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> CONTENTS

04 CESA/AON EXCELLENCE AWARDS WINNERS All the winners in the 2015 consulting engineering awards.

06 VALUE ENGINEERING: ACHIEVING A TRUE PAYBACK Still underutilised in the commercial property industry?

08 ARCHITECTURE FOR SOCIAL GAIN AWARD WINNERS Recognising and rewarding design for learning spaces.

11 NEW CHALLENGE Sustainable construction places new responsibility on QSs.

17 PHILIPPI VILLAGE – A CATALYST FOR GROWTH New development aims to change how business is conducted.

22 CHALLENGES OF MAJOR STRUCTURAL ALTERATIONS Adapting when structural engineers change refurbishment.

26 WATERFALLS'S PROGRESS The Mall of Africa is opening in less than a year.

28 STABILISING BUILDING PLATFORMS IN MPUMALANGA Emoyeni Mall needed various stable terraces.

30 BUILDING ON THE CO-WORKING CONCEPT A trend that started in the USA is gaining in popularity.

32 CIVIL STRUCTURES ON TRACK An 18 km contract on the N4 is progressing as planned.

34 HYDRO CUTTING'S BENEFITS A strategic investment saw an asphalt producer solutions increase.

36 TRADITIONAL RETAINING WALL ALTERNATIVE The Tensa TW1 System was used at the new Ballito interchange.

44 MAPUTO RUNWAY RECONSTRUCTION A project that required an in-depth understanding of cross border work.



08



22



26



36



20 COVER STORY

AfriSam's Thank Tank: at the Totally Concrete Expo held in May, AfriSam ran a campaign where attendees were asked to pay tribute to the many builders whose efforts and craftsmanship make a tangible difference in so many people's lives. Attendees submitted messages as an 'ode to the builder' to AfriSam, and these were replicated as graffiti on one of AfriSam's Readymix trucks.

1

REGULARS

- 4 Marketplace
- 12 Environment and Sustainability
- 16 Property
- 22 Project Profile
- 26 Projects and Contracts
- 44 Equipment
- 49 Products and Services
- 52 Diary and Appointments

EDITOR'S COMMENT



> In 2010, when South Africa just started with its drive to generate more electricity from renewable sources, particularly solar energy, there were almost no utility-scale photovoltaics in the country.

Today South Africa has a capacity of 1 000 MW which is a bit more than the power a nuclear reactor generates. The construction of renewable installations, such as the massive 320 000 photovoltaic panels of the 94 MW Sishen solar project, is surging in South Africa and elsewhere in the developing world. In fact, in April the process of harvesting renewable energy was accelerated in line with the National Development Plan.

The irony is that in South Africa – the world's fifth biggest supplier of coal, used in the generation of electricity – solar and other renewable energies are gaining very fast. So fast that since 2011 these industries have attracted some R193-billion in investments.

There is still a huge difference and some way to go, but the gap is closing: 88% of SA's electricity is generated from coal, while a mere 1,8% of electricity is generated from wind and solar.

There are many reasons for the accelerated growth. The obvious is the extreme electricity shortage, exacerbated by the fact that that Medupi and Kusile coal-burning power stations are years behind schedule and have cost significantly more than originally

budgeted for. Renewable power has shed the perception that green power is expensive power and is now viewed as a very viable and easy option (a big photovoltaic plant takes only 16 months to build).

Renewable installation is a bright light – in both the electricity industry and the construction industry in South Africa. According to the Council for Scientific and Industrial Research, government will procure in excess of 6 000 MW of wind, solar and hydro plants which represents the biggest surge in power capacity since the 1980s.

Wilhelm du Plessis
Editor

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A sustainable construction world

Sustainable Construction World is published as a supplement to *Construction World*. This 36-page magazine highlights the advances South Africa has made in building in a sustainable manner by focusing on celebrated projects, a new tool available from the Green Building Council of South Africa (in its quest in leading the South African construction industry to building greener), sustainable building materials and alternative energy sources.

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CESA/AON EXCELLENCE Awards winners

In a celebration of innovation, quality, outstanding workmanship and professionalism in the consulting engineering sector, Consulting Engineers South Africa (CESA) held its prestigious CESA Aon Engineering Excellence Awards at Vodacom World in Midrand on 12 August 2015.

4



It was a feast of engineering talent and rewards an explosion of innovative engineering solutions, celebrating excellence in basic service delivery to our people.

The Awards sponsored by Aon South Africa are a platform to showcase the important role that infrastructure plays in the sustainable development of our country and focus on consulting engineers and their clients who participate in or initiate projects that promote the advancement of our nation and the people of the continent.

Judge Jurgens van Zyl considers it a privilege to be on the judging panel and to be exposed to the creativity, tenacity, skill and sometimes sheer determination of this industry.

Engineers removed toxic water from the depths of the earth and made it safe for industry to use; built a beautiful highway interchange in the tightest of spaces; suspended buildings; raised a bridge and even played snakes and ladders.

No challenge seems too big or complex for this talented group of engineers, who, like magicians, make the impossible appear mundane. These wizards of industry always bear in mind that the best marketing for a company is a happy client and a good engineering project. What set the winners apart are those that display particular innovation and overcome extraordinary challenges of design and construction.

Awards were handed out in the following categories: Engineering Excellence for projects with a value of less than R50-million; projects between R50-million and R250-million and for projects with a value of over R250-million; Best International Project; Visionary Client of the Year; Mentor of the Year; Business Excellence; Mentoring Company of the Year; Young Engineer of the Year; Publisher of the Year; Job Shadow Initiative; and Branch of the Year.

Here are the winners

The category of *Engineering Excellence with a value greater than*

R250-million was won by Moroff & Kuhne for WBHO's 'The Point'. The client's brief for the re-development of the old Galleria building at 76 Regent Road, Sea Point, into a 28 000 m² shopping and lifestyle centre – required innovative and out-of-the-box thinking. The increased retail and commercial space required additional undercover parking for shoppers and tenants.

A fourth basement had to be created over the full extent of the building footprint, while anchor tenants were fully operational.

In order to promote the consulting engineering industry to young professionals, CESA recognises the contribution young engineers make to the industry and to the future of the profession. The winner must be available to receive the award and attend the International Federation of Consulting Engineers (FIDIC) convention. Furthermore, he or she must be available to serve on CESA's Young Professional's Forum for a 12-month period. Judges look for outstanding performance in areas including technical achievement on a project; educational achievement; recognition such as awards received; contributions to sustainable development – such as environmental initiatives, social responsibilities, and community involvement.

Airports Company South Africa (ACSA) sponsored the *Young Engineer of the Year Award*. The winner in the category of Young Engineer of the Year is Geoff du Toit from Aurecom with Rudolf le Roux from Arup receiving a commendation.

The category of *Engineering Excellence with a value less than R50-million*, was won by Royal HaskoningDHV DHV for the New Microbiological Laboratory for the National Bioproducts Institute. When the National Bioproducts Institute wanted to upgrade their Microbiology lab they knew who to approach to provide specialised cleanroom services. After all, this is a unique lab which manufactures life saving plasma-derived medicinal products and hence security was critical in their choice of contractor.

The category of *Engineering Excellence with a value between R50-million and R250-million* was won by Bosch Projects for the Bronkhorstspuit Biogas Project for Bio2Watt. It is the first project of its kind in Africa. It will provide green energy, in the form of electricity, to a private industrial consumer through a City of Tshwane and Eskom agreement.

Bigen Africa won the *Business Excellence* category. This privately-owned project-based group of companies specialises in infrastructure and has the vision of creating long term development impact within the African economies and communities that it operates in. It is Bigen's proven expertise in engineering, management consulting and development finance which proactively seeks the best outcome for customer, community and country.

In the category of *Best International Project*, sponsored by the Built Environment Professionals Export Council (BEPEC), the winner was Bigen Africa for the Botswana North South Carrier 2: Water Transfer System for the Botswana Ministry of Minerals, Energy & Water Resources. The development and execution of this approximately



R6-billion project has demonstrated engineering excellence. It has enhanced regional economic growth and significantly improved the quality of life of the Botswana people.

Bigen Africa also won the *Mentoring Company of the Year*, sponsored by Bosch Holdings. Bigen Africa states that its biggest asset is human capital. They have designed and implemented strategies which align business objectives with individual expectations of career success.

In an effort to promote mentorship of young engineers CESA recognises the contribution *Mentors* make to the industry and the future of the profession. Colin Andrews is the mentor of the year. He exudes a passion for mentoring that has produced impressive results at Royal HaskoningDHV, which has made him the obvious choice for preparing guidelines for the KwaZulu-Natal Department of Transport's Mentoring Programme.

In the *Visionary Client of the Year* category, which is sponsored by Santam, CESA nominates candidates for the award, which must then consent to their nomination. Nominees in this category can be from the public, parastatal or private sectors, and are judged inter alia on their contribution to sustainable economic job creation in South Africa and or Africa. Creating sustainable development in communities through skills and knowledge transfer is an equally important factor. The judges also look at the opportunities provided for the growth and expression of professionals, including those from formerly disadvantaged communities. Projects should also have embraced innovative designs that highlight the ability of South Africans in the technological field. CESA this year gave recognition, in the category of Visionary Client of the Year to the Development Bank of Southern Africa.

In recognition of the role that the media plays in the industry, 3S Media received recognition for *Publishing Excellence: Trade Publication* and Independent Newspapers received recognition for *Publishing Excellence: Daily Newspapers*.

UWP Consulting was announced as the winner of the *CESA Job Shadow* Initiative with Royal HaskoningDHV, Hatch Goba and Infraconsult as runners-up. CESA's KwaZulu-Natal Branch was named winner of the *Branch of the Year Award*. <



BUILDING A SUSTAINABLE FUTURE

"I want people to know that Shando's Construction is a small company with a big vision," says managing director Princess Ndiweni.

> There is no doubt that the construction industry is a man's world but a fearless Princess Ndiweni together with her business partner, Dickson Dladla, are tackling it head-on.

This former administrator at Sasol became an entrepreneur because, "I've always dreamt of owning my own business and when the opportunity presented itself to start a company, I jumped at it. The zeal of owning a business in a male dominated industry was just a plus for me, I wanted to be one of those women who face the challenge head-on and simply do better and excel in it," she explains.

Ndiweni adds, "My passion is to be part of a transformed and competitive construction industry that delivers quality infrastructure, promotes economic growth and also become a company that cares for its employees." Besides building construction, the company offers a number of services including plumbing, paving, landscaping, electrical, carpentry and painting among other specialities.

The business continues to grow since she and Dladla started it in 2011. The first project they won was pure luck, she approached a company in Potchefstroom for a project but she didn't give up. She continued to pursue the opportunity until they gave her a chance, however, it turns out that the contract was meant for another woman also named Princess. She grabbed this chance with both hands and never looked back. In four years they have worked on both major and small projects. However, for these two, the size of the project does not matter – they make sure they leave behind top quality work.

It's this quality work that has opened doors for them. Over the years, the company has achieved great results working closely with construction giants such as Group Five, WBHO, Dalmar Construction, Trecon construction, Cross Border, Gorogang and Toro ya Africa. Some of the projects that Shando's Construction have completed referrals – an impressive feat considering that the partners did not have any experience in this industry when they started - but they learned and persevered. "We gained knowledge as we learned and we are still learning even now. We welcome any grooming from the companies which we work with because we also want to grow," says Ndiweni.

Shando's Construction's 100 employees are scattered across the Gauteng province working on various projects which include the Nelson Mandela Children's Hospital – it's working with Group Five on this project. It's also building a fire station in Germiston, renovating schools and homes and one of the small projects it's working on is building office blocks in Sandton. Previously, the company built the retirement homes in Waterfall Estate, miners' accommodation in Potchefstroom and was contracted by Anglo American to build a block of flats in Rustenburg.

Another great referral came from a friend who introduced them to The Hope Factory. The duo joined the Enterprise and Supplier Development mentorship programme and according to their mentor, they are thriving in their business. "It's been a great experience to have someone who's neutral listen to your ideas and give objective advice. This has made our decision making much easier," she says.

The owners want to grow the company so it becomes a significant player among the best and leave a legacy. Part of this growth also includes introducing more women to the industry. Currently, Shando's Construction employs two female safety representatives and wants to expand this in the future. The company is also giving back, and has provided an unemployed youth the opportunity of an internship for gaining valuable work experience. <

Shando's Construction managing director, Princess Ndiweni.

Value engineering: The key to ACHIEVING A TRUE PAYBACK

Value engineering is still an underutilised practice in the commercial property industry. Integrating mechanical engineering, Environmentally Sustainable Development (ESD) concepts and energy efficiency into each major decision from project inception, through the design, construction, operation and decommissioning, offers an opportunity to demonstrate whole-life benefits for users of the building as well as the building owners.



Aurecon's Building Services Professional, Ashley Underwood, explains what value engineering is and why having expertise in it should be a prerequisite when sourcing engineering consultants for projects.

"Value engineering looks at the capital cost of a project and determines whether the function and quality of the results are equal to the perceived value. It's a management approach that focuses on the benefits, payback and overall return on investment that a client will achieve instead of looking at different parts of a project in silos," says Underwood.

While it's easy to see the benefit of value engineering, problems arise because it is often applied late in a project. When value engineering is incorporated during the design and concept phase, consultants are able to thoroughly look at the life cycle cost of each decision, and this type of analysis includes financial payback, as well as environmental impacts such as carbon emissions and material selections.

"The rising cost of energy has essentially aligned the financial and environmental benefits for many energy-saving initiatives. With value engineering of energy-savings, you are now able to create a building that will result in a true payback for the client, but this approach needs to be implemented in the concept and design stages. The number of Green Star rated projects that Aurecon has worked on is a testament to what is achievable when combining the efforts of environmental modelling software programmes, mechanical engineering expertise and buildings sciences consultants early on in a project," he says.

Aurecon is a recognised leader in the use of a range of powerful environmental modelling software programs to optimise the performance of buildings. The 3D modelling software takes every aspect of a building into consideration.

"Engineers and designers can improve the occupants' comfort using 3D modelling of a building's orientation and form, external shading and fabric performance. We can make real changes to the energy consumption of the building by looking at the building services as a whole, which includes aspects such as mechanical systems, hot water generation, escalators, lighting systems and any miscellaneous services such as irrigation," comments Underwood.

It is important to get the right mix. Normally, the building shell, including insulation and glazing spec, is optimised to ensure high thermal comfort for the people occupying the perimeter zones of the building, while increasing insulation beyond this has only a small effect on the building's energy use.

"To achieve additional significant energy-savings, we look carefully at the mechanical and electrical systems," says Underwood. "For the electrical systems, we strive to only use energy-efficient lighting, while for the mechanical systems, we generally recommend a high efficiency plant with a range of energy-saving features such as, economy cycles, CO₂ based demand control of fresh air, CO₂ based demand control of car park ventilation, etc.

"Aurecon has developed a number of calculation procedures that helps us to ensure 3D modelling is relevant in a South African context, which is a unique value-adding benefit to our clients."

Real savings rest in the engineering domain

Aurecon's use of 3D modelling software, coupled with the in-house calculation methodologies that the company has developed for local buildings, is only a part of the value engineering services that we offer. The fact that the mechanical engineers and building sciences professionals are able to work together to find sustainable, energy-saving solutions is the thread that ties everything together in order to provide real value for clients.

"The digital recreation of a proposed building isn't merely a placeholder or an estimate of what could potentially be achieved, it's a very accurate replica of how the building will operate and function once constructed," asserts Underwood. "We use the energy simulation results to guide the implementation of energy sub-metering strategies and then to track and manage energy use within the operational buildings."

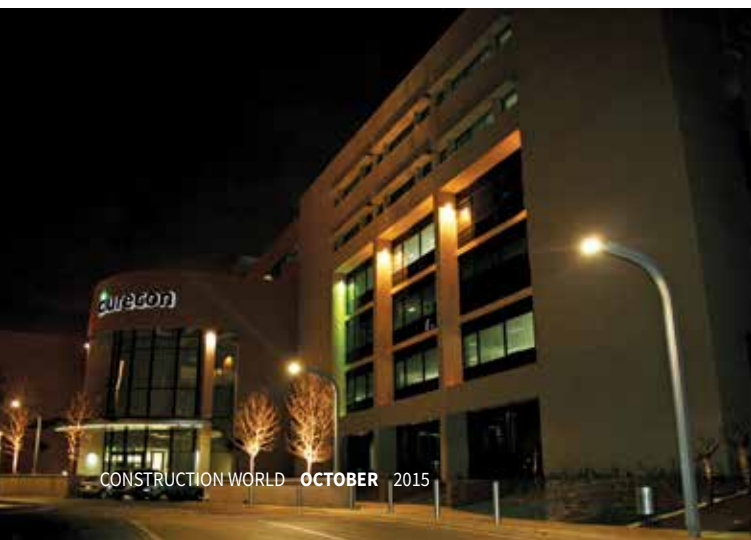
Value engineering in practice


Aurecon achieved a first in Tshwane in 2011 when its Lynnwood Bridge Office Park building, situated alongside the N1 highway, achieved a 4 Star GreenStar SA - (Office Design v1) rating from the Green Building Council of Southern Africa. The company has recently completed another 'green' office building in the same precinct achieving a 5-Star rating, which will comprise five base-level levels, as well as ground plus five floors.

The project team took a value engineering approach during the design and construction phase of the new building. Unlike the traditional model of three overlapping financial, social and environmental circles where the only commonality



Aurecon's building services professional, Ashley Underwood.





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ARCHITECTURE for SOCIAL GAIN

Award winners

The inaugural Architecture for Social Gain 2015 awards ceremony was held at historical landmark, Glenshiel, in Johannesburg recently.

➤ The Social Gain awards were conceptualised by Saint-Gobain to recognise and reward talent in the design of spaces that promote learning and development, as part of the company's 350th anniversary celebrations.

"The awards really promote and celebrate architecture that posi-



Penguins Preschool: a sample EcoBrick Wall. (Photo by Threeclouds Photography)

tively effects the integration of community and environment for the long term benefit of both people and planet, complimenting Saint-Gobain's commitment to support social change and make a difference in the spaces we live, learn, work and play in" said Evan Lockhart-Barker, MD Weber Saint-Gobain in his opening address.

An impressive 38 entries were received across the three categories, FUTURE, BUILT & ADOPT-a-School. "We were thrilled with the number of online entries received as these awards challenged industry norms, with the call for strictly digital entries architects were challenged to move beyond the traditional medium of submitting hardcopies of drawings and renderings, and embrace the realm of the video entry format, which encouraged digital story-telling around submissions," added Evan.

The judges were so impressed with the quality of entries and the quality of the digital submissions that an additional award for 'Best Movie' was added to the competition during the judging process. Judges noticed that these awards saw a new wave of up

FLYING HIGH

The Pitts Special aerobatics team has become a well-loved and recognised name in South Africa. Renowned as best in their class with their Pitt's special aircraft with many collective awards to their names, these daring aviators, Scully Levin, Arnie Meneghelli, Ellis Levin and Sean Thackwray are a common sight at corporate days, shows and events.

8

➤ This team has been sponsored by Torre Automotive, formerly Control Instruments for 16 years. With the acquisition of Control Instruments by Torre Industries, the team was rebranded as Team Torre and other business units in the Torre Industries stable were offered sponsorship.

