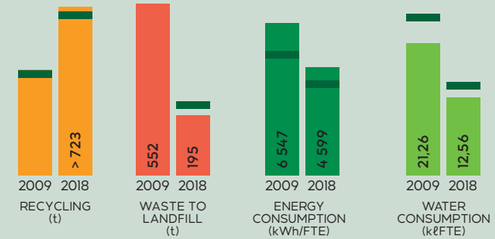
The bank has been setting and achieving ambitious internal reduction targets in its operations for over a decade. Here are some of the highlights of our sustainability journey:

Green stars

In 2009 Nedbank achieved the first Green Star rating in South Africa for Nedbank Phase II. Currently Nedbank occupies 10 Green Star-rated buildings, reaping the benefits of water and energy savings as well as staff wellbeing. Interventions in our buildings include tap aerators, air-flush toilets and motion-sensitive lighting.

Reduce first, then offset

Nedbank has been carbon-neutral since 2010. The bank focuses on internal awareness initiatives and behavioural change to drive reductions and invests in offset projects that preserve the natural capital and improve the society in Africa.



REDUCTION TARGETS

Targets per fulltime employee (FTE). Water, waste and recycling are based on Nedbank campus and mini-campus FTEs. Read more about Nedbank's operational footprint and its related scope and boundaries at nedbank.co.za.

Our net operational water usage is zero

The WWF-SA Water Balance Programme ensures healthy and effective water source areas in South Africa and helps to increase water supply through the removal of invasive alien plants. It also delivers economic and social benefits through job creation.

Donated R12m over eight years:

> 450 hectares of land cleared

± 1 billion litres of water a year kept in vital water catchments

> 47 000 workdays created for communities

NEDBANK

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The official publication of GBCSA

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

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Cover image: The MARC, Sandton; photo by Adam Letch

As the concept of sustainability is applied to the built environment, it has become clear that doing less damage is not enough.

A MESSAGE FROM THE CEO

Beyond: Shaping Cities of Tomorrow is our annual convention theme for 2019, tying in with the launch of this fourth edition of *Positive Impact*. How will you contribute to shaping the cities of tomorrow beyond buildings? What kind of environment do we want our children to grow up in? What pressing issues can future cities help us solve? How does government and business need to adapt to make better future cities a reality? These are the questions we need to explore, and they go beyond being green.

Green building is an absolute necessity, but with much of the world becoming a global city it simply cannot be viewed in isolation. According to the *World Urbanization Prospects Report* published by the United Nations Department of Economic and Social Affairs in May 2018, 55% of the world's population lives in urban areas, and a proportion of that is expected to increase to 68% by 2050. Projections show that urbanisation – the gradual shift in occupation of the human population from rural to urban areas, combined with the overall growth of the world's population, could add another 2.5 billion people to urban areas by 2050, with close to 90% of this increase taking place in Asia and Africa. Urban growth is also coupled with the rapid development of mega-cities, almost tripling from only ten in 1990, to 28 in 2014. This trend is expected to continue with up to 90% of global urban growth coming from low- and middle-income countries, especially in Africa and Asia. This brings a rising number of challenges including poverty, lack of basic resources, overcrowding, deep eco-footprints, etc.

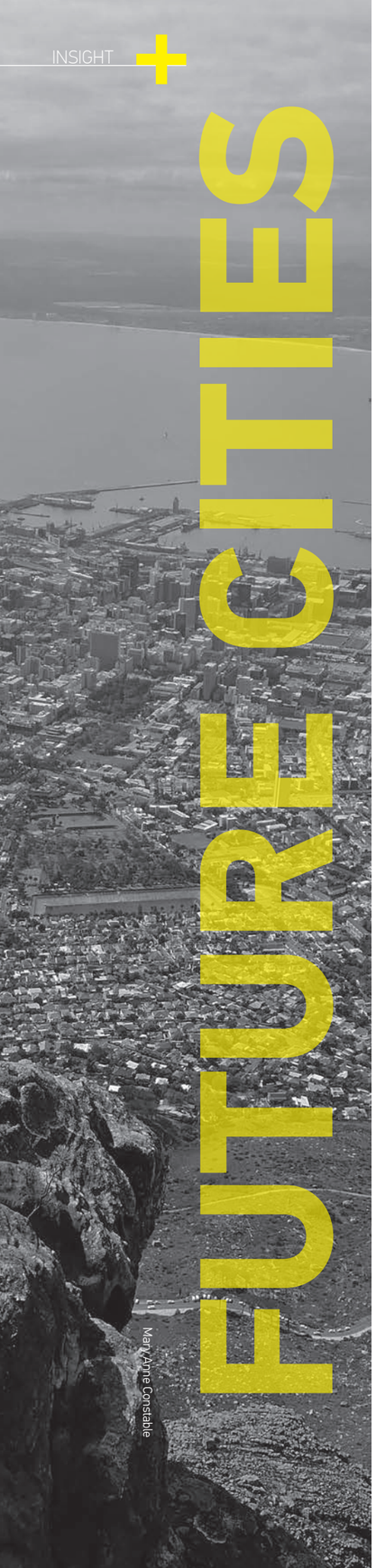
DOING LESS IS NOT ENOUGH

Initially, green buildings were intended to reduce damage to the environment and human health caused by creating and maintaining buildings and neighbourhoods. As the concept of sustainability was applied to the built environment, it has become clear that doing less damage is not enough. Leaders in the field now speak about buildings and communities that are regenerative, meaning that these sustainable environments evolve with living systems and contribute to the long-term renewal of resources and life. This was the theme of our February issue, with practitioners exploring what it would mean to move beyond 'sustainable' and participate as a positive developmental force in our ecosystems and communities. Regenerative projects strive toward 'net zero' – using no more resources than they can produce.

And then there's the challenge of creating an inclusive city – one where its development programme includes ample participation from its citizens and a variety of activities with no sort of; its activities are planned with local communities in a transparent way and recognise diversity while promoting equality; urban factors such as affordable housing with access to necessary infrastructure and services are considered, and overall economic growth should engulf all of these factors, attempting to provide employment opportunities and aiming to eradicate poverty.

These are the building blocks that the GBCSA and its stakeholders are working with to help take us to a sustainable future – come journey with us, and see what is being done to create cities that are cleaner, healthier, happier places to live, work, learn and play.

Dorah Modise
Green Building Council of South Africa



It's been a year since *Positive Impact* was launched at the 2018 GBCSA Convention, and what a year it's been. The IPCC special report on global warming revealed the disconcerting effects of an imminent 1.5°C increase in average global temperature; Greta Thunberg inspired a movement of teenage climate activists; the Extinction Rebellion movement raised global awareness; the Amazon rain forest continued to burn (as did Notre Dame Cathedral); and unsurprisingly Britain is still part of the EU.

We submitted our February 'regeneration' issue of the magazine to the 2019 SAPOA (South African Property Owner's Association) Journalism Awards for Excellence, this year themed: 'Authentic journalism is good business practice'. In June we were honoured with the grand prize: Property Publication of the year. To me it is extremely significant that a brand new non-mainstream publication, that holds sustainable building practice at its core, was accoladed above all other property publications (which this year included online as well as print) – a noteworthy nod to the green building industry, and evidence that our voice is being heard above the fray. May this recognition continue to grow.

Every year, our October magazine will run alongside the GBCSA Convention theme. This year, *Beyond: Shaping Cities of Tomorrow* – an exploration of green building in its wider context of the city, and an imagining of the city of the future. This theme is explored in more detail elsewhere in this issue, so I'll whet your appetite with a concept that I believe can help us lay the foundations for the cities of tomorrow.

The future city is not a more mechanised one but a living one.

A couple of months ago I attended an inspiring talk about ecosystem restoration by visiting Chinese American ecologist, John D Liu, organised by Greenpop. "Ecological function is more valuable than 'things'," he said, noting how our current economic structures lend towards exploitation and ultimately degradation of our natural environments and landscapes. In a personal interview with Liu a few days later, he spoke about mankind's obsession with 'abiotic' or non-living systems – systems that are finite, measurable and controllable. Abiotic things are created and then end up in the trash. He argued that generation of societal wealth is based on abiotic systems, usually in parallel with exploitation of 'biotic' or living systems. He calls this a false narrative. Biotic systems on the contrary, are massively complex, never fully understood and cannot be controlled. They hold one special power that abiotic systems will never trump (had to use that word) – the ability to resurrect themselves when they die. This is the core of regenerative practice.

The building industry is traditionally based on abiotic systems. Buildings are usually static, made up of inanimate materials, and controlled by finite mechanical systems. These are the spaces we spend our lives in, and the building blocks of our cities. But to me 'real' architecture (and I mean good proper resilient design) is about more than abiotic systems – it is about connections between the living and non-living, and a manipulation of inanimate space to serve those who live within it. It is about more than just a building but about the spaces around and between buildings, and the connections within the city. A skilled architect is able to bring a space to life.

The future city is not a more mechanised one (it will no doubt be a 'smart' one controlled by hi-tech digital systems) but a living one; a regenerative and caring one; one that values people over things, and resilience and longevity over short-term gain. It is also one in which we all take collective responsibility, acknowledging our individual roles in maintaining the commons. Jason F McKlennan, architect and creator of the *Living Building Challenge*, and also a keynote speaker at this year's convention, concurs. "In the future there will be a lot more reliance on natural ecosystems to do the work; blending nature and cities is more possible. It is very much the opposite of a science fiction future."

So, I pose the question to you: What does your city of the future look like? Is it one that you want to be living in? And if not, what can you do today to change that?

Mary Anne Constable

Editor *www.thepaperarchitect.com*

Turning Joburg's inner city into a construction site

It's one thing to hear a declaration that Johannesburg's Inner City is going to be turned into a construction site; it's quite another to see soil being turned, which is exactly what happened recently as Executive Mayor Herman Mashaba, Cllr Reuben Masango (MMC for Development Planning) and Cllr Leah Knott (MMC for Economic Development), together with other key stakeholders, attended ground-breaking ceremonies at four of the city's 84 reclaimed buildings that have been awarded tenders for development.

The buildings are the first in a batch of 154 derelict inner-city buildings that have been put out for tender to the private sector. They have attracted R22 billion investment, will create approximately 12 000 jobs and will yield about 6500 affordable housing units, as part of this ambitious project to rejuvenate Joburg's inner city and make it a place where people can live, work and play. "To put things in context," explains Mayor Mashaba, "when I took over the administration in 2016, I realised we had a backlog of about 300 000 affordable housing units. We had a student housing crisis, with students sleeping on the street and in libraries. While housing is not a mandate for a municipality, I began to conceive a dream, and in my first one hundred days in Office I issued a profound statement that I was going to take back the inner city, including all the hijacked buildings, and offer them to the private sector to submit proposals for development." This includes proposals for a variety of mixed uses, including student and residential accommodation, SME centres and all the other services (schools, retail etc) that make a city liveable.

The Mayor explains that many were sceptical about the feasibility of the idea. "But I kept thinking, if you have a government that is willing to work with the private sector, I cannot see why the private sector would not accept this offer?" Today, Mayor Mashaba is happy and humbled to say that the uptake of the private sector has far exceeded their expectations, and, after the imminent release of the next 70 buildings, another 350 or so will follow in due course.

A MIXED BAG

Cllr Masango, MMC for Development Planning, explains that the releases consist of a "mixed bag of land parcels" – buildings together with open spaces of land; all of which will be demolished or renovated or redeveloped according to the community's needs. World-class affordable accommodation will be available from R900 per month, per unit. "For me personally, in addition to being clean and safe, I believe that a pedestrianised inner city, with a connected transport system, free from traffic congestion, is key. If people can walk around, it contributes towards making the city vibrant and inviting of economic activity." The Counsellor said that his Department is working on the release of a Green Building Policy, given that sustainability is a critical part of designing cities for the future. On the issue of green building, Mayor Mashaba made the comment that even without a policy in place, the majority of the private sector investors had plans to build green, given its environmental importance as well as good business sense. Cllr Knott, MMC for Economic Development, cites one of her favourite proposals, that of a restaurant in the old inner city firehouse. "They have planned for air quality control, rain water harvesting, and various other features to breathe sustainability into this historic space."

Speaking of good business sense, Cllr Knott weighed in with her view that buy-in from the public and proper support from the government, as well as realistic expectations makes a great property investment. "Converting a derelict property miles from commercial hubs into social housing, for example, achieves nothing except placing people further away from opportunities. Proper precinct planning and a land strategy from the side of the City greatly assists in achieving investment goals," she said. The City has already vastly increased investment into the area over the last three financial years to over R16 billion in the 2018/19 year which is outside of the inner city property release programme. This proves private investor confidence has steadily risen over the last few years. "As investors see the value of the buildings and land increasing around them, it creates a knock-on effect, and the increase is exponential. Excitingly, that is what we are seeing happen," she says.

"To investors, I'd say that now is the time to invest in the City of Johannesburg," says Mayor Mashaba. "Those that come in three to four years' time will find that it is expensive. We believe that the Inner City will overtake Sandton; but it will be for low-to-middle income South Africans, as that is the majority that needs to be catered to."

NOT AN EASY ROAD

Of course, achieving this lofty goal does not come without obstacles, and Cllr Knott says that in many ways their real challenges will start now, given that building has commenced. "Ten years ago, we had about two million people in the inner city; we are now dealing with upward of ten million. That's a huge number to contend with, amidst the chaos that comes with construction." For Mayor Mashaba, a great risk is the breakdown of the rule of law. "It is the role of national government to punish criminality. We need to mobilise society to express that this needs to happen, that criminal activity must be punished in South Africa." Cllr Masango explains that the Inner City Programme calls on many departments to work together, and this can pose quite a logistical challenge. "It's about co-ordinating housing, city power, infrastructure; being mindful of heritage, open spaces, the environment, social issues etc – it is about bringing everyone together on the same page, and we are starting to see that happen, which is encouraging."

Being able to work together and partner is also one of Mayor Mashaba's highlights so far. "One of my biggest fears was not getting the support of my coalition government, and it was a real high point when they got behind me and bought in to the dream. Cllr Masango says that the fact that the large investment figure attracted by a single project is significant from his side. "As well as the job creation. Anything that brings job creation is a highlight for me."

Mayor Mashaba mentions as a matter of interest that the Minister of Public Enterprise contacted him recently about how they can roll the project out nationally. "Derelict inner cities are a national problem. I have provided them with a draft MOU on how to run their project, as we are already three years' down the line. We would love to see this happen across every province, and are calling on the private sector to help take back all our cities. The last thing we want is to be victims of our own success, and have people flocking to Joburg's Inner City from all across the country."

"I was recently in Singapore," says Cllr Masango, "and was struck by the similarities we share in terms of challenges. They have managed to turn their city around using the same principles of public private partnership. What struck me as being important for us to get right locally, is how the people of Singapore take ownership over their public spaces – they don't litter or vandalise, and their parks are looked after by the people who use them." A collaborative effort is of course at the heart of future success. The City of Joburg are working together with the private sector to deliver the right development mix, at the right price, and then it is up to citizens to take back their city for themselves, one individual at a time. +

www.joburg.org.za

GREEN BUILDING COUNCIL SOUTH AFRICA

12TH GREEN BUILDING CONVENTION 2019

Shaping the cities of the future

We are living in a reality that was once the imagined domain of science fiction stories. The climate is changing; extreme weather events occur daily; pollution is affecting our food and water systems; and rapid urbanisation is increasing demands on cities' infrastructure and social housing. How can we adapt and address these concerns?

The GBCSA's 12th Green Building Convention tackles the theme *Beyond: Shaping Cities of Tomorrow*. GBCSA CEO, Dorah Modise, explains that initially green buildings were intended to reduce damage to the environment and human health caused by creating and maintaining buildings and neighbourhoods. As the concept of sustainability was applied to the built environment, it has become clear that doing less damage is not enough. "Pioneers in the movement have now begun to explore buildings and communities that are regenerative and fully integrated. These are spaces that encourage full participation of those who live, work, play, learn, and live in them. All-rounded sustainability solutions are now being applied to design, construction and operational elements of neighbourhoods and that for me is the essence of what cities of tomorrow should morph into."

***Positive Impact* spoke to five of the convention keynote speakers to discover their thoughts on driving transformation towards resilience and regeneration, and reimagining the cities of the future.**

WORDS Melissa Baird

JASON F MCLENNAN

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 architect and thought leader, and recipient of the prestigious Buckminster Fuller Prize – the planet's top prize for socially responsible design. He created the *Living Building Challenge* and has authored six books on Sustainability and Design.

REGENERATIVE DESIGN

You are an architect and thinker who is helping to re-shape the world. How would you explain the philosophy of the 'living building'?
JM: What I do and promote is the idea of regenerative design, meaning we are creating projects that leave the world in a better place because of how they happen. It is time we learn to design cities and buildings that are truly net-positive. They can't be less bad. We need to consider how we regenerate and create greater conditions for life – that is the philosophy of the Living Building Challenge.

How do you feel about visiting Cape Town and presenting your keynote address?
JM: I am delighted to be coming to Cape Town and sharing the lessons we have learned by doing regenerative design. It seems to me, the time is ripe for South African municipalities to make a big leap forwards in terms of how they build and their relationships with energy, water and other materials. The technologies have come a long way and the costs have changed so it's time for a big shift in how we do things. Around the world we are seeing more communities declaring a climate emergency and putting in place policies that can address that emergency. Different communities are trying to find out how to set up incentives and new regulations to quickly change the climate footprint on a city-to-city scale.


Heron Hall – residence in Washington, US.


Phipps Conservatory


Bullitt Centre


Brock Environmental Centre

The Living Building Challenge

The *Living Building Challenge* (LBC) calls for the creation of building projects that operate as cleanly, beautifully, and efficiently as nature's architecture. The LBC is the built environment's most rigorous performance standard, conceived by Jason F McLennan and administered by the International Living Future Institute, which he founded. As a standard, it provides a holistic approach to high-performance building that aims to address health, community, equity, energy, water, and beyond. The above images show three examples of full LBC-certified projects in the US.

Can you speak about urban sprawl from a living building perspective?
JM: It is part of the reason we are in the trouble we are in. Cities have sprawled without designing public transport systems that are adequate, and the automobile has become the dominant form of transport. It is a problem every city has. We fell in love with the automobile and didn't think of the consequences of the emissions from the fossil fuels.

What does the city of the future look like?
JM: A lot of what I am writing about is around that very subject: how are going to live in the future and what would that look like? The infrastructure of the future is going to be very different from what it is today, which is all about hard engineering solutions that use a lot of energy. In the future there will be a lot more reliance on natural ecosystems to do the work; blending nature and cities is more possible. We are going to be inviting nature back into our communities more actively in terms of how we manage food production, and how we handle storm water and urban greenways. The cities of the future will be quieter, cleaner and run on natural energy. It is very much the opposite of a science fiction future – which is not a healthy built environment to be in. Imagine cities that are living and thriving. They are a human habitat and a habitat for other species, and this is what we are going to have to get to if we are going to make it.

mclennan-design.com

LUISA BRAVO

Regeneration is a result of systems that enable life to flourish. In cities, access to space is a question of economy and privilege, and this is where the work of Luisa Bravo has captured global attention. She is the chief architectural engineer of her company Bravo Design, and a world-renown academic scholar with expertise grounded in extensive post-doctoral research and teaching in Europe, US, Middle East, Asia, and Australia. Luisa has as much insight to give into the future of urban planning on an intellectual level, as she does on a practical level.

DEMOCRATIC PUBLIC SPACE

How did you become a 'transformer' in the renovation of public spaces and what is your vision for the next five years i.e. what are the key areas of your focus and how will you measure success?
LB: After working as an urban designer, both at the academic and professional level, I realised that something was missing in my approach and theoretical understanding. I needed to change my perspective, so I founded the NGO – City Space Architecture to explore and learn from the bottom-up. That was a turning point in my career: I could clearly see complexities and difficulties in defining public space as a common good. I experienced inequalities, contradictions and conflicts and that's when I started to shape my vision. I'm currently leading a global campaign aimed at including public space in the Concept Note of the 10th World Urban Forum, that will take place in Abu Dhabi, and I'm working to start the Public Space Academy in 2020 (www.publicspaceacademy.org).

Describe the focus of the UN-Habitat's Global Public Space Programme and its relevance in guiding future development of the built environment in South Africa.
LB: The UN-Habitat's Global Public Space programme is committed to promoting public space as an important urban asset for more compact, connected and socially inclusive cities. It consolidates knowledge, good approaches and methodologies on public space for local governments, through policy guides, capacity building, knowledge sharing, and by carrying out advocacy work and actual implementation. The future development in South Africa should be informed by this human-oriented approach and grounded in an effective public space strategy. This means redefining urban environments around public space, bringing awareness across urban actors on sustainable planning principles and tools, managing rapid expansion and retrofitting existing settlements towards more sustainable patterns, reducing poverty and supporting human rights and gender equality in urban areas, and promoting public space as a priority in the political agenda.

In your experience how have public spaces been able to action social transformation?
LB: Public space can foster innovation and social transformation. Well-designed and well-managed public spaces provide opportunities for both formal and informal economy; attracting investments, entrepreneurs and services; enhancing the value of land and of real estate properties; redefining urban environments with human vibrancy and livelihood; encouraging walking, cycling and play; as well as improving physical and mental health.