Torre Lifting Solutions signed an exclusive contract to sponsor the branding on one of the four-plane fleet. The Team Torre branding also extends to the flight suits and other promotional material at events. Quentin van Breda, technical director at Torre Lifting Solutions, points out that the company has a long tradition of identifying and capturing opportunities to increase its market penetration.

"Our cranes and other lifting solutions are highly visible and, in particular, our Potain tower cranes have become a regular and noticeable feature on major construction sites throughout southern Africa. The sponsorship of the Pitts Special plane and crew was a natural extension of our sustainable brand growth. We have the added advantage of having customer flip days during the year to offer our clients a very different experience in an aerobatic aircraft. As with all of our endeavours, we believe in aligning ourselves with the best in breed," Van Breda explains. ■

Torre Lifting Solutions signed an exclusive contract to sponsor branding on one of the four-plane Pitts Special aerobatics team's fleet.



➤ (or triple bottom line) is the small area in the middle, a value engineering model is a strong sustainability model. The environmental and economic benefits are a subset of the sustainability aspirations, and are the core values underpinning every aspect of the design solution.

"During the design phase of the new Lynnwood Bridge building, each energy-saving feature was modelled and calculated in order to predict how each aspect would impact the electricity consumption of the actual building. The state-of-the-art 3D modelling software, coupled with the expertise drawn from the company's global team, allowed us to create data that accurately showed the future building's performance, predict utility bills, and create energy targets to track building performance," says Underwood.

Analysing energy efficiency initiatives before implementation

One of the biggest challenges of current energy-saving initiatives in buildings is when a supplier offers a solution that won't necessarily lead to a payback for the client. Underwood stresses that the effect of any energy-saving component needs to be analysed before being adopted.

"Supplier data needs to be put into a South African context. The supplier could be providing data that is relevant for countries in Europe where there is a cooler climate, or the supplier could take a single operating point and extrapolate the data over the course of an entire year, which could lead to misleading results. In order to know for sure what your building's payback will be, clients need to take a value engineering approach and make sure they know how the building will perform once the energy-saving initiatives have been implemented," he says.

"Trying to predict the impact of a chilled beam system or an energy-efficient heating, ventilation and air conditioning (HVAC) system, for example, is impossible without looking at the entire system design holistically, doing the calculations and analysing the results. Advanced 3D modelling software gives engineers the tools they need to predict whether an energy-saving initiative is going to have a marginal or worthwhile return on investment. Clients need to partner with engineering consultancies that have the capability to analyse the effects of different initiatives if they want real value," emphasises Underwood. ■



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The Market Theatre Foundation Multipurpose Facility.

and coming architects entering the fold and highlighted that the awards were unique in that it was refreshing to see submissions from both professional architects and student architects, competing alongside each other for the same award.

Judges went as far as saying that the Social Gain awards raised the benchmark for South African architects to step up to the plate and push themselves to meet international standards. The awards attracted international interest as visits to the official awards website were recorded from all around the globe with particular interest noted from the US with 538 unique visits and Germany with 487 unique visits.

The People's Choice award, which invited online public participation attracted an impressive 8 896 votes in one week, another affirmation of the popularity the competition attracted.

The Architecture for Social Gain Awards look specifically at the following types of building projects:

- Education – preschool to high school, colleges, universities, training colleges
- Community – buildings that are multifunctional and offer facilities like training, family law, counselling, AIDS, health education and trauma counselling
- Development – buildings such as training and sports centres and other facilities focused on human development

10

The winners

BUILT Category

Overview: Projects completed between January 2011 and June 2015. These are spaces where people can develop themselves. This includes new and renovated work.

Trophy winner

- **Project:** Outreach Foundation Community Centre – Hillbrow, JHB
- **Architect:** Local Studio – Johannesburg

Merit certificates

- **Project:** Vele Secondary School – Limpopo Province
- **Architect:** East Coast Architects – Durban
- **Project:** SOS Children's Village – Tadjourah, Djibouti
- **Architect:** Urko Sanchez Architects – Kenya



(LEFT) BUILT Category Winners: Local Studio. Bongani Bingwa, Thomas Chapman, Elizabeth Barbier (French Ambassador to SA), Evan Lockhart-Barker.



(RIGHT) FUTURE Category Trophy Winners: KHM Architects. Bongani Bingwa, Denis Simonin, Wayne Mansfield, Evan Lockhart-Barker.

FUTURE Category

Overview: Proposed future developmental projects. It includes unbuilt work, proposals for projects or commentary. This category is separated into two sub-categories; Professional and Student.

Trophy winner

- **Project:** The Market Theatre Foundation Multipurpose facility
- **Architect:** KHM Architects – Cape Town

Merit Certificates

- **Project:** Transitional Learning Centre
- **Architect:** Noero Architects – Cape Town
- **Project:** Sol PLaatje University Competition – Kimberley, Northern Cape
- **Architect:** Savage + Dodd Architects – Johannesburg

Student Merit Certificate

- **Project:** Delft Exchange Towers – Cape Town
- **Student architect:** Anees Arnold & Jonathan Wilson – Cape Town

ADOPT category

Overview: The Adopt-a-School Foundation is a non-profit organisation that supports the creation and enhancement of a conducive learning and teaching environment in disadvantaged schools. In this categories, entrants chose a school from a supplied list and submitted a design proposal. The winning proposal will be built in 2016 by Saint-Gobain in association with Adopt-a-School.

Trophy winner

- **Project:** Motshegofadiwa primary – Hammanskraal
- **Architect:** Kate Otten Architects – Johannesburg

People's Choice Award

Overview: All entries are posted on the social-gain.co.za website and people could vote for their project of choice, by liking sharing on social media. The project with the most support wins.

- **Project:** Penguins Preschool
- **Architect:** Stauch Voster Architects, Ecobrick Exchange

Best Movie Award

Overview: A special award was introduced by the judges to recognise an architectural practice that really embraced the format of digital submissions with a movie that told a story of a building, which demonstrated the fundamental principle of Social Gain, user satisfaction.

East Coast Architects used one of the learners of the Vele Secondary School to take the viewer through the project highlighting every sustainable design feature from the vegetable gardens to the recycling of 'grey water' in the bathrooms. This resulted in a documentary style movie, which made for a refreshing and innovative submission.

Winner

- **Project:** Vele Secondary School – Limpopo Province
- **Architect:** East Coast Architects – Durban



NEW CHALLENGE

The increasing emphasis on sustainable construction has placed new and unprecedented responsibilities on the shoulders of the quantity surveying profession, Dr Deen Letchmiah, Board member of the Association of South African Association of Quantity Surveyors (ASAQS), has stated.

➤ Speaking at the recent ASAQS seminar, 'Building on Sunshine', held in Johannesburg, Dr Letchmiah, who is CEO of the LDM Group and represents ASAQS on the Green Building Council of SA (GBCSA), said the days of quantity surveyors' role in the building environment concentrating mainly on cost control, were over.

"Modern quantity surveyors need to consider the driving forces of the green environment in which they operate. They need to be holistic in thought and execution to drive sustainability directives and realise that all components of structural development and operations must be reviewed to provide sustainable solutions," he told the more than 200 delegates from all over the country who attended the first ASAQS annual seminar.

Dr Letchmiah said sustainable construction presented new challenges – as well as important new opportunities – to quantity surveyors. "New services can now be offered to clients, such as analysing and advising on Green Capital Costs, promoting the benefits of Life Cycle management, Green Financing and Green Leases, and cost effective sustainable strategies. Property Performance Appraisals, Value Management and Engineering solutions, as well as the use

of information technology such as Building Management Systems and Information Models, will now all form part of the services a QS can offer clients."

He said Life Cycle Costing and Facilities Management, in particular, were two services quantity surveyors could offer – and specialise in – to achieve sustainable building.

"The Green Revolution is not a fad, and the roles of building industry professionals are changing rapidly. An integrated design process is required and for the quantity surveying profession there is the opportunity to stimulate change and attract the right people – and retain their commitment to the profession," he added. ◀

Pictured after a preliminary progress report to GBCSA at the ASAQS annual congress in Johannesburg recently were (back row, from left): Dr Deen Letchmiah, Deon Vermeulen, Bert van den Heever, Prof Basie Verster (all ASAQS), Jarrad Lewin and Eric Noir (GBCSA). Front row (from left): Onesimo Dhliwayo (ASAQS), Thulani Kuzwayo (GBCSA), Larry Feinberg, Hoffie Cruywagen, Danie Hoffman (all ASAQS), and Brian Wilkinson (GBCSA).



A challenge ... and opportunity

In opening the seminar, Bert van den Heever, president of ASAQS, said a "tsunami of change" was sweeping the planet, with the need to create sufficient renewable energy regarded as critical in many countries of the world. Other speakers and the issues they dealt with included:

Prof. Chrisna du Plessis of the Department of Construction Economics at the University of Pretoria, who warned that buildings were responsible for 90% of greenhouse gases because of the materials selected for construction.

Logan Rangasamy, head of international economic relations and policy at the SA Reserve Bank, who said that the electricity crisis – likely to last at least another five years in South Africa – created a huge market for sustainable solutions.

Henning Holm architect and energy authority of the Holm and Friends practice, who said real energy tariff increases had been above inflation since

2003 – and the real cost of energy was the loss of production when energy supplies were disrupted.

Graham Cruickshank of Ernst & Young, who emphasised the vital role of adequate public transport in a sustainable built environment.

Wally Weber of Blackdot Energy, who said there was huge untapped potential in South Africa for solar process heating.

Alwyn van der Merwe, director of investments at Sanlam, who warned that consumer and business confidence was at its lowest ebb in 50 years and that uncertainty regarding production energy supply played a major role in this disenchantment.

In closing the seminar, Larry Feinberg, executive director of ASAQS, said industry was South Africa's largest polluter and that the quantity surveying profession would in future have to strongly consider the environmental responsibility and carbon footprint of all companies that formed part of the building supply chain.

* ASAQS is currently conducting an in-depth and ongoing research study for the Green Building Council of SA on the comparative costs of 'green' and conventional design and construction, and a progress report and preliminary findings of the study were revealed to the GBCSA during the 'Building on Sunshine' seminar.

ENSURING COMPLIANCE with regulations

According to 2012 statistics released by the Department of Environmental Affairs, an approximate total of 108-million-tonnes of waste is generated nationwide. General waste accounts for around 59-million-tonnes, unclassified waste 48-million-tonnes, and hazardous waste the remaining one-million-tonnes. Of all this waste, only 10% is recycled – the rest is landfilled.

> With a continuously growing population and economy, waste generated in South Africa is expected to double to approximately 216-million-tonnes by 2025. “Our current lack of recycling facilities and great dependency on landfills – most of which are not compliant – means that we are rapidly running out of space to contain our waste,” says I-CAT Environmental Services manager Rachelle Stofberg.

12

Additional challenges include: increased complexities of waste streams, historical backlogs of waste services and a limited understanding of waste flows and SA’s national waste balance. Under-pricing is a major issue in local waste management, and there are also few compliant hazardous waste management facilities.

In response to these challenges, the National Waste Management Strategy (NWMS) was developed and subsequently implemented by government in 2012. It is a legislative requirement of the National Environmental Waste Act (NEMWA) of 2008, in order to achieve the following objectives:

- Promote waste minimisation, re-use, recycling and recovery of waste
- Ensure the effective and efficient delivery of waste services
- Grow the contribution of the waste sector to the green economy
- Ensure awareness of the impact of waste on people’s health, wellbeing and the environment
- Achieve integrated waste management planning
- Ensure sound budgeting and financial management for waste services

I-CAT Environmental Services manager, Rachelle Stofberg.



- Provide measures to remediate contaminated land
- Establish effective compliance with an enforcement of the Waste Act

A variety of tools have been developed to assist in achieving the goals set out in the NWMS. These tools include inter alia:

- Waste Classification and Management System
- Norms and Standards
- Licencing
- Industry Waste Management Plans
- Extended Producer Responsibility
- Priority Waste
- Economic Instruments

Regulations

The Waste Classification and Management System provides a methodology for the classification of waste and provides standards for the assessment and disposal of waste for landfill disposal. To this effect, the Waste Classification and Management Regulations came into effect in August 2013.

Under the Regulations, all waste generators are required to classify each waste stream according to the SANS 10234 Globally Harmonised System of Classification and Labelling of Chemicals.

SANS 10234 establishes criteria for the classification and labelling of hazardous substances and mixtures, including waste, to ensure safe transport and disposal. Under SANS 10234, it must be established whether the waste is hazardous based on physical, health and environmental hazardous properties (hazard classes), and the degree or severity of the hazard posed (hazard categories).

Stofberg indicates that most of the timeframes for achieving goals set out in NWMS have not been met. “In cases where particular standards have been developed, we are observing a slow progression by industry to comply with the latest regulations and standards.”

She adds that hazardous waste is also not being classified in accordance with SANS 10234 nor classified within 180 days of generation. “General, hazardous and recyclable waste are still being mixed. Unfortunately, this demonstrates little commitment to compliance.”

Stofberg attributes this lack of compliance from industry to a variety of factors, including; a lack of understanding of the new regulations and the incorrect interpretation of roles, responsibilities and compliance timeframes associated with regulations. “This is further compounded by financial costs associated with new waste management infrastructure, record keeping, and SANS 10234 classifications, together with limited compliance enforcement from the regulating authorities.”

Certain compliance, such as the NEMWA Waste Classification and Management Regulations, must be complied with within three years of promulgation. This means that mandatory compliance is little more than a year away. I-CAT offers a comprehensive range of services to assist its clients in complying with the new Waste Classification and Management Regulations.

“I-CAT Environmental Solutions adds measurable value in assisting various operations in the industrial and mining sectors, by offering specialist services in waste classification and management, environmental compliance monitoring (water, dust, noise), environmental authorisation processes, and comprehensive annual audits and reviews,” Stofberg concludes. **<**

BUILDING ON GOOD REPUTATION

SRK Consulting (SA), the Africa arm of the global consulting engineering firm, has appointed principal scientist Vis Reddy as managing director, based in the Johannesburg office.

Reddy has been with SRK since 1997, and has managed the KwaZulu-Natal business unit for eight years, growing the operation into a substantial contributor to the company. With 24 years of experience in environmental geochemistry and air quality management, Reddy has consulted extensively in these fields as well as in contaminated land and water quality management.

He was made a partner in SRK in 2005, and a director in 2009. Taking over the reins from former MD Peter Labrum who stepped down at the end of April 2015 but remains a full time employee of the company, Reddy leads an organisation that has grown to 12 offices around the African continent – including South Africa, Ghana, the Democratic Republic of Congo and Zimbabwe. The global SRK network, of which SRK Consulting (SA) is a part, comprises over 50 offices on six continents, employing more than 1 500 professionals.

He said his focus as MD will be to build on the strong reputation of SRK in the mining sector – its

primary market segment – while continuing its expansion into the range of other sectors where the business now has considerable involvement.

“Our services outside of our core business – which is to service the mining sector – have grown steadily over the years,” said Reddy. “We plan to continue building our market share in industrial, petrochemical, government and water sectors, for instance. Our offices around Africa signal to these markets that we are there to stay, and offer a valuable combination of local expertise and global standards.”

He said SRK’s work in the public sector was an important growth area, including infrastructure services such as stormwater management, water supply, water reticulation, flood risk assessments and disaster management.

“Working with government at national and regional level has also been an exciting area for us, and one which we intend to expand,” he said. “This includes policy and planning work, and extends from mining, infrastructure and water issues to environmental projects like bio-regional



Recently appointed managing director of SRK Consulting (SA), Vis Reddy.

plans that help conserve biological diversity and inform development plans.”

Reddy studied geology and chemistry at the University of Natal, where he also completed a BSc (Hons) in geology; he went on to obtain an MSc in environmental geochemistry at the University of Cape Town.

He is registered as a Professional Natural Scientist (Pr. Sci. Nat) and is a member of the Geological Society of South Africa (GSSA), the National Association for Clean Air (NACA) and the Water Institute of Southern Africa (WISA). □

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BREAKTHROUGH

5 Star Green Star SA Interiors Rating

The Green Building Council of South Africa (GBCSA) celebrated another milestone in the movement to a greener built environment with the recent Green Star SA Interiors certification of Standard Bank's newly-refurbished 3 Simmonds Street office in Johannesburg.

> Reinforcing Standard Bank's green leadership, the first to seventh floors of the building located on Simmonds Street in the Joburg CBD have achieved a 5-Star Green Star SA Interiors rating. It is only the second interior project in the country to be rated using the Green Star SA Interiors Pilot rating tool, making it a landmark achievement for design and interior fit-out in South Africa.

Hot on the heels of this landmark rating, Standard Bank Century City Branch, inside Canal Walk Shopping Centre, has achieved a 4-Star Green Star SA Interiors v1 rating.

Walking the talk

Says Brian Wilkinson, CEO of the GBCSA: "Standard Bank was the main sponsor of the innovative Interiors rating tool, which will help assure people that they are working, shopping and living in healthy environments. They have also taken their commitment beyond this, by using the tool on their very own offices. The overall aim of this new rating tool is to encourage the reduced environmental impact of interior projects."

Wilkinson explains the tool gives recognition to the design of interior spaces that provide spatial efficiency, improves produc-

tivity and occupant performance. It looks at a whole range of important factors including the quality of internal air, lighting, temperatures, and visual comfort, acoustic quality, ergonomics, as well as energy monitoring and greenhouse gas emissions.

With a focus on educating staff and visitors about the sustainable initiatives that were implemented at Standard Bank, and to help staff maximise the building's advantages, it has its very own Occupants User Guide. In place is a 'green owner's commitment', making energy, water and waste monitoring and reporting a priority. Visual displays of these results and consumption data recorded by water and energy meters are also displayed in the foyers and lifts of the refurbished building as a learning resource for building users to show them their environmental footprint.

Commitment to sustainability

Nathi Manzana, Standard Bank's head of professional and technical services, comments: "As a proud sponsor of the Green Star SA Interiors Pilot Rating, it only made sense for us to apply this tool to our own building. We are committed to sustainable business and sustainable building practices. Not only are we supporting the environment but also providing a productive, comfortable space for people to do their jobs effectively, educating them on their environmental impact at the same time."

Sustainable features

In addition to energy and water sub-metering, other features of the refurb include occupancy sensors for all light fittings, daylight harvesting and dimming of fluorescent lights and an energy-efficient, water cooled chiller plant.

Underfloor air distribution via fan coil units has been put in place and a full economy cycle fresh air plant has also been provided. This has ensured that the quality of internal air provided is operating at a rate 33% greater than the requirements of SANS 10400-O-2011. The building also makes use of Energy Star rated appliances and all printers and photocopy equipment are certified as having low emissions.

Low volatile organic compounds paint, adhesives, sealants and carpets were used



throughout to reduce the internal air pollutant levels, and innovation points were achieved for the reuse of an existing building as well as having an educated Green Star SA Accredited Professional (GSSA AP) design team.

The initiative has not only benefitted Standard Bank, its people and the building's visitors, but had many other far-reaching positive impacts.

As part of the development, the project design team passed their GSSA AP exam and are now qualified Accredited Professionals either in the Green Star SA new building rating tool or Interiors rating tool.

Wilkinson believes that this proved an enormous benefit to the project and helped the project team integrate the Green Star SA Interiors tool aims and processes effectively.

Marloes Reinink founding member of Solid Green Consulting, the Green Building consultants for the projects, notes that Standard Bank made a real effort to green its building interiors.

"The requirements for the Green Star Interiors rating are stringent, especially for materials. They aren't easy to achieve, but working with a client and professional team with experience in green buildings made the





process easier. Standard Bank will reap all the good benefits of its new green interior, including a healthier workplace, as well as energy and water savings,” says Reinink.

Materials used within the fit-out were sourced locally whenever possible. To further reduce the environmental impact it was also a requirement for the majority of all furniture, assemblies, flooring and wallcoverings within the refurbishment to either be reused, have a recycled content, have a certified label or alternatively, be designed for disassembly so that the item could be easily moved or reused at a later stage.

Reducing the building’s environmental footprint by keeping cars off the roads and cutting down harmful emissions, the Standard Bank building also provides easy access for staff and visitors to amenities in and around the Standard Bank complex. Public transport facilities are all located within 800 metres walking distance of the offices, ensuring both staff and visitors have access to alternative traveling options that result in better environmental outcomes across a variety of impact categories.

At the Standard Bank Century City branch, the bank has gone the extra mile by

continuously displaying sustainability initiatives implemented in its fit-out as learning resources for users and visitors. The branch displays energy and water consumption data, as well as initiatives to encourage environmentally responsible steps, in its foyers. Recycling is encouraged through informative posters on designated bins to demonstrate waste types that can be recycled in the branch.

Besides its energy-efficient operation, low-emission equipment and low volatile organic compound materials, Standard Bank also undertook an ergonomic assessment of its office furniture and workstations and achieved innovation points for its Hazardous Materials Survey and Universal access.

“Green Star SA Interiors Rating tool gives businesses a competitive advantage. It identifies industry leaders who are willing to provide smart and healthy work, shopping and meeting places that stand out in the marketplace. It is not only a responsible investment, but serves to heighten a business’s appeal as an investment, a partner and an employer,” says Wilkinson. <

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Louis Phillips is synonymous with Cape Town's winelands architecture.

UNIQUE architectural style

Louis Phillips is synonymous with Cape Town's winelands architecture. His internationally recognised and highly sought-after designs are often the preferred choice for homeowners at some of South Africa's most luxurious estates.

16

> Louis Phillips Architects & Associates' contemporary style is especially beautifully showcased at Pearl Valley Golf & Country Estate – recently named the Top Residential Estate in South Africa 2015 by New World Wealth – with no fewer than 78 homes to date bearing Phillips' unique architectural stamp. "My approach is to craft a unique design for each client to fit their individual lifestyle needs, whether it's a family with children, a business owner working from home or people who entertain regularly," Phillips explains.

This individualised approach combines with Phillips' ability to interpret from his own experiences and intimate knowledge of Pearl Valley's unique setting in the Berg River valley, surrounded by the Simonsberg mountain. "Having grown up in Paarl, I'm familiar with the local nuances, such as the location of the sun at certain times of the day, wind factors, and temperature changes as the seasons progress," he says, "and we take cognisance of these factors when we design. It's also become increasingly important to consider orientation, which is known to impact energy efficiency, as homeowners have developed a greater awareness of and desire for energy-efficient solutions."

Phillips' open-plan style lends itself perfectly to incorporating outdoor living, which at Pearl Valley means taking advantage of spectacular views – with the estate boasting some of the Cape winelands' most scenic panoramas. Whether overlooking a lake, the mountains or the fairway, the ultimate goal is to draw the outside in, bringing these stunning views to the fore and showcasing the natural surrounds in which the home is nestled.

In 2013, Phillips and his partners' simple yet elegant approach was rewarded when the firm achieved third place in the Grand Prix international architectural competition in the residential category. More than 250 designers worldwide entered the competition, backed by prestigious Italian brand Casalgrande Padana. Phillips' achievement is all the more impressive as Casalgrande Padana entered his design without his prior knowledge.

Louis Phillips' architectural journey has spanned over two decades. After matriculating from Paarl Boys' High School and completing his Bachelor of Architecture at the University of Port Elizabeth (now the Nelson Mandela Metropolitan University) in 1995, Phillips returned to the Cape winelands. He steadily built up a reputation in the region, completing more and more luxury homes.

"Pearl Valley is unique and special for many reasons, which differentiates it from other estates," says Phillips. "Apart from the award-winning Jack Nicklaus signature golf course, which is the estate's showpiece,

there are the world-class facilities, the integration of lakes that reflect the mountains and landscape, and of course the views."

The large, north-facing plots – with options ranging from 900 m² to 1 300 m² – contribute to a feeling of both space and privacy, while the "clever building-line system" opens up the vistas between the homes, eliminating the cluttered feeling so often found on other estates.

Phillips' design journey with a homeowner will start with spending time with the client to truly appreciate their lifestyle needs. "It's essential to really understand both the client and their vision for their home," he explains. The view, orientation and spatial flow are then considered, before Phillips begins "an interactive and dynamic process" that culminates in a final concept that the client loves.

Energy efficiency

Energy efficiency is incorporated in all of Phillips' designs, which comply with the new SANS 10400 XA regulations. Double glazing and solar systems with battery backups are often installed, and Phillips says there's also more focus on lighting design, with the emphasis on energy efficiency and the use of accent rather than directional lighting.

A strongly emerging trend is the move into warmer finishes and textures, with the combination of durable materials such as natural timbers, copper, granite and neutral porcelains with contrasting high-gloss surfaces. Phillips is finding that many people who are spending money on building big and expensive homes are choosing high-quality materials that will last for at least 10 years.

Pearl Valley is, unlike many residential estates, fairly accommodating in terms of architectural guidelines, in the establishment of which Phillips' played a guiding role. As a result, "If you want to build something unique and truly special, you can do that at Pearl Valley," he says. <



PHILIPPI VILLAGE – a catalyst for growth

Philippi Village has ambitions to change the way local business in the area is conducted, offering the kind of A-grade office environment you might expect in the buzz of Cape Town's trendier urban spaces.

> The building itself is a transformation of genius that was designed as a thesis project for a Masters in Sustainable Design by one of Cape Town's acclaimed architects, Philip Briel. Intended to provide a space where people come to work to find inspiration, the clever integration of the debris from the demolished factory into the walls of the new building offers a tangible example of the idea that new and lovely things can be created in broken and abandoned places.

A brief history

This all started in the early 2000s when The Business Place Philippi became the owner of the old cement factory premises.

The Sustainability Institute at the University of Stellenbosch raised funding to partner The Business Place Philippi in conceptualising the project, which is intended to become a mixed-use development with light industry, housing, food gardens and even a hospital. The residential section and the gardens are planned down the line, but The Business Place Philippi has been operating since 2005 in a renovated smaller building on site where business support services could begin. This has seen significant uptake, and more than 4 000 people have been through its doors, all receiving business development services of one sort or another.

The renewal

The renewal of the much bigger factory precinct as a business office space required development funding of a completely different order. An R80-million cash injection

has come in the form of a joint investment from the Bertha Foundation, based at UCT's Graduate School of Business, and the Jobs Fund. This enabled the construction of the new Business Hub and set the ball rolling for the remainder of the project. Already the ground floor has been fully let. Half of the offices on the first floor, which has been configured to offer much smaller premises, have been taken up. And the top floor has been designed to accommodate large companies such as call centres.

A pre-primary school has opened its doors, a Leap Maths and Science Academy has begun operating and the Department of Coffees is about to start trading on the mezzanine concourse. A City Library will welcome readers soon in one of the bigger spaces on the ground floor.

Alongside these are a number of entities which have a similar vision: to make a difference to the lives of people in the area. Abalimi Bezikhaya, which provides support to urban micro-farmers is there; so is the AfriCan Café which provides bakery and coffee shop skills training in remodelled containers which it runs as fully functioning coffee shops. Simphiwe Shoes is a small business startup.

One of the founder members of The Business Place Philippi, Alan Fleming, designed a container-based fish farm, of which two prototypes operate on the property, growing two tons of tilapia per year. Conceptualised to bring commercial aquaculture into a poor urban environment, 'The Fish Farm' has captured several innovation awards already.

The next phase at Philippi Village will see the launch of a Container Walk, situated on the property, which will be integrated into the

Village. In this phase, which has been planned as the pilot for a bigger Container Walk, 24 remodelled shipping containers will be available to small businesses in a dedicated precinct. The design for these containers was put out to tender and the winning design, which was required to give business owners flexibility in how they configure their premises individually, is presently in production.

The first 24 containers will all be occupied when they arrive on site – they are already fully subscribed and more are in the pipeline.

Amor Strauss, the general manager of Philippi Village, said that without advertising, within a five-day period, 250 people applied for occupancy of the 24 containers. She and her team decided to weed out those who were taking a chance from those who were serious about starting businesses and they called for deposits. Within a week from that decision, they had collected R60 000 in deposits.

The Container Walk will open when Philippi Village is officially launched in September. The plan for the Village to be a creative space where people gather for more than just doing business will ultimately see the creation of a residential component, a light industrial zone and an area that will be called the Village Square housing food outlets and providing green spaces for socialising and relaxing.

The design will see the transformation of further dilapidated structures on the property to become a user-friendly space for the people of Philippi.

For Thomas Swana, CEO of the Philippi Economic Development Initiative (Pedi), the project is a no-brainer. It is set in the heart of an area that is poised for greater development, with a raft of infrastructure catalysts either in planning or about to begin, that will change the way the suburb functions.

Streets are to be upgraded, the MyCiTi bus system will be expanded into the area, and the two train stations that serve Philippi are to be modernised. **<**

LEFT: Philippi Village – the old cement factory site. RIGHT: An architect's impression of the developed site.



THAVHANI MALL in Thohoyandou

Vukile Property Fund has secured a 33% (R350-million) stake in the 50 000 m² Thavhani Mall at Thavhani City in Thohoyandou, Limpopo, after signing a deal with the developers of the new regional shopping centre, Thavhani Property Investments. The acquisition will extend Vukile's retail exposure.

> Thavhani Property Investments is made up of pre-eminent shopping centre developers and investors, Flanagan & Gerard Property Investment and Development, together with local partners that make up the company Zevodox.

Thavhani Mall is now under construction and scheduled to be complete and open to the public in 2017. It is being developed on a prime site in Thohoyandou, at the intersection of the R524 road to Louis Trichardt (Makhado) and the new Giyani Road to Sibasa. Thavhani Mall is now more than 80% let with confirmed anchor tenants including Pick n Pay, Super Spar, Woolworths and Edgars, while a broad range of other national retailers will be part of the tenant mix.

Laurence Rapp, CEO of Vukile Property Fund comments: "This is a landmark acquisition for Vukile of a significant stake in the new Thavhani Mall regional shopping centre development. It is in line with Vukile's strategy of growing its quality portfolio of retail properties, thereby extending Vukile's exposure to the retail sector. Vukile will take transfer of its stake in Thavhani Mall upon completion in 2017 at a yield of 8% and with an income guarantee for the first year."

Rapp adds: "Vukile has already prefunded the acquisition through its highly successful capital raise conducted in April 2015. The money was raised at a lower yield than the purchase yield of 8% for the stake in Thavhani Mall, therefore the transaction will be yield accretive immediately. We have effec-

tively de-risked the funding of the mall.

"Thavhani Mall is an exciting project and part of a bigger strategic nodal development in the local Thulamela Municipality in Limpopo. It is great for Vukile to be partnering with a developer of the calibre of Flanagan & Gerard Property Investment and Development, together with the local partners in Thavhani Property Investments."

Commenting on the deal, Patrick Flanagan, executive director of Flanagan & Gerard, says: "Vukile is a leading, predominantly retail focused, South African Real Estate Investment Trust (SA Reit). Flanagan & Gerard is proud to have secured the investment of Vukile into our landmark new Thavhani Mall region shopping centre development."

He adds: "Thavhani Mall will be a cornerstone of the Thulamela Municipality's vision of a new Town Centre and expansion of the urban cityscape of Thohoyandou in a mixed-use precinct of some 85 ha. The Mall will be the anchor development of an exciting surrounding nodal development, with future projects including drive-through restaurants, motor dealerships, an office park, big-box retail and other commercial developments.

"While the mall will open at 50 000 m², there is capacity to expand the centre when demand warrants such expansion. Thavhani Mall is a catalytic development that is set to have a major positive socio economic impact on Thohoyandou and the greater Thulamela Municipality. The local community will not only benefit from job opportunities and

transfer of skills through the mall's development, but will see valuable spend being retained in the region. The iconic nature of the project and planned new Town Centre will attract further investment and galvanise excitement in the local community."

Flanagan concludes: "Flanagan & Gerard, together with Vukile and our partners in Thavhani Property Investments, are looking forward to the opening of Thavhani Mall in 2017. The mall will be dominant regional centre and prime retail asset, offering a first-rate shopping destination to the community of Thohoyandou, and surrounding areas." <



Laurence Rapp, CEO of Vukile Property Fund, speaking at the recent sod-turning ceremony to mark the official start of construction on the new R1-billion Thavhani Mall.



Patrick Flanagan, executive director of Flanagan & Gerard Property Development and Investment, speaking at the recent Thavhani Mall sod-turning ceremony.

An artist's impression of the new 50 000 m² Thavhani Mall regional shopping centre development in Thohoyandou, Limpopo.



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This is according to Richard Tomes, sales and marketing executive at AfriSam, who says that AfriSam has a legacy of more than 80 years and is today the largest concrete materials producer in the country with the capacity to produce in excess of 2 million cubic metres of readymix concrete, 10 million tons of aggregate and over 5 million tons of cementitious products per annum.

"AfriSam is continuously looking to expand its operating presence and in line with this the company recently acquired an equity stake in Port Elizabeth based, Concrete 4 U thereby expanding its readymix footprint to the Eastern Cape," Tomes says.

"It is AfriSam's size, scale and experience as well as our innovative approach to partnerships and concrete technology that enables AfriSam to create concrete possibilities for our customers," states Tomes.

Scale, size and experience

Tomes points out that there is a growing trend where contractors, particularly those on larger projects, seldom make their own concrete leading to an increased demand for readymix concrete. This is particularly apparent in the burgeoning Sandton, Midrand, Centurion corridor where numerous buildings are being upgraded, refurbished and a number of very modern facilities are being constructed.

"The general upgrade of the Sandton inner city area will not only dovetail with a number of high profile projects such as the Discovery Head Office, Alice Lane Phase III, Mall of Africa and the new PWC headquarters

in Waterfall, but will also effectively transform the transportation systems within the area," Tomes explains.

Having product available where its customers need it is exactly what AfriSam specialises in. "Being close to the industry has seen us strategically and systematically increase our readymix capacity to ensure that customers have access to consistent quality concrete solutions for these major projects. At the same time it was important for the company to ensure that supply requirements of smaller contractors are also catered for.

"We have a number of plants servicing these areas and are able to provide a combined capacity of 300 m³ per hour. The clustering of readymix plants provides a valuable back-up service enabling contractors to successfully complete large and continuous pours," Tomes adds.

While the individual plant operations are different, the batching interface is identical across all AfriSam's readymix plants. Use of the same interface ensures consistent batching, minimises errors and provides the ability to deliver supply backup from various locations. Customers, therefore, have the absolute assurance that potential disruption to an individual operation will be minimised.

Given the reality of operating plants in South Africa, Tomes says that all AfriSam readymix operations are equipped with generators to ensure that the supply of readymix will not be interrupted, should there be any power outages. This is an important advantage for all contractors in these growth nodes where the construction programmes are tight and disruption in supply of the concrete materials can result in bottom line penalties and losses.

"We maintain close interactive relationships with our customers and industry, and this has facilitated an in-depth understanding of the challenges faced by contractors and developers," Tomes continues.

He explains that the use by contractors of readymix concrete brings with it

numerous advantages as it removes the issue of operating an on-site batching plant with the associated aggregates and cement stock requirements. It minimises the number of deliveries reducing traffic to and from the site, a major advantage on already congested roads. This, with the reduced dust and water consumption on site, is far kinder to the environment as well.

Innovative partnerships

AfriSam is also unlocking value for its customers by partnering with innovative companies that specialise in the application of its products and services. Through its partnership with Concrete Laser Flooring (CLF), AfriSam is pioneering some of the latest trends and developments in concrete technology in the South African construction industry. These include a patented seamless concrete flooring system and the introduction of the 'tilt-up' construction method of using the floor of a building as a casting bed for the wall panels, then lifting these panels into position using a crane.

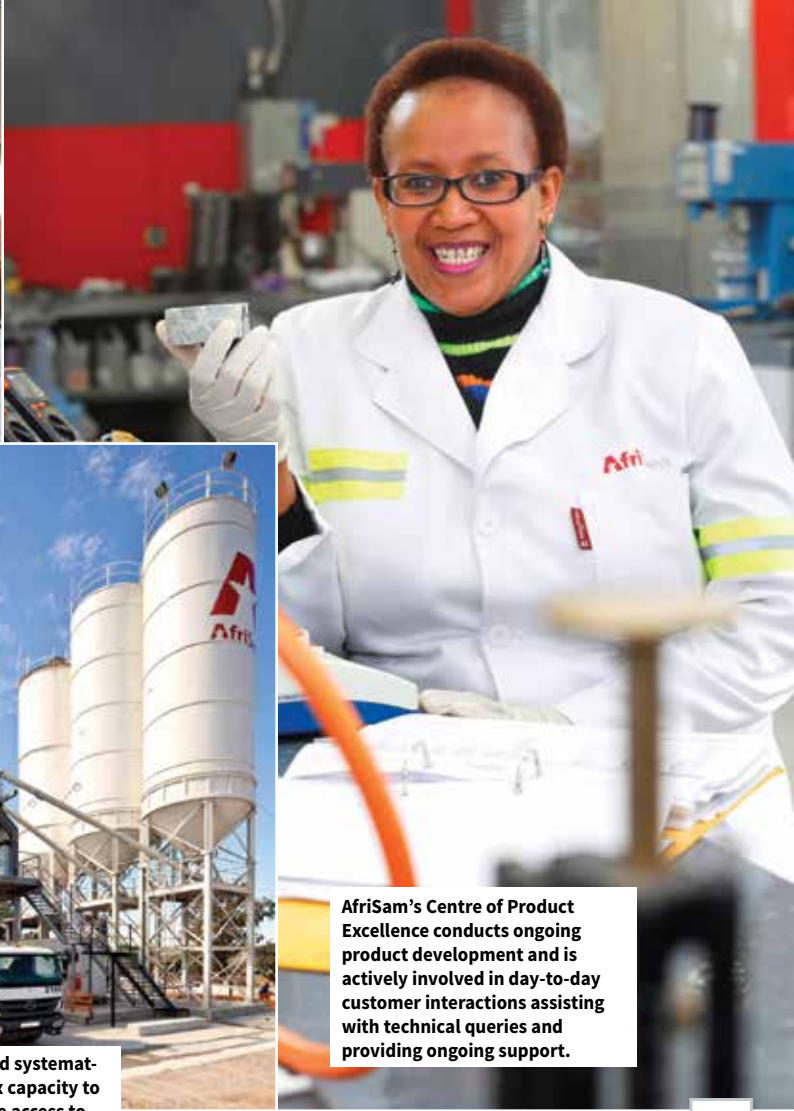
In addition, the partnership has produced a more environmentally friendly floor concrete by replacing cement in the mix design with activated slag and admixtures. This specialised concrete mix for floor applications sees a significant reduction in the use of cement.