What is your vision for the cities of the future?
LB: They should be committed to pursuing human-oriented urban planning strategies, strongly informed by public space culture. My ambition is that future generations of urban citizens will define public space as an 'urban common' which is open and inclusive and offers a stage for freedom of expression, civil rights and human coexistence. Today, more than ever, we need a proper understanding and consciousness based on human beings. We need a different system of education based on public space culture for youth – the leaders of the future. We need to invest in human capital and become humanists in order to unfold a new human-oriented vision.

Learn more:
www.cityspacearchitecture.org
www.journalpublicspace.org
www.standupforpublicspace.org

ERNESTO INFANTE BARBOSA

The green economy is driving transformation in the banking sector which is responding to the need to adapt funding methods in order to encourage development of energy-efficient and less carbon intensive social housing. Ernesto Infante Barbosa joins the convention in his capacity as an economic expert and experienced implementor in sustainable social development. His work in green finance flows over into sustainable housing and education. His current role is as advisor to the governor of Mexico's Central Bank.

GREENING DEVELOPMENT FINANCE

What have your major obstacles to encouraging a new direction for the banking system to opt for less carbon-intensive investments been?
EB: The main problem is awareness and costs. We need to develop social housing and the financial systems to support it in a way that does not exclude people from the base of the pyramid. Developers always send the costs towards the buyers, so development of the market will help to lower the cost and we can provide more information in terms of the vision. We also need to be more transparent with what we are delivering and the disclosure of information, as well as policy. In Mexico if we don't have the government saying this is the way it is, no one will follow.

Your experience in developing sustainable housing projects has been extensive; what advice would you give to South African developers about developing sustainable projects at scale?
EB: In association with multi-lateral and bilateral banks, as well as green funds, we have been able to offer incentives towards changing the way things work. The new financial schemes gave a 2-3% discount on the interest rate of the construction loan, and this enabled investment in better technology. We also developed a taxonomy to show how social housing was built from the low and middle end. I focus on climate finance, mitigation, and understanding social housing in order to help families pay less for the operation of the house; and at the same time not pay extra for a green mortgage, as the developer cannot sell the house at an extra cost for the technologies, given that they receive a subsidy in the construction loan that should match that extra cost.

Talk to us about the success of the ECO Casa and how it has been measured.
EB: The ECO Casa was launched in 2013 in association with the IDB and KfW who provided funding through a blended finance scheme from the World Bank's climate investment funds. ECO Casa takes into consideration the conceptual design of the policy of the NAMA (Nationally Appropriated Mitigation Actions) for housing, management of waste, transport, and agriculture. With the cooperation of our UK and German experts, we created a map and developed financial schemes that would be helpful from the supply side (for developers), and then pushed the demand side with the mortgage institutions (for the public and private sector).

The current portfolio for ECO Casa is mitigating 2.5m tonnes of CO_2 in approximately 80 000 units. ECO Casa has changed the paradigm – it is the real hero of green housing in Mexico. There are huge opportunities for IFC (International Finance Corporation) with EDGE in all sectors – residential, educational, industrial and hospitality. In this context, ECO Casa has also given opportunity for other schemes to be created because the banks and developers now understand. We have democratised the sector.

Has this technology been introduced to South Africa?
EB: In South Africa you have some software options like EDGE, the Green Star rating tools, and LEED. It's important to understand your needs first, and then implement the software – this helps the banks and developers. To certify a project in LEED costs a lot of money, so LEED for homes wouldn't be feasible in emerging markets for now.


ECO Casa – a green finance solution.

DAVID VINER

Professor David Viner (FIEnvSci) has extensive experience in research and policy creation. He is the global practice leader for climate resilience at Mott MacDonald and a visiting professor at the University of East Anglia. He was a lead author on the *Special Report on Climate Change and Land*, and is a co-ordinating lead author for the *Sixth Assessment Report of Working Group 2* of the IPCC (Intergovernmental Panel on Climate Change).

CLIMATE CHANGE POLICY

In your role as global practice leader, how do you overcome the barriers to scientific understanding that prevents government and business leaders from making radical changes to policies that could be more socially, ethical and environmentally sound?
DV: One of the key challenges is that people think climate change science is complicated; it isn't. Greenhouse gas emissions have irradiating properties – this is basic science. The challenge is how we deal with this consequence and how it affects the global economy that has been founded on carbon-based energy supply for 250 years.

You are presenting to a South African audience about how policy can help drive change, what does this mean for you and what polices are pivotal to a resilient city?
DV: In the South African context (I've worked with the Ethekweni Municipality) the legislation that exists is progressive. The South African government has accepted climate change science and created policies to reflect this. Education and knowledge development are crucial, so people understand what's going on. We only have 10 years to put in place effective policies to reduce greenhouse gas emissions and turn this rapidly southward – we must hit net negative by 2050.

South Africa is not operating on its own, there is the global context which is why governments must provide policies at a national level that contribute positively to the global context. Extreme weather impacts across the world occur on a weekly basis, killing people and causing massive damage to infrastructure. We must build a future that is resilient, and this involves lifestyle and consumption changes as much as it does policy.

We will need to have policies that move away from internal combustion engines and that stop the sale of these types of vehicles. We need an enabling environment to support good public transport, and legislation must be in place to target and minimise food waste. In the USA and UK, 50% of food ends up in the bin. Everything that is built must reduce its impacts and have zero-carbon impact. Products need to be able to be reused and recycled. I wonder if the buildings we build today are set to deal with the climate in 2050.

So, the city of the future is populated by vegetarians who cycle to work and have their own energy systems that support the national grid?
DV: I won't say you have to become a vegetarian, but science is proving that plant-based diets have less impact on land use and land use is pivotal in how we manage our future impacts on the planet. People think just changing from an internal combustion engine car to an electric car will solve the problem, but we must examine if there are enough resources to build new cars. The city of the future will have functioning public transport systems which use resources better.

People must see what is coming toward them. As cities get hotter, healthcare systems need to be in place to manage the ails of citizens. As extreme rainfall events becoming more intense, stormwater run-off and potential flooding need to be managed effectively. Coastal cities are going to feel severe impacts.

www.mottmac.com

Hope for the future: Tree nursery and local growers, Malawi.
Background: The Shire River – the largest river in Malawi – plays a crucial role in Malawi's economic development and power production. However, widespread soil erosion from a mix of heavy precipitation, mass deforestation, and poor farming practices throughout the basin, is silting up hydropower stations and threatening to cause long-term damage to water supplies, power supply, food security, and the region's micro-climate. This project, funded by World Bank, involved working with the government of Malawi and local communities to help reverse this downward trend. Mott MacDonald's International Development team were involved in, among other things, a tree nursery project – enabling livelihood promotion, environmental awareness, and the provision of a suite of ecosystem services (carbon sequestration, water attenuation and purification, erosion control, etc). Over 8000ha of forest was replanted and regenerated.

JO RUXTON

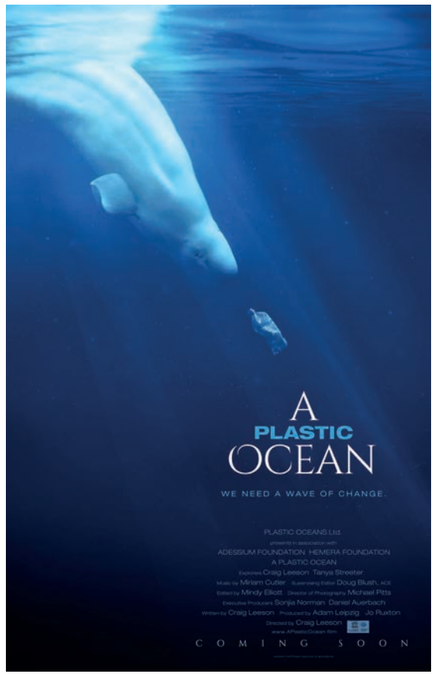
Policy, philosophy, economy and democracy can create shifts, but can be done about the tonnes of waste that cities create? Jo Ruxton is a champion against waste, with a passion for telling powerful stories in order to shift perspective on the issue. She began her career with the World Wildlife Fund in Hong Kong and was a producer at the BBC for the Natural History unit. This media-rich background led her to produce the highly-acclaimed film: *A Plastic Ocean*.

MANAGING PLASTIC WASTE

As the co-founder of the Plastic Oceans Foundation, what have you found to be the most successful campaign tactics in inspiring behaviour change in consumers about their relationship to plastic?
JR: The campaign began with awareness through the film. Unlike many environmental films, it sets a very simple, eye-opening context, showing strong images with compelling stories. This makes the message hard to ignore and the solutions something everyone can contribute to.

What ocean-clean-up technological solutions have you seen, and do you think these innovations are enough to turn the tide on plastic waste in the ocean?
JR: It is a misconception that you can clean the oceans, you can't. Ninety percent of the plastic is on the sea floor and much of it is broken into tiny fragments. Most is either too deep and mixed with sediment or it is microplastics at the ocean centres mixed with life-giving plankton, which you cannot separate out and it is invisible from the surface. Clean-up methods have been designed based on the myth that there are giant 'islands of plastic' at the centres of the oceans, but these are inaccurate portrayals of a much more insidious problem. The only real way to tackle this is to prevent it from happening in the first place.

Do you think more stringent bans and levies would assist the reduction of plastic consumption?
JR: I think that more stringent bans and a resulting reduction would help the current situation. Banning styrofoam all together would be a good start. Polystyrene has been shown to leach chemicals into hot food and drinks, fatty foods in particular. Yet it perpetuates in an industry that relies on fast food and disposability. Polystyrene is almost impossible to recycle, there are very few facilities that will take it, and yet it is ubiquitous. Huge pieces of this foam are used as packaging, especially in the large electronics industry and yet moulded recycled cardboard does just as good a job, as does mushroom mycelium, which quickly grows and dries into the shape of the mould. The mycelium can protect delicate goods as well as any polystyrene and when it is no longer needed, it decomposes naturally. +

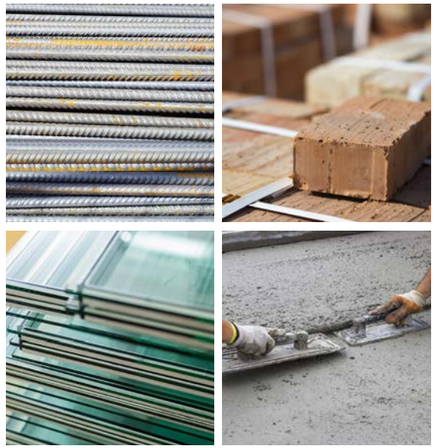


A Plastic Ocean was filmed in 22 locations around the world and took eight years to produce. It has been seen in more than 60 countries. Described by Sir David Attenborough to be 'The most important film of our time' it documents the global spread of plastic waste and why we must change our behaviour and turn the tide.

www.plasticoceans.uk

Agrément South Africa

set to launch eco-labelling system for building materials and products



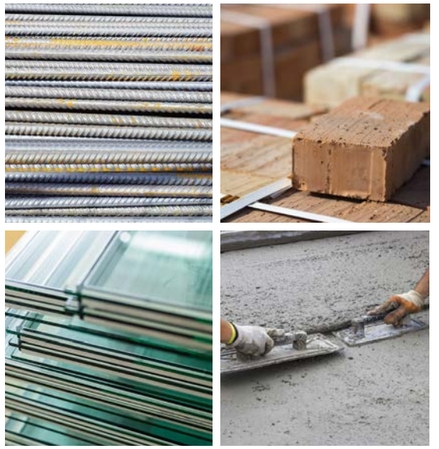
The Department of Public Works and Infrastructure (DPWI) launched its *Green Building Policy* in October 2018. This policy sets out principles for government-owned, operated or occupied buildings. These principles will be used by the department to develop, maintain and operate its portfolio of buildings to reduce their environmental impact. The *Green Building Policy* is implemented through the Department's Green Building Programme which addresses; energy efficiency and renewable energy; water efficiency; integrated solid waste management; eco-labelling of building materials and products; and the integration of Indigenous Knowledge Systems (IKS), such as biodiversity and building materials.

One of the objectives of *The Green Building Policy*, is to facilitate the establishment of an eco-labelling system for building materials and products. This government-endorsed eco-labelling system aims to encourage the principles of indoor environmental quality and comfort, and material resource conservation and efficiency. The Department of Public Works and Infrastructure will develop requirements for the use of environmentally sensitive eco-labelled materials and products to be incorporated into the South African National Standard – Part X, which deals with environmental sustainability. The Department, through its entity Agrément South Africa, will develop guidelines and minimum standards, referred to as *Specifications*, for the use of environmentally sensitive eco-labelled materials. These guidelines and specifications will be adopted by the Department and incorporated into the Department's relevant *Standard Specifications for Construction Works*.

Agrément South Africa, an entity of the Department of Public Works and Infrastructure, was appointed as the Competent Body (or the licensor) to oversee the establishment and operationalising of the government's eco-labelling system for building materials and products, provisionally known as ecoASA Label. The entity was established in 1969 and operates under a delegation of authority from the Minister of Public Works. In December 2015, Agrément South Africa was recognised as an independent agency to bring impartial judgment to the evaluation of innovative construction products and systems in the interest of the consumer, and the construction industry at large.

At inception, a Working Group established at the Department's level evaluated existing international and local eco-labelling systems in order to determine if any of the systems could be adopted. The group concluded that none of the evaluated systems could be adopted for use in South Africa and that there would be a need to establish a government-endorsed eco-labelling system, drawing on international standards but modified for South African conditions. The eco-labelling system will be established based on existing international standards and adapted for suitability in South Africa. In particular, the system will so far as possible conform to ISO 14024 Environmental Labels and Declarations: Environmental Labelling Type I, Guiding Principles and Procedures. The principles of this standard state that:

- Type I environmental labelling programmes must be voluntary in nature;
- The labelling programme must conform to ISO 14020 Environmental labels and declarations – General principles, in addition to ISO 14024;
- Environmental labels may only be granted where the material or products complies with South African environmental and other applicable legislation;
- Eco-labelling criteria referenced in the various Specifications must consider the whole product life cycle;
- Eco-labelling criteria shall differentiate environmentally preferable products from others based on a measurable difference in environmental impact;
- Attainable levels must be set for eco-labelling criteria, considering relative environmental impacts, measurement capability and accuracy;
- Eco-labelling criteria shall consider the fitness-for-purpose of the materials and products, as well as their level of performance;
- Eco-labelling criteria must be established for a set period and reviewed within a predefined period, considering factors such as emerging technologies, new products, environmental information and market changes;
- The criteria development process of establishing eco-labelling criteria must comprise formal open participation among interested parties;
- The eco-labelling criteria requirements must be verifiable by a Competent Body;
- Transparency must be demonstrated in all stages of the development and operation of the eco-labelling system;
- The eco-label must not inhibit trading practices;
- The eco-labelling system must be open to all qualifying potential applicants;
- The development of eco-labelling criteria must be based on comprehensive scientific and engineering principles, and must be the result of data in support of the claim 'environmental preferability';
- The eco-labelling programme must be free from undue influence and source(s) of funding must not create a conflict of interest;
- The costs and fees for participation in the eco-labelling system must be kept relatively low and applied fairly to all participants;
- Confidentiality must be maintained for all information considered confidential; and
- Mutual recognition and based confidence should be encouraged and pursued as appropriate.



The system will also include a rating mechanism based on a quantifiable degree of conformance with relevant eco-labelling Specifications. Although a government-endorsed initiative, the eco-labelling system will be promoted as a national system for the private and public sectors. Unlike eco-labelling systems from other countries, ecoASA Label will be limited to building industry materials and products, and will not undertake to issue licences for materials and products existing outside of this sector.

As the Competent Body managing ecoASA Label, Agrément South Africa has been tasked with developing a set of Scheme Rules that document the necessary procedures to be followed in the establishment of eco-labelling Specifications, as well as the requirements and procedures for materials and products to be certified by the Competent Body against applicable specifications.

The Specifications to be developed will reflect South Africa's socio-economic development objectives, whilst maintaining consistency with international environmental standards and South Africa's environmental commitments.

The criteria contained within a specification will not include a full life cycle assessment (LCA), but instead include simplified LCA criteria such as environmental impacts during manufacture, including CO_2 emissions, water demand, waste minimisation etc. and the recyclability and reuse of the material or product.

Looking at the number of certificates per product category, awarded by various international eco-labelling organisations, a task team comprising members from the Construction Industry Development Board (cidb), Agrément South Africa and the Department of Public Works, determined the priority specifications to be considered for development. These are:

- paints and surface coatings;
- adhesives and sealants;
- flooring and carpets;
- wall and ceiling panels and products;
- building insulation products;
- concrete and concrete products;
- masonry products;
- ceramics;
- long steel products; and
- cleaning materials and products used in Public Works buildings.

Agrément South Africa aspires to develop and implement two Specifications by June 2020, thereafter, officially launch ecoASA Label and award its first eco-labelling certificate. "As the only government-endorsed South African environmental claims verification body for building materials and products, we're proud to have been given the opportunity to lead this initiative and raise the environmental performance benchmark. We look forward to welcoming our first clients next year." – Zama Thusi, R&D Specialist, Agrément South Africa. +

Transport in South African Cities:

Are we moving forward or standing still?

In most South African cities, the motor car is king, and congested traffic and long commutes to work are the norm. In Johannesburg though, the Gautrain has been a gamechanger for surrounding areas – increasing accessibility to public transport and thus stimulating the emergence of denser business nodes. It has been key to unlocking the land value.

WORDS Alan Cameron

Convenience is an elixir which accelerates the business case of transit-orientated development in South African cities. Several factors of 'convenience' combine to accelerate the growth of property values in an area. These are physical factors, such as property characteristics, land-use type, and existing infrastructure; environmental factors, such as neighbourhood characteristics and; accessibility factors, such as how easily people and goods can travel to a site.

New or improved transport infrastructure increases land accessibility and triggers an increased viability for developers. Different land uses respond differently to access. For example, a central, highly accessible area is suitable for retail, while an outlying area with good roads is often attractive to logistics centres.

LOCATION, LOCATION, LOCATION

"There is a significant link between transport, the economy and property development," says town planner and land economist, Rob McGaffen. "Where things happen, matters."

"But remember that convenience is often a two-way street. Businesses are no longer prized for giving staff, suppliers and customers easy access to their location, but also for their ability to go to customers. More than two-thirds of Cape Town's economy is based on delivering goods and services so accessing customers are increasingly important," he predicts.

Cities are the engine of national economies, why? Because, "concentrating so many people in dense, interactive, shared spaces has historically provided a distinct agglomeration of advantages. Through agglomeration, cities have the power to innovate, generate wealth, enhance quality of life and accommodate more people within a smaller footprint at lower per capita resource use and emissions than any other settlement pattern," according to UN Habitat's *Urban Patterns for a Green Economy* series.

McGaffen continues: "There are only certain areas where you have an agglomeration effect – where businesses feed off each other. Hence, it is important to get these places right because South Africa has a particularly high cost of logistics, which directly impacts a service economy."

Roger Behrens, University of Cape Town associate professor and director at the Centre of Transport Studies, says: "Many economies measure a 7% cost of logistics against their GDP. South Africa scores in the teens, which has a lot to do with the sprawling nature of our cities and the state of the transport infrastructure within them."

Transport performs a distinct function for each type of property. The office market is driven by being able to get people with skills to their place of work, retail is about convenience and industrial use is becoming a logistics game, most new industrial areas focus on warehousing and distribution.

"Look at office nodes in Cape Town. Historically it was only the CBD, mainly because all roads, rail and bus routes led to it. It was a product of a transport system and the result is uni-directional traffic flow and congestion. But appropriate property development can create multi-directional flow in areas that are not currently busy. Getting this right is difficult, but it is very important.

Motorists have no compelling reason to stop driving. Everyone who owns a car has decided that rather than using public transport, spending staggeringly more to sit in traffic is the best option.

Keenan Constance

"What is really frustrating is that we are in a situation where the congestion is getting increasingly bad. The Tom *Tom Traffic Index* finds that between 6am and 9am, and 3pm and 6pm – at peak times – Cape Town motorists spend an average of 67% of their commute in congestion. These conditions push people out of cars. The frustration is that one of the main alternatives should be the train – but the train's dysfunction means they already shed passengers into busses and minibus taxis." Cape Town train passenger trips have halved from 600 000 to 300 000 in the last decade.

"This volume of trips has accelerated our congestion levels to the point where Cape Town is the worst in the country. Employers and employees alike spend longer on the roads, emitting more carbon, wasting time. This lost productivity has all sorts of multiplier effects.," Behrens adds. "Our public transport is at capacity at peak," asserts transport planner Gerhard Hitge. "In Blouberg many motorists who have switched to MyCiTi bus services have been replaced by new motorists. While the MyCiTi is a brilliant example of where the shift is happening, it still only accounts for 4% of morning trips on public transport at peak in Cape Town."

In 2015, Hitge and professor Marianne Vanderschuren authored a paper describing the difference in travel time between captive users who had no choice other than to use public transport, and choice commuters with access to private cars. On average captive users spend almost double the time per trip during the morning peak.

"A short-coming of current public-led approaches is that we try the 'big bang' approach. Our planning proposals go from where we are now to where we want to be, and there is a giant leap to the second scenario. The reality is that property development is incremental and often a large change is not feasible. The typical response is reducing parking and having maximum parking restrictions in policy. But when there is no [viable] public transport available, this creates difficulties," says McGaffen.