"Our partnership with both CLF and Concrete 4 U is in line with our vertical integration and brand extension strategy. It positions AfriSam as an integrated concrete solutions company. We do not only supply cement and concrete, but offer a total solutions approach to our customers' varied needs. We are always on the lookout for new solutions, innovations and opportunities to bring to the attention of customers, as well as advancing the knowledge and skills base of the industry itself through our active participation in The Concrete Institute," says Tomes.

Concrete solutions technology

Another and equally important area where AfriSam supports its customers is with concrete solutions technology. With changes in the market in recent years, few construction companies have in-house concrete technologists and do not have the specialist concrete technology skills to proportion mixes, thus relying on suppliers like AfriSam who have the in-house expert skills.

AfriSam believes it creates concrete possi-




Through its partnership with CLF, AfriSam is pioneering some of the latest trends in concrete technology such as a patented seamless concrete flooring system.

bilities for its customers by providing convenient, one-stop concrete solutions including the development of fit-for-purpose mix designs, testing the quality of raw materials, proportionally mixing the material, slump testing and delivery to site. "Contractors can focus on their core business being construction, while having peace of mind that the experts in concrete technology are taking care of their concrete solution requirements," Tomes says

AfriSam has built a solid reputation of working collaboratively with the industry to provide sustainable concrete solutions. AfriSam's Centre of Product Excellence is actively involved in day-to-day customer interactions assisting with technical queries and providing ongoing support. The support function is performed by a team of skilled and experienced individuals who fully understand the science of the materials and how these perform, and also have an appreciation of the finished product as well as the challenges contractors face in handling and applying the product on site.

AfriSam is considered one of the leaders in Durability Index testing in South Africa and offers durability testing to its customers. These tests include water sorptivity, chloride conductivity and oxygen permeability, all of which are designed to assess the working life of the structures being built with AfriSam's concrete products. Enhanced durability mixes are easier to place and generate less heat of hydration which prevents thermal cracking while reducing the carbon footprint.

Another function of the Centre of Product Excellence is ongoing product development. AfriSam produces a number of bespoke products and is also involved in customising mixes that are perfectly suited to the customer's specific application requirements. "This process starts with a comprehensive understanding of the customer needs and requirements and is followed by an in-depth test programme in the Centre's laboratory. The end product is guaranteed to have the necessary integrity and meet the most stringent quality requirements. We therefore regard our product laboratory as an important part of customer support, providing substantial benefit to our customers."

"These developments form part of our strategy to be truly customer focused in order to unlock value for customers through innovative concrete solutions. The response across the industry has been extremely favourable and is proof that we're making headway on our journey of delivering a whole new level of service to our customers," Tomes concludes. 



AfriSam has strategically and systematically increased its readymix capacity to ensure that contractors have access to consistent quality concrete solutions for major projects. AfriSam recently commissioned what is deemed to be their single largest stationary readymix plant in operation in South Africa, at beginning of April, at its Jukeskei operation.

AfriSam's Centre of Product Excellence conducts ongoing product development and is actively involved in day-to-day customer interactions assisting with technical queries and providing ongoing support.



AfriSam's size, scale and experience as well as its innovative approach to partnerships and concrete technology enables the company to create concrete possibilities for its customers.

The challenges of major STRUCTURAL ALTERATIONS



Leading Gauteng building contractors, J.C. van der Linde & Venter Projects, have completed a R21-million contract for extensive refurbishment – involving ‘massive structural alterations’ – to the Mercedes-Benz AMG Driving Academy at the Zwartkops Race Track, near Pretoria.

in all, over 1 200 cubic metres of soil had to be backfilled after the foundations were completed. The excavations and provision of new foundations took about two months to complete.

“Another challenge we had to cope with was restricted working space: the fence of the race track is only a few metres from the Driving Academy building,” says Joubert

As part of the refurbishment contract, J.C. van der Linde & Venter Projects had to replaster all the walls that were not demolished, and provide additional new walls, floors, and ceilings, as well as undertake the tiling of the walls. New lifts and lift shafts had to be provided, and – because noisy, high-speed driving regularly takes place on the adjacent track – double glazing had to be installed to improve interior acoustics and audibility, particularly for the safe driving lectures regularly provided within the premises. ➔

22

Thomas Joubert, contracts director of J.C. van der Linde & Venter Projects, says the challenging contract called for the demolition of about 40% of an existing upmarket double-storey building overlooking the Zwartkops Race Track, from where the AMG Driving Academy is offered, and other major Mercedes-Benz corporate functions are staged.

“The refurbishment contract awarded to J.C. van der Linde & Venter Projects called for the demolition of the western part of the building, to be replaced by an ultra-modern double-storey structure overlooking the race track. Luxury balconies and a mini-pavillion adjacent to the track also had to be provided,” Joubert states.

“The new design included large volumes of open spaces inside the premises so the existing structure had to be strengthened through the installation of steel plates totalling 385 metres in length, and 100 mm by 12 mm in dimension.

In addition, 1 627 chemical steel anchors and several structural steel I-beams, up to 457 mm in depth, were employed to carry the weight. For additional support – and to maximise the interior open spaces – 15 relatively thin steel columns only 10 mm thick with base plates 30 mm thick, were installed instead of conventional bulkier columns.”

Total revision

Joubert says a total revision of the refurbishment of the new section of the building followed the appointment of new structural engineers when the project was already underway who felt that the original plans did not provide sufficient support for the upper

levels of the structure. “The new specifications received at that time inevitably posed major time and labour challenges for us as building contractors.”

The new plans also called for the redesigning of the foundations for the new section of the building and its heavy roof. Massive excavations – in formidable, exceptionally clay soil – had to be undertaken and,





ABOVE: The Mercedes-Benz AMG Driving Academy prior to refurbishment.

RIGHT: J.C. van der Linde & Venter Projects' demolition of the section to be refurbished; and the structure prepared for rebuilding.



BELOW: The completed refurbished building pictured from the visitors' parking area, and also from the Zwartkops Race Track.



The professional team

- Mercedes-Benz SA project manager: Phil Longbottom
- Architects and principal agents: ARCA Architects and Designers (Faan Nel and Yolandi Smit)
- Quantity surveyor: Taljaard Meyer & Storm (Fred Khors)
- Structural engineer: Delta Built Environment Consultants (Schalk Neethling)
- Electrical engineer: Delta Built Environment Consultants (Malcolm Grift)
- Civil engineer: Delta Built Environment Consultants (Stephan le Roux)
- Mechanical engineer: Delta Built Environment Consultants (Ricardo da Silva)



The impressive new Mercedes-Benz facility is modelled on the motor company's AMG High Performance premises in Affalterbach, Baden-Wurtemberg, in Germany. AMG models are the highest-performing class within the Mercedes-Benz range and hundreds of Gauteng Mercedes owners regularly use the Zwartkops Race Track to fully experience their cars' capabilities.

The completed project.

Work on the contract started in May last year and was scheduled for completion in October 2014 but the building contract's period was extended to March this year to cope with the new structural changes specified by the new consultants.

"In fact, the refurbishment project was so extensive that at times I felt that total demolition and rebuilding might have been a better option – but that's just a personal opinion," Joubert adds.

Faan Nel, of Arca Architects & Designers, comments: "The brief called for a building that would evoke and build passion for the Mercedes-Benz AMG brand, and our design set out to create a memorable and extraordinary experience for all visitors. J.C. van der Linde & Venter Projects' passion, commitment and attention to detail were invaluable to the highly successful end-result."

Pretoria-based J.C. van der Linde & Venter Projects is a member of the Master Builders Association North and company director, Charl Venter, is currently president of MBA North.

The J.C. van der Linde & Venter Projects team that assisted Thomas Joubert on the provision of the new Zwartkops facilities were Johann Walters (contracts manager) and Gerrie Mostert and Dirk Bakker (site foremen).



Interior of the refurbished section of the building, showing one of the 15 thin steel columns used to support the structure; entertainment area leading to the balcony overlooking the race track; and covered pavillion for viewing action on the track.



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WATERFALL'S PROGRESS

26

Attacq, South Africa's leading capital growth fund listed on the Johannesburg Stock Exchange, with a market cap of approximately R17-billion, hosted an exclusive gathering to showcase the significant business strides the company has recently made with regards to its key Waterfall development pipeline. Selected senior journalists were provided the opportunity to experience the substantial progress made in Gauteng's new and rapidly developing growth node, Waterfall and its prestigious CBD – Waterfall City.

Attacq's business has two focus areas; investments and developments. It has consistently delivered growth in capital to its investors through its strategic property holdings and developments. Attacq focuses on sustainable capital appreciation through the development and ownership of a balanced portfolio of properties with contractual income streams. Capital appreciation is supplemented by development and redevelopment profits made in the company.

Attacq's investments comprise landmark commercial and retail property assets across an ever-expanding international footprint. Its portfolio of properties is geographically diverse and includes a growing portfolio of international investments in sub-Saharan Africa with a direct shareholding in Att Africa of 31,25%, and exposure to property investment in Germany, Switzerland and the United Kingdom via a strategic 45,3% shareholding in JSE-listed MAS Real Estate Inc.

Attacq's investment portfolio is expanding and is doing well. Morné Wilken, CEO of Attacq, confirms: "Attacq is working hard on its diversification strategy including its international footprint."

Attacq's prestigious Waterfall development continues to expand and provides Attacq with an attractive 15-year pipeline. Waterfall is regarded as the new inbound headquarter destination for many international corporate firms seeking a foothold in Gauteng as the commercial hub of South Africa and the economic gateway to Africa. A number of corporates have already committed to Waterfall, including Massmart,

PwC, Novartis, Cummins, Schneider, Cipla, Honda, Cell C, Group Five, Premier Foods, Covidien, Westcon, Altech and Servest.

"Some impressive buildings have already been completed in Waterfall while others are making rapid progress." Wilken emphasised however that Attacq's goal at Waterfall is more than the development of impressive stand-alone buildings. "We want to build a world-class city that works". Urban design and planning is a key focus to ensure this prestigious new urban development along the N1 will develop into a world class city; changing the landscape to one of an economic powerhouse with fantastic infrastructure and unparalleled access linking this growth node in our province to the rest of the world," says Wilken.

It is insightful that in a recent survey of corporates who have already relocated to Waterfall the high visibility, central location and advanced architecture in Waterfall have been identified as the top reasons for making Waterfall their destination of choice. Respondents felt that Waterfall City offers great value for money while being a 'cool site' with a great reputation to work at. Some also indicated that the location provides the ideal location to consolidate Pretoria and Johannesburg operations while, infrastructure was cited as a further key draw card by others. The combination of work and lifestyle was also mentioned as being attractive and some companies' feel that Waterfall as an employment destination will be a top talent destination in future.

The new CBD of Waterfall, Waterfall City, is also adding significant economic value to Gauteng. During the construction phase of Waterfall City over the next few years, Attacq will create almost 27 000 new employment opportunities. A significant number of sustainable direct and indirect job opportunities will continue beyond construction into the operational phase of the new economic hub, both as part of the development itself as well as the occupants of the various buildings across the new city.

"Waterfall City, will be anchored by the 131 000 m² Mall of Africa due to open in April 2016," says Wilken. "The Waterfall development as well as the commercial jewel in the crown, Mall of Africa is well on track and we look forward to the mall opening in 40 weeks with prestigious brands," states Wilken.

The massive 131 000 square metre shopping mall will combine significant scale with innovative architectural design to set a new benchmark for malls on the continent. The Mall of Africa is the largest mall completed in a single phase in South Africa. This first phase of Mall of Africa competes favourably with some of the largest completed multi-phase expanded mall developments on the continent and indeed the southern hemisphere.

Mall of Africa is set to be a major catalyst for further growth in the greater Waterfall mega development node. Attacq Limited owns 80% of Mall of Africa while Atterbury Property Holdings, Attacq's appointed



Morné Wilken, CEO of Attacq hosted selected senior journalists at Gauteng's new and rapidly developing growth node, Waterfall.



developer, currently owns the remaining 20% of the mall. Wilken explains that designing a mall of this size in a single phase creates a seamless flow with its surroundings, which is difficult to replicate in malls that expands in several extension phases.

"Attacq will always remain a principled and integrity-driven business that seeks opportunities and capitalize on them through astute but nimble decision making by a strong, creative team. Attacq is driven by a passionate entrepreneurial spirit, brought to life by a committed and enthusiasm. A proactive and hands-on management approach, coupled with a positive outlook and belief in the future of South Africa, has built Attacq to the highly regarded industry force it is today," concludes Wilken. <

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STABILISING BUILDING platforms in Mpumalanga

Five geosynthetic reinforced retaining walls using precast concrete retaining blocks manufactured by Aveng Infraset have played a crucial role in creating stable terraces for the construction of Emoyeni Mall, a recently completed shopping centre situated on the R538 between Nelspruit and Hazyview in Mpumalanga.



The mall was built by one of the country's leading rural retail centre development specialists, McCormick Property Development, a company with a strong focus on the emerging markets of South Africa. Engineered Interlock Solutions (EIS) in conjunction with TMV Consulting Engineers designed the geosynthetic reinforced concrete block retaining walls. The walls were built by EIS in close collaboration with the main earthworks contractor, Joubert en Seuns.

EIS owner, Manie Troskie, says that EIS won the retaining wall tender on the basis of an alternative and more cost-effective design

which also offered better functionality.

"There are substantial quantities of sub-surface water on this site and our design had to make provision for extensive drainage. In fact there were some embankment sections where one could actually see water oozing from the ground.

"Three walls were open-face designs and were built with Aveng Infraset's Terrace Blok® TB 490 and TB 300 retaining wall blocks. The other two walls were closed-face and built with the Infrablok™ 350."

The largest wall, some 200 m long, was built in an open-face configuration at an angle of 70°. It was constructed on

the perimeter of the property to reinforce an embankment which rose to 12 m at its highest point from a service road below.

"We only had five to six metres to work with on this wall and the installation of extensive sub-surface drainage was required before construction of the wall could begin. Sub-soil drains were installed on top of the foundations three-to-four blocks below kerb level. Fin drains, wrapped in A2 bidem which go right back to the cut face, were laid to trap water at the top, sides and bottom of the embankment.

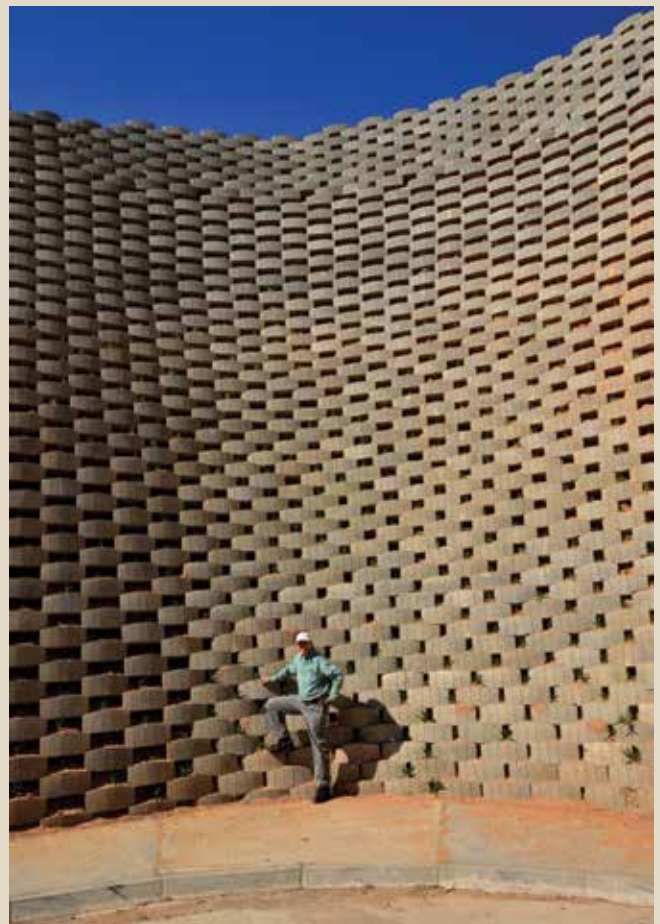
"We also installed 250 mm Kaytech wick drains which were wrapped with bidem. And in areas with the heaviest water flows we positioned 100 mm slotted pipes covered with stone and Geomesh geotextile to trap the water at the cut face. All ground water drains into a pipe at the bottom of the wall which runs parallel to the foundation and feeds into the stormwater drainage system.

"The foundation of the perimeter wall was steel reinforced. One metre wide, it varied between 450 mm and 300 mm in depth depending on the height of the wall.

The 200 m perimeter wall built with Aveng Infraset's TB 490 and TB 300 concrete retaining blocks.



The 200 m perimeter wall at its highest point of 12 m.





One of the open-face retaining walls at Emoyeni Mall.

“TB 490 retaining blocks were used to erect the lower section of the perimeter wall and the upper section was laid with lighter TB 300s,” said Troskie.

High tenacity Paragrid reinforcing supplied by Maccaferri was used to reinforce the wall. The material was specified due to its very low elongation properties. It also attains its tensile strength very quickly and has a stretch factor of less than 5%. The Paragrid reaches back to the cut face and was laid at a spacing of every second block on the lower half of the wall. Macgrid WG4 was installed at every third block on the top half and extends nine metres into the fill.

The parking basement wall was also built as a geosynthetic reinforced wall. Rising to 5,5 m it takes a heavier loading than the perimeter wall as it has to support a portion of the weight of the building which was built on a jockey slab, concrete columns and normal foundations. Because of the heavier loading, the wall was built using the TB 490 block only.

“Basement walls are normally built with solid concrete retaining walling, however, retaining block walls are more cost-effective,” advised Troskie. Two closed-face walls were built using Aveng Infracrete attractive Infracrete™ 350 at an angle of 85° due to limited space. The one wall which varies in height between one metre and 3,4 m was built adjacent to a car-park feeder road and supports a building platform on which a Cashbuild store was built. The walls were built around the concrete support columns and reinforced soil, and the retaining wall supports a portion of the building’s loading.



ABOVE AND TOP RIGHT: One of the closed-face walls built with Aveng Infracrete’s Infracrete™ 350.

Maccaferri Paragrid was used to reinforce this wall to prevent any soil movement under the building’s foundations.

The second closed-face wall was built around a water reservoir situated on ground above the centre. This wall was constructed with Infracrete™ 350s at a face angle of 75° and Macgrid WG4 was used for geosynthetic reinforcing. A combination of Macgrid WG4 and cement-stabilised backfill was deployed in areas where the space between the reservoir and the concrete block retaining wall was limited.

Other members of the professional team included the main consultant, Endacon Consulting Engineers, and the main building contractor, Ikotwe Construction.

Over the past 33 years McCormick Property Development has completed 58

“Basement walls are normally built with solid concrete retaining walling, however, retaining block walls are more cost-effective.”

shopping centres which have become the benchmark for rural retail development. They are now extending their reach into Africa with a number of large scale projects in the pipeline, most notably the Mall de Mozambique in Matola, Mozambique. <



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Building on the CO-WORKING CONCEPT

A trend that first took hold a decade ago in San Francisco is gaining momentum in South Africa, and is breathing new life into the Cape Town CBD spaces as freelancers and small businesses group together in working hubs.

> The concept of co-working made it onto Wikipedia some time ago, defined as “a style of work that involves sharing a working environment, often an office, and independent activity.”

The term ‘co-working’ itself is credited to San Franciscan Brad Neuberg who, in 2005, coined the phrase when he set up what he called the ‘Hat Factory’ – a live-work loft space that was home to three IT workers around the clock, but open to others from 9 to 5. From there, Neuberg also founded the first “work only” co-working space – Citizen Space.