A short-coming of current public-led approaches is that we try the 'big bang' approach. Our planning proposals go from where we are now to where we want to be, and there is a giant leap to the second scenario.

PUBLIC TRANSPORT IS THE BACKBONE

McGaffen affirms that public transport is the backbone of the transport system. "We're never going to deal with our transport needs without it. It's imperative that Metrorail [Cape Town's city rail network] starts to work efficiently again. In order to get our public transport working we need to restructure our cities to be multi-nodal and mixed-density, and to create a mixed-use type of pattern.

"The big reality check is that public transport is expensive to roll out. National treasury funds capital expenditure, and this pool of money is drying up. Further, to run trains is very expensive and this operating cost is put to the municipality. Financially sustainable public transport systems normally require residential densities of about 50 dwelling units per hectare. South African cities average at 15."

Traffic and transportation veteran Steve Sutcliffe of Trafficon explains that worsening congestion in our cities means we no longer enjoy consistent travel times, even in private vehicles. "Think of it like the Cape Town water crisis: we each have to change our behaviour, before we begin to see an overall difference. Private motorists need to help themselves through entrepreneurial solutions – like cellphone apps – which can demonstrate how to reduce congestion. The municipalities have enough trouble trying to help the poor communities – those disadvantaged and captive to public transport."

Transport consultant, Gail Jennings, concurs: "About 60% of trips in South Africa are made by minibus taxi. So, if you're going to invest in improved transport, it needs to be where the majority of your users are."

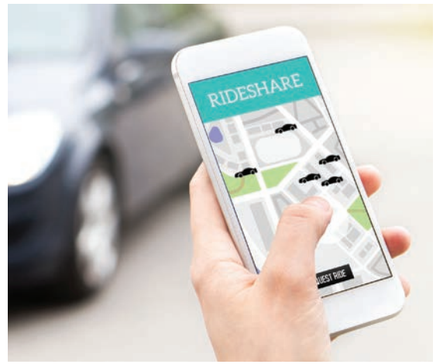
CRIME CRIPPLES THE PROMISE OF PUBLIC TRANSPORT

More important than whether a transport mode is reliable, predictable and affordable, is safety, says Jennings. "Ultimately, the challenge is that public modes of transport [nationally] are inflexible and dangerous. Motorists have no compelling reason to stop driving. Everyone who owns a car has decided that rather than using public transport, spending staggeringly more to sit in traffic is the best option." One result is an extended morning and afternoon peak travel period of three hours.

Cape Town has some of the worst congestion levels in the country. Employers and employees alike spend longer on the roads, emitting more carbon, wasting time. This lost productivity has all sorts of multiplier effects.

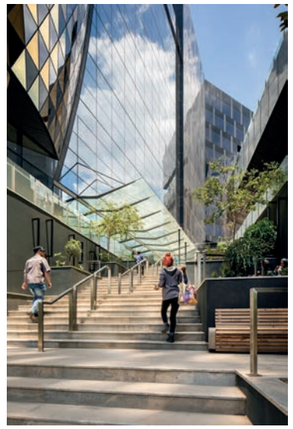
Bob van Bebber, director at Boogertman + Partners agrees. While a modern security camera network is useful, the presence of informal traders is a 'huge advantage' for authorities and developers to create safer streets. Jennings notes that the transport department doesn't have the responsibility, competency or budget for policing or making precincts safe. Which is why, Hitge believes that a dependency on the municipality to keep the pedestrian route safe and well-lit is a weak link in any retail development.

This is partly why a secondary (and often privately funded) network around Gautrain stations is so important to enabling high-volume development, like The MARC in Sandton. Congestion may be the cost of doing business, but crime is a more sinister one that ultimately devalues property. It's also one that can be successfully addressed at a local level, which The MARC does particularly well with its high-quality pedestrian environments – thus setting an example for other developers to follow. ►►



THERE'S AN APP FOR THAT!

Lula and *City One* are two home-grown apps aimed at private transport needs. *Lula* provides shuttles for corporates who are looking for safe, timely and affordable transport for their staff and *City One* is a ride-sharing commuting app that enables motorists to find people who travel the same route to work.



Adam Letch

CASE STUDY: THE MARC, JOHANNESBURG

The MARC, an acronym for the location of the precinct on Maude and Rivonia Corner, is situated in the Sandton CBD. The mixed-use development features two distinctly different office towers, enfolding between them a pedestrian-friendly realm surrounded by a two-storey retail centre. The towers achieved 4-Star and 5-Star Green Star Office Design ratings, and the whole development received high credits in the 'Transport' category.

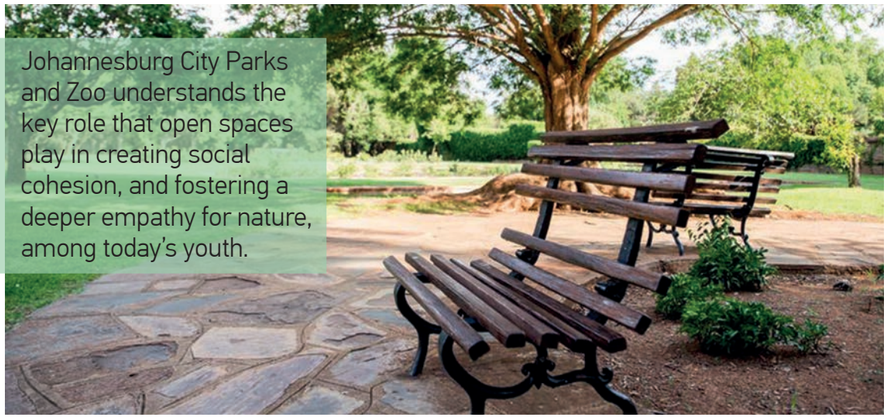
Its central location in an already commercial district, a few hundred metres from the Gautrain station, and along Maude Street – one of Sandton's key pedestrian routes – was key to the development's success according to Van Bebber, director at Boogertman + Partners, architects on the project.

"Without the Gautrain and the BRT (bus rapid transit) loop around the adjoining blocks, a building like The MARC would not have been possible," says Van Bebber. It provided a marketing angle to attract the corporate users required to fill the building.

"Walkability between The MARC and this improved network, as well as the taxi rank, was a key consideration. While Rivonia Road isn't the most walkable street, it was important for us to create access to a pedestrian environment. We improved the way the building interacted with the street edge and walkways and responded to pedestrian crossings and building entry points adjacent to the site. During development there was a much bigger drive to improve pavements and cycle lanes in Sandton, so we also have a cycle lane coming in front of The MARC.

"We created on-grade access to a bespoke double-level retail node that would benefit the office users and increase the number of permanent residents in the area. At lunch time and after work, this convenient access proves itself, as other building users stream into The MARC." +

Cities for our youth



Johannesburg City Parks and Zoo understands the key role that open spaces play in creating social cohesion, and fostering a deeper empathy for nature, among today's youth.

South Africa's young people are the generation who will shape our future and there can be no greater objective for South African cities than the development of our youth. This group faces many challenges (a 2013 study showed 70% of unemployed people in South Africa were youth), and with a significant percentage living in degraded conditions in impoverished communities; empowering the youth is a complex and multi-faceted goal.

Placemaking has gained momentum in South Africa in recent years. It focuses on the social and cultural importance of lively neighbourhoods and inviting public spaces; given that cities should be designed first and foremost for people. Public spaces that are kept clean, orderly, and beautiful (by planting and maintaining trees and gardens) go a long way towards boosting a person's sense of pride for the area in which they live and interact and, research shows, even inspire them to become more socially responsible.

Beyond that, the introduction of facilities and infrastructure into these spaces can create opportunities for social interaction, which encourage and divert youth away from a life of drugs and crime towards a bright future – simply by gaining a sense of belonging and knowing their role in the community. An example of this is outdoor gyms and sports facilities – which have been used to great effect in improving youth self-esteem: being physically fit helps one's mental state, and being involved in outdoor activities can become a platform for growing and showcasing skills, as well as meeting new friends.

Public spaces that are kept clean, orderly, and beautiful go a long way towards boosting a person's sense of pride for the area in which they live.

NURTURE NATURE

Developing and conserving open public spaces in this way – to create a liveable city – is the mandate of the Johannesburg City Parks and Zoo department. By working to maintain the city's parks, green spaces and trees, and by caring for and sharing the animals at the Johannesburg Zoo, their goal is to demonstrate the value and values of stewardship, and contribute towards a generation of young people who understand that their future is tied to their environment. For youth who would otherwise have no contact or exposure to non-domestic animals, zoos remain an excellent way to connect them to nature. Having these connections to ecosystems is the first step to developing an appreciation for them and fostering the motivation to take action to protect and nurture them.

"Having an arena where you can escape from your poverty background and be in a place where everyone is equal is an important asset," says Thendo Sadiki, environmental officer in-training at Johannesburg City Parks and Zoo. "In informal settlements in particular, public open space can serve as that arena – everyone comes together and there is no differentiation between rich and poor; it is a safe haven for all." Ntwanano Ndlovu, also an environmental officer in-training adds that a major challenge is to reframe the tension around either maintaining public spaces or providing basic services to communities. Rather a both-and approach is required, where recognition is given both to the precious, tangible benefit that functional public spaces give to surrounding communities and basic service provision. "There is still a great need to educate the public more about the important role that open spaces play in our day-to-day lives – beyond the critical element of filtering the very air we breathe." +

www.jhbcityparks.com

Net zero and building for the future: A radical shift required

Co-ordinated efforts from business, government and non-governmental organisations ensure steady progress towards net zero goals, but massive rollouts at property portfolio and city levels are needed to create viable future cities. One year after the 2018 GBCSA convention focused on net zero, what progress has been made?

WORDS Christy Borman

The agreement that South Africa committed to, at global climate negotiations, is that greenhouse gas emissions will level off from 2020 till 2025, and decrease from then on. This means that as the country progresses and develops – growing the economy and building new offices, warehouses, malls and homes for the rapidly growing population – it will need to do this with fewer harmful emissions. But can this be done, and how?

ENTER NET ZERO

The built environment is a major contributor to greenhouse gas emissions thus decarbonising and lowering the environmental impact of buildings is imperative. The ambition to be net zero in buildings is being propelled by the World Green Building Council (WGBC) and various national green building councils (including the GBCSA), as well as C40 Cities who are pushing the issue at a city level.

"Net zero is in my opinion, the most exciting initiative in the green building environment today. It's a way to at least be neutral in a natural system that constantly gives, and which humans have become used to just taking from and polluting," says Kevin James, CEO at GCX Sustainable Business Consulting Services. "The climate change agenda has risen to the boardroom level and more companies want to be part of the solution. Corporations in South Africa are becoming increasingly aware and are taking responsibility by driving performance in response to climate change, with some setting ambitious carbon reduction targets, aligned with science and the net zero targets," he adds.

Environmental issues can no longer be ignored and are being recognised as business risks. The drought in Cape Town is an often referred to example highlighting the risks of water shortage, making people aware of the critical function of this precious resource. The energy crisis of 2008 did much to propel energy efficiency in South Africa. Increased electricity tariffs, tax on carbon as well as targets and incentives in this regard, mean that net zero carbon and renewable energy are often described as 'no-brainers'. Waste is viewed as the next looming crisis as landfills become full and close, increasing the costs of waste management.

With this array of push factors, the GBCSA's suite of net zero rating tools and certification options present a realistic and practical way for buildings to do better. "Aligning buildings and portfolios with net zero ambitions contributes toward business continuity and resilience and significantly addresses impact on the scale at which we need to generate change," emphasises Georgina Smit, head of sector development and market transformation at the GBCSA. Smit adds

WORLD GBC ADVANCING NET ZERO PROJECT

Aim: All new buildings operate at net zero carbon by 2030, all existing buildings by 2050

24 GBCs worldwide participating and actively working to advance net zero carbon buildings.

9 Net zero carbon certification schemes launched globally.

388 Buildings worldwide certified net zero through the various certification schemes (May 2019).

Tim Johnson

that net zero is a call to do things radically differently, not just slightly better, and provides a clear end goal to focus on. It presents an opportunity for projects to explore regenerative design solutions, through building specific energy efficiency measures and alternative supply initiatives.

To date, the GBCSA has awarded 13 net zero certifications, on 10 impressively innovative projects in South Africa, with more projects in the pipeline. The challenge now is to move 'from thousands to billions' as the WGBC puts it. Co-ordinated action from business, government and NGOs is required to reach environmentally critical targets. Property developers should be looking to apply net zero at a portfolio level just as governments have recognised that they need to pursue it at a city level.

In its full lifecycle, a net zero carbon building is the more cost-effective route as compared to a standard building, even without considering future climatic risks and externalities.

LEVEL UP

A major message from the GBCSA's Race to Zero convention in 2018 was that the technologies and expertise to limit temperature increase and improve the built environment exist. "We need to transition from innovation to replication," said Ed Garrod from Integral Group at the convention. WGBC's Advancing Net Zero project has set targets for all new buildings to operate at net zero carbon by 2030, and all existing buildings reach net zero carbon by 2050. The project is gaining momentum. Twenty-four green building councils across the world are participating in the project and are actively working to advance net zero carbon buildings, while nine net zero carbon certification schemes have been launched. By May 2019, 388 buildings had been certified net zero through the various certification schemes around the world.

Even more encouraging is that 23 C40 Cities city mayors have signed the global Net Zero Carbon Buildings Declaration for net zero carbon new buildings by 2030 and all buildings by 2050. Locally, the City of Tshwane, City of Joburg, City of Cape Town and eThekwini Municipality have signed and committed to the ambitious goals.

The work being done by C40 Cities is laying the very important groundwork for the ambitious goals to be met. The South African New Buildings Programme within the C40 Building Energy 2020 (BE2020) Programme is being co-ordinated by Sustainable Energy Africa (SEA) and is working with Johannesburg, Tshwane, Durban and Cape Town via embedded expert advisors to develop low and zero carbon building codes, going beyond national requirements. The policy and related codes should be in place by the end of 2020. These aim to boost building energy efficiency between 2025 and 2030 and then introduce the requirement for remaining building energy use to be met by renewable energy from 2030.

Lack of policy coherence; departments working in silos at national, provincial and local level; and lack of technical capacity at the local level are the major challenges often said to be holding back progress on environmental goals. The BE2020 programme tackles these challenges head on.

With the help of the embedded technical officers, SEA has designed a template guideline on implementing net zero building policy. The policy guideline is performance rather than prescription based, encouraging flexibility and aiming for destination Net Zero, whichever path best suits your situation. "It's a design journey, we learn as we go ahead – testing and applying innovations. Comparing which mechanisms make the most sense at the local level," adds Peliwe Jubase, Sustainable Energy and Climate Change project co-ordinator at SEA.

"Even though the cities differ hugely from climatic profiles to population size and infrastructure, the programme seeks to maintain a balance of similarities between the cities' approaches, to ensure that development is uniform, and avoid property developers moving a proposed building development from one city to another just because it may have less rigorous bylaws," adds Jubase.

It's a design journey, we learn as we go ahead – testing and applying innovations.

Modelling by SEA to develop an empirical base underpins the policy guide. This has identified which building types are best suited to achieve early results (office blocks and retail developments) and explores dynamic funding models and changing premiums. The focus is on lowering energy intensity until 2030, shifting the focus to renewable energy being a requirement, post-2030. Financial modelling demonstrates the business case for various building typologies, and the business case is positive for commercial buildings to implement energy efficiency.

CITY CHAMPIONS AND BYLAWS

The C40-SEA technical officers based in the different cities support a culture of sustainable development within the city. "Included within my duties is exploring innovative and economically reductive ways to implement policies that would ensure that all new buildings erected within the municipality are of a low to zero carbon profile," says Naseema Elias, C40-SEA technical officer: Energy Efficiency in New Buildings, at eThekwini Municipality.

At the City of Joburg, C40-SEA technical officer Azola Zulu says that her role, and the programme

Aligning buildings and portfolios with net zero ambitions contributes toward business continuity and resilience and significantly addresses impact on the scale at which we need to generate change.

as a whole, "requires a total rethink of the current institutional and development processes within the built environment to ensure that the city is resilient from future threats and shocks such as climate change and resource depletion. A large portion of the work is unlocking the current institutional blockages towards developing an implementable policy."

It is expected that between September and November 2019, all four cities will submit the draft net zero policy to their respective councils for approval. Requests have already been put in to start drafting the bylaws.

Stanley Nyanyirai, C40-SEA technical advisor to the City of Tshwane Nyanyirai says that the work under the BE2020 Programme enhances the work that the City is doing on building efficiency. Funding from USAID's Low Emissions Development Programme also enabled the training of 105 City of Tshwane building control officers on SANS 10400. The training was conducted by Green Building Design Group with co-ordination from SEA and City of Tshwane. The South African New Buildings Programme is now supporting the training on the national energy efficiency regulations for the development and planning officials of the four cities (2019 – 2020).

Elias highlights that at eThekwini, extensive climate change awareness training is being delivered to all relevant stakeholders and staff within the City to facilitate a culture of sustainability. Additionally, training on the national energy efficiency regulations for buildings has begun as an ongoing process. In this way the programme aims to support improved energy efficiency compliance monitoring. There are plans for future training for both City staff and the public, adds Elias.

PUBLIC PERCEPTION

In preparation for the required perception shift, the BE2020 Programme has established an evidence base to support the feasibility of the implementation of this programme. One such element was developing a cost model that would display the cost benefit analyses of net zero carbon buildings. "In its full lifecycle, a net zero carbon building is the more cost-effective route as compared to a standard building, even without considering future climatic risks and externalities," explains Elias.

Delivering innovative net zero projects, should be viewed as an aligned way to help meet the country's National Development Plan, the Sustainable Development Goals and provide the services that are so eagerly sought by South African citizens. It's encouraging to hear that this is starting to happen.

"Being part of this project is so exciting because it's new and it's a chance to be pioneering and ambitious. It requires upskilling every day and liaising with all the stakeholders affected, all the time. We are in a generation where we will see renewable energy take over. At the rate that costs are coming down, it's a possibility for everyone, and that's life changing," concludes Radebe. +

GBCSA CERTIFIED NET ZERO: 10 PROJECTS, 13 CERTIFICATIONS

- **MDA Property Holdings**
  Net Zero Carbon Pilot, level 1 modelled
- **Wild Coast Sun**
  Net Zero Waste Pilot, level 2 measured
- **Virgin Active Constantia**
  Net Zero Waste Pilot, level 2 modelled
- **The District**
  Net Zero Water Pilot, level 2 (occupant consumption) modelled
- **Vleihuis**
  Net Zero Carbon Pilot, level 2 modelled; Net Zero Water Pilot, level 2 modelled; and Net Positive Ecology Pilot, level 1 modelled
- **78 Corlett Drive**
  Net Zero Carbon Pilot, level 1 modelled
- **Two Dam Sustainable**
  Net Zero Carbon Pilot, level 2 (occupant emissions) measured
- **Greenfield Industrial Park**
  Net Zero Carbon Pilot, level 1 modelled
- **The Estuaries Plaza**
  Net Zero Water Pilot, level 2 (occupant consumption) modelled
- **Vodafone Site Solution Innovation Centre**
  Net Zero Carbon Pilot, level 2 modelled; and Net Positive Ecology Pilot, level 1 modelled

* Modelled is similar to a 'Design' or an 'As-Built' rating in Green Star terms, as it focuses on the design and constructed elements of the building's lifecycle, while the 'measured' certification evaluates 12 months operational performance of the occupied space. New and existing buildings, precincts and tenants can achieve this certification. The rating expires after three years.

Office of the Future

Oracle South Africa's new head office casts a futuristic vista across Johannesburg North's skyline. But more than the sum of its external parts, the internal spaces are designed to mirror the ingenuity of Oracle's workforce.

WORDS Linda Doke IMAGES Oracle

The brief given to Empowered Spaces Architects was to design an easily accessible green building that flows; one that would foster inspired innovation. Positioned in Woodmead North Office Park, the building had to complement the ecosystem of skills the organisation delivers to its global clients, and also to fit the international spec of the multinational computer technology corporation. In keeping with its corporate policy worldwide, Oracle sought not to own but to lease the property. It partnered with one of South Africa's largest corporate property development companies, Zenprop Property Holdings, to deliver the mandate.

Earthworks on the project began in January 2018 and working with a strategic team of focused experts across the build, project completion was achieved just 10 months later. The result is striking: a futuristic, visionary building that is at once beautiful and highly efficient, all in keeping with Oracle's global branding.

REACHING EVEN HIGHER

The finished building, which covers 4 289.7m² over three floors, with basement parking and an open-aspect ground floor with business lounge and reception, has achieved a 4-Star Green Star Office Design rating for the base build. WSP sustainability consultant and GBCSA accredited professional for the project, Alison Groves, explains Oracle, as the building's tenant, is responsible for the fit-out, and is in the process of applying for a 5-Star Green Star Interiors rating.

"Oracle wanted to demonstrate its commitment to the Green Star accreditation concept by achieving a 5-Star rating for the interior fit-out. The interior fit-out is within the organisation's control and is beneficial to the occupants of the building. Achieving a 5-Star rating would show Oracle's obligation to its staff and to the environment," she says.

"It is fairly unique for a tenant to seek an interiors rating as well as an As-Built rating. Usually companies are satisfied with a Green Star Office rating, but Oracle is taking it one step further by ensuring that not only is the building sustainable, but the selection of materials, such as furniture and interior fit-outs, also adhere to strict sustainability criteria." The organisation hopes to achieve the rating before the end of 2019.

CONNECTION IS THE FUTURE

Empowered Spaces architect Ricardo Pedro describes how the building's streamlined exterior, with its slick glass surfaces and curves, was inspired by the look and feel of a curvilinear touch-screen smartphone that plays such a prominent role in business today, reflecting the need to be constantly connected. "The expression of technology, creativity and simplicity was fundamental in the design, and led to three major design elements: site, entrance and vessel," he clarifies.

The site choice was strategic. Located alongside the N1 highway which overlooks the densely trafficked Buccleuch interchange, the characteristically Oracle-red building maximises its public exposure, acting as a highly visible billboard for the corporation. In order to create a relationship with the N1, focus was placed on the west and south façades; and to encourage a prominent presence on the site, the structure was built on a plinth slightly raised above natural ground level.

Pedro explains how the envelope wrapping the building on the south façade was the defining factor of the Oracle building from an architectural point of view. "The U-shape of the envelope is inspired by full exposure evening highway photos of the N1 highway and the fluid motion of a single stroke of a pen.

Project dates:	Construction started: April 2018 Practical completion: February 2019
Green Star rating:	4-Star Green Star Office Design targeting 5-Star Green Star Interiors
Location:	Woodmead North Office Park, Johannesburg
Type of building:	Commercial office building

Charles Johnstone

RIGHT: The entrance embodies the idea of movement with the pronounced, double-open U-shape in Oracle's corporate colour punched through a large charcoal-coloured mass with random slit windows.
BOTTOM LEFT: The U-shaped curvilinear underbelly houses the two-storey office portion of the building.

The U-shaped curvilinear underbelly houses the two-storey office portion of the building. This elongated architectural feature which floats above the glazed ground floor, creates a visual connection between the highway and Woodmead Drive, both on external approach and from within the building, delivering visual synergy in movement," he says.

"The entrance embodies the idea of movement with the pronounced, double-open U-shape in Oracle's corporate colour punched through a large charcoal-coloured mass with random slit windows. This creates the effect of a portal from the busy exterior to the tranquil, enclosed, triple-volume cathedral-like foyer on entering the building."

Choosing eco-friendly materials was key to keeping within the design ethos. The façade's smooth, slick glass surfaces were designed for easy cleaning with minimal maintenance, and only timber and paints that are environmentally viable were utilised.

With Oracle's international focus on streamlining its business and cutting unnecessary real estate and operational costs, the importance of designing a working space that enabled a progressive office environment for employees and environment was fundamental.

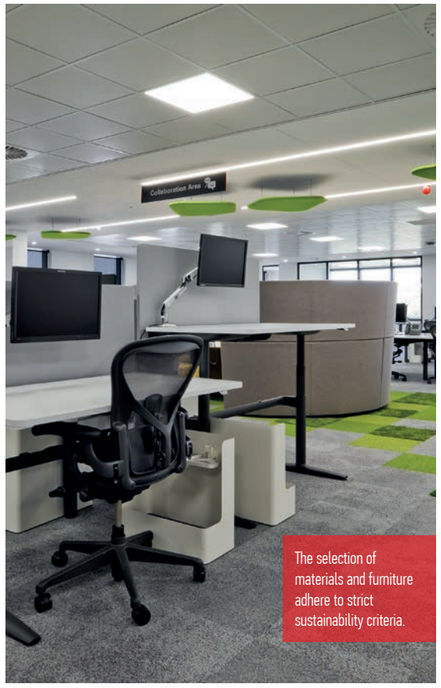
ADVOCATING ALLIANCE

Real estate and facilities project manager for Oracle sub-Saharan Africa, Morena Rakometsi, highlights the company's emphasis on creating a space that would attract the workforce of the future. "Oracle encourages a culture of idea-sharing, and a more flexible, mobile working style. As a result, our workspaces are designed to be engaging and promote collaboration, so that creativity can be shared and employees can thrive in a competitive environment," Rakometsi clarifies.

The interior office design and fit-out of the building was done by Trend Group. Senior designer, Dorethe Swiegers, expounds that the focus was to create an engaging open-aspect workplace that not only attracts; but retains talented individuals. "We worked closely with Oracle to ensure we crafted a product that was unique and suited the Oracle global guidelines and operational requirements, implementing innovative new ways of working. Workplace design has changed drastically in the past decade, times are changing and working hours are no longer structured. The space planning and realisation of the vision presents a progressive office environment that gives employees options as to how they wish to work."

"Oracle employed a change management system that managed the transition, ensuring all employees were involved and their expectations met. Through axonometric 3D plans, 3D renders, and a complete 3D walkthrough of the space, the entire company engaged in the design process and development and were able to visualise what their new home would look like once completed," says Swiegers. Quiet spaces for focus, quiet time, creativity and innovation also played an essential role in the interior design.

> **The focus was to create an engaging open-aspect workplace that not only attracts; but retains talented individuals.**



The selection of materials and furniture adhere to strict sustainability criteria.

"The wellness of its employees is always at the core of Oracle's business model – healthy employees are the happiest, and the work environment is key to achieving this. Natural lighting is maximised throughout the building, creating an airy, spacious environment. There is an assortment of workspaces primarily based on an open-plan environment, interspersed with quiet areas where people can relax, brainstorm and be creative. There are also a few closed offices for employees who fulfil critical functions that require concentration and privacy. The flexible spaces, phone booths and focus rooms are not permanently assigned, however – they are simply private spaces that can be used for a set time. This encourages the idea of not needing to always be in one space to be productive," adds Rakometsi.

Quintin van Greunen, electrical project engineer at RWP Taemane Consulting Engineers, describes how sustainable energy management by the building's electrical installation was central to the green focus of the project. "Even from the early stages of design, emphasis was placed on designing a sustainable and efficient building. Oracle was able to provide records of their current building, which enabled a benchmark to be defined. The aim was to achieve a green building with a 4-Star Green Star rating," van Greunen says.

The expression of technology, creativity and simplicity was fundamental in the design, and led to three major design elements: site, entrance and vessel.

GREEN MEANS SAVINGS

"In the fit-out, lighting power density of less than 1.5W/m^2 per 100 Lux was achieved; and this combined with occupancy sensors and BMS switching capabilities, further reduced the electrical consumption of the building. Boardrooms and the various enclosed offices are fitted with occupancy sensors that control both the lighting and the HVAC system, allowing further reduction in energy consumption," states van Greunen. Additional energy savings were achieved by incorporating energy-efficient equipment wherever possible, and by reducing electrical appliances in the canteen kitchen.

Rainwater is channelled into an attenuation pond in the business park and is used for irrigation purposes. A smart irrigation system with rain- and moisture-sensors ensures the plants in and around the building, all of which are indigenous and water-wise, are only watered through the dry season.

"The savings shown since the move to the new premises have been remarkable, with overall electrical usage down by 50% from what it was in our previous premises. Currently the new building runs at an average of 38 VA/m^2 including the HVAC and all other services. The maximum demand has also reduced by more than 55%," reveals van Greunen.

The final tie-in of the photovoltaic system, together with the quarterly tuning of the building over the first year of occupancy, is expected to further reduce these figures, ultimately delivering not only monetary savings but also a smaller carbon footprint than previously. +

Inside Innovation

Becoming the first 6-Star Green Star Interiors accredited office in the country is a lofty goal – but it made perfect sense as something for leading ergonomic furniture supplier, Formfunc Studio, to strive for. After all, the achievement embodies everything their brand stands for; in optimising workplace health, productivity and efficiency.

WORDS Nicole Cameron IMAGES Richard van Zyl

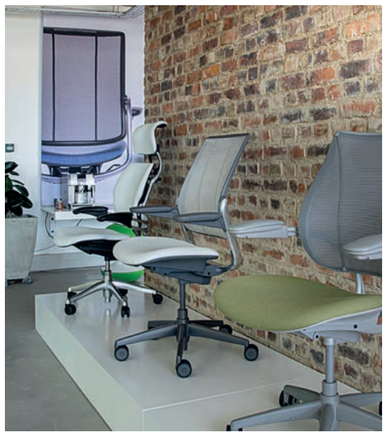
In August 2009, Peter and Kim Kowalski started Formfunc Studio, recognising the importance of ergonomics in supporting a work environment that is conducive to keeping employees healthy, inspired and productive. This ties in closely with a desire for sustainability in the workplace, something which Peter was passionate about, earning himself the title, 'green warrior' alongside 'designer' and 'entrepreneur'. Peter sadly passed away earlier this year, and the Formfunc team, driven not only by their company philosophy, but also the desire to uphold his legacy, have worked tirelessly to prepare their Johannesburg-based distribution centre for the 6-Star Green Star Interiors v1 certification in October 2019.

In addition to passionate Formfunc staff members, this dynamic team included consultants from environmental firm Terramanzi Group, as well as numerous contractors who took on the challenge of 'the vision'. Formfunc firmly believes that 'less is more', and so, from the day they signed for their new space, they resolved to apply this attitude throughout the fit-out process.

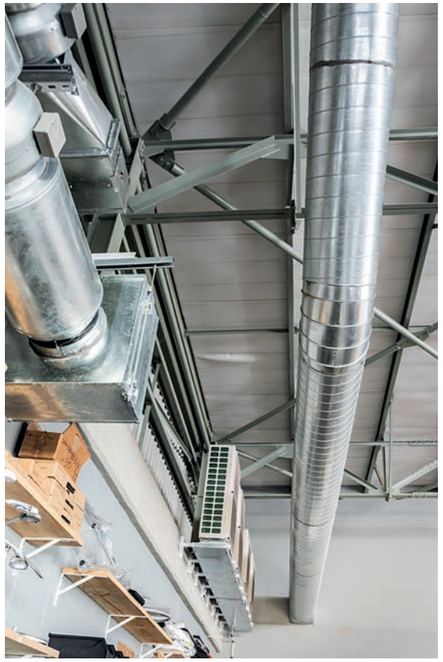
A STRINGENT TOOL

"The Green Star Interiors tool is a stringent tool in the sense that it comprehensively addresses all aspects of a tenancy fit-out," explains Terramanzi's director Fabio Venturi. "Some of the unique features that the studio incorporated relate to targets around Work Space Efficiency – where occupant density is to be equal to or less than a required standard; Visual Comfort – to encourage and recognise the delivery of well daylit spaces that provide high levels of visual comfort and views to occupants; Ergonomics – to encourage and reward the choice of ergonomic equipment and design of space that promotes wellbeing, efficiency and effectiveness; and Local Connectivity – to encourage and recognise tenants that choose to locate their premises within walking distance of high-quality amenities, such as shops and parks, thus reducing private vehicle use and the associated negative impacts.

"To begin with, we looked at each point individually. We first needed to gauge which were achievable," says Formfunc production manager and sustainability champion Kieran McNaughten. "After that we explored



Location:	Lanseria Corporate Estate, Gauteng
Type of building:	Commercial office space / Distribution warehouse
Rating after Round 1:	5 star (January 2019)
Targeted rating after Round 2:	6 star (expected October 2019)



Many aspects of the Formfunc Studio were left unfinished in order to reduce resource use. This has inspired an aesthetic that blends 'industrial' with contemporary style.

various implementation options and looked at different materials which would be both aesthetically pleasing, as well as practical, not forgetting making the most 'green' sense. From there we took design decisions, which suited the desired look-and-feel of the space."

In order to score well in the materials category, many aspects of the Formfunc Studio were unfinished to a large degree, to reduce resource use. This is evidenced in the unplastered walls within the facility, and the exposed ceiling as well as floor in the showroom and warehouse. Any paint and sealant products used had extremely minimal-to-no VOCs. The facility exhibits large areas of glazing (floor-to-ceiling), which invites a large quantity of daylight throughout. The lighting ingress proves highly effective in the showroom facility on the first floor, which is separately zoned to the office facility, and is then also able to capitalise on the daylight. The separation of these two spaces allows ample daylight into each zone. The warehouse also incorporates natural light through high-level windows. Formfunc targeted the Green Star credit 'Quality of Internal Air', whereby they used their HVAC system to improve their outside air rates into the building above SANS 10400 requirements.

Waste is separated at source.

FINGER ON THE PULSE

Additionally, contractor Aethyr IT installed CO_2 sensors to monitor and control carbon dioxide levels within the facility. "This was achieved through the installation of our EnviroPulse solution, which sends instant notifications to Formfunc if and when the CO_2 levels rise above 600 parts per million (ppm)," says Aethyr IT's Gavin Bagley. EnviroPulse measures temperature and humidity levels.

Aethyr IT installed Smappee Water and Electrical meters, which offer live time water and electrical consumption to be measured and compared against daily consumption parameters. "Again, Formfunc are notified when consumption rises above acceptable levels," says Bagley. "Knowing and having the ability to control one's utilities and environment is a fundamental part of being able to contribute towards a sustainable setting, and so this is how we empower our clients to make wise live-time choices by 'keeping their finger on the pulse'."

McNaughten says that in many respects they were lucky because they could 're-use' several products from their previous showroom, including ergonomic furniture and lighting. Hema Maskowitz, of Mask Design, a consultancy for lighting design and engineering, helped facilitate the process of gaining a Green Star rating for this interior aspect – she created a 3D model based on photographs and details of the lighting, and then ran a simulation to see what changes would be required to meet the accreditation criteria. "Lighting is a critical design element in any interior or exterior space, and it is often ignored, or left to the last, and then underwhelms when budget becomes more important than lighting design," she says. "If more clients can understand the value of a lighting simulation, as well as proper planning and design, I think more buildings will become eligible for Green Star Ratings."

Formfunc director Kim Kowalski says that one of the main reasons they feel they were so successful in what they accomplished, is the 'human factor'. "We worked and shared ideas with each and every person involved – from consultants to contractors. It was amazing to witness collaborative ideas take shape. It made each one of us look into how we do things in our daily lives – and showed a way for everyone to make even the smallest change (waste segregation for instance) which has a big impact in the long run."

And so, do they think they have what it takes to achieve the '6-Star dream'? "Peter was extremely passionate about doing things right. This was his vision, which was applied everyday no matter the task," explains Kim. "Peter always said, 'surround yourself with people that are better than you', and our team believes in this mindset. Together, as a team, we were able to confidently sign off and submit for a 6-Star interior fitout." +

Africa's Greenest Precinct

The V&A Waterfront continues to raise the bar on sustainable, innovative award-winning commercial, retail and residential development. All new architectural designs and buildings aim to achieve a minimum 4-Star rating, in line with the Green Building Council of South Africa (GBCSA) awards.

Sustainable elements considered by the GBCSA in awarding 16 Green Star awards to the V&A Waterfront include:

- Enhancing energy efficiency through use of fluorescent and LED lighting, and maximising natural daylight with large glass windows, skylights and atriums
- Minimising greenhouse gas emissions with public transport links via the MyCiTi bus service, and by introducing safe cycling lanes and storage for bicycles
- Onsite recycling and waste management facility, using green cleaning practices and setting green criteria for tenants
- Conserving water resources with low-flow and low-flush water fittings
- Using paints, floorings, adhesives and sealants without toxic emissions

www.waterfront.co.za

The V&A Waterfront has installed photovoltaic solar roof panels on several buildings resulting in significant energy savings. The V&A Waterfront also makes use of intelligent systems to control and track energy and water usage. Monthly analysis of the building's carbon footprint shows significant reductions over the past nine years, considering the growth of the property. Electric car charging points are provided in the Silo District basement parking and at the Victoria Wharf Shopping Centre.

Elsewhere on the property, the reimagined Watershed craft market for African design received a 6-Star Existing Building Performance v1 rating, while the commercial Waterway House in the Canal District has earned a 5-Star Green Design Office v1.1 award.

The reimagined Watershed takes full advantage of natural light, and large doors on either end of the building are opened during the day to allow natural ventilation. The building has retained much of the original structure and finishes, including the old timber warehouse floor, refurbished windows on the south-east, and hanging the first floor from the original gantry structure, rather than constructing columns. As a result, less materials were used, reducing the embodied energy of the building.

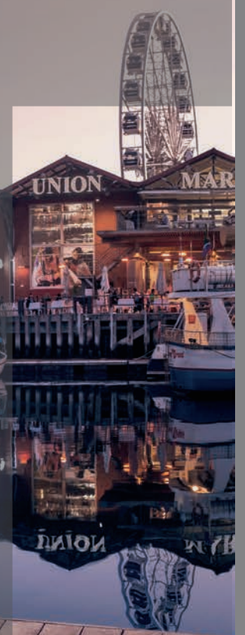
Older buildings have also benefited from retrofitting. The GBCSA has awarded 4-Stars to the existing buildings at Merchant House, home to BP's head office and the V&A Waterfront's own offices, West Quay offices in Port Road and Granger Bay Court offices in Beach Road. West Quay and Granger Bay offices have a solar system which provides the buildings with renewable energy.

The popular Victoria Wharf Shopping Centre was initially awarded a 4-Star Green Building Performance v1 rating in 2015, and in July 2019 the centre became the first existing shopping centre to ever achieve a 5-Star Existing Building rating.

The building scored particularly well in land use management and ecology, transportation, water conservation and usage, and the management of material and products used on the property. Other outstanding improvements that earned the higher rating include improved waste management systems, commissioning an on-site waste handling and sorting facility, extensive measurement and application of new measuring technology for managing emissions, the installation of 10 PV panels on rooftops and putting a Marine Wildlife management programme in place.

With an average tenant vacancy rate of only 1% at Victoria Wharf, it became imperative to introduce a green vision that would be inclusive of tenants. In 2015 the V&A Management committed to introducing a Green Lease toolkit focusing on operational efficiencies within tenant premises by means of reporting on water and energy consumption, the measuring thereof and introducing levels of incentives for tenant to recycle. By 2019, almost a quarter of the Victoria Wharf's 450 retail tenants and 80 eateries have signed up to the programme.

Currently, the on-site Waste Recovery and Recycling facility which has been in operation since January 2018, has created 46 new jobs on the property and of the 6,300 tons of waste collected per annum, more than 2,000 tons are diverted from landfill. +



At the 80,000sqm multiple-use Silo District a central seawater cooling and heating plant connects buildings in the District, cutting down on the need for traditional air-conditioning or even water-cooled systems. The plant channels ice cold water drawn from the Atlantic sea through a system of pipes before releasing it back into the sea.

No. 1 Silo housing the Allan Gray head office was the first building in South Africa to ever achieve a 6-Star 'As-Built' rating.

No. 2 Silo was the first residential building in the country to be assessed using the GBCSA's version 1 rating tool and was awarded a 4-Star Green Design rating.

No. 5 Silo is a multi-tenanted commercial building that is also home to PWC. It achieved a 6-Star Green Design rating for an office, as well as a 6-Star Green As-Built rating for the interior fit-out of tenant PWC. Exceptional features are a high performance, unitised façade that uses well-designed building fabric, glazing specification, insulation and shading to reduce solar gain and control heat. CO_2 sensors ensure that only the required amount of fresh air is provided, to manage the natural flow of fresh air. An air-tightness test was also done to check the building for any uncontrolled leakages.

No. 6 Silo most recently became the first new hotel to receive a 5-Star Green Custom Hotel Design rating of Green 5-Star rating and a 5-Star Green Hotel As-Built rating. The building is home to the Radisson Red hotel. The building is spatially efficient and has low VOC finishes, and good levels of natural lighting, together with appropriately designed facades ensure maximum efficiency of resources. An independent commissioning agent was appointed to manage the commissioning and tuning process, which ensures optimum operations of the building.

V&A WATERFRONT'S FUTURE SUSTAINABILITY PLANS INCLUDE:

- All future developments are to be Net Zero Rated
- Investigating the possibility of applying the Sustainable Precinct rating to the property, highlighting various buildings based on performance as pockets of excellence
- Water augmentation through the implementation of a permanent desalination plant increasing production to 3,2 ML of water per day during peak season
- Reducing water consumption at the Victoria Wharf Shopping Centre by replacing the traditional cooling with more efficient sea-water cooling systems
- Introducing a bulk-water recycling plant for irrigation purposes
- Investing in a waste-to-energy plant to further reduce energy consumption and reducing waste to landfill
- Installing more solar PV systems to reduce energy consumption further
- Alternate energy sources in future developments

With just one percent of South African building stock made up of newly constructed buildings, greening existing buildings will have a far more dramatic effect on the process of greening our cities and reducing carbon emissions. But just how possible is it to achieve this affordably? And is it worth the effort? We take a closer look at the Victoria Wharf Shopping Centre, which recently upgraded its Existing Building Performance Green Star rating from 4 to 5 stars.

WORDS Gillian Gernetzky

Existing buildings:

The solution to greening at scale

V&A Waterfront

The Victoria Wharf at the Victoria and Alfred (V&A) Waterfront in Cape Town, is South Africa's most visited destination, with approximately 24 million people visiting every year. It is also one of South Africa's largest shopping centres, with a GLA of 88 647m^2, over 450 retail stores and 80 eateries. Built in 1992, and since extended twice, the centre was awarded a 4-Star Green Star Existing Building Performance (EBP) rating by the GBCSA under the pilot tool in 2015. It undertook a rerating earlier this year and was awarded a 5-Star Green Star EBP v1 rating in May 2019.