The concept gained ground fast and today there are co-working spaces across the globe, with one multinational (Regus) even making it a global business, having to date set up 2 300 business centres across 106 countries – many housed in large, formal corporate-like environments, including Pretoria, Johannesburg and even Cape Town.

However, since Capetonians largely tend to do things a bit differently from the norm, in the Mother City it appears that the co-working trend tends to stay true to its original standard of setting up shop in less formal environments.

The Cape Town CBD in particular seems to be taking to the trend like the proverbial duck to water, with nine of the 27 spaces found to date in the metropole being situated in Cape Town’s traditional downtown, and it’s allowing entrepreneurship to blossom, according to Rob Kane, chairperson of the Cape Town Central City Improvement District (CCID).

“What we’re seeing is a number of underutilised B and C-grade spaces receiving significant overhauls,” says Kane. “Co-working communities are bringing life back into spaces that have been overlooked or passed over by the more traditional corporate environments.

“It’s a trend we’ve seen for a number of years now among the creative industries based in the CBD, but now we’re also seeing the trend being embraced by other fields – lawyers, accountants, engineers.

East side

Steven Harris who, together with his partners, has created four floors of co-working space at 75 Harrington in the creative East City side of

the Cape Town Central City, believes that the collaboration between coworkers is of prime importance to the success of the initiative.

“It’s about building a community of practice,” says Harris. “Lots of landlords can set up a co-working space, but not everyone can build a community. This is what differentiates a co-working success story from other shared spaces.”

“The major advantage of co-working spaces is that they are far more interactive than just sitting in a café or at home: they also provide an environment where people can share ideas, network and possibly even collaborate on projects.”

By this Harris means having the ability, as the owner of a co-working space, to network among and on behalf of those who rent desk space: “And in turn ensure that these tenants are prepared to engage with the rest of the community in the building and even in the immediate neighbourhood beyond its doors.

“People at 75 Harrington Street can find themselves in a ‘win-win’ setting if they are prepared to look at what they can add back into the overall community; for example in terms of services they can offer to others in the space, or how they engage in the flow of ideas. Many people who come into our space end up working on projects together.”

Inner City Ideas Cartel

Schuyler Vorster, who owns the 2 000 m² Inner City Ideas Cartel (IC-IC) at 71 Waterkant Street, agrees on the importance of delivering the right collaborative approach to his tenants: “It’s your responsibility to help people work better.”

The idea of developing a co-working space came to Schuyler while working in a Cape Town coffee shop, when he realised “that we needed to do better as a CBD” to support serious business people working on their own “but who still appreciated the finer things in office life.”

The range of coworkers occupying the IC-IC’s desks is very diverse, from small law firms and PR practitioners, to IT specialists, recruitment agencies and those involved in advertising. Rates range from a co-working desk in the open plan space at R2 000/month to a semi-private or shared office at R3 500/month, to a private office plus ensuite bathroom and shower at R12 500/month, or even R15 000/month for a private office seating up to six staff members. Rates include all the usual amenities and services expected of a co-working space.

Dave Russell, a director at property brokering company Baker Street Properties, remembers his company brokering the first stand-alone co-working space that opened in the Cape Town CBD, long before anyone knew what to call it: the Bandwidth Barn – a space shared by IT specialists and related professionals that opened back in 2000.

“What we saw before that,” says Russell, “was the more corporate-dominated market of the Regus model, which catered to a more formalised work space. But mobile platforms have evolved so much in the past few years that what is required now is a far less formal plug-in-and-play environment where all someone really needs is a desk and a good internet connection.

“The major advantage of co-working spaces is that they are far more interactive than just sitting in a café or at home: they also provide an environment where people can share ideas, network and possibly even collaborate on projects.”

Twenty Fifty

Gareth Pearson is the innovative soul behind the CBD’s highly successful First Thursdays, which sees art galleries and other venues stay open beyond 5pm on the first Thursday of every month. Twenty Fifty at 8 Spin Street is now the co-working space he’s opened with partner Nathan Heller.

Explains Pearson: “We had our eyes open for unique opportunities. Cape Town needed it, we needed it, and we couldn’t find this kind



Collaborating in the right places

According to the state of *Cape Town Central City Report 2014* (published annually by the Cape Town Central City Improvement District as an investment guide into the CBD), as at December 2014, SAPOA vacancy rates indicated:

- Of the 515 535 m² of B-grade space available in the CBD, 53 862 m² was available for leasing, ranging from R80 to R115/m²;
- Of the 145 178 m² of C-grade space available in the CBD, 31 711 m² was available for leasing, ranging from R47 to R95/m².

By the second quarter of this year, SAPOA figures revealed that the vacant space in B-grade property had dropped to 47 375 m² available, while C-grade had dropped to 29 758 m² available.

According to Rob Kane, Chairperson of the CCID: "These represent drops in our vacancy rate from 10,4% to 9,1% (for B-grade) and from 21.8% to 20.5% (for C-grade) respectively. We believe the rise in co-working spaces in the CBD has impacted in some way on these vacancy rates, and also reflects the growing desire by people attracted to this type of working environment to be part of the Cape Town Central City's growing live/work/play environment."

or environment anywhere except in Europe or South America. So we decided to take a risk and dive in head first."

Agreeing with Steve Harris on the need for collaboration above and beyond the working space, Heller advises: "Co-working is about the community and the relationships and interactions between everyone in the space. So it's less about managing the physical space, and more about building the community. That's more of an art and requires more energy." <



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CIVILS STRUCTURES on track

Work on the civils structures on the Murray & Roberts Infrastructure contract on the N4 toll road project is on track. The upgrade project involves increasing the carrying capacity of an 18 km section of the toll road from east of the Rockdale interchange to just west of the Arnot interchange. The contract was awarded by Trans African Concessions (TRAC).



Also under Murray & Roberts Infrastructure's scope of work are the construction of a new bridge, the extension of an existing bridge and the construction of six large in situ concrete culverts and associated drainage works.

The civils structures will be constructed using a high specification readymix concrete with a high cementitious content to ensure optimum durability. The readymix is being supplied from AfriSam's Middelburg readymix plant where the company installed a generator to ensure continuity of supply even under load shedding conditions.

Pierre van Vuuren, contracts manager at Murray & Roberts Infrastructure, who is responsible for civil works on the project, explains that consistency of supply was important and that the locality of the AfriSam plant as well as the competitive concrete solution offered meant that AfriSam was selected.

The readymix being supplied by AfriSam will create a more durable concrete with less likelihood of concrete deterioration and also allow more efficient use of labour as a

result of the workability and easier placing and finishing. It also offers guaranteed early strength performance.

In addition to being cost effective, AfriSam's enhanced durability mix designs meet all the durability specifications. AfriSam is considered one of the leaders in Durability Index testing in South Africa and the mix design underwent special durability tests at AfriSam's Centre of Product Excellence in Roodepoort. These tests included water sorptivity, chloride conductivity and oxygen permeability, all of which are designed to assess the working life of the structures being built with this concrete solution.

According to Mike McDonald, manager at AfriSam's Centre of Product Excellence, the AfriSam enhanced durability mixes are easier to place and generate less heat of hydration which prevents thermal cracking while reducing the CO₂ footprint.

Van Vuuren says that the contract is particularly challenging as one of the culverts is being constructed at the entrance to the Middelburg Dam and portion of the new bridge over the Klein Olifants River is being

constructed in an area where there is a constant flow of water.

Although the construction programme required that this culvert be constructed at the end of February, which theoretically marks the end of the major rainfall in the region, the catchment area had experienced a great deal of unseasonal rainfall and the water level in the dam was thus higher than anticipated.

To facilitate the construction of the culvert it was necessary to first build a large rock fill berm with a bentonite clay core on the northern or dam side of the culvert and then to dewater the area wherein the culvert was to be constructed.

"The construction of the berm was exceptionally challenging for a number of reasons, but mostly as a result of the water level in the dam," Van Vuuren says.

Excavating the trenches to facilitate the placement of the bentonite presented challenges, particularly with respect to dealing with the displaced water and this was done in a phased approach with trenches of 3 to 4 metres being excavated at a time.

Van Vuuren says that the section of the bridge being constructed in the middle of the river is being done using a system of girders and beams in place of traditional staging. "This is the most appropriate option as it is not possible to erect staging due to there not being a stable surface on the river bed," he explains.

"With all these challenges facing us, it was critical to develop a relationship with a supplier like AfriSam who could readily and reliably supply the 12 500 m³ of readymix concrete we require for use for the civil structures on the project," says Van Vuuren. <

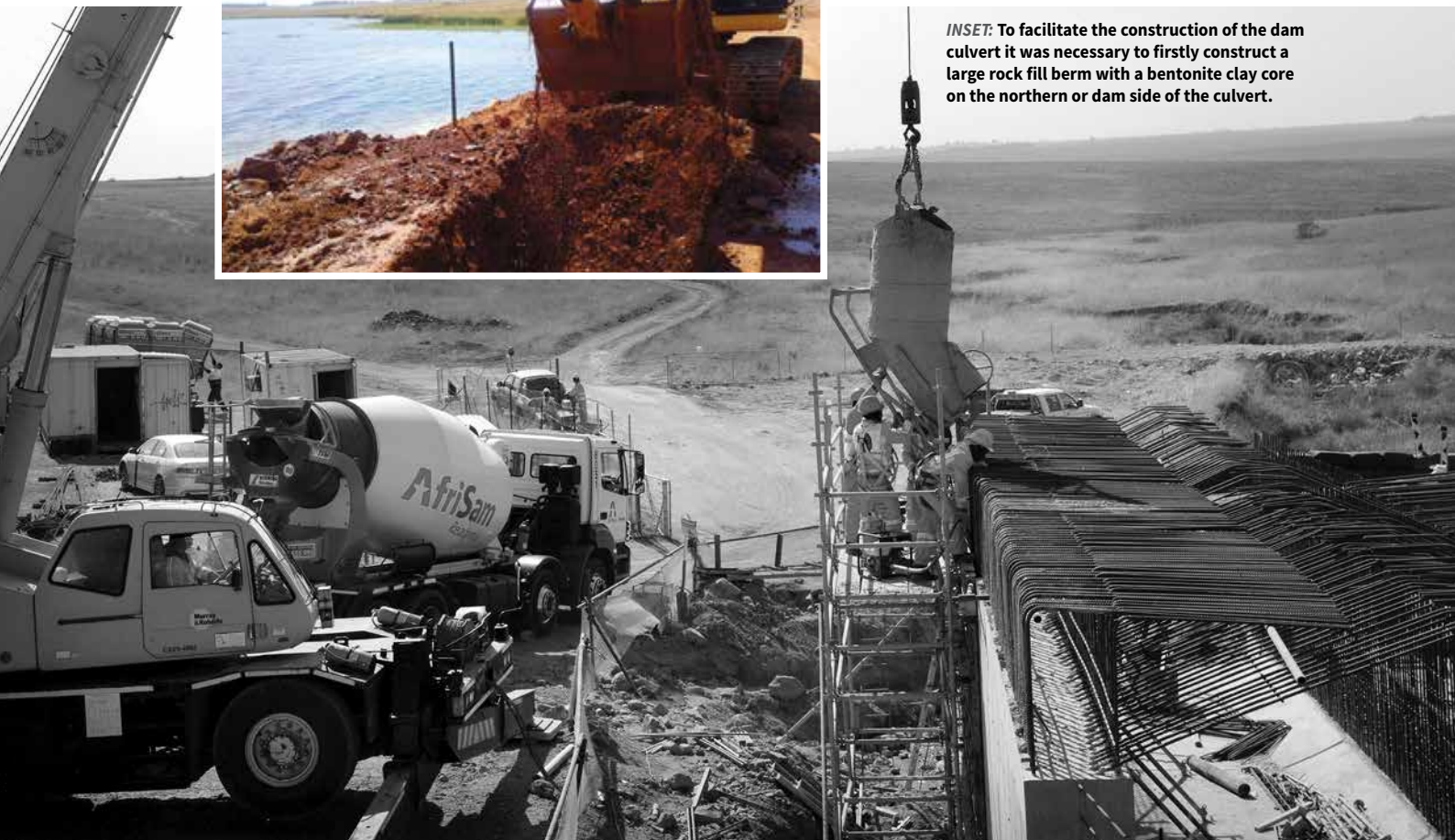
32

The entire bridge construction will require 2 000 m³ of concrete.





INSET: To facilitate the construction of the dam culvert it was necessary to firstly construct a large rock fill berm with a bentonite clay core on the northern or dam side of the culvert.



Murray & Roberts Infrastructure's scope of work includes the construction of a new bridge and the extension of an existing bridge.



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HYDRO CUTTING'S BENEFITS

A strategic investment in Shishalanga Construction by National Asphalt last year saw the addition of hydro cutting technology to the company's road surfacing solutions.

> Sean Pretorius, managing director of National Asphalt, says that this cost effective and environmentally friendly system for the repair and remediation of flushed bituminous pavements offers a number of significant advantages. "Hydro cutting restores the friction and texture of a pavement using high pressure water blasting, and can be used to remove flushed seals including bitumen, asphalt and concrete without reducing the structural life of the surface," he says.

"This innovative technology improves the porosity of the asphalt which significantly reduces the risk of aquaplaning, limits the road spray generated by vehicles by as much as 90% and reduces the road noise factor by 50%," Pretorius says.

"All of this improves general road safety while extending the life of the road surface as the stone chip matrix remains in place after the bitumen has been removed."

Pretorius says that when it comes to multiple seal layers, seal stability is dramatically improved with a reduction in the overall bitumen content ratio by up to one litre per square metre per single treatment and a substantial improvement of the micro and macro texture of the seal.

The hydro cutter process, which is operable in all weather conditions, can also be used to clean open graded asphalt that has been clogged by debris. By simply changing



National Asphalt's strategic investment in Shishalanga Construction last year saw the addition of hydro cutting technology to the company's road surfacing solutions.

the spray bar nozzles, spindle speed, cutting speed and pressure to create a 'washing' action, the hydro cutter will revitalise the asphalt by removing all detritus. The water pressure can be adjusted from 85 bar to 850 bar, and significantly no chemicals are used in the process.

The hydro cutter comprises a truck mounted high pressure water pump and vacuum recovery system and offers the flexibility to treat widths from 0,75 metre to 3,45 metre. The high velocity vacuum system allows the cutting pressure as well as the texture depth to be determined while the machine is in operation.

Water energy is focused in fine streams at high speed via five rapidly rotating blasting heads.

The water streams physically cut the binder from the stone with the energy of each 'needle' of water dissipated upon contact.

Using only water, this method of remediation is environmentally friendly and safe.

Another significant and environmentally important advantage is that the hydro cutter can capture and secure all spillages and waste material gathered for disposal at designated waste sites. 95% of all waste is recovered by the system. The unit has a 5 000 litre water tank and a 10 m³ waste water storage capacity.

Pretorius believes the company's strong focus on innovation and the continued development of new technologies will bring further benefits to all stakeholders including an enhanced road user experience with maximised safety.

"By employing one or a number of technology solutions that National Asphalt offers customers will be able to drive down costs in an environmentally friendly and minimally invasive manner," Pretorius concludes. <

34

Hydro cutting restores the friction and texture of a pavement using high pressure water blasting.



The hydro cutter comprises a truck mounted high pressure water pump and vacuum recovery system and offers the flexibility to treat widths from 0,75 m to 3,45 m.





Hydro cutting is an environmentally friendly system for the repair and remediation of flushed bituminous pavements, and offers a number of significant advantages.

The hydro cutter comprises a truck mounted high pressure water pump and vacuum recovery system and offers the flexibility to treat widths from 0,75 metre to 3,45 metre.



PREFERRED SUPPLIER

Aveng Rand Roads has been announced as the preferred supplier for the N14 Phase I Project which has been awarded to Power Construction. This entails the upgrading and rehabilitation of the N14.



Lee Cochrane, GM of Aveng Rand Roads

The project, which is expected to run from July 2015 to June 2016, will initially be supplied out of Aveng Rand Road's Pretoria West Asphalt plant, and once established from their mobile asphalt plant on site. This arrangement essentially enhances functionality and mitigates risk for the contractor by ensuring regular and consistent supply on demand.

The awarding of this contract to Aveng Rand Roads is testament to the company's reputation as a reliable and quality service provider in the road and infrastructure industry.

Aveng Rand Roads is a specialist division within the Aveng Grinaker-LTA stable that has expanded its service offering since the company first began operating in 1970. Today Aveng Rand Roads offers a full range of high quality bituminous binders and asphalt products which they manufacture and supply for road rehabilitation and infrastructure.

Lee Cochrane, GM of Aveng Rand Roads, commented: "It is a little known fact that we have two bitumen processing facilities and rubber plants in the country, a number of static asphalt plants and a mobile plant which can be deployed to service projects in other parts of the country."

Throughout the recent bitumen shortage, Aveng Rand Roads has managed to sustain its operations and have comfortably been able to provide a sufficient supply of raw bitumen. This has placed Aveng Rand Roads in a position where it can adequately meet local demand for bituminous products. ■



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ALTERNATIVE to TRADITIONAL retaining wall options

Introduced into the South African market by Kaytech, the Tensar TW1 System was developed as an alternative to traditional retaining wall options and has been used extensively in Europe and elsewhere internationally.

The system was recently used on a major SANRAL road upgrade contract in Ballito, one of the first and largest local applications of the system to date. Project engineers, SMEC South Africa, were involved in the detailed design of the system and realised a number of cost benefits on the project by using the Tensar TW1 System.

The scope of works entailed the widening of a two-lane, single carriageway to a three-lane, dual carriageway in Ballito, about 40 km north east of Durban. Due to the site's undulating topography, earth retaining structures had to be built to bring the extra lanes to level. The lane widening had to be constructed within the road reserve to eliminate encroachment into existing developments. To reach this objective, two near-vertical, Mechanically Stabilised Earth (MSE) walls of 11 m and 5 m, covering a total length of over 400 m, and 2 000 m², were proposed.

MSE walls, broadly, consist of fill material with horizontal layers of reinforcing elements which may take the form of sheets, grids, strips or meshes. The reinforcing elements, which are either metallic or polymeric, are able to sustain tensile loads and the effects of deformation or soil strains developed in the fill, part of which is transferred to the clad face through some form of positive connection.

Following a competitive tender process, the tender for construction of the project was won by Afriscan Construction, which included the use of the Tensar TW1 system. The project consulting engineers were satisfied that the system would meet the technical requirements and were subsequently closely involved in the detailed design of the system.

The intricate design needed to ensure

that the system complied with internal and external stability and project technical requirements. A benefit of the system was that lower quality fill, which was more readily available and less expensive, could be utilised as the grids provide greater coverage and soil adherence than other systems on the market and the product is also not prone to degradation or chemical attack by natural soils.

A further benefit to the system was that adjacent landowners were satisfied that the appearance of the split-face blocks would provide a high aesthetic appearance which would complement the local architecture.

Tensar TW1 System

The system, developed by Tensar International of the UK, comprises the specially designed TW1 block, combined with high density polyethylene (HDPE) grid mats – known as Tensar uniaxial geogrids – that are attached by a special connector into the blocks and extend horizontally to secure and reinforce the fill, thereby turning the whole structure into a monolithic mass.

The positive connection to the cladding or split-block face is an important attribute of the system and allows it to be used on near-vertical walls exceeding 7 m; which is the present maximum height attainable with other retaining systems available locally.