So how exactly was the improved 5-Star rating achieved, especially by a building of this scale and with the added complexities of multiple tenants? Sow & Reap's Francois Retief, who managed the 2019 Victoria Wharf EBP submission, says that a major step in the certification was to gain a deeper understanding of the building. "On-site audits undertaken among tenants to understand and identify fresh air concerns, temperature issues, and energy and water performance resulted in a number of points being achieved. It also allowed us to raise awareness of the precinct's sustainability initiatives, and educate tenants around energy efficiencies, recycling, best practices and the overall performance of the building."

Retief adds that simply being part of the V&A Waterfront precinct gave the building a head start. "The V&A has set out to embed the core principles of the EBP tool across the precinct. As a result, the building starts off with a huge number of points already earned through precinct policies, plans and procedures such as those relating to waste, 'green cleaning', landscaping and green leasing. It is this solid base that elevates their buildings into higher ratings. On top of that, each individual building's performance brings even more to the party, for example the exemplary water performance at the Victoria Wharf."

In fact, one of the major areas of improvement in the rating lies in water consumption. With the water crisis in Cape Town, the V&A Waterfront has led the charge in terms of water efficiency, with technologies such as ultra-low-flow taps and vacuum toilets being trialled.

The challenges presented by load shedding and the water crisis also presented the opportunity for the Waterfront to become leaders in energy and water efficiency. "Using 2010 as a baseline, overall savings of 60% in water consumption and 35% in energy consumption were achieved across the precinct as at the end of 2018," says the Waterfront's safety, health and environmental manager, Mareli Cloete. "Although the Waterfront led the industry even before these crises, achieving this level of efficiency was key to allowing us to continue business as usual while conserving the planet for future generations. The Waterfront has become self-sustaining by implementing innovations such as PV panelling, boreholes, desalination plants, water recycling systems, and district cooling plants, allowing us to operate normally even during power cuts or water shortages."

If we consider buildings as commodities with embodied energy impact or 'energy footprints' then locking that energy into the building for a longer period of time through a Green Star EBP certified retrofit, rather than demolishing and rebuilding, it is an environmentally responsible decision.

Project dates:	Built 1992, EBP ratings 2015 and 2019
Green Star rating:	EBP Pilot 4-Star (2015) EBP v1 5-Star (2019)
Location:	V&A Waterfront
Type of building:	Shopping centre

While the building and precinct boast impressive sustainable building features, the EBP tool measures the operational efficiency of a building, which means that the ongoing resource efficiency and behaviour of tenants have a significant impact on the rating. To this end, noteworthy improvements that helped to achieve the 5-Star rating include excellent recycling initiatives, tenant recycling incentives, an on-site waste handling facility, the use of intelligent systems to control and track energy and water usage, as well as monthly analysis of the building's carbon footprint. Tenants have been further encouraged to green their operations through training, implementation of the green lease and ongoing communications, including an operational drive to rid the centre of single-use plastics and the implementation of a marine wildlife management programme.

Using 2010 as a baseline, overall savings of 60% in water consumption and 35% in energy consumption were achieved across the precinct as at the end of 2018.

Of course, the 25-year-old building did present some challenges in its bid to attain a 5-Star rating. "The age of the building meant that there are certain concerns that must be contended with, such as the energy efficiency of the HVAC heating plant. These issues have been identified through the process, however, and improvement planned into future maintenance and replacement cycles," says Retief. In addition, the sheer scale of the shopping centre resulted in its own complexities: Auditing a building with over 400 retail stores was not a simple task. However, using digital auditing systems, the team was able to efficiently collect all data and automate reports to identify and address concerns.

GBCSA's managing executive for market engagement, Grahame Cruickshanks, notes that the environmental benefits of refurbishing existing buildings to a green standard are overwhelmingly backed by the embodied energy argument. "GBCSA uses this definition of embodied energy: energy that is used during the entire life-cycle of the commodity for manufacturing, transporting and disposing of the commodity as well as the inherent energy captured within the commodity itself. If we consider buildings as commodities with embodied energy impact or 'energy footprints' then locking that energy into the building for a longer period of time through a Green Star EBP certified retrofit, rather than demolishing and rebuilding, it is an environmentally responsible decision. UK studies have shown that, while the ratio of embodied energy to operational energy of buildings differs from sector to sector, on average over a 30-year period around 50% of the total carbon is tied up in embodied versus operational energy."

But does it make financial sense to improve the performance of a building that was designed and built before resource scarcity and carbon emissions became a global concern?

Research now conclusively supports the business case for green building – whether building new or refurbishing old. The annual MSCI Green Property Index consistently shows that green buildings outperform their non-green certified counterparts in terms of total return and vacancy levels, and SAPOA research indicates that Green Star-certified properties demand premium rentals. Cruickshanks adds that reduced operational energy consumption offers utility cost savings as well as environmental benefits

V&A Waterfront

Cape Town's V&A Waterfront is one of the most-visited tourist destinations in the world - with approximately 24 million people visiting every year. The Waterfront precinct features a large number of Green Star-rated buildings, reflecting the Waterfront's commitment to building sustainably.

V&A Waterfront

through lower emissions from energy consumption. In addition, the *Green Building in South Africa: Guide to Costs and Trends Report: 2019 Edition* released by the GBCSA, the Association of SA Quantity Surveyors and the University of Pretoria, which measures the green cost premiums associated with new buildings in South Africa found that these premiums decreased significantly between 2009 and 2018.

Cloete agrees with all these findings. "Due to the perceived associated cost factor, many people are still under the impression that green buildings and their management are more expensive than non-green buildings, which is not the case. Apart from green buildings being cheaper to operate, current technologies have advanced to such an extent that the return on investment period has been shortened immensely. For example, PV panelling's payback period has reduced considerably due to the sharp increase in the cost of electricity," she says.

She adds that the Victoria Wharf has a vacancy rate of just one percent – significantly lower than the national retail sector vacancy rate of 4.2%[1]. "We believe that the greening of the centre and the EBP rating has definitely led to the retention of tenants and staff. It has also inspired major flagship stores such as Woolworths to undertake major refurbishments and implement additional sustainable green practices."

Retief is of the same opinion, saying that a focus on improving the performance of existing assets makes sound business sense, particularly in the constrained financial times that we're currently experiencing. "The greenest building is one that isn't built, so managing existing assets is extremely important. It all starts with understanding these assets better in terms of their operating costs and efficiencies, the future-proofed nature of the building and the quality of space it offers the tenants. If undertaken correctly, the EBP tool offers landlords this level of insight into their buildings and can help them prioritise upgrades and improvements to keep the asset performing optimally," he says. "This is critical in a competitive property market and one cannot wait until the poor performance of a building results in tenant churn and the need for major refurbishment." +

The Victoria Wharf has a vacancy rate of just one percent – significantly lower than the national retail sector vacancy rate of 4.2%.

[1] According to the *SAPOA Retail Trends Report 2018*

5-Star sustainable standards

The fact that those involved in the design and build of Barloworld Automotive & Logistics' new corporate head office in Centurion deem their 5-Star Green Star-certified project as a 'standard commercial development', says more about the green building sector and its pervasiveness into the mainstream world, than about the building itself; which certainly sets a few standards of its own.

WORDS Nicole Cameron IMAGES Jamie Thom

For starters, the 11 000m² development marks the first phase of the new Irene Link mixed-use precinct. As accessibility to Sandton became increasingly more difficult, the company saw the potential in relocating from Barloworld Park to this new vibrant and energetic urban renewal centre. The major advantages of the location include the accessibility to the highway from the site, and the brilliant exposure which can be achieved for the brand, comments Simon van Helsdingen of developer Abland. "It is also well located in terms of being in close proximity to where many of the staff reside."

Van Helsdingen says that in addition to achieving their 5-Star Office Design rating in July, they are currently underway with the 5-Star As-Built rating. "Future-planned commercial buildings will also achieve green ratings, and we are also considering a green precinct rating for the Irene precinct, a new rating tool introduced by the GBCSA." A hotel, medical offerings and a convenience retail centre are just some of the developments in Irene Link's future.

As to the design concept, PW Hattingh of Nsika Architecture & Design says that they like to think of the project as a 'standard commercial development', with the building footprint being simple in form through an efficient central building core configuration. "The building concept was to create a permeable glass envelope that would sit lightly on a naturally-ventilated basement. This design decision allowed for seamless views between the high energy of the highway and the safety of the adjoining residential area of Irene. The envelope character was a high priority for the design team, and much attention was given to how best to optimise the shading structure," says Hattingh.

Location: Irene Link, Centurion
Type of building: Commercial office space
Green Star rating: 5-Star Office Design targeting As-Built
Date Certified: July 2019

LOUVRES, FAÇADES, AND UNINTERRUPTED VIEWS

With a ratio of more than 80/20 between glass and solid façades, the challenge was to create active shading that would still allow views from inside the building outward as well as outside views inward, explains Hattingh. Several shading design options were investigated, taking each option's performance and aesthetic character into consideration. In the end, a vertical aerofoil louvre fin structure was decided on, that would wrap around 42% of the building's eastern and northern envelope. The louvres were also used as a permeable 'jacket' that would keep the building cool in summer and warm in winter. This was achieved by optimising the fin spacing to the predominant heat-gain orientation, with the angle of the fins turned in such a way as to still allow efficient views.

"A lot of time was also spent in optimising the cost of the façade glazing in relation to the extent of shading structures. A double-glazed façade system has been used on the northern and western façades and single-glazed systems on the eastern and southern façades. A floor-to-soffit ground floor glazing is shaded by the stepped upper floors that protrude over the façade," says Hattingh. This design feature added to the permeability of the building. The first and second floors are wrapped with the louvered 'jacket' and the third floor is set back again to allow for proper shading created by the roof

The vertical louvres act like a permeable 'jacket' that keeps the building cool in summer and warm in winter.

overhang. A water feature next to the main entrance is fitted with foam jet-nozzles that allows for passive cooling as visitors and tenants enter the foyer.

In terms of 'stand-out' features, Hattingh says that clear-as-possible glass used in the façade enhances the feeling of connectedness between tenants and the outside environment. It also makes the building permeable at night, which is beneficial in terms of internal branding.

The neutral earthy colour palette of the building is contrasted by the dark-coloured shading support structure and frames the louvres as a stand-alone building element. The entrance foyer is characterised by a triple volume atrium that is well lit with a 12m-wide skylight. Sunlight is reflected off a feature wall, cladded with large format Calaccatta tiles, back into the atrium. "It is always a challenge to design a well-proportioned and usable atrium – it needs to have a function and create a gathering space. In this instance; pause areas, kitchenettes and open-plan office spaces were placed next to, or near the atrium, in order to enhance its value as a central connection," says Hattingh. The office space also includes amenities like boardrooms, a canteen, gym, coffee shop and cyclist facilities.

INSPIRING TO USERS, KIND TO THE ENVIRONMENT

As the site is mostly characterised by hard surfaces, the outside did not allow much in the way of elaborate landscaping features. As a result, time was spent designing proper break-out spaces. This means that tenants can use outside podium spaces as recreational, entertainment and leisure spaces – something not usually associated with commercial developments.

Beautiful lighting outlines the façades after dark. Most of the building lights have been fitted with motion sensors and all the lights are energy-efficient fittings.

With a ratio of more than 80/20 between glass and solid façades, the challenge was to create active shading that would still allow views from inside the building outward as well as outside views inward.

Dashiel Coville of Solid Green Consulting, the accredited professional on the project, points to some of the sustainable features of the building, including an extensive photovoltaic installation on the roof which will provide 25% of its electricity requirements, and a Thermal Energy Storage (TES) system, which allows for off-peak cooling, which is then stored in glycol-water-filled storage vessels. The tanks and heat-pump chiller supply the building with the required cooling during standard tariff times, thus providing a substantial saving on energy costs.

"The build scored extremely highly with regards to water credits, as much time was spent actively looking at minimising water use in the building, as well as providing an effective and safe back-up water supply," says Coville. "The area has experienced regular water interruptions in the last three years, which is extremely detrimental to the efficient running of a densely-occupied building. Run-off water from roofs and balconies is collected and solids are removed before it is stored in reservoirs located in the basements. The water is then filtered and treated before it is circulated back into the building as potable water." Water efficient amenities and fittings are also provided throughout the building's toilet areas, canteen and gym.

Most of the building lights have been fitted with motion sensors and all the lights are energy-efficient fittings. A Building Management System (BMS) has been incorporated into the building design to actively record and monitor services consumption such as water, electricity and HVAC. Real-time consumption is displayed on a monitoring screen that is in the foyer of the reception area. Staff and visitors can consciously react to this display during their time at the building.

In a feat that can also in no way be called 'standard', the entire development was completed in a mere eight months. "This created major pressure for the building contractor, as well as the professional team, tenant and developer," says van Helsdingen. "And we incorporated some changes along the way – Barloworld required more floor area so we had to figure that out without causing delays. The entire team handled all the challenges extremely well and delivered an excellent product on time."

The build scored extremely highly with regards to water credits, as much time was spent actively looking at minimising water use in the building, as well as providing an effective and safe back-up water supply.

It seems as if proactive participation between all parties involved was the key towards producing this milestone-first in the Irene Link precinct. And with that, the bar has been set for all the buildings to follow. +

The building concept was to create a permeable glass envelope that would sit lightly on a naturally-ventilated basement.

Testing Sustainability in architecture practice

In the six months since its launch in April 2019, Boogertman + Partners' new thinktank, FuturePart has leapt into action on several projects that explore the intersection between thinking and doing, a celebration of process and collaboration with many diverse skill sets and stakeholders. From architects to filmmakers, scientists and artists, FuturePart is pushing process to formulate and live up to its proposition: *Meaning in the Making*.

WORDS & IMAGES FuturePart

A recent announcement by RIBA President, Ben Derbyshire, highlights the importance of designing for the benefit of the planet: "The climate emergency is the biggest challenge facing our planet and our profession. But to have a significant impact, we need to do more than make symbolic statements – we need to turn warm words into impactful actions."

At FuturePart, sustainability focuses on questioning the practices of the present to inform the ability of future generations to meet their needs. The three conventional pillars understood as the broad concept of sustainability are economic, environmental and social, known informally as profit, planet and people. These pillars underpin our work.

Our new multidisciplinary research studio aims to stretch current thinking through rigorous research and apply insights to architectural practice to prepare for:

- The ideas economy and knowledge production, which will challenge outmoded business models of architecture.
- Designing within the accelerated degradation of the planet and growth in population.
- New technologies from socially and digitally connected 'smart cities' to innovative materials.

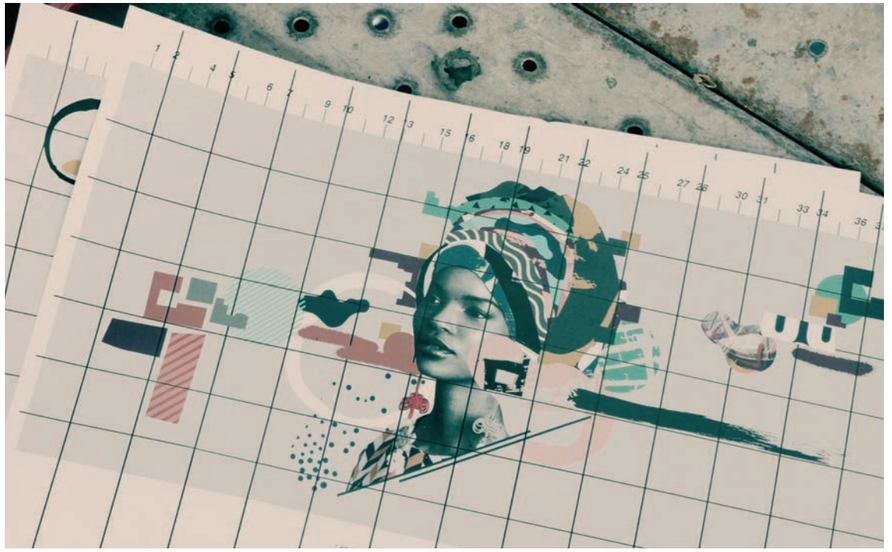
DEFINING COLLABORATIVE PRACTICE

While FuturePart is situated within the Boogertman + Partners practice and operates mainly from their Johannesburg and Pretoria offices, the teams collaborate on and spearhead design and research projects throughout Africa with multiple stakeholders. The tough part of collaboration, however, is that it involves working with diverse teams to produce, create or achieve a shared vision. It relies on the support of a more extensive network and culture of more efficient knowledge sharing and linking across disciplines. Every project must be curated with a uniquely assembled project team to encourage a new way of thinking about how we work and share.

Collaboration can be daunting, but Kirsty Groves and Oliver Marlow in their book, *Spaces for Innovation*, identify the need to lead people through change: "When facing new challenges that cannot be met with previous approaches, people need to learn new ways of operating. It is during these times of uncertainty and increased complexity when results cannot be predicted conclusively, that leaders need to invite others in to share diverse knowledge, discover new processes, and revitalise strategies."

> **For an architectural practice to remain relevant, it needs to explore how these new collaborations and intersections of disciplines can engage with its core focus of designing better buildings in order to shape our future cities.**

The FuturePart Team:
Gordon Jubber
Clifford Gouws
Bob van Bebber (director)
Nisha van der Hoven
Bertus van Sittert
Francois Bredenkamp (director)
Glenda Venn



Can art and urban design encourage new pedestrian behaviours?

This question was explored for The MARC Precinct in the heart of the Sandton CBD. What was once an ordinary alley became the platform for an urban art intervention. The graffiti installation challenged the notion of a journey by creating an experiential link between the Sandton Gautrain and the new development. The concept, focusing on urban density, tells the layered story of the city's spatial fragmentation. The urban art form is translated into a series of geometric shapes and patterns reminiscent of city figure-ground maps overlaid with texture and colour blocking. Across the 150m long passage, three distinct graffiti walls have been curated to engage people, place and social culture.

Telling the story of the graffiti project and how it successfully fostered collaboration required consultation with sound engineers, filmmakers, the artist, the client, the project team on site, and the video editor. The result is a compelling movie that explores the process of creating new journeys that has been shortlisted for the Archiboo 2019 Awards in the *Best Use of Video* category. The exploration of using artwork and feeding into the highly visual popular Instagram culture becomes an asset for The MARC precinct.

As part of the Privately Managed Public Spaces research, FuturePart has been digitally tracking movement and experimenting with how to convert this into 3D models. The exploration of moving data into new materials and shapes, enables fresh ways of interpreting data. The smaller globes or spheres represent faster movement of an individual through a space and the larger spheres map an extended period of time spent in one space.

Can cities become more welcoming shared spaces?
FuturePart is exploring Privately Managed Public Spaces (PMPS) in African cities and how they can become more welcoming shared spaces for both transient informal stakeholders and formal leased stakeholders and property owners. This is an academic research project with a team of architects, photographers, map makers and graphic designers led by Dr Britt Baillie and curator Nisha van der Hoven. The topline objective of this research is to bring the practice of architecture closer to the rigour of academic research and to demonstrate valuable content and knowledge production that informs future design.

In South Africa, many public spaces suffer from high levels of crime, dilapidation, and appropriation. The flight of capital from the Johannesburg CBD in the late '80s and early '90s saw decreased maintenance of public spaces, leaving the burden of maintenance solely on municipalities who lack sufficient resources to maintain them. Proponents suggest that PMPS can become well-used amenities for the city; enhance the quality of the workspace for employees; act as foyers for their corporate owners; add value to real estate; and/or be central to sustainable urban regeneration efforts. However, research is needed to identify how PMPS respond to the everyday realities and needs of African CBDs.

With the Johannesburg and Nairobi CBDs as the focus areas of their research, the team are involved in mapping the physical features of the space coupled with a series of walking-interviews carried out on site with different user groups that engage with the space. As part of the research outputs, the team collaborate with street photographers, graphic designers, 3D printing specialists and filmmakers to explore new ways of visualising their data to consider how we reimagine the role of PMPS in future cities.

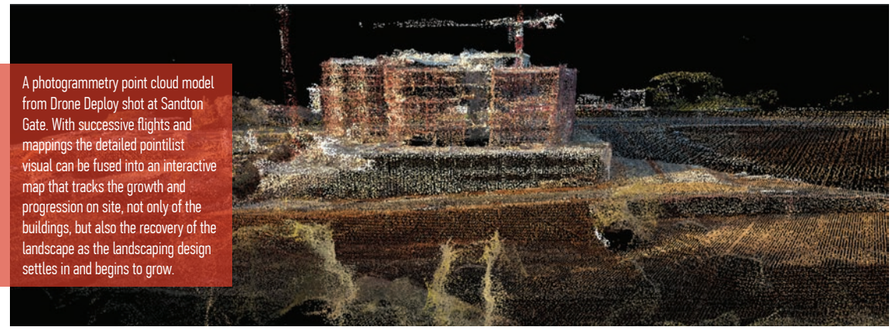
A handbook or 'code' book of best urban practice principles based on the research findings and insights will be published by the end of the year and it is envisioned that an exhibition of the maps and the digital exploration of tracking movement in an urban space will be part of a public exhibition in the first quarter of 2020.