Internationally, maximum tiered wall heights of 60 m have been achieved with the TW1 system, with a maximum single tier height of 22 m in Fujairah, UAE.

Geotechnical investigation and design

As this was one of the first of these walls in the country, the design of the wall was a close collaborative effort between Kaytech, Tensar and SMEC South Africa. SMEC undertook the final design checks to ensure overall stability of the system and compliance with project specifications and local codes. These included integration of the system with the new roadway and New Jersey barriers along the top of the wall, as well as cognisance of the overall geotechnical conditions.

Design optimisation

A key consideration in the design was to

optimise the use of lower quality fill material, whilst simultaneously minimising the amount of lateral support required in cutting back and benching into the existing roadway, i.e. the back excavation slope. Limited space was available for the 11 m high wall, which restricted the length of the strips to 7 m. At the same time it would be beneficial to the project if Berea sands could be utilised. However, by using the lower quality fill, strip lengths would need to be increased, which implied either increased cut or the use of a near vertical back excavation slope requiring the use of shotcrete and ground anchors or nails.

After a number of iterations, the final design for the 11 m high wall comprised the use of 7 m long strips, a granular (COLTO G6) backfill for most of the height and 1 m thick granular soil-raft foundation. No lateral support was thus required and conventional benching into the existing fill was utilised. For the upper 3 m of the 11 m wall and for the 5 m high wall, Berea sand was used throughout.

Construction

Some of the further benefits of the Tensar TW1 System are that it is labour-intensive and eliminates the need for cranes and other heavy lifting equipment. Additionally, the TW1 block is manufactured locally by Remacon, a Tensar licensee, for that specific block manufacture.

In utilising the new system a number of challenges were experienced during construction. These included: the setting of the base block, which is key to achieving the final face inclination of 86°; compaction criteria; stormwater control; and the use of labour inexperienced in building these walls. However, these problems were quickly resolved through close collaboration between the contractor, consultant and supplier. The Kaytech and Tensar teams were able to provide technical assistance to the contractor and consultant's supervising team with regards to installation, testing standards and quality control and assurance.

Conclusion

The project has showcased the level of knowledge and experience required to design and construct a Tensar TW1 Mechanically Stabilised Earth Wall. This has been a major achievement for Kaytech, considering this is the first wall of this size to be constructed in South Africa. The system provides a number of benefits over other block and other Mechanically Stabilised Earth systems, including: the effective connection between block and geogrid; a near-vertical face inclination; locally manufactured blocks; aesthetic appeal; labour intensive construction; and eliminating the use of heavy lifting equipment. ◀

Tensar Polyethylene RE560 uniaxial geogrid.





Installation of crash barrier on 11 m high Tensar TW1 wall at Ballito Drive.



Locally manufactured Tensar TW1 blocks on 5 m high wall section.

Project statistics

- Contractor: Afriscan Construction
- Supplier: Kaytech Engineered Fabrics and Tensar International
- Design and supervising engineer: SMEC South Africa
- Construction value: R45-million (walls and fill: R8,5-million)



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N1 REHABILITATION

– Pienaarsrivier to Bela Bela

For the past 15 years, the N1 National Road north of Pretoria has been maintained by the Bakwena Concessionaire operating under license from the South African National Roads Agency Limited (SANRAL). Standard maintenance projects over the years had not prevented further cracking and rutting in certain sections.



38



In 2009 consultants Jeffares & Green were hired by Bakwena to design a more robust, permanent pavement solution, in which they specified Kaytech's bidim A4 and Flo-Pipe drainage system to control the ingress of water into the layerworks. The project implemented in 2012 proved so successful along one section of the dual carriageway road, that Kaytech was again contracted to supply these top quality products for the next section between Pienaarsrivier and Bela Bela in Limpopo.

Bidim is a continuous filament, nonwoven, needle-punched geotextile manufactured from 100% recycled polyester. The needle-punching process imparts several advantages including appreciable thickness, high porosity and a high drainage capacity both transverse and normal to the plane.

Flo-Pipe is manufactured from the highest quality HDPE and is optimally slotted for maximum infiltration with minimal blockage. The twin-wall sandwich design provides strength and flexibility.

This new section of road requiring rehabilitation presented with additional water problems. Since the road was so flat, large volumes of water were accumulated in the median and filtered through into the layer works causing major degradation. The solution was to install sub-soil drains in the median of the road.


Concor Roads and Earthworks installed the drains which consisted of a trench (600 mm deep x 300 mm wide) lined with bidim. This was followed with a 110 mm Flo-Pipe encased in 19 mm concrete stone. Water collected by these drains was to be channeled into 110 mm Kayduct pipes connected to stormwater drains. The success of the project was proven soon afterwards when an inspection revealed large volumes of water flowing from the Kayduct pipes into the stormwater manholes.

Besides the water problems in the median of the road, engineers identified severe cracking along the slow lane and shoulder of the road, in both directions. Since these parts of a road carry the largest volume of traffic as well as the heaviest vehicles, it was important to effectively reinforce the asphalt overlay. To solve the problem, design engineers specified Kaytech's GlasGrid, a polymer-modified, bitumen-coated, woven fibreglass grid structure with a pressure sensitive adhesive.

GlasGrid is designed to redirect crack stresses horizontally and to dissipate traffic-induced stresses. The exceptional engineering in the configuration of the fibreglass strands in GlasGrid provides a combination of high tensile strength and high modulus of elasticity at low elongation. These properties make GlasGrid, pound for pound, stronger than steel.

The reinforcement design involved milling out a m wide section of the slow lane to a depth of 110 mm. As a leveling course, a 40 mm bitumen treated base (BTB) layer was laid down, followed by adjacent rolls of 2,1 m wide GlasGrid 8511. To perfectly cover the 4m wide trench, these were laid down with a 100 mm overlap. A pneumatic Tyre Roller was used to ensure good adhesion of the GlasGrid onto the leveling course. After a SS60 tack course was sprayed onto the surface, a second BTB layer (70 mm thick), was installed over the GlasGrid.

Once the fast lane subsoil drainage project was completed, a 40 mm asphalt-wearing course was laid down along the slow lanes. Independent laboratory tests prove that by reducing thermal and stress-related reflective cracking, GlasGrid extends pavement life significantly.

By completion of the project the contractor had installed 85 000 m² of bidim, 32 000 m of Flo-Pipe and 250 000 m² of GlasGrid 8511. The combination of skillful design and Kaytech's superior products should considerably extend the lifespan expectancy of this major South African route. 

FROM TOP TO BOTTOM:

The existing surface was milled.

A 40 mm BTB layer laid.

Rolls of Glasgrid were laid with a 100 mm overlap.

STAKE IN LEADING READYMIX SUPPLIER

AfriSam, the largest producer of concrete materials in Southern Africa, has acquired an equity stake in Port Elizabeth based Concrete 4 U, expanding its footprint in the Eastern Cape.

> AfriSam has an existing well established cement presence in the Eastern Cape through its depots in East London, Queenstown and Port Elizabeth, which are supplied from its highly efficient integrated cement plant in Ulco, in the Northern Cape. This acquisition augments and strengthens AfriSam's ability to provide superior quality concrete solutions to its customers in this region.

"The equity acquisition in Concrete 4 U expands AfriSam's readymix footprint in the Eastern Cape region and fully aligns with our growth strategy", says AfriSam CEO, Stephan Olivier.

"We are making good progress with our growth plans and this transition will also be further strengthened by our planned grinding plant at the Coega Industrial Development Zone (IDZ). Our intention is to begin construction soon as we have received a positive environmental authorisation," he adds.

Established in 1994 Concrete 4 U is, in its own right, a leading producer of quality readymix concrete in the region. With distribution plants in Port Elizabeth, East London, Mthatha and Port St Johns, Concrete 4 U prides itself in the production and distribution of quality concrete.

With its sound infrastructure, technolog-

ical prowess and committed people, Concrete 4 U is well positioned to expand its customer base, offering quality products and support services throughout the region.

"The relationship with AfriSam is in line with our progressive strategies, allowing us and our customers to benefit not only from the production and supply of quality products, but also with the integration of technologically advanced systems," said Deon Fourie, managing director of Concrete 4 U.

The AfriSam and Concrete 4 U affiliation forms a strong foundation for continued future expansion within the construction industry as a whole, creating job opportunities and security in tandem with future economic developments.

AfriSam is a leading concrete materials group in Africa, holding an impressive 98% shareholding by historically disadvantaged South African and with operations in South Africa, Lesotho, Swaziland and Tanzania.

The company supplies superior cement, readymix and aggregate products and technical solutions to its customers from its seven cement production facilities, 17 quarries and 42 readymix operations. Founded in 1934, the company employees over 2 000 staff and is a proud Level 2 Broad Based Black Economic Empowerment (BBBEE) contributor. ■

Established in 1994, Concrete 4 U is a leading producer of quality readymix concrete in the Eastern Cape.



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COMPLETE OFFERING

Lafarge South Africa is in a unique position to provide the construction industry with building materials and solutions through having a strong presence in all of its construction related business lines of cement, aggregates, ready-mixed concrete, fly ash and gypsum plasterboard. The company focuses strongly on the needs of its customers and their projects to develop innovative holistic product supply solutions. The approach is proving to be highly effective, offering customers peace of mind and better value in a competitive marketplace.

ready-mixed concrete plant was 45 km from the project site. The second concern was ameliorating the Heat of Hydration (HOH) in the extremely hot, humid conditions.

Lafarge's successful offer to supply all main building materials, concrete, cement, fly ash, and 165 000 t of road aggregates, as well as 4 500 t of the company's specialised cementitious roadbinder, RoadCem 32,5N, made it viable to provide a Lafarge mobile concrete batching plant on site. This enabled the required combined total of 13 000 m³ of CRCP mix and other Conventionally Vibrated Concrete (CVC) to be supplied without compromising the quality or integrity of the concrete.

The solution to assisting the contractor to control heat of hydration was the supply of 6 500 t of Lafarge's Powercrete Plus CEM II 42,5R premium technical cement. This unique product is not only a Low Heat Cement with a typical Heat of Hydration value of 227 J/g (compared with the EN 197-1 criterion of < 270 J/g at 41h), but it can also be extended further on site with fly ash to meet the various mix requirements.

as roads, airports, water and power utilities.

All round support at Eteza

A recent example of Lafarge South Africa's efficient integrated service was on the SANRAL contract to construct an overload control facility and full diamond interchange at Eteza on the N2 in KwaZulu-Natal. The main contractor was concerned about two main concrete issues.

The driver of the project was their ability to place the Continuous Reinforced Concrete Pavement (CRCP) on time and within specification, when the closest commercial

Meeting a tight durability specification

Similar support was provided to the main contractor on the SANRAL contract to upgrade Section 14 of the N1 freeway between Trompsburg Interchange and Fonteintjie, a distance of 20,8 km. The site is some 120 km from the nearest fixed commercial ready-mixed concrete plant and this represented a potentially significant risk in terms of compliance with the tight durability specification.

The solution from Lafarge South Africa was to position a mobile concrete batching plant optimally on site to service the major concrete pours and take on the durability risk. This was conditional on being awarded the full supply package of building materials. The successful outcome was the supply of 10 000 m³ CVC concrete, on-specification and on-time. This involved the supply 3 500 t of Lafarge Powercrete Plus 42,5R cement, 7 000 t of aggregates, 1 000 t of fly ash, as well as 8 000 t of cementitious roadbinder, RoadCem.

"Our construction contractor customers are appreciating the benefits of having their building materials supplied and managed from a single reliable source," comments Lafarge South Africa's, Mike Fisher, infrastructure road & rail development manager.

"By matching the extensive capabilities of Lafarge South Africa with the needs of the specific construction project and the individual construction company, we achieve consistent quality and better value all round for the stakeholders." <



Lafarge South Africa is the local presence of the international Lafarge Group, a world leader in building materials. The Group's brand baseline 'Building better cities' is founded on the huge global trend to urbanisation and reflects Lafarge's commitment to help create cities that are desirable, sustainable environments for all people.

This means contributing to better solutions that meet the needs of communities for decent housing, hospitals, schools and offices, together with the associated infrastructure to connect and service cities, such



BEST YEAR EVER

Expect more from the readymix industry in future as years of hard work and planning culminate in the professionalisation of the industry and the widespread adoption of certified readymix as the construction material of choice by the country's most influential construction bodies.

➤ The year 2015 will go down as the most ground breaking year since the establishment of the Southern Africa Readymix Association (Sarma) more than a decade ago, as industry organisations representing engineers, contractors and building professionals accept Sarma certification as the criteria for all readymix supplied to their members' construction sites.

Simultaneously, the country's main contracting firms, as well as parastatal organisations including the South African National Roads Agency Limited (Sanral) and other Government entities have also specified that only Sarma certified readymix concrete may be used on their sites.

Growing support

"This had the knock-on effect of attracting a growing number of non-member readymix suppliers who have begun working tirelessly to meet membership requirements and become part of the association. As a result membership has grown in leaps and bounds with growth of 11% in accredited member numbers during 2015.

"This is good news for the local construction industry as it ensures our construction projects have world-class concrete. It also ensures that acceptable minimum standards are maintained that will put an end to building collapses and ramshackle houses as a result of inferior products being used," says Sarma president, Deon Fourie.

Speaking at the association's annual general meeting recently, he said that these developments mark a watershed as the construction industry embraces necessary quality over price. Sarma certified members cannot cut corners and had sometimes been undercut by non-compliant readymix suppliers. This not only jeopardised the integrity of the structure but also led to unfair competition.

Ongoing initiative

"Thanks to the efforts of general manager, Johan van Wyk's role-players across the country and increasing amount of organisations are seeing the benefits of using only accredited readymix and he is slowly winning the fight to professionalise readymix concrete in South Africa.



Sarma Chairman, Deon Fourie.

"Under his leadership the association is also throwing its weight behind the setting up and adoption of new modern-day standards for readymix, as well as pushing for higher standards of testing from the country's laboratories when it comes to dealing with concrete. In addition, there are also moves afoot to start a cleanup squad to remove concrete spills from our roadways, as well as new training initiatives to improve the skills of concrete workers and professionals," Fourie summarised. ❏

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Reducing THEFT COSTS

Fuel theft and wastage place increasing pressure on fleet managers, whose bottom lines are already under severe strain from rising fuel costs. Innovative new fuel measurement technology from leading asset management solutions provider QCIC ensures that fleet owners in numerous industries have full control of their fuel management.

The fuel management solution, which works in conjunction with the company's flagship QIC-FLEET GSM fleet management solution, is comprised of capacitive probes that are fitted to the tank of the vehicle.



QCIC director, Brian McKenzie.



The fuel management solution, which works in conjunction with the company's flagship QIC-FLEET GSM fleet management solution, is comprised of capacitive probes that are fitted to the tank of the vehicle.

The solution is designed for three different asset configurations, namely; singular fuel tank system, dual fuel tank system and after-market long-range double dual fuel tank system.

QCIC director Brian McKenzie states that there are a number of different probes that cover a wide range of tank capacities. "The solution is ideal for numerous asset types, from standard commuter vehicles and trucks, to farming equipment and large fuel storage tanks located at depots."

McKenzie notes that the solution enables the user to monitor the fuel by taking a sample of each sensor as the vehicle moves. "A fuel graph is then used as a consumption tool. On the more modern vehicles, a CAN-BUS interface enables the user to see exactly how much fuel is burned by the engine, this, together with the capacitive probe installation gives the fleet owner total control, such as consumption per trip and over the life of the vehicle as well as fuel theft and fill-up notification and reports."

Fuel theft – a growing concern

According to McKenzie, truck stops are a hotbed for fuel theft. "Fuel

thieves use a telescopic jacks that has a sharpened steel pin welded to the top. Moving underneath the tank, they then push a hole in the tank from the bottom, and take the jack out, place a container underneath to capture the leaking fuel, and subsequently plug the hole. This very often happens without the driver's knowledge, who may be asleep in the locked truck while the tank is being emptied."

Drivers may also be involved in fuel theft, by siphoning from the tank into a separate container and selling the product at another stop further down route. The QCIC fuel management solution prevents theft from taking place, by informing the software operator of when the vehicle reaches a filling station, and the exact amount of time spent there as well as the exact fuel level on arrival.

"The amount of fuel contained in the tank before and after entry is also recorded to ensure that the risk of theft is greatly minimised. What's more, the unit is highly-robust, with IP67 rating for dust and water. This ensures that it is able to withstand the harsh road conditions and climate with minimal maintenance, while offering an operational lifespan of around six years," McKenzie concludes. <

EXPANDING SKILLS BASE WITH HIGHLY QUALIFIED WOMEN

Condition monitoring specialists WearCheck employed several more ladies recently:

- 1 **Lea Bodenstien** has been appointed as a diagnostician for condition monitoring specialists WearCheck, based at their Middelburg laboratory.
- 2 **Loshini Govender** has been employed as the manager for WearCheck's speciality laboratory (WSL) in Johannesburg.
- 3 **Salisha Dhanasar** has been promoted to laboratory supervisor for WearCheck's Middelburg laboratory.
- 4 **Annemie Willers** has been appointed as reliability solutions lubrication.



MANAGING FUEL on site

Managing fuel on a construction site can be a challenge. Ensuring that the correct amount of product has been received and that the tanks are adequately stocked are of prime importance. Added to this one has to ensure that the product is being dispensed correctly. Accurate inventory management is required.



A manual system using dipsticks and manual records is open to abuse and inaccurate information. Any normal dipstick can only give an indication as to how much product is in the tank. It is well known that different people will take different readings on the same amount of product in the tank.

This can lead to abuse. The risk exposure on this amount can be anything between 3 and 7%. Risk Exposure means the potential loss of product that can go undetected as a result of operating a purely manual system. Other challenges are that short deliveries can occur, tanks can leak and unauthorised drawings from the tank or tanks can take place. Without any authorisation it is also possible to fill any container or vehicle.

Liquid Automation Systems – one of South Africa's leading fuel management companies has recently introduced a new entry level fuel management system designed specifically for the construction and agricultural markets.

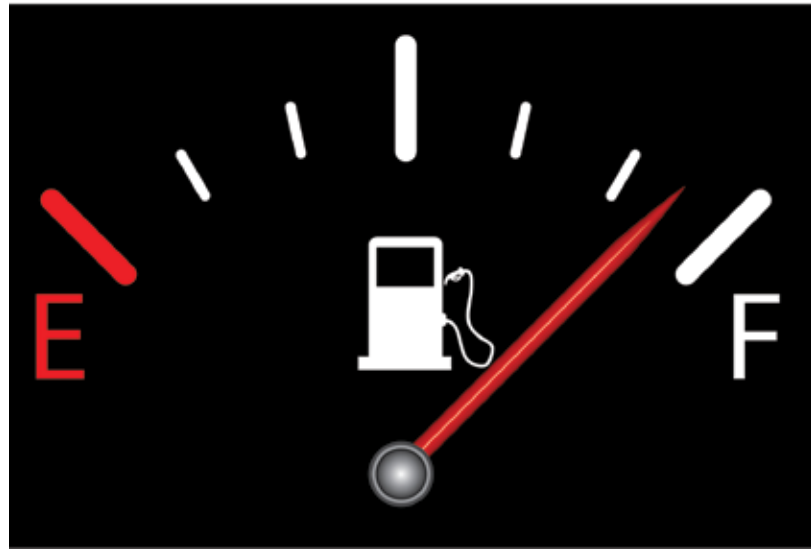
The complete systems is able to manage:

- The receiving of fuel on the site.
- Instant and automatic tank dipping or gauging.
- Dispense fuel into authorised vehicles.
- Log date and time, quantity and vehicle that received fuel.
- Optionally odometer information can be included as well.

The Trimlite Controller has already proved itself in the harsh South African mining environment. A vehicle is fitted with a RF-ID (Radio Frequency Identification) tag that gives each vehicle a unique identification number.

The nozzle reader is fitted with a RF-ID reader that reads the vehicle tag. The tag id is transmitted to the Trimlite. The Trimlite contains a database of vehicle identification numbers that can refuel at the controller.

As an option the user can enter odometer information manually or a second option is to fit an AVR (Automatic Vehicle Recognition System) on the vehicle which transfers the odometer information required automatically. The benefit of this system is that it removes the possibility of inaccurate or wrong information being entered into the system.



Once the vehicle is identified the controller will switch the pump on or open a valve to start flow. The product going into the vehicle will be recorded.

The vehicle identification, the quantity dispensed, the date and time of the transaction and the vehicle odometer (optionally) will be logged in the Trimlite's transaction database. The controller can operate in a fixed installation or a mobile installation on a bowser. The Trimlite can operate autonomously.

The transactions and vehicle database can be polled with the Opti-MIM software. In conjunction with our Opti-MIM Software the Trimlite System is able to produce a variety of reports enabling a more streamlined and economically run site.

- Tank levels and tank trend reports in terms of losses and gains.
- Equipment consumption reports in terms of time and distance.
- Consumption comparisons.
- Product reconciliation reports.
- Filling by KPI by cost code.
- And most importantly reports that point out any exception events.

Benefits

- Reducing product shrinkage from tanks and vehicles.
- Limiting fraudulent activities.
- Improving vehicle consumption and engine life.
- Accurate and on time data that can be integrated into accountancy software.
- Fuel Accounting technology to make every drop count. <

43

Can you accurately account for your lube expenditure?

LAS can assist you to derive the following benefits:

- Prevent product contamination • Accurate cost allocation • Each oil identified and measured individually
- Each oil is verified individually before dispensing • Each transaction logged against specific vehicle information



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MAPUTO RUNWAY reconstruction



B&E International is crushing aggregates for use in the reconstruction of the Maputo airport runway.

44

An in-depth understanding of cross-border work, coupled with its access to a large crushing and screening fleet operated by highly skilled teams, has positioned B&E International to become one of the leading aggregates crushing companies in Africa.



One of its latest contracts, secured on the back of these market differentiators, is for Razel Mozambique, a company within the Fayat Group, which is undertaking the contract to rehabilitate the Maputo airport in Mozambique. Razel-Bec is a major civil engineering firm that designs, funds, produces and operates major public structures at national and international level. The Fayat Group is the largest independent construction group in France with 138 independent subsidiary companies and a geographical presence in 120 countries worldwide.

B&E International's portion of the six month contract comprises the production of about 100 000 tons of minus 26 mm G1

base course and approximately 160 000 ton of asphalt aggregate. Aggregates for the reconstruction of the airport runway are being produced at the company's crushing operation, situated at Joacco Quarry in the Mohamba district, and material is being hauled around the clock to Maputo by a subcontractor.

Razel Mozambique has two large asphalt plants set up at the airport to service this contract. One of these plants is essentially only a back-up plant. Given the tight timeframe for work, this expediency was necessitated due to the fact that all asphalt work takes place at night and the contractor has to ensure continuity of operation.

"The fact that work can only be under-

taken within a small window of opportunity means that there is a requirement for large volumes of asphalt aggregate to be readily available. Fortunately, B&E International is known for achieving very high efficiencies without compromising on the quality of the aggregate being produced, so we can ensure uncompromising continuity of supply from our side," says Chris Weideman, director of operations at B&E International.

B&E International is also contracted to crush 400 000 tons of ballast material for Sulbrita Lda in northern Mozambique, over a five month period. This material is for the construction of the Moatize Nacala railway line, which forms part of the Nacala logistics corridor commissioned by global mining company, Vale.

It will open up the vast coal reserves of the Tete basin in a route traversing remote areas, crossing through southern Malawi and reaching the east coast of Mozambique. B&E International's high capacity plant, located at Namialo Quarry, is crushing in the region of 4 500 tons per day. ◀

A view over the B&E International crushing operation which is providing aggregate for the Maputo airport runway upgrade.



MAKING CONSTRUCTION A PAYING PROPOSITION

Murray and Dickson Construction is a company that has managed to defy industry trends by enjoying significant growth over the past five years.

> The company has used Komatsu products over the last decade, and is delighted with the price and performance of two recently acquired PC350 LC-8 excavators, one of which is currently engaged in a major pipe laying project in Alberton, south of Johannesburg.

CEO Rukesh Raghuram explains that a major driving force behind the company's expansion is that it offers a comprehensive package of services, including civils, construction, pipes, road building and earthworks to enable maximum participation in different facets of a project, both locally and cross border.

"We are active in the domestic public and private sectors as well as in a number of infrastructure creation projects, including oil and gas developments, across Southern Africa. We are currently exploring opportunities in the SADC region, and have invested a significant amount of capital in the continual upgrade of our fleet of civils and construction equipment," he says.

This includes the two Komatsu excavators which proved to be very competitive in respect of price related to specification benefits, in an industrywide product survey and procurement process.

Chris Porter, Murray and Dickson's vastly experienced head of roads and earthworks, makes no bones about the fact that the aftermarket experience is a key element in supplier selection.

"It is essential to have confidence in a supplier's ability to support its equipment. For example, let's take an excavator that stands idle for the need of a replacement part. In the big picture it is not just this machine that is incurring down time, but the 10 or more trucks that it is supposed to load. The shortage of just one component can cost us thousands an hour and impact on our ability to meet crucial deadlines."

Komatsu have shown their commitment

to delivering world class after-sales service to its customers by building a state-of-the-art centralised Parts Distribution Centre in Isando. This centre uses highly advanced systems in computer-driven warehousing technology to ensure parts are available whenever they are needed.

The Komatsu PC350 LC-8 is winning new friends in the field, and according to M&D Pipe's site manager Kyle Peinke, his crew is enthusiastic about the excavators' performance.

"It's a great machine and the commissioning process and training supplied by Komatsu was good. We had absolutely no hassles. The guys love it, especially our top operator who has more than 30 years of pipeline experience. This is someone who really knows his equipment."



FROM TOP TO BOTTOM:

A Komatsu excavator PC350 LC-8.

Komatsu products working a pipeline project in Alberton.

Chris Botha on left with Kyle Peinke (site manager).





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EXEMPLARY SERVICE SOLUTIONS

Bobcat Equipment South Africa, part of the Goscor Group of companies and Imperial, is making significant investments into its service portfolio in line with the compact equipment specialist's mantra of delivering a comprehensive and exemplary customer service.

“Once customers take delivery of their machines, Bobcat's Service and Parts Department enters the business relationship,” states Bobcat Equipment's national aftermarket manager, Mike Lowe. “It is our role to keep our customers' equipment operating at maximum capacity and efficiency. We strive to offer a full service spectrum that is permeated with quality and our scope of work includes servicing, repairs, parts sales, machine rebuilds, repainting and engineering as well as component repairs.”

Bobcat's service enhancement strategy is a three-tiered approach involving appointing additional Aftermarket advisors and parts representatives at some of the company's branches, broadening the company's local and cross-border footprint and upgrading the service fleet.

Skilled and competent people are the cornerstone of Bobcat's Service and Parts Department which now comprises a total complement of close to 100 people. “Training forms an integral part to keep our service team up to date with the latest equipment, products and techniques so that they can attend to customers' requirements professionally, rapidly and efficiently,” says Arina van der Westhuizen, Inventory & Logistics Manager at Bobcat Equipment. “Our regular training regimen includes the Bobcat University Training on parts counter sales, aftermarket advisor, technical training and technician customer interaction skills.”

“We are expanding the Bobcat footprint through the establishment of new dealerships to reduce the distance between ourselves and our customers across the mining, construction, forestry, water and power generation industries,” explains Van der Westhuizen. New Bobcat dealerships in Nelspruit, Polokwane and Welkom will complement Bobcat's existing eight countrywide branches and four dealership based in Witbank, Botswana, Namibia and Zimbabwe. “The dealer expansion which also reaches neighbouring countries will assist us in delivering our parts and services even faster,” adds Van der Westhuizen.

The Bobcat service fleet has been boosted with the recent purchase of ten new vehicles. The 10 parts and 26 service vehicles are well equipped with toolboxes, compression testers, a diagnostic service tool, pressure and flow gauges, torque wrenches, drills as well as some fast moving parts enabling the 30-strong technician team to deal with virtually any service requirement or emergency breakdown. The vehicles have also been re-branded in line with Bobcat's new corporate image.

Lowe and Van der Westhuizen state that the mining and agriculture are two sectors currently showing the most growth potential. While the low commodity prices in mining present a serious challenge, Lowe and Van der Westhuizen anticipate a full recovery in around 8 to 12 months. “We are currently positioning the business to be ready for when this happens.”

Bobcat's ‘one tough animal’ range of machines together with the wide and versatile array of attachments can meet virtually all requirements of the agricultural industry, a sector which Lowe affirms they are currently actively targeting. “We are also making inroads into and have started supplying the military.”

The Bobcat after-sales service is unique in the sense that it encompasses a very wide selection for customers to choose from. Genuine Bobcat parts, tyres and specialised lubricants, service contracts, short term rental, repairs, servicing and maintenance, operator training, free technical advice and we also sell the Bobcat branded clothing range. “We have covered all the bases on our endeavour to offer end-to-end service solutions to meet all our customers' requirements and provide a personal touch where no customer is too big or too small,” conclude Lowe and Van der Westhuizen. ■

Bobcat service enhancement strategy includes upgrading of the service fleet.



OPTIMUM ENVIRONMENTAL PROTECTION

Developed for use in a wide range of applications and conditions where environmental impacts are a key consideration, Cat Bio HYDO Advanced provides superior performance across a wide temperature range.

“A green solution, Cat Bio HYDO Advanced is a synthetic ester based hydraulic fluid with >90% bio-based content (per ASTM D6866 test method). Unlike fossil carbon, bio-based carbons are derived from renewable sources: fluid biodegradability to OECD 301B is estimated at around 80% after 28 days.

Comparable to premium mineral-based hydraulic oils, Cat Bio HYDO Advanced has been awarded a number of eco-labels, including the EU Flower. (The EU Flower is the only eco-label that covers all aspects of sustainability, including product performance, toxicology, pollution mitigation, and the utilisation of renewable resources.) The product is also listed in the US Department of Agriculture's BioPreferred® programme

Key product features include superior, consistent wear protection throughout the entire temperature range from -30°C to 45°C, excellent corrosion resistance, and fast air release.

Good foam control and fast air release are important properties of any hydraulic fluid.

Air trapped in hydraulic oil reduces system response and causes “sponginess” at the controls. Trapped air also accelerates oil degradation.

“Excessive air and foam can lead to cavitation (collapsing air bubbles) and damage to hydraulic components,” comments Barloworld Equipment group product specialist, Reuben Phasha.

Cat Bio HYDO Advanced releases air very quickly and special additives keep the hydraulic fluid clear of foam, even when it becomes contaminated with engine oil.

Due to the oil's excellent oxidation stability, extended drain intervals up to 6 000 hours are achievable when combined with Cat S•O•S fluid analysis monitoring.

“In the past, switching from a premium mineral-based hydraulic fluid to a synthetic ester fluid meant shorter drain intervals and increased operating cost,” he adds. ■

IMPROVED and ENHANCED

CSE Equipment's SR and SV series skid steer loaders, encompasses a range of models, with advanced features for improved performance, enhanced productivity and increased operator comfort.

➤ "Robust Case SR and SV series skid steer loaders have been designed for exceptional driving force, increased stability and reliable handling in all conditions," says Brenton Kemp, managing director of CSE Equipment – the Capital Equipment Group (CEG) of Invicta Holdings Limited.

"Turbocharged, four cylinders, Tier 3 certified diesel engines, which provide the power and torque required to efficiently cope in the toughest site environments, also ensure operating efficiency and fuel economy. An important feature of this highly efficient series is the large fuel tank - with a capacity of between 60,5 and 96,5 litres - which enables the machine to operate all day without the need to stop operations for re-fuelling.

"Six radial lift SR boom skid steers have been engineered for digging, prying and pushing and three vertical lift SV machines efficiently handle demanding lift and carry tasks."

Models in the SR and SV series range from the SR130 unit, with a 590 kg operating capacity, to the SV300 machine, with a 1 360 kg operating capacity. Peak torque specifications are from 130,5 Nm at 1 750 rpm, to 340 Nm at 1 400 rpm. Tipping load capacities extend from 1 179 kg to 2 720 kg and the breakout force of the bucket cylinder are between 18,5 kN and 38,2 kN.

Users can choose from standard mechanical drives, or optional electro-hydraulic (EH) switchable controls. The EH option facilitates the match of control patterns to operator preference.

There is a new 'Power Stance' chassis with up to 21% longer wheelbase and 30/70 front/rear weight distribution, designed to safely increase the capacity to lift and haul more material. These machines also offer increased travelling speeds and improved stability, regardless of working conditions.

The new design of this series enables easy, ground line access for daily maintenance checks. Two retaining bolts facilitate convenient

cab tilting for access to hydraulic and transmission components when necessary. A safety locking system, which prevents the cab from dropping, is automatically activated. Battery and environmental drain hoses are easily accessible from the side of the machine for quick service and maintenance.

The new cab design of this series offers 25% more interior width, with improved visibility, comfort and control. The cab has been sealed to reduce noise levels and dust ingress. There is an ultra narrow wire side screen design, with more glass surface area to provide 360° visibility for the operator. Side lighting enables 24 hour operation.

Optional attachments for these skid steer loaders include buckets, pallet forks, breakers, augers, sweepers, backhoes, stump grinders, cement mixers, cold planers, trenchers, rollers and slot cutters. An hydraulic coupler enables the operator to switch attachments, without having to leave the cab. The standard Connect Under Pressure (CUP) feature allows connection of tool hoses, without the need for a wrench.

Various tyres for specific applications include heavy and severe duty, non-pneumatic, flotation, mining and premium liner options. ◀

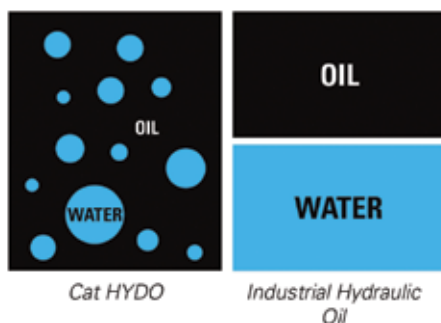
CSE Equipment's SR and SV series skid steer loaders, encompasses a range of models, with advanced features for improved performance, enhanced productivity and increased operator comfort.



47



Cat Bio HYDO
Advanced versus a
standard industrial
hydraulic oil.



**Cat wheel loader
hydraulic system
cross section.**



BACKHOE LOADERS well received

Hyundai earthmoving equipment, available exclusively in Southern Africa from HPE Africa, encompasses backhoe loaders which have been well received by the local market.



“The robust H930s backhoe loader series is particularly well liked by businesses that need smaller machines, without having to make a substantial capital investment in large excavators and loaders,” says Alex Ackron, HPE Africa’s managing director. “Hyundai backhoe loaders, with a reputation for efficient performance, low operating costs and minimal maintenance requirements, are also popular with plant hire companies. “The company supports this range with a two year/ 3 000 hour warranty.”

Hyundai H930s backhoe loaders are fitted with fuel efficient, low noise, environmentally friendly Perkins 2 tier diesel engines. Standard power shift transmission and a convenient gear/shift selector, enable fast, easy and efficient operation and precise control, even in arduous operating conditions.

These machines have been designed for smooth, easy control and powerful loader performance. The loader boom is integrally welded, with dual lift and tilt cylinders for maximum strength. A strong, rigid loader frame ensures a greater lift capacity and improved overall visibility.

The backhoe boom allows for a clear line of site into a trench when the operator is digging around buried constructions, like water mains, sewer pipes and utility lines. An optional extendable dipper increases versatility. Front and rear axles have been designed for efficient and safe operation in uneven ground conditions. Oil immersed wet brakes,

which eliminate possible external contamination, are individually actuated by two separate brake pedals.

Self adjusting brakes that automatically regulate disc clearance, ensure improved brake performance and reduced service time. The parking brake can be activated by an electric switch from inside the cab.

Optional features for enhanced performance include the four wheel drive system that improves mobility and an ‘automatic return to dig’ function on the loader attachment that reduces loading cycle times. The ‘ride control system’ – also optional – has a shock absorbing accumulator that cushions the boom, reduces material loss and improves operator comfort. The operator is able to turn this system on or off with an overhead switch.

Standard features are complemented by a choice of hydraulic systems that incorporate the latest technologies for improved efficiency. These options include a load sensing hydraulic system that matches the engine power to the appropriate hydraulic flow, based on the load demand required. Sufficient flow is provided, whether the machine is operating in a trenching application, for fine control digging, or when suitable speed is needed for high productivity applications.

An adjustable flow control system (AFCS) can be installed to divert unused hydraulic fluid from the second pump to the hydraulic reservoir. In a loader application, AFCS optimises the travel power of the machine and improves productivity – this is particularly useful when travelling on the road.

For easy serviceability, these machines have a tilt-up hood which provides convenient access to the engine compartment and a single piece hood tilts away for ground access to all critical services and grease points.

The hydraulic oil sight gauge is installed on the side of the hydraulic tank for convenient inspection from ground level. A safety bar and locking pin are an integral part of the loader arm to ensure safety during servicing.

Hyundai has designed these machines with advanced features for maximum operator comfort, improved safety and low noise levels. The operator can easily reach all controls, whether the machine is in the loader or backhoe position. The cab has rounded front glass and larger door glass for a better field of view and an optional climate control system improves heating and cooling in the cab. Hinged type side windows provide ventilation inside the cab and a fully adjustable suspension seat improves operator comfort.

The steering column and backhoe control tower can be tilted and adjusted for convenient operation. The cab structure is supported by six pillars, meeting ROPS/FOPS safety requirements.

Optional safety features include a switch on the rear console that disables the control lever of the loader, backhoe and stabiliser and a clam safety system which prevents the uncontrolled opening of the clam bucket by its weight of load during loading and dozing processes.

Adjustable front and rear 55 watt halogen work lights can be fitted to provide illumination for increased safety at the work area.

HPE Africa supports the full Hyundai range – which encompasses wheel loaders, excavators, skid steer loaders and backhoe loaders – with an operator training programme to ensure optimum performance from every machine. <

Hyundai earthmoving equipment, available exclusively in Southern Africa from HPE Africa, encompasses H930s backhoe loaders which have been well received by the local market. This range is supported by a two year/3 000 hour warranty.



CHOICE AND FLEXIBILITY

The patented 'Freedom Approach' from Bosch Power Tools is a first-of-its-kind concept globally, which provides professionals with greater choice and flexibility, as all Bosch Blue tools, batteries, chargers and carrying cases are now available in individual units. This unique and convenient concept was launched worldwide in early-2015.