Can the visualisation of space connect the end-users of a precinct to the multiple design concepts, and assist practitioners that roll out the vision of a property developer, to create a green-rated precinct?
Smarter precincts are becoming increasingly relevant in the creation of the cities of tomorrow. Smart is partly about digital disconnection and placing the wellbeing of the community over and above the individual as well as focusing on global environmental concerns over and above the immediate context.

A recent FuturePart project explored the opportunity of how visualising the process and multiple inputs of a large project could meaningfully connect end-users to the design and investment in a sustainable precinct. Using evocative imagery in a film which shows lab footage of endemically indigenous plants 'being cleaned up' in reverse, and mapping the area with drone-originated photogrammetry point clouds, we could reach into peoples' imaginations and dreams and help them envisage the end result beyond the raw construction site. The power of this type of visualisation and level of storytelling is that it reinterprets our relationship with the context in which we live – our social and natural ecosystems. It provides rewarding material outputs that bring to life the level of community and stakeholder engagement required to successfully produce a green precinct.

FuturePart is an experimental start towards exploring a sustainable economy shaped by ideas, where there is an opportunity for research and design to each play a significant role in contributing to each other's processes and outputs. For an architectural practice to remain relevant, it needs to explore how these new collaborations and intersections of disciplines can engage with its core focus of designing better buildings in order to shape our future cities.

Find out more: **www.futurepart.co.za** +



A photogrammetry point cloud model from Drone Deploy shot at Sandton Gate. With successive flights and mappings the detailed pointilist visual can be fused into an interactive map that tracks the growth and progression on site, not only of the buildings, but also the recovery of the landscape as the landscaping design settles in and begins to grow.

Growing Green:

Timber structures for sustainable cities

Around the globe, urban populations are growing rapidly, requiring city centres to densify, often by building taller and taller skyscrapers. At the same time, the impetus to have a less carbon-intensive building industry is increasing. In the current South African setting, most high-rise structures are framed in concrete or steel. Are these the most sustainable structural materials for the task? Or could timber soon become the favoured option?

WORDS Melinda Hardisty

Ludwig Sevenster

Timber is both one of the oldest and one of the most modern building materials. For centuries humans have been harvesting trees to create structures. In the modern age, especially in South Africa, people tend to think mainly of log cabins and wendy houses, or conventional roof trusses, when they think of timber as a structural element. Recent technologies, however, have started to harness the natural strength of timber and improve it, creating a new range of 'engineered timber' or 'mass timber' that can be used for modern high-rise construction.

In Europe, North America and Australia, timber structures are becoming the preferred structural material for sustainability and comfort. Planet Ark, an environmental organisation in Sydney, Australia, started their *Make It Wood* campaign in 2011. David Rowlinson explains that the campaign aims to promote the use of responsibly-sourced timber as a building material, based on a large body of research that highlights the significant environmental and health benefits of building in timber. In 2017, Australia's largest engineered timber office building, International House, was constructed in Sydney, and the country continues to be a front runner in sustainable timber construction.

Dr Philip Crafford, of Stellenbosch University, concurs. His 2019 dissertation into the environmental sustainability of timber buildings in South Africa, states that there are "numerous international studies showing that wood-based constructions display lower environmental impacts in terms of energy use, greenhouse gas emissions, air pollution, water pollution and solid waste production than steel and concrete systems". So, how widely is this known, and how is it affecting current building trends?

As of March 2019, the Mjøsa Tower in Brumunddal, Norway is the world's tallest timber-framed building at 18 storeys and 85.4m high. It is unlikely to hold the title for much longer though. Several other taller towers are in planning stages around the world. Sumitomo Forestry in Japan has revealed their plan for a 350m-high timber tower in Tokyo, to mark the company's 350th anniversary in 2041.

Timber is naturally a very strong and durable material but, in its natural form, it is only suitable for buildings of up to about four storeys high. Recent advances in technology, however, have produced several engineered timber materials that dramatically increase the strength of the timber, enabling it to be used as the main structural material for much taller buildings.

Roy Southey, of Sawmilling SA, explains four of the new timber materials used structurally, as well as their availability locally.

Glued Laminated Timber (Glulam) is a type of engineered timber that is made up of standard-sized timber planks that are bonded together with a highly durable water-resistant adhesive. The wood grain of all the layers runs in the same direction, making it very strong in a single direction, and most suitable for columns and beams. It can be made up into many different sizes. Glulam is readily available in South Africa and used extensively for structural elements in buildings.

Cross Laminated Timber (CLT) is a modern engineered timber product, developed in Austria. Conventionally sawn lumber is layered together, with each layer's grain rotated at 90 degrees, and glued together to form sheets. The innovative rotated grain technique results in a strength that is similar in profile to that of precast concrete panels but at a fifth of the weight. This is the product that is currently most widely used for walls and floors in high-rise timber structures. There is one small manufacturer in Cape Town, but not yet any commercial-scale production locally. It is therefore mostly imported.

Diane Snape and Emma Cross

Library at The Dock is Australia's most sustainable community building, constructed primarily from Cross Laminated Timber (CLT) and recycled hardwood. Designed by Lendlease with Clare Design and Hayball.

Timber structure and cladding, including acoustic treatments made of timber. Pretoria University's 'Future Africa' campus, by Earthworld Architects. Imported materials were simply detailed to allow small, local businesses to be involved in the manufacture and installation.

Dook

Laminated Veneer Lumber (LVL), sometimes referred to as 'technical ply', LVL is like CLT but a lot thinner, and produced in conventional structural dimensions. It is slightly more technical to manufacture than CLT and is not yet produced locally. It is currently imported, mostly from Scandinavia.

Thermo Timber is made through a specialised kiln process where conventional lumber is taken to extremely high temperatures that almost causes combustion. The sugars in the wood come close to the surface, making it more durable, resistant to insects, and dimensionally stable (i.e. it doesn't bow, warp, or expand and contract with temperature or moisture changes). Its overall strength, however, is less than that of CLT, as it doesn't have the benefit of the cross laminated grain. It is a new and very technical process and it is not yet widely-produced in South Africa, though it can be imported.

Southey explains that there is a lot of interest in these products from local architects and timber producers, but not yet enough focus on innovation. There is a shortage of product development and equipment locally, and the cost of importing specialised equipment required from North America or Europe is high.

Jedd Grimbeek from MDA Projects, a Cape Town-based project and development management company, is passionate about timber as a construction material and is pushing for it to be more widely used locally. His interest was first sparked while doing research for a tender bid for 'carbon neutral' city buildings in Cape Town. Through his research for this, Grimbeek realised that timber is the best structural material to be able to achieve 'carbon neutrality'.

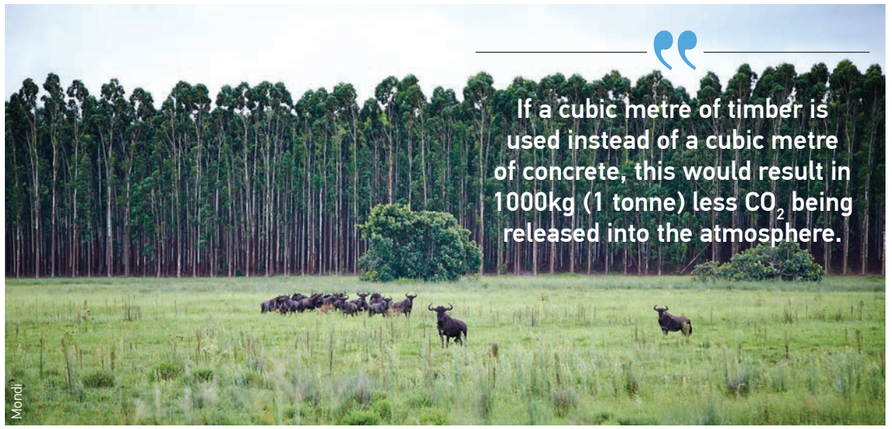
During the investigations, a list of eight criteria was established as a benchmark to ascertain whether timber could meet all the required South African demands: sustainability, quality of South African timber, quantity of South African timber, certification, fire, design, project funding, and project insurance.

Timber is extremely sustainable and has a low carbon footprint, provided it is responsibly sourced.

Dook

Brett Boardman

Macquarie University's Innovation Hub, in New South Wales, Australia, was mostly pre-fabricated offsite, and the entire on-site build and fit-out was completed in only five months. Designed by Architectus. FAR LEFT: The timber framed dining hall at Pretoria University's 'Future Africa' campus.



Mondi

If a cubic metre of timber is used instead of a cubic metre of concrete, this would result in 1000kg (1 tonne) less CO_2 being released into the atmosphere.

They found that timber structural materials were of a high enough quality to construct high-rise buildings, with CLT being the best suited. South Africa is not fully geared up for its production, but there has been positive engagement with a local timber producer and the timber industry at large. Timber is extremely sustainable and has a low carbon footprint, provided it is responsibly sourced. South Africa's local timber supply is good – with pine and eucalyptus being the most common varieties – and there is room for growth if demand of timber increases. Stellenbosch University has submitted the North American timber codes to SABS for adoption into local standards.

Fire safety is often a concern when people think of timber as a structural element. In fact, mass timber (like CLT) performs in a very predictable way in a fire. It doesn't melt, twist or crumble. Once the external faces are charred, they protect the timber within. The charred layer will increase, but the process can be predictably measured, meaning that fire safety guidelines and escape times can be calculated easily and catered for in the designs. There are a few international engineering practices with CLT experience that are locally available to address design to achieve building performance levels. Project funding was found to be easily achievable provided that all normal statutory requirements are met. Project insurance is still a sticking point; however, processes are underway at the moment to mitigate the misconceptions that have resulted in higher insurance premiums on timber structures. So, the results of the investigations into the eight criteria seem to suggest a growing viability for timber as a structural product in South Africa.

Now that we've established that timber can be used in large structures, why *should* it be? What makes timber a good choice over more conventional building materials like concrete, particularly when it comes to the question of sustainability and low environmental impact?

Planet Ark boldly states that "wood is the only building material that helps tackle climate change". They explain that timber does this in three ways; through being entirely

Roger Jardine

The Lake House in the KwaZulu Natal midlands, by Koop Designs. Interiors are mostly recycled Oregon and Yellowwood, with a Cedar pergola.

LEFT AND BELOW: International House, in Sydney, is Australia's largest engineered timber building. Designed by Tzannes Architects.

renewable, by sequestering CO_2, and by reducing CO_2 emissions. Wood is a truly renewable resource and, if certified sustainable forestry is used, demand for structural timber will increase the number of trees on the planet. Planet Ark uses the example of the Brock Commons University Residence in Vancouver, Canada. Until recently, this was the tallest timber-framed structure in the world, at 18 storeys (53m) high. Studies have shown that the volume of timber used in this construction will, on average, be regrown in the USA and Canada in a mere six minutes.

Wood sequesters (stores) carbon in the tree as part of the process of photosynthesis. If a tree dies and decomposes, that carbon is released into the atmosphere, but if the wood is utilised in a building's structure, that carbon is stored for the lifetime of the building (and beyond, if the timber is reclaimed and used again). The more trees are grown and used for structural timber; the more carbon is being removed from the atmosphere.

Finally, the CO_2 emissions in the processing and manufacture of structural timber are significantly lower than other building materials. Planet Ark references studies that show that if a cubic metre of timber is used instead of a cubic metre of concrete, this would result in 1000kg (1 tonne) less CO_2 being released into the atmosphere. This is an immediate environmental benefit, as opposed to one that is realised during the building's lifespan.

Bunjil Place is a multipurpose arts, civic and community facility designed by FJMT in the outer Melbourne suburb of Narre Warren.

Jonn Collings

Timber also offers a healthier alternative to many other materials. Adhesives and treatments for infestation are not always completely environmentally friendly, but they are constantly improving. There is still a huge reduction in chemicals, Volatile Organic Compounds (VOCs), and other harmful materials, and it appears to positively affect humans on a psychological level too. This is linked to the concept of 'biophilia' – the hypothesis in the field of psychology that states that humans have an instinctive bond with other living things. Essentially, we are happier in nature. The use of natural materials, including timber, in buildings is sometimes referred to as 'biophilic design', and it has been shown to reduce stress, lower blood pressure, improve cognitive ability, and promote feelings of happiness, tranquillity, comfort, and safety.

It seems that the pros of timber construction far outweigh the cons. Apart from growing sustainable forestry and setting up the facilities to manufacture engineered timber on a larger scale, South Africa is geared towards a shift in that direction. So, multi-storey buildings are becoming a viable option and, perhaps someday, South Africa will also compete for the 'Tallest Timber Building' title. +

A natural escape in South Africa, of timber and local stone.

Eco Log Homes

Holistic Lighting Design

for responsible environments

Arup lighting designers, Jeff Shaw and Carin de Beer, discuss the benefits of integrated sustainable lighting design.

Peter Oravecz

homechoice
for the home you love

AN (OFFICE) SPACE TO CALL HOME

The offices of **HomeChoice** International PLC (HIL), an investment holding company, are located off Main Road, Wynberg, in Cape Town. As the largest home shopping retailer in Southern Africa selling homeware merchandise and financial services to the middle income mass market, the 22,000sqm building is home to over 1800 employees.

The space has attained a 5-Star Green Star Rating 'Existing Building Performance V1' accreditation from GBCSA, and includes a number of sustainable features that contribute towards making the space comfortable for occupants and to lighten the organisation's environmental footprint.

External views have been maximised for employees, given that this visual connection to the outside world has the benefit of reducing eyestrain and enhances the overall working environment. Double-glazing on the windows reduces the solar gain without cutting out natural light and, in terms of indoor lighting, energy efficient solutions have been installed throughout.

As the location of the office is close to key transport nodes, attention is also being given to the development of a Green Travel Plan through a survey of various modes.

CLEARING THE AIR

The indoor air quality is optimised through the careful implementation of a Green Procurement Policy which ensures that the purchasing of paints, carpets, adhesives and sealants are all selected to minimise unhealthy emissions. There is a Green Cleaning Policy in place which ensures that all cleaning materials used are 'green' and the building has been declared a 'no smoking' building.

The quality of the air is tested with regards to CO and CO^2 lux levels and thermal comfort, and occupant comfort has been assessed through surveys which have brought helpful feedback to the Project Team.

The **HomeChoice** offices feature a groundwater harvesting system to maximise the conservation of precious water resources, and all materials consumed in the building are appropriately recycled and includes the separation of organic waste for composting.

Perhaps one of the most important factors in sustaining a green office into the future lies in the education and raised awareness of our staff. All employees have been exposed to talks, interviews and presentations on the subject and have been inspired to become Green Champions in their own right. This is maintained through interdepartmental guidelines for all occupants, as well as the development and implementation of a Building User's Guide, Landscape Management Plan, Hardscape Management Plan and Pest Management Plan.

www.homechoice.co.za

greenstar AFRICA South Africa | Existing Building Performance v1 ★★★★★ 5 Star Rating South African Excellence CERTIFIED AUGUST 2019 | GREEN BUILDING COUNCIL SOUTH AFRICA

Lighting design is not always about grand gestures and flashy decorative effects. One measure of a successful lighting installation is how much it is noticed by those who experience it. If people mention the lighting in a space, it is usually because there is something wrong with it. A scheme that the day-to-day users don't particularly notice or talk about while they enjoy the space in comfort, is likely to be a successful scheme.

INTEGRAL INTEGRATION

It is very difficult to get to this point if you do not take an integrated approach to the design – good quality lighting cannot be considered as an 'add-on' or an 'optional extra'. Lighting must be developed alongside the architecture and landscape design and with deep understanding of the end-user's requirements and the client's aspirations. A scheme must be fit-for-purpose, but it also must fit in with the space. The degree of integration that fully supports this requires close collaboration with other members of a design team.

FINDING THE BALANCE

Lighting design is about balancing many things. As well as meeting functional requirements and good integration, lighting can impact people's comfort, safety, health, well-being, sense of place and orientation; and there are potential wider social impacts, and impacts on local ecology and, of course, the environment. Responsible design is about balancing these things without compromising the result. It is not just about minimising the carbon footprint; one can create an extremely low-energy scheme, but if the lighting is inadequate, people will not use the space or will not be comfortable in it, and this therefore is not sustainable design.

LESS IS NOT ALWAYS MORE

Sustainability is a key factor for any lighting scheme – but that does not always mean that less is more. On the face of it some external lighting can seem superfluous (and much of it is), but having no light is not always the sustainable solution. Light forms the character and identity of a city after dark; well-designed façade lighting not only benefits the owner of the building in conveying their brand image, but the lighting can help to invigorate and activate urban space, augmenting the lit environment.

A public park with no lighting may not use any energy, but people would be unlikely to feel safe in the park at night, and the local community may therefore lose access to an important facility for social activity after dark. On the other hand, adding considered light and visual interest to a previously poorly lit and unsafe-feeling pedestrian path can open new routes at night and help to regenerate a local area – justifying and compensating for the energy used in achieving it.

As we grow our understanding of how light affects humans, one thing that we can be certain of is that daylight is the most natural and comfortable source we can use, and it also uses no energy.


Tessa Brunette

LED Lighting SA

LIGHTING CONTROL

Appropriate lighting control is also an important factor – by definition, the lighting is wasting energy if it is switched on when it is not needed. Light that escapes to the sky obscures the night sky ('light pollution'), and light spillage to the surroundings can cause a nuisance or affect local ecology. This spill light is also light (and energy) that is wasted, as it is not contributing to lighting the space. Careful design and specification of the lighting can ensure that this spill light is minimised, directing the light only where it is needed to create the desired ambience.

Lighting must be developed alongside the architecture and landscape design and with deep understanding of the end-user's requirements and the client's aspirations.

LIGHT FOR PRODUCTIVE SPACES

Moving inside, natural light is one of the most powerful elements in the commercial environment. It can make or break our experience of a space. Daylight provides a sense of warmth and enjoyment in a building, functional illumination in working areas, and various important health benefits from vitamin D production to improving the quality of our sleep. Yet daylight illuminance levels that are too high can also cause occupant discomfort and reduce visibility. Integrated lighting design finds the balance between this, creating optimal environments for workplace productivity. ▶▶

Jeff Shaw is a lighting designer and an associate director in the Arup London lighting team. He believes that good lighting is key to one's experience of a space and is intrinsic to people's perception of a company, an institution or a brand. He has extensive experience working in multidisciplinary teams on a wide range of lighting projects including commercial, retail and residential developments as well as museums, theatres, and transport projects. He provided technical expertise for the integrated lighting strategy for Park Square, Umhlanga.

Carin de Beer is a professional architect practising as a lighting designer and daylight specialist. She joined Arup in 2014 as part of the environmental and sustainable design team. De Beer has extensive experience in daylight design and analysis on award-winning buildings and precincts in South Africa, including Park Square in Umhlanga and the Silo District at the V&A Waterfront in Cape Town. She has extended this experience into her passion for lighting design and is currently sitting in the New York lighting team working on projects in both North America and South Africa.

A LIGHTING NARRATIVE

Arup applied these principles when approaching the lighting design for the new mixed-use Park Square development in the heart of Umhlanga New Town Centre, Kwa-Zulu Natal. Sustainability and energy savings, being important themes for the project, were considered when answering the key questions needed for a meaningful scheme:

- Who will be using the space and what do they need?
- What is the purpose of the scheme – what are the client's aspirations?
- What is the context – the location within the urban fabric, the local culture and history, how does the scheme integrate with the surrounding areas and fit into the urban tapestry?
- What does the lighting need to achieve beyond its basic function? In Park Square, the lighting helps to create identity and a sense of place for the development; it supports public safety and it assists with wayfinding and orientation.

The answers to these questions are drawn together to form the 'story' – the narrative that ties together the lighting design in a coherent way while integrating with the architecture. Responsible design also plays a role. Any scheme should aspire to use local materials and suppliers as far as possible and to minimise energy use.

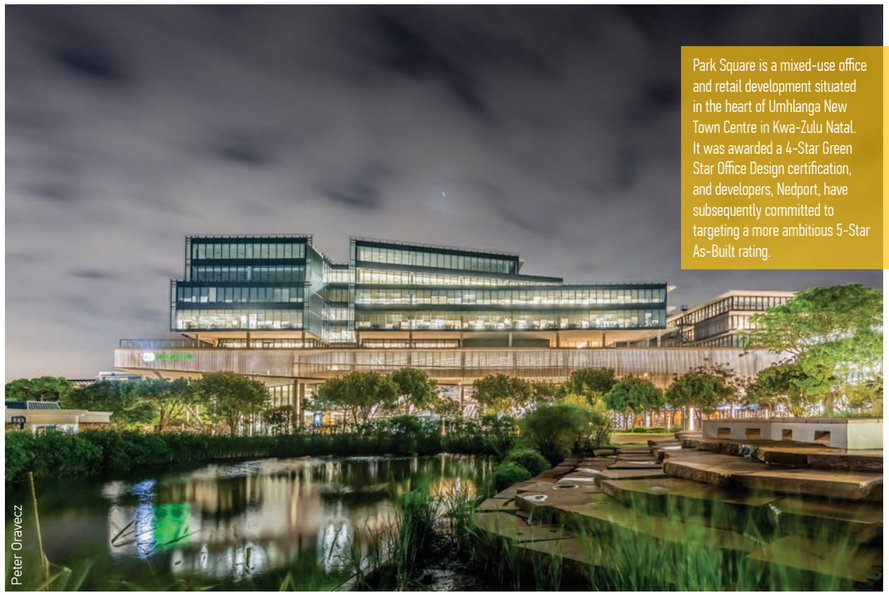
For the external lighting strategy of Park Square, Arup looked at each outside lighting element in detail with a view to creating a high-quality night-time environment. Light modulated the architecture, creating visual interest and users are guided by well-illuminated focal points and destinations. A high-quality lit environment was achieved by using a limited light colour temperature palette of white light, together with a range of light intensities, giving definition to the different areas and functions of the site. Dynamic lighting components create visual interest that encourage people to linger in the space rather than simply pass through.

The design strategy for the internal office space at Park Square was for it to be lit primarily by daylight. Wherever practical, the lighting control system reduces electrical light according to available daylight in the space. The use of electric lighting is thereby kept to a minimum, and generally takes place only on the cloudiest of days and after dark.

To counteract the negative impact of harsh sunlight, Arup investigated the impact of different scenarios on the heat load and useful daylight illuminance (UDI) early in the design process. UDI is a valuable method for assessing daylight in buildings that determines the percentage of time during a typical year that daylight illuminance falls within a comfortable working range. Arup compared various façade and glazing types for each orientation in order to specify a façade that both allows daylight illuminance levels in the space to reduce the need for electric light and limits occupant discomfort.

The understanding of the effect light has on human health and wellbeing is a topic where our understanding is still growing; for example, it is likely that the use of warmer light at night – avoiding too much of the blue part of the spectrum – better supports people's circadian rhythms and sleep patterns. For most of history, humans evolved with darkness or warm firelight by night, and in daylight during the day. As we grow our understanding of how light affects humans, one thing that we can be certain of is that daylight is the most natural and comfortable source we can use, and it also uses no energy.

For more information: **www.arup.com** +


Peter Oravecz

Park Square is a mixed-use office and retail development situated in the heart of Umhlanga New Town Centre in Kwa-Zulu Natal. It was awarded a 4-Star Green Star Office Design certification, and developers, Nedport, have subsequently committed to targeting a more ambitious 5-Star As-Built rating.

Smart Transmission

A smart grid can help utilities become more efficient while increasing grid stability. This implies a more flexible grid that monitors, controls and communicates with its users, providing consumers with more information and choice of energy supply. Electric vehicles can become a major role player in making this happen.

WORDS Femke van Zandvoort

Governments around the world are looking towards smart grid technology to achieve their carbon emission-reduction targets and sustain economic growth. According to SANEDI (South African National Energy Development Institute), the introduction of smart grid technology is key for the country to achieve its energy mix and meet its climate change objectives at municipal level. A 'smart' energy grid integrates all actions of users that are connected to it. These users can be consumers, but also renewable energy sources, such as solar or wind power, as well as 'new' loads, such as technology gadgets and electric vehicles (EVs).

PEAKS AND VALLEYS

"In a nutshell, the aim with smart grids is to balance the energy grid," explains Gideon Treurnich, strategic business development manager: Transport and Planning, Royal HaskoningDHV – southern Africa. Looking at the consumption of a conventional fossil fuel-powered energy grid, usage peaks in the mornings and early evenings, when people leave for and return from work, respectively. Usage dips during the night, while people are sleeping and not much energy is consumed. These load fluctuations are problematic to energy providers because electricity cannot be stored effectively for later use, and when demand is too high, black outs (or load shedding) can result.

The smart grid concept is aimed at flattening the energy curve by filling in the lows and shaving off the tops of the peaks. The addition of renewables such as solar photovoltaics (PV) can offer some respite, but PV peaks (which happen during the day, when the sun is at its highest) don't match with typical power demand. This is where EVs can be a key tool for grid management. The EV's batteries can store energy from the grid (either coal-fired electricity or better yet solar). When demand is high, the stored energy in the car battery can be used to power your home or office. When demand decreases, your car will be recharged according to smart charging principles.

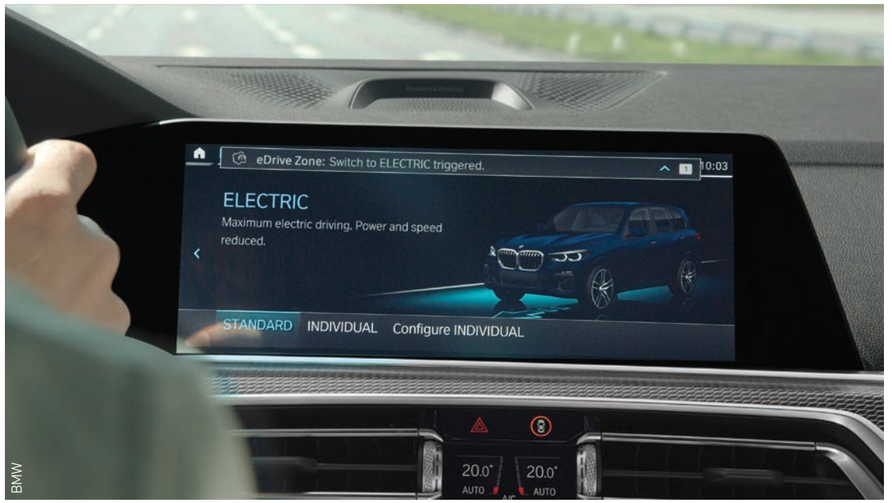
THE ENERGY ECOSYSTEM

"EVs are certainly part of the bigger energy ecosystem", says Hiten Parmar, uYilo eMobility programme director. "There is a mythical perception that EVs only take energy from the grid rather than also offering solutions to its problems. Traditionally, mobility has always just been a mode of transport from A to B, however, EV ecosystem technologies are providing new opportunities. EVs can also contribute to energy- or grid-resilience," he adds. Most vehicles are only used 7% of the time for transport purposes. Therefore, fully charged EVs can contribute to the grid in the form of grid services while they are parked (vehicle-to-grid, or V2G).

The current global focus is on frequency-regulation services, which makes the grid more stable, while also generating revenue for the vehicle owner. "Even if we have an exponential growth in EVs over the next ten years, the peak consumption of EVs will be only within 7% of national electricity demand by 2050. The impact of EV consumption on the national grid from an energy perspective is thus minor, as long as it is managed accordingly," Parmar points out.

In South Africa the backbone system of EV charging infrastructure is already designed according to international communication standards aligned smart grid principles. EV charge point operators like GridCars, BluePlug and EV BackOffice have products which automatically manage charging according to grid demand, by checking the current status of the grid

There is a mythical perception that EVs only take energy from the grid rather than also offering solutions to its problems.



BMW

BMW GROUP RACES AHEAD

Light, lines, and simplicity defined the refurbishment of the BMW Group South Africa head office in Midrand in 2014. Originally designed by Hans Hallen in the '80s, the building was modernised to reflect BMW's corporate identity and achieve a 5-Star Green Star As-Built rating while at it. The outer façade of this circular building remained largely unchanged, while the inner façade received a face-lift by becoming fully glazed. Innovation points were scored by the installation of glass louvres actuated by solar tracking. Energy and water metering linked to a live display system and charging points for electric cars were installed. 98% of the building material was recycled.

The greening of its head office falls in line with the company's drive for more sustainable car manufacturing. The 25 EV models initially announced for 2025 will now be available in 2023, two years earlier than originally planned. Over half of these 25 models will be fully electric.

The smart grid concept is aimed at flattening the energy curve by filling in the lows and shaving off the tops of the peaks.

and only charging when the grid is not constrained. "The same principle used with many geysers through 'ripple-control' relays – although at a higher technology level – will be applied to EV charge points. And if the grid is unable to provide you with the power, the consideration of solar and battery power should keep the EVs charged at 100%," Parmar says.

PERSONAL EXPERIENCE

The EVs currently on the South African market – Nissan Leaf, BMW i3 and Jaguar I-Pace – use the two main global charging standards: CCS2 and CHAdeMO. Each manufacturer has its own branded chargers, but they are all operating on a Type 2 socket and a fast-charge plug specific for their vehicles. Charging takes from 20 minutes to 10 hours. Ranges are from 150km for the Leaf up to 470km for the I-Pace and are continually improving.

Treurnich very recently started driving a BMW i3 and mentions he should have made the change to an EV a long time ago. Initially, he, like many people, worried about running flat – so called 'range anxiety' – he found out the range can be stretched quite a bit, especially since the car also charges when going downhill for instance. "And there are a lot of charge stations popping up on your navigation screen while driving, so if you are really scared of running flat, you can stop for a coffee and charge quickly."

BMW's head office in Midrand achieved a 5-Star Green Star Office rating in 2014.

CITY OF THE FUTURE

While EV integration poses some challenges to the grid, it presents utilities with a valuable opportunity to maximise their existing infrastructure by managing peak demands. A smart grid also allows utilities to collect specific data, offer special rates for EV charging, and engage with consumers. Presently, people only physically interact with electricity when they switch on a plug. Whereas in a smart grid environment, people will check via an app on their phone or computer to see if it is safe to switch on their geyser or use another high-consumption unit.

But inclusion of EVs also has the potential to create a connected city according to Treurnich: "The developments in Internet of Things (IoT)/Industry 4.0 are having a massive impact on EVs and their connection to the infrastructure," he explains. Through IoT, vehicles communicate with the greater citywide infrastructure. This provides opportunities for smart traffic management and intelligent transport systems. Major cities in South Africa are in the process of implementing adaptive traffic controllers, whereby during times of increased traffic flow in certain areas, the green light phase will be increased. EVs communicate to infrastructure with vehicle-to-infrastructure (V2I) and vehicle-to-everything (V2X) technology. "It will be possible to tell your vehicle when you need to be at a meeting, and your vehicle will advise you on what route to take and when to leave as it is aware of the traffic situation along that route," says Treurnich.

BARRIERS TO ELECTRIC VEHICLES

The main reason why South Africans have not embraced EVs en masse, is the high purchase price. EVs are not currently manufactured in the country, thus import and ad valorem tax amounts to around 40% extra in total added costs. Parmar says uYilo and supporting stakeholders are currently working with government to address this. "Many governments have incentivised the use of EVs, for instance in Oslo, Norway, where in March 76% of new car sales were electric. In South Africa we cannot expect any financial incentives, but at least we aim to create a more enabling environment for EVs", he says. We are also likely to see a landslide move towards EVs in coming years as prices drop and supporting infrastructure improves.

"There is a big move going on in South Africa to not only get private cars into the electric space but also ▶▶

UYILO EMOBILITY PROGRAMME

The national uYilo eMobility Programme was established in 2013 as an initiative of the Technology Innovation Agency to enable, facilitate and mobilise electric mobility in South Africa. The programme is also one of the Strategic Initiatives within the Green Transport Strategy of the national Department of Transport (DoT) that promotes the introduction of EVs under strategic pillar 8. uYilo is working closely with various parties including the South African Smart Grid Institute (SASGI), Eskom, and other role players, on extending the possibilities and integration of EVs in transition to the smart grid.

The uYilo smart grid facility provides a live testing environment that facilitates universal connectivity between EVs and supportive smart grid infrastructure. The facility provides local insight into EV usage profiles and associated energy requirements, while providing valuable information for vehicle manufacturers, utility, and energy companies, to further optimise energy management. At 128 kW total EV charging capacity, it is the largest dedicated EV charging facility and the most technologically advanced in Africa.

The facility consists of the various EV ecosystem elements such as EV fleets, a mix of AC charge points, DC fast-chargers, a vehicle-to-grid (V2G) station and supporting information communication systems. Renewable energy is incorporated through solar, and energy storage is achieved through repurposed electric vehicle battery packs in 'second-life'. The network management system is aligned to global smart grid protocols in order to support future innovative developments and implementation.

The current capacity from the grid; the time of use; as well as the current energy tariff for cost-effective charging is monitored by the incorporated autonomous energy management system. If the grid is constrained, it then utilises solar and batteries to charge to EVs.

The V2G station is directly plugged into an EV, and when fully charged, allows for frequency regulation services to the grid, contributing towards building grid resilience.

The uYilo smart grid ecosystem facility in Port Elizabeth is already demonstrating local activities of smart grids with EVs – solar charging optimisation, second life EV batteries, vehicle-to-grid, and autonomous energy management.

corporate fleets, freight and public transport," says Treurnich. Various cities in South Africa are embarking on a strategy to have their corporate fleets changed to EVs. The City of Cape Town has just completed a study with Royal HaskoningDHV to understand the challenges and opportunities of shifting the City's own fleets to EV.

Another cause of the slow uptake is that many people are unaware of the technological advancements taking place around EVs. Mary Haw, manager at the City of Cape Town – Sustainable Energy Markets, who is tasked with the promotion and facilitation of renewable energy technologies and the uptake of EV by Cape Town residents, says it is still early days. The City sees EVs as an opportunity for cleaner air, better local transport, reduced reliance on price-volatile imported liquid fuels and opportunities for reduced CO_2 emissions in line with the Carbon Neutral by 2050 commitments. Cape Town wants to be a leader in EV deployment and is currently investigating opportunities to promote the move to e-mobility as well as mitigate the risks associated with the change.

Grid integration is an area of concern as the regulations are not in place and a sudden high uptake of EVs may cause problems in some areas where the grid is already constrained. "We are investigating a number of elements including tariff design, the impact of EV charging on the electricity grid, charging regulations and, as mentioned before, the options for converting our own fleets to EVs" says Haw, adding: "We are well aware, however, that the industry is not going to wait for us, so we need to be proactive if we are to be a leading EV city."

Dr Minnesh Bipath, acting CIO and general manager: Smart Grids, Data and Knowledge Management at SANEDI acknowledges that uncontrolled charging of EVs without proper visibility and control will be detrimental to the aging distribution infrastructure at this stage, as was pointed out by a feasibility study of EVs by the United Nations Industrial Development Organisation (UNIDO) and the Department of Trade and Industry (DTI). It has been recognised that smart grids can eliminate this challenge. "Apart from the actual grid which needs to be upgraded, ICT infrastructure ('smart grid technology') – needed to enable visibility and control – is non-existent in most municipalities. This investment will also be guided by what happens to the Eskom restructuring. We could potentially end up with a single smart grid or 257 smart grids," Bipath explains.

LOCAL MANUFACTURING

Bipath further mentions that micro-economic studies are being undertaken by the DTI to answer questions around the knock-on effects on jobs, mechanics and the whole value chain of the road transport sector.

Treurnich believes that the South African car manufacturing industry could be more proactive. "You can say: 'South Africa is autonomous; we are doing our own thing.' But we are not. About 60% of the vehicles that have been manufactured here are going to Europe. Europe has already placed a ban from 2024 on most of the conventional ICE vehicles. If we are not preparing ourselves to change our vehicle manufacturing over to EVs, we are suddenly going to have massive job losses and a reduction in the market of exported vehicles because nobody wants – or is allowed – to buy them," he warns.

'Adapt or die' seems to be the motto, or as Taru Madangombe, vice president of Power Systems for Schneider Electric puts it: "We are amid a global evolution toward energy systems that are cleaner and increasingly decentralised, with energy generated, stored, and distributed closer to the final customers, with renewables and storage technologies. At the same time, digitalisation will allow customers and electricity system operators to control where, when and how electricity is being used and allow new business models to emerge. Finally, new and more energy uses are going to be electrified – mobility being one of the critical ones." +

BUILDING WITH LIME

Wuppertal is a small historic missionary village situated in the Cederberg mountains in the Western Cape; with origins dating back to the early 1800s. The village was devastated by a fire on the 30th of December 2018, leaving many people homeless and destroying many historical buildings in its path. The tragedy was widely documented in the media.

Seven months on, Afrimat Cape Lime is now on site, involved in the rebuilding process of this iconic historical village. Although the rebuild project has only recently started, significant and valuable insight into the use of lime in the project has already been gathered.

REBUILD, RESTORE

Most of the damaged and destroyed buildings consist of soft burned clay bricks, stone, lime mortars and mud-straw mortar and plaster. In projects of this nature, it is imperative to use building materials that are compatible with these old buildings and their inherent substrate. Much European-based research has proven that despite their strength, the widely used modern cement-based mortars are not vapour permeable and can actually cause decay of these soft older building materials. It is for this reason that lime-based mortars and plasters are used for their vapour permeability and breathability, as well the compatibility with older soft building masonry.

When it comes to the hydration of lime, each renovator has their own recipe, and it can be the source of much discussion. Technical terms such as hydrated lime, slaked- and un-slaked lime, hydraulic lime, and quick lime, can create confusion amongst mainstream construction persons and historical restoration experts alike; with debates around whether lime should be hydrated on-site in the form of hot-lime (hydrating quicklime) or hydrated hydraulic lime. Arguably it may come down to the romance of doing it the way that it has always been done, and thus depends on the preference of the artisan or heritage expert.

In earlier years CaO (oxide) was hydrated by mixing lime with water in, for example, an old oil drum. This reaction creates heat and steam whereby the oxide breaks down to a putty or powder, depending on the amount of water. When looking at the lime cycle, after lime has been hydrated, the formed Hydrated lime $Ca(OH)_2$ absorbs CO_2, thus setting and forming $CaCO_3$, which is effectively lime stone in its original form. The issue with this type of on-site hydration is that there is no quality control, and as such it is impossible to identify how much of the oxide hydrates. The implications are that when un-hydrated lime (oxides) particles later get in contact with moisture, it will hydrate in the already plastered wall, causing blow holes. This explains why many on-site hydration methods can take three months and more.

Afrimat Cape Lime negates these on-site hydration risks by hydrating lime through a pressure hydrator. This guarantees that all lime particles in CLC building lime have been hydrated and will react with CO_2 to carbonate. Currently CLC building lime is the only SABS 523 certified building lime in South Africa for use in plaster and mortar work.

DISPELLING PERCEPTIONS

Many on-site mix design trials have been conducted to produce a satisfactory plaster mix. Site tests have emphasised the important role that sand plays in the quality of plaster and mortars. Sand with an estimate 30% clay/silt content caused shrinkage and spiderweb-like cracks. Clean sand with almost no clay/slit content produced a contrastingly different quality plaster.

Although it is known that lime gains strength slower than cement, the perception amongst locals that lime cannot be used as a mortar was soon crushed when the first test structures on site were built. Upon interviews with local artisans, one builder reported, "I have been laying bricks for 58 years and I have never known that I would be able to build a wall with just lime and sand."

The structure in the photo was erected in two days using just a lime and sand based mortar, which shows that in practice it is possible to build with a 'cement-free' lime-based mortar in the same way as it was done in the early 1800s.

This project is only in its infancy and this is a great case study in the argument of building with lime. **+ www.afrimat.co.za**

CLC AFRIMAT

Get educated for Industry 4.0

Cranefield College offers tech-enhanced online courses to give you the edge...

In the Fourth Industrial Revolution (Industry 4.0) economy, private and public organisations collaborate with inter-organisational partners in virtual networks, focusing on their own core business and competencies, while partners perform non-core tasks. This applies to all local government entities and profoundly to aspiring Smart City municipalities. In partnering they first seek candidates closest to them before moving regionally, nationally or globally. This stimulates the growth of small and medium sized enterprises, as well as job creation in their immediate vicinity. Four aspects most affected by Industry 4.0 are customer expectations, product and service enhancement, collaborative innovation, and organisational forms.

Industry 4.0 brings major organisational transformation and change across all four aspects led by collaboratist leaders who are super-transformational with respect to behavioural, technical, and structural strategies. In modifying behaviour and concomitant mindsets to the Industry 4.0 perspective, staff of these organisations become skilled at creating, acquiring and transferring new knowledge and insights. Employees and partner resources operate in high-performance teams where good communication and information flows flourish. Behavioural change affecting mindsets is crucial for success.

Collaboratist leadership flourishes in open innovation ecosystems where modern business models and organisational forms are the order of the day. Key enabling technologies, *inter alia*, artificial intelligence (AI), internet of things (IoT), and robotics, largely influence the design of product and service processes constituting Industry 4.0 organisational forms. These processes are shaped cross-functionally and need to be programme-managed. Hence, a key success factor is for leaders to possess sound project- and programme management acumen, and to be able to intellectually stimulate their own virtual teams, as well as those of partner members, so that they can perform effectively.

Strategic leadership

Industry 4.0 leaders are guardians of an organisation's value system, requiring them to be role-models of the preferred organisational culture. This encourages positive perceptions about the ability of leaders to create an organisational climate conducive to high motivation. It can be argued that to achieve success in Industry 4.0, superior strategic leadership should display all characteristics alluded to above. It constitutes the ultimate talents that modern day organisations can utilise to become highly competitive and achieve superior performance. Moreover, innovative governance and creative organisational structures and mindsets led by collaboratist leaders, must be combined with virtual networks of partner organisations to also ensure collaboration and synergy.

Prof Pieter Steyn, Principal, Cranefield College

Cranefield College's academic qualifications and short courses are designed to master organisational leadership, management and governance needs to cope with the Industry 4.0 environment. Students are taught how to achieve organisational performance excellence through program-managing inter-organisational value chain activities. This includes program-managing supply chain- and project portfolios. Over the past two decades, our lecturers performed extensive research, addressed international symposiums, and published ground-breaking articles on Industry 4.0, resulting in Cranefield becoming an educational leader in this field.