> Bosch Power Tools SA senior brand manager Juergen Lauer says that the flexibility of giving customers this choice means measurable cost savings on batteries, as Bosch Blue batteries and chargers can be used across a variety of products. "This gives customers the freedom to choose any combination that suits their specific individual needs," he explains.

With the Freedom Approach, the customer has maximum flexibility and freedom of choice to purchase exactly what is required to get the job done without any unnecessary extras. Furthermore, the customer can always renew or change the power supply over the lifetime of the tools, and will always have easy and quick access to the latest power supply technology without having to consistently replace cordless tools.

"This provides them with a great cost saving as they do not have to purchase a tool with a battery and charger for each new tool they need, but rather just the solo tool. However, all Bosch Blue tools are also available as solo items and come in a carton box. Batteries and chargers are not included in the carton box, but may be purchased separately," Lauer continues.

This ability to mix and match also saves space in the workman's kit, while ensuring a simple switch-over between tools. "Matching system accessories for all Bosch Blue power tools has set new market standards, as the Freedom Approach enables the dealer and tradesperson to make a simple four-step purchase, namely; tool, batteries, charger and case," adds Lauer.

Bosch Power Tools has also expanded its battery range for professionals and has set new standards in lithium-ion batteries. With its new 6 Ah battery launched in early-2015, Bosch Power Tools is the first manufacturer worldwide to offer the highest rated charge to date in the 18 V class.

Lauer points out that the 6 Ah battery has a 20% longer runtime than the 5 Ah batteries that were launched in January, and 50% longer than that of the widely-used 4 Ah batteries. "The new 6 Ah batteries offer the longest runtime in this segment and enable professional tradespeople to work without interruption."



49

Juergen Lauer Senior Brand Manager at the South African division of Bosch Power Tools.

He adds that these batteries have Bosch CoolPack technology, which means that they last for twice as long as batteries without CoolPack, which increases the productivity of professionals. Two batteries and chargers are available for all Professional cordless drills, impact drills and impact wrenches from Bosch. ☑

GROUNDBREAKING SUPPORT APP

Imagine having answers to all your geosynthetic queries at the touch of a button? Kaytech has developed an APP that gives you access to wide-ranging geosynthetic support at the touch of your smart phone screen.

> KayApp invites you to learn about their products, contact their sales team, connect with its technical team, and more ... from your mobile device wherever you are.

Nine clearly defined buttons on your touch-screen will give you immediate accessibility to the solutions you seek in the world of Kaytech Engineered Fabrics:

1. Order request: If you know what product you want, simply place a specific order from your phone or your desktop. Send them your specs and they will send you a quote and delivery date.
2. Technical support: Request a data sheet, information from their library, ask a technical question, or request training. Simply pick a topic, send details of your

query and a human expert will respond within 24 Hours.

3. Design request: Get help with designs on subsoil drainage, ground stabilisation, road maintenance, haul roads, mine waste containment, landfill linings and cappings, dam linings, sludge dewatering, erosion control, coastal erosion protection, and DIY. An expert will respond with application recommendations for your geotextile requirements.
4. Account enquiry: For a new account application, credit limit increase, invoice request, statement request, transaction query, or to check on your account status.
5. Access information on Kaytech geosynthetic applications and products.

6. bidim game: Play the recycling game.
7. Media links: Connecting online to YouTube, LinkedIn Facebook and Twitter.
8. Find us: Locate your nearest Kaytech branch or distributor.
9. Website: Connect direct to the Kaytech website.

Who benefits?

Contractors can place an order, check their account status, or get product info – when they are on site, while administrators can request quotes or credit applications via the app instead of phoning in.

Consulting engineers can put through a design request if they are having problems onsite, while Joe Public can access product information for his DIY project and place an order via his smartphone.

Available for windows phones, android and iPhones as well as desktop applications. ☑



REDUCING BLAST VIBRATIONS

SA-based blasting leader BME is supplying advanced detonators and expertise to Rock Busters PTE, a blasting specialist subcontractor to Samsung for the construction of Land Transport Authority (Singapore) Caldecott Station, T213 Thomson-East Coast Line (TEL T213) to blast with the least possible vibration impact – protecting nearby tunnels, skyscrapers and other sensitive structures on the land constrained city-state.



Umesh Chhika, general manager for Asia Pacific and strategic projects at BME, said the company has been engaged to provide electronic detonation systems and related technical advice to ensure low-vibration blasting in the 35 metre-deep box cut, from which three more rail tunnels will be developed.

He said the special requirements of the project suited BME's specialised expertise in electronic detonation services and products.

"We have made huge strides in advancing the field of controlled blasting through our digital blasting systems," said Chhika. "Electronic delay detonators play a vital role in controlled blasting, especially when used in conjunction with our in-house AXXIS digital initiation system and supporting software."

The timing flexibility of the AXXIS system supports the detonation of small, multiple charges in each blasthole to keep vibration levels down, he said, and the accuracy of the timing between individual charges allows vibrations to be predicted accurately and reliably.

The TEL project is a 43 km underground rail

line between the existing Thomson and Eastern Region commuter lines in Singapore, and will add 31 new stations to the existing rail network. The first phase of the facility is expected to start operating in 2019.

"To further enhance our controlled blasting techniques, BME employs its own Blast-MapIII software to plan complex timing designs and also analyse the results for each blast," said Chhika. "Our extensive experience – which earned us this contract – includes blasting for various civil blasting contracts."

BME's advisory services will therefore augment the company's products and software to ensure the success of their contribution. ■

The TEL project is a 43 km underground rail line between the existing Thomson and Eastern Region commuter lines in Singapore, and will add 31 new stations to the existing rail network.

ABOVE: The timing flexibility of BME's AXXIS system supports the detonation of small, multiple charges in each blasthole to keep vibration levels down, and the accuracy of the timing between individual charges allows vibrations to be predicted accurately and reliably. TOP: Electronic delay detonators play a vital role in controlled blasting, especially when used in conjunction with BME's in-house AXXIS digital initiation system and supporting software.



50

WATERPROOFING LOADING ON REVIT

South African architects and other designers have welcomed the fact that the specifications for a.b.e. Construction Chemicals' waterproofing products have now been preloaded on Autodesk REVIT software.

a.b.e. is part of the Chryso Southern Africa Group. Ivor Boddington, a.b.e.'s Product Manager: Concrete Repairs & Protection & General Construction, says Autodesk REVIT is an innovative building information computer program that has transformed building design from drawing flat sketches on paper to creating virtual, three dimensional designs.

"It enables architects; structural engineers; mechanical, electrical and plumbing (MEP) engineers, designers and contractors to design a building and its components in three dimension, annotate the model with 2D drafting elements – such as used for waterproofing – and then access construction information from the building model's database," Boddington stated.

"Three-dimensional modelling itself is not new but in the past the 3D models would merely

illustrate what a building would look like when completed. Now, thanks to the Autodesk REVIT program, architects and other parties involved in designing and construction can plan ahead when it comes to the finer details of their design, including the annotation of the a.b.e. waterproofing the new structure will require.

"The fact that a.b.e. waterproofing specifications can now be extracted and inserted to a project at the design stage means that the designers can automatically generate a Bill of Quantities containing all the products and measurements required, the extruded elevations to be provided for, as well as the final conceptual visualisation," Boddington explained.

Autodesk REVIT enables designers to extract energy analyses and environmental impacts, as well as waterproofing requirements, prior to the construction of a building, thereby saving

important additional unforeseen costs later in the construction schedule.

Boddington added that a.b.e. is planning to preload all other applicable a.b.e. products onto Autodesk REVIT software, including a.b.e.'s flooring, specialised adhesives, structural glazing, concrete repair, silicone and sealants, and construction commodity products. ■

a.b.e.'s full range of waterproofing products are now within easy access for architects and designers through Autodesk REVIT software.





PREDICABLE POWER

To meet the specific needs of the construction and general rental sectors, Atlas Copco is introducing a new range of portable generators. The application-oriented QES, available for worldwide order now, was designed to offer ease of use and straightforward service.

> The new generator range currently comes in five models, from the QES 9 (9 kVA rated power) to the QES 40 (42 kVA rated power). Additional models will follow shortly.

Multiple customisation options allow individual customers to choose a QES that perfectly fits their individual requirements while enjoying the Predictable Power they expect.

Robust and quality components, including a Kubota engine, deliver a high level of perfor-

mance and long service intervals of 500 hours.

The units are both compact and stackable, reducing storage and transport costs. The forklift slots and lifting eye ensure the models can be easily moved from one location to another.

Each model is easy to operate and manage thanks to the new Qc 1011 controller, which provides advanced engine monitoring and protection features.

The QES generators offer efficient servicing, with easy access to components and the availability of spare parts through the Atlas Copco global support network.

"Customers in the construction and rental industry have very specific needs. The QES was designed to meet them all," says Angel Nieto, Product Marketing Manager, Atlas Copco Portable Energy. "With its application-oriented design, quality components and high performance, the QES gives them tailored value through Predictable Power." ❏



PICTURED ABOVE: New QES range of portable generators from Atlas Copco is ideally suited to the construction sector: designed for ease of use and straightforward service.

New range of application-oriented QES portable generators from Atlas Copco available in five models: QES 9 to 42 kVA.



New range of application-oriented QES portable generators from Atlas Copco: QES 30 homologated trailer.



2 KG GROUT BAG LAUNCHED

To improve productivity and efficiency in tiling projects, TAL now supplies its tried-and-trusted Wall & Floor grout range in a 2 kg packaging option – ideal for the DIY enthusiast.

> The new 2 kg packaging option, which officially went into production in June 2015, perfectly complements the existing 5 kg and 20 kg TAL Wall and Floor grout bags. TAL marketing manager Gela Ohl explains: "Having identified the issue of wastage in smaller work areas, TAL responded to the market's needs with the introduction of this new bag size, which is ideal for smaller installations, repairs or when reviving grout."

TAL Wall and Floor grout is a cement-based grout specifically-designed for filling wall and floor tile joints between 2 mm and 8 mm wide. For added convenience, the 2 kg TAL Wall and Floor grout is packaged in plastic bags that feature a clear window. This allows the user to easily identify their preferred colour options, since powder grout is the same colour as grout that has cured in the tile joints. In the case where a latex additive such as TAL Bond has been added as a total water replacement in the grout mix, the final grout colour will be slightly darker or richer. The 2kg bag also includes a QR Code which links to TAL's step-by-step YouTube channel video guide on how to grout.

"I am confident that the new 2 kg TAL Wall and Floor grout bag will be well-received by retailers, as it completes the retail product offering. The launch of this new packaging is proof of our ongoing dedication to continuous product research and development, in order to ensure the highest levels of customer satisfaction on a long term basis," Ohl continues.

TAL boasts a comprehensive range of grout for specialised grout applications, including: Goldflex rapid-setting grout; quarry grout for wide tile joints; as well as a number of epoxy-based industrial grouts. For improved efficiency, TAL also supplies installation tools, such as squeegees, sponges and trowels. ❏

TOWARDS A GREENER WORLD

Leading the movement for a greener built environment in Africa, the Green Building Council of South Africa's (GBCSA) Annual Convention to be held in Cape Town from 2 to 6 November will provide a programme of top-notch speakers and thought-provoking topics

> The convention will go beyond simply finding ways to cope with the country's current energy crisis, and help move South Africa towards more innovation and future-orientated thinking to 'Inspire Better Buildings'. Anyone who wants to effect environmental transformation in Africa's built environment should be there.

Proudly sponsored by Property Finance at Nedbank Corporate and Investment Banking, and one of the highlights on the South African property and sustainability calendar, the Green Building Convention is highly regarded as the event where experts and decision makers gather to effect environmental transformation in the built environment within the African region.

Brian Wilkinson, CEO of the GBCSA says in addition to inspiring delegates on the broader subject of sustainability, the convention also aims to provide a forum in the South African property sector to discuss current trends, share knowledge and engage in compelling debate to make a difference to the way we do business in the built environment.

"Buildings are the key to a cleaner and greener future and delegates are invited to join in working towards a better future. Building green is an opportunity to use resources efficiently and address climate change while creating



Speakers include: Jochen Zeitz, Prof. Jonathan Jansen, Donald Thompson, Prof. Michael Braungart and Prince Ea.

healthier and more productive environments for people and communities. We need to make a change," says Wilkinson.

Through inspirational thought and action, the Green Building Convention is leading the sustainability journey in the South Africa property industry.

Robin Lockhart-Ross, managing executive of property finance at Nedbank Corporate and Investment Banking, says Nedbank continues to both support and drive the sustainability agenda. "The convention, now in its eighth year, is a testament to how sustainability in the property sector has moved beyond a buzzword to the right thing to do. Green buildings are better buildings, making the theme of the 2015 convention a very fitting one."

The Green Building Convention will take place at the Cape Town International Convention Centre. It provides outstanding networking opportunities with key decision-makers and industry professionals who share the latest in green building practices and principles, both from the podium and in conversation. ❏

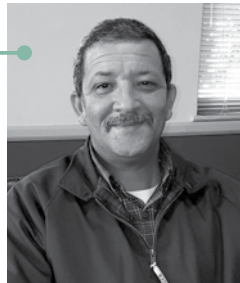
APPOINTMENTS



Cathlean Willemse,
retail sales and
marketing manager.

Uniclox

Shorne Groep,
key
accounts manager.



Roland Ramasami,
technical support
manager.

Jacques Schoeman,
sales manager.



Emira Property Fund



Geoff Jennett, chief executive officer.

SACSS and SAPOA

Nomzamo Radebe,
President of the South
African Council of
Shopping Centres
(SACSC) and named
President Elect of
the South African
Property Owners
Association (SAPOA)
for 2016/7.



LEADING THE MOVEMENT

> Furthering its commitment to greener, more sustainable South African buildings, Property Finance at Nedbank Corporate and Investment Banking (NCIB), will again be the principal sponsor of the Green Building Convention hosted by the Green Building Council of South Africa (GBCSA).

The annual Green Building Convention is leading the sustainability journey in the South African property industry by bringing the country's significant property players together around inspirational thought and action for our built environment.

This important event has built a formidable reputation for helping move South Africa towards more innovation and future-orientated thinking to "Inspire Better Buildings".

Property Finance at NCIB has long been a strong supporter of the convention and the efforts of the GBCSA. It has sponsored the convention since its inception eight years ago. This strong partnership is helping to create healthier and more productive environments for people and communities.

Widely recognised as South Africa's 'green bank', Nedbank has achieved an impressive sustainability journey of its own, which includes an array of notable firsts in the industry.

Its head office on 135 Rivonia Road was awarded South Africa's first ever Green Star SA rating issued by the GBCSA in 2009. Today, Nedbank owns and occupies five Green Star SA rated buildings including the Menlyn Maine Nedbank Falcon building, which has just become the first building in the country to achieve a 4-Star Office v1 Design, 5-Star Office v1 As Built, as well as a 4-Star EBP Pilot Green Star SA ratings. ❏



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BUILDING TRUST



Towards a **SUSTAINABLE BUILT** environment

A few years ago I was a guest of the German government during which it showcased the extent of sustainable architecture in Germany.

The German built environment is very impressive for various reasons: Germany is a first world country, it has a stable population (as opposed to the increasing South African population), unemployment is significantly lower than South Africa's 25%, the built environment has a much longer history of ownership than here in South Africa, sustainability is part of the design (and not cosmetic as is often still the case locally) and finally, Germany envisions, that by 2050, all energy it produces, will be renewable.

The South African movement to build in a sustainable manner is still in its infancy. The Green Building Council of South Africa, a non-profit company, was formed as recently as 2007. It aims to lead the greening of South Africa's commercial property sector: to ensure that buildings are designed, built and operated

in a sustainable way. It provides various tools, training, knowledge and networks that help to promote green building practises and hopes to eventually change the way in which South Africa builds – given that the built environment is a main contributor to climate change.

In 2002, five years before the GBCSA was established, *Construction World* introduced a category to its Best Projects awards – a category that is now known as the 'AfriSam innovation award for sustainable construction'. It was the first award to recognise sustainability in the built environment and therefore it makes sense that the magazine would publish a supplement – *Sustainable Construction World* – to recognise the achievements, advances and status quo of the South African built environment.

Wilhelm du Plessis

Editor



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Contents



6 LSFB – the most sustainable construction method around?

There are claims that Light Steel Frame Building rates highly on most or all of the sustainability considerations.

8 Moving beyond green buildings

The engineering principles of creating 'green' buildings are both well understood and have been widely applied. Where to now?

12 Principles of material choice with reference to the Green Star Rating System

Coralie van Reenen says the South African government as well as each citizen, has the responsibility to ensure the protection of the environment.

18 SA's first socio-economic impact certification

Karl Bremer Office Park in Bellville is the first project to achieve a Socio-Economic Category Pilot rating in Africa.

20 Lesson in sustainable design

Boogertman + Partners recently designed the company's first six star rated green building for the Department of Environmental Affairs – and learnt some valuable lessons.

24 EC metro gets SA's first bioregional plan gazetted

The gazetting of SA's first bioregional plan is a milestone towards the more sustainable development of towns and cities.

26 Brick buildings for a better world

Simple clay brick construction goes beyond the important fundamentals of durable, low maintenance and aesthetic integrity.

28 Asphalt gets progressively greener

Much Asphalt has upgraded all but two of its 17 static plants in SA to include recycled asphalt in new asphalt mixes.

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Beware of inexperienced solar power providers



Manie de Waal, divisional head of Solar & Storage at Energy Partners.

The local manufacturing and installation of solar photo-voltaic units could create more than 2 000 jobs over the next three to five years, according to Western Cape MEC for economic opportunities, tourism and agriculture, Alan Winde.

While the boom in solar power is positive from a job creation perspective, the increasing need for both businesses and residential energy users to have access to alternative energy solutions has resulted in a growth in unqualified solar power companies.

This is according to Manie de Waal, divisional head of Solar & Storage at Energy Partners – a leading energy solutions provider in South Africa – who says the solar industry is booming as a result of the national energy crises. “In addition, the potential 25% tariff increase proposed by Eskom will further fuel the growth of the industry.”

De Waal warns that with this rapid expansion there are many operators emerging that may not have the experience and capabilities to deliver the right solution for a client’s specific needs. “Residential and commercial property owners must partner with a reliable service provider who can manage the generation and storage of solar electricity effectively and efficiently.”

He says that the first and most important step is to select the right PV solution for the specific site and lists the following basic solutions:

- Firstly there is the grid-tied PV solution without battery storage. This solution ties into the power grid and feeds the load with the solar power that is generated. While this solution is likely to decrease utility costs, it is not suitable for uninterrupted power supply (UPS) as the solar system is completely dependent on the grid to transport energy.
- Secondly there is a grid-tied solution with battery storage. This solution is also tied into the grid when it is available, but excess solar power can be

stockpiled and utilised when required, for example in the event of a power outage.

- The last, an off-grid PV solution, has no connection to the grid and acts as the main source of electricity, often assisted by diesel generation in the event of prolonged periods without sunshine.

De Waal explains that the nature of renewable energy is irregular as it depends heavily on external sources. “If combined with storage however, alternative energy solutions such as solar power can drastically minimise the reliance on grid electricity for companies and households.”

In order to reap the full benefits of a solar power solution, it is imperative that the company or resident uses the services of a tried and trusted energy solutions partner to avoid financial loss in the long run, concludes de Waal. ∞

About Energy Partners

Founded in 2008, Energy Partners is a leading energy solutions provider in South Africa that provides clients with innovative solutions (including fully outsourced supply contracts – e