In tune with our digital age

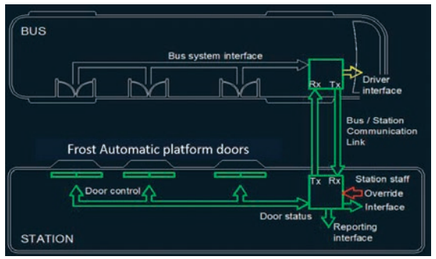
The project and program management acumen taught by Cranefield embeds valuable knowledge and skills in organisational mindsets for coping with Industry 4.0 aspects. It delivers a clear customer expectation focus; innovative continuous improvement with respect to product and service enhancement; a learning mindset for collaborative innovation; and the matrix methodology for managing networked virtual cross-functional processes of new Industry 4.0 organisational forms.

Cranefield offers technology-enhanced live-online distance learning with limited class contact. Classes are offered at our auditorium in Midrand, Gauteng, and simultaneously streamed live globally. This makes it possible for students to enrol from anywhere in Africa and the rest of the world. High definition videos of all classes are made available to students via Cranefield's high-tech online Learning Management System. Recorded sessions are available after each lesson.

Increasingly, employers prefer job-relevant education and training for improving the competence of employees, and providing them with beneficial skills. "*What I learn from Cranefield today can be implemented in my work tomorrow*" is a student accolade often received. Cranefield offers a host of academic qualifications and short courses, including a specialised professional Master's degree and a PhD. See **www.cranefield.ac.za**. **+**

CRANEFIELD

GREEN LIGHT AHEAD FOR SUSTAINABLE TRANSPORT



Cape Town based Specialist Contractor, Frost International is proud to have contributed to the Bus Rapid Transit (BRT) systems in place in Cape Town (MyCiti) and Tshwane (A Re Yeng), and is currently working on the next phase of Johannesburg's Rea Vaya, as well as the upcoming BRT project in Rustenburg (RRT). The Frost BRT Station Interface System (SIS) makes use of a real-time dashboard, which displays error codes should there be a problem: Faults on busses and/or station platform safety doors can be monitored live and this information is relayed from the Station Control Board (SCB) using the relevant infrastructure (wifi/fibre) to the Transport Management Centre/ APTMS Contractor and/or the Frost International Control Centre. This means that repairs and preventative maintenance can be proactively managed, saving time and money for all stakeholders.

The system operates using RFID communications between the Platform Safety Door Operators (FROST AUTOMATICS on above projects) and the Bus Relay Units (BRU) located on the busses. RFID (radio frequency identification) is automatic recognition technology that uses wireless communication. On docking of a bus in the correct position at a station platform, the communication comes into effect and the SIS protocol automatically kicks into play. The bus driver receives information via the BRU display that the bus is docked correctly, and proceeds to open his bus doors independently. For every bus door that successfully opens, the corresponding Platform Safety Door opens. This all happens in a specified sequence to ensure safety of users. On departing from a station, the bus driver will enter the sequence for the closing of the bus doors. This information is picked up by the Station Control Board (SCB) and the reverse sequencing of opening the doors is followed automatically, to ensure a safe closing sequence.

Frost has a component of its system that can assist in creating this success: The Frost Vehicle Prioritisation Initiation Link (VPIL) technology means that the system can be linked to nearby traffic lights, so that buses always have a green light ahead of them. On departing from a station, the lead door will send a signal to the Station Control Board that it is closing, which will set off a sequence of events that will allow the next traffic light to be able to be manipulated to be green on arrival of the bus as it arrives at this position – leading to optimal efficiency, with time and money savings. Advantages of this are obvious: faster and more efficient travel time; less stop/start time of the bus; reduction in harsh braking; overall less wear-and-tear; a wholly convenient and user-friendly solution.

BENEFITS ALL ROUND

Frost International currently have over 600 FROST AUTOMATIC sliding door operators managing the platform station doors on the above BRT Systems, with more on order, as well as having communications using the SIS on over 420 busses, with a further 140 busses expected on the Rea Vaya system.

To summarise the benefits of the Frost SIS: Safe sequencing of door actions; effective system monitoring against abuse; security of doors and communications; driver feedback on door status; rapid response to problems; continual health monitoring of all systems; over-the-air firmware upgrades; ease of management.

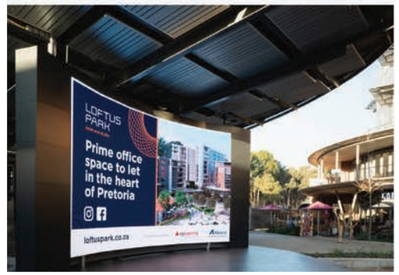
The benefits of a BRT system to a city include:

1) Travel time savings: Dedicated bus lanes separate the BRT buses from regular traffic, allowing them to travel more freely through congested areas on the city.
2) Reduction in emissions: BRT systems reduce the overall driven kilometres travelled in a city.
3) Improved traffic safety: The implementation of a BRT system reduces traffic incidents and fatalities.

Frost International is the only South African company that can provide a complete one-stop-shop solution to a BRT- anywhere in the world! ✚

www.frostint.com

FROST INTERNATIONAL
Specialist Contractor



HD MEDIA™

Pure Digital Innovation

The uprising in today's advertising world, founded HD Media, a digital LED display turnkey service provider solution.

HD Media is an international digital display solutions company. HD Media is a story of success through innovation, design and operational excellence. We are a network of big thinkers, tech-savvy craftsmen, and resourceful can-doers who are setting the standard as an industry leader. As audiences and communication channels become more fragmented, HD Media stands out for its ability to combine mass media and targeted solutions. Being the sole distributor of Polaroid digital displays makes it easy to attain such high standards in bringing clients ideas to life every single time.

With global population becoming increasingly urban and mobile, our solutions become more effective each passing year. We are now one of the most influential LED digital display players, and one of the most flexible. To date, HD Media covers over 2500 square meters in LED displays across South Africa, reaching millions of South Africans every day. We pride ourselves as being the largest supplier of wall mounted LED Screens, look around you, we have caught your eye by now! From concept to completion, our philosophy and entrepreneurial spirit is driven by one purpose: to supply a powerful platform for advertising, by working towards harmonious integration, rigorous upkeep and the ongoing benchmarking of new requirements and practices within the South African media market.

HD Media wants to improve your outdoor or indoor experience and make cities more attractive, more intelligent, more responsible, more connected and more engaging. Whether it's a project as small as a Kiosk or as colossal as a skyscraper, we've got you covered.

Lets talk, let us connect your audience today.

Lets Talk:
www.HDMedia-ltd.co.za
www.PolaroidDigitalDisplays.com
Email: sales@HDMedia-ltd.co.za
Tel: +2710 516 0001


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

Water-saving the Scandinavian way

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

How did the company start?

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

Does The EcoFlush looks different compared to a standard toilet?

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

How much water can you save?

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

What is the shower you are showcasing?

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

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

SCANDINAVIAN
WATER SAVING PRODUCTS
www.swsp.co.za

Quantifying the Environmental cost of building

Construction uses approximately 40% of the world's raw materials. We have discussed the effects of climate change, the ozone, water shortages and depletion of natural resources. What are, 'we', as the built environment doing to combat this?

Koen and Associates is amulti-disciplinary firm, who over the past 15 years, has strived to include green building practices into their designs. The price of going green as an initial investment is quite high, but over the course of a few years, the financial and environmental benefits outweigh these.

At the new Serengeti development– the architect has tasked himself with making the residential building as green as possible. Located within the Serengeti, Golf and Wildlife estate, the residence is a 2-story open-plan showpiece; whose façade design fits into the archetype of the Serengeti homeowner's aesthetics. What makes this home exceptional is the attention to green initiatives. From the walls to the floors, the architect has created a perfect blend of modern architecture and has constantly remained cognisant of environmentally sensitive design principles.

The cavity wall construction is made up of a 30mm air gap and a 30mm Isoboard wall insulation. The cavity wall construction will prevent heat transfer and build up to the inner leaf of sun-exposed walls. Moisture within the cavity is prevented from condensing onto and penetrating through the inner leaf. The insulation restricts heating ingress to temperature controlled and passive cooled environments.

The Thermal Conductivity (k value) of new IsoBoard is 0.024W/m°C, and that of 5-year aged IsoBoard at 90% relative humidity is 0.03W/m°C, which is referred to as the 'long-term design' value. The Thermal Resistance (r value) of the IsoBoard is 1.25. The walls were than further plastered with perlite, supplied by CemteQ, which has been specifically developed for energy-efficient building. Perlite is a lightweight, thermally insulating and fireproof cement aggregate that can double a wall's thermal insulation. Using perlite as an additive to the floors and walls increased the thermal properties of the residence. It is nine times the insulating properties of normal screed and seven times better than ordinary plaster, having a thermal value of 0.128m2. k/w as opposed to the normal r value of ordinary plaster (0.0212.k/w).

The excessive heat gain in our warmer summers was counteracted with the use of double glazing, with a low e-coating to the glass which has a 30% reduction in heat gain or loss compared to the single glazed windows. The cost is 50% higher in terms of pricing but will be offset by the long- term usage of artificial cooling and heating.

The residence has also made use of solar power. According to solar suppliers, Solareff, since commissioning the system five months ago, it has generated 5.5MWh of energy (5500kWh). Depending

on the season the solution provides 27% to 37% of the total power requirements.

On normal sunny days the Serengeti Residence operates independently from the grid between 9am to 3pm. Apart from the monthly cost savings of almost R25 000, the system also has a 10kWh Lithium Iron Phosphate battery that is able to run essential loads during a power interruption. All lighting within the residence is LED to decrease the load on the solar and in the event of power outages all lights can still function optimally.

As the project will no longer be utilising the electrical municipal supply, the architect decided to go a step further and prevent water wastage with the use of rainwater collection. At this point, rainwater collection is used for the exterior of the residence but with continued use, we hope to progress to a point where we no longer require municipal water and reduce water waste.

The change can be as small as a residence or as large as a corporate block. Building from the ground up allows us to have the opportunity to include all the wonderful facets of the green building world such as solar heating, gas heating, rainwater storage, and insulation walls and plaster. There is a trend towards renovations and giving old buildings a 'face-lift' with very few buildings starting from the ground up. Architects and developers are aware that some aspects of the building can only be incorporated in a new design, but the hope is that we incorporate what we can in all designs.

These changes have a positive impact leading to the greater return on investment; investment in financial terms but also investment in our planet. +

KOEN & ASSOCIATES
ARCHITECTURE

Isoboard XPS Inverted Roof Thermal Insulation Application

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

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

ISOBOARD IN PRACTICE

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

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

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

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

Repurposing buildings: New life from solid stock

Some buildings have their lifetime's design calling: cathedrals: monuments, hospitals and palaces. Some are homes, renovated and refreshed from time to time. And others once had a particular purpose; long forgotten as the needs of the community changed.

As an example, in Somerset West we have what was once perhaps a light industrial workshop or warehouse, now reinvented as a chic interior design showroom – The Mood Collective. A large walled space with mezzanine, ideal for displays, with offices, and lovely natural light beaming through the high industrial windows. With a lot of love, effort, tears, and perhaps some money, the industrial building has been refreshed into a stunning showroom, where interior specialists showcase their wares to interior designers and homemakers.

ADDING PASSIVE COMFORT

Amongst the challenges to be overcome in preparing the building was adding passive comfort, to allow patrons to browse at their leisure. While the building has some aspects which contribute to occupant comfort, such as cross-flow ventilation and high thermal mass solid walls, it was built in an era when limited thought was given to the disposition of occupants, and the effect of discomfort on patronage and energy efficiency. The 300m^2 asbestos fibre roof was completely uninsulated, meaning high temperature loads in summer, and a cold interior in winter.

While one option would have been to remove and replace the roofing after installing thermal insulation, because there was opportunity to work from within the empty structure, the decision was made to solve from within. In addition, this saved replacing the roof sheets.

The solution chosen has been to add proven thermal insulation, in the form of 30mm thickness IsoBoard panels, directly adhered to the existing roof sheets. IsoBoard panels were factory painted per specification, glued to the asbestos sheeting between the existing purlins, and finished with a trim piece. This intervention has made a considerable difference to the interior comfort and the aesthetic appeal of the showroom, while preventing any shedding of asbestos fibres.

A NEAT, QUICK AND RELATIVELY AFFORDABLE SOLUTION

The installation team of four took a week to install the IsoBoard roof lining panels, working from scaffold platforms. The adhesive forms the permanent bond between the roof sheets and interlocking IsoBoard panels, making use of no mechanical fasteners at all. The key to this installation is having dust and oil-free surfaces on the sheeting and boards, allowing the water-based adhesive to bond. The recommended adhesive allows IsoBoard panels of up to 2 400mm in length to adhere almost instantaneously, enabling the installation of the next and subsequent boards without dislodging the initial board. Pre-painting the boards saved time, mess and disruption on site.

Overall, this has been a neat, quick and relatively affordable solution, delivering a comfortable and appealing environment for occupants, without affecting the integrity of the roof system. +

Appropriate solutions for every lighting condition

Product Review: Junkers & Müllers Silkshade Blinds by Luminos

JM Silkshade is a range of fabrics that offers a choice of appropriate solutions for each specific lighting condition. Luminos Blinds uses these fabrics in various applications such as roller blinds and pleated blinds, using only the highest quality systems and components available to the industry. These products can also be motorised for convenience as well as energy savings.

The fabric, produced in Mönchengladbach, Germany, has four quality grades with a 5% openness coefficient. These come with or without an aluminium backing. JM Silkshade D with a 3% openness coefficient can be easily combined with the similar optics of the 5% article. The product range is complemented by a blackout product, which achieves one additional level of light screening. The high gloss character of the product makes JM Silkshade interesting, not only for the commercial sector, but also the home environment. The colour range extends from white to fashionable linen and stone colours to black. With a product width of up to 310 cm, these materials are also recommended for large window areas.

A FABRIC THAT OFFERS LONG-TERM SECURITY

The core component of JM Silkshade is Trevira CS, an inherently flame-retardant polyester with a strong environmental profile due to its permanently flame-retardant properties. Unlike fabrics that receive a surface treatment at a later stage, Trevira CS fabrics offer long-term security. The flame retardant Trevira fibre and yarn types ensure that Trevira CS furnishing materials satisfy all important international fire protection standards. Flame retardant Trevira fibres and filaments are, furthermore, certified to the Oeko-Tex 100 Standard.

Since 1972, the Oeko-Tex® Standard 100 has offered textile companies the opportunity to have their products' human ecological characteristics voluntarily tested and certified. Junkers & Müllers has had its entire sun shading, Mediatex and EventTex product ranges certified in accordance with the Oeko-Tex® Standard 100 IV, and can therefore guarantee that its fabrics do not contain any harmful substances.

The Oeko-Tex® label "Textile Trust" is a global synonym for responsible textiles manufacture – from raw materials through to the finished fabric. For the consumers, this label represents an important decision guidance. They can rest assured that they are buying high quality products, which are harmless to their health.

LUMINOS BLINDS

Luminos is the key brand of The Blinds Syndicate, a world class-manufacturer based in Durban, Kwa-Zulu Natal, which specialises in highly technical coverings for doors and windows. Our blinds are locally manufactured, handmade, and prized for their outstanding quality and workmanship, thus offering architects, interior consultants and Green Building professionals products which boast technical qualities to control light, heat, sound and hygiene. Luminos holds the sole distribution rights in the entire SADC region to the most highly specified technical textiles in the world. These textile companies include Junkers & Müllers Technical Textiles. +

Luminos
BESPOKE WINDOW BLINDS AND SHUTTERS

JM Technical Textiles

Thermguard Insulation: Recycled for Your Future

Many industry specifiers are unaware of the significant impact their choice of insulation can make – not only on the thermal and acoustic comfort of the homeowner, but also on the environment. Here are a few of the environmental advantages of Thermguard insulation:

RECYCLED CONTENT

Thermguard insulation is manufactured from 80-85% post-consumer recycled newspaper (one of the largest parts of our waste stream) which would otherwise be dumped in landfills, using up valuable space and creating greenhouse gasses whilst decomposing.

ADDITIVES

The non-recycled fire-retardant additives in cellulose fibre insulation are environmentally preferable as they are non-toxic and natural. These natural salts and minerals are used in agriculture to promote plant health; stop and prevent wet and dry rot in timber; and they also have various uses in the household and medical fields. Borate additives in Thermguard are harmless to humans and pets; however, it will irritate insects and rodents such that they will not live in the material or use it to build a nest.

EMBODIED ENERGY

The embodied energy of cellulose insulation is by far the lowest compared to all other insulation materials commercially available. Furnace-made insulation materials (fibreglass and polyester) require around 10 times more energy to produce compared to cellulose fibre. Cellulose fibre is also 100% biodegradable and will not negatively affect ecosystems or wildlife.

The decisions we make from this point on will affect the sustainability of our planet for all future generations. Remember, Thermguard is Recycled for Your Future. +

www.thermguard.co.za

PERFECT FINISH, PERFECT FLOW

Johannesburg's retail and office complex THE MARC has utilised a variety of resin solutions from Flowcrete Africa to create stunning, high performance surfaces. THE MARC is named after its location in South Africa's financial district, as it is on Maude and Rivonia Corner in Sandton CBD. The project's architects wanted to build a facility that reflected the area's fashionable, modern and energetic atmosphere. This meant choosing a floor finish that would convey a contemporary, decorative aesthetic but that would also be able to maintain this look even after extensive use and wear. Initially the architect opted for tiles, due to its cheaper initial cost, however after seeing examples of what could be achieved using the seamless resin terrazzo system Mondéco, they quickly changed their minds!

SHADES OF GREY

Following consultations with Flowcrete's team of resin flooring experts as well as test samples being put down and analysed, THE MARC's architects specified a bespoke, eye-catching Mondéco Earth floor. Mondéco Earth was chosen in three colours and applied in bands of complementary colours across the shopping centre's main walkways. 1,865m² of Mondéco Earth in Polar Mist was selected as the main colour for the floor with 840m² of Light Grey and 550m² of Mid Grey utilised for adding interest and accents into the finish, particularly along the floor's edge and for breaking up the main colour with curving shapes.

In addition to the Mondéco Earth, 374m² of Peran STB in Light Grey was installed on levels 15 and 16 of the development. Peran STB is a decorative and durable epoxy resin floor coating made up of colour stable quartz granules sealed within a clear resin binder. Away from the public facing areas, 7,000m² of the self-smoothing epoxy resin floor finish Flowshield SL 1000 in Mid Grey was applied throughout all the tank rooms and back of house areas thanks to its robust nature. +

www.flowcretesa.co.za/terrazzo

GREEN STARS FOR POSITIVE IMPACT MAGAZINE

In June 2019, *Positive Impact* was awarded the prestigious 2019 Property Publication of the Year at the SAPOA (South African Property Owners Association) Journalism Awards for Excellence. We are extremely proud to see green buildings and sustainability receive mainstream recognition, and hope that you will join us on our mission to create a greener built environment. See how you can get involved below.

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

FROM LEFT TO RIGHT: Nomzamo Radebe (SAPOA), Pardon Mutasa (GBCSA), Gordon Brown (pubtisher), Mary Anne Constable (editor), Brian Azizollahoff (SAPOA)

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.

ADVERTISE WITH US

For advertising and sponsored content contact Thandiswa Mbijane: *thandiswa.mbijane@alive2green.com.*

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

EDITORIAL 2020**

Design Edition ~ January 2020
Top-rated green buildings and interventions
Passive design as the foundation for green buildings
Interviews with top architects and designers
Designing green interiors
How Industry 4.0 can aid design

Residential Edition ~ March 2020
Top-rated residential projects and interventions
GBCSA's new residential rating tool
Passive design as the foundation for green homes
Urban food systems – becoming self-sufficient
Unpacking the concept of a smart green home
Light steel frames as a concrete alternative
Recycling at a residential scale
Greywater systems for home use
Affordable housing – is greener better?

Property Edition ~ June 2020
Top-rated green buildings and interventions
Showcase of what major property developers are doing to green their portfolios
How the public and private sectors can work together
Interviews with youth and women in the green sector
Exploring net-positive and self sufficiency
Low carbon concrete – is there such a thing?
Responsible water course management
How to make green industrial buildings
Responsible demolition

GBCSA Convention Edition ~ October 2020
Exploring the theme of the GBCSA Convention
Interviews with convention keynote speakers
Top-rated green buildings and interventions
Smart buildings and smart cities

**Subject to change

We Tread Softly.

As the first South African flooring manufacturer to earn the coveted Global Green Tag eco-label certification, as well as internationally recognised ‘Level A’ Global Green Tag certification, GreenRate, Belgotex products are eligible for 100% of the available credit points across all South African Green Building Council (GBCSA) rating tools.

We aim to ask more of ourselves and less of the planet in all that we do.
We call it – **Our Green Journey.**

Cape Town Design Centre: Showroom B, The Matrix, 8 Bridgeway, Century City.
Johannesburg Showroom: 1 on Jameson Ave, Cnr. Glenhove Rd & Jameson Ave, Ground Floor, Melrose Estate.
Durban Showroom: 31 Solstice Road, Umhlanga Ridge.

Belgotex™

—
www.belgotex.co.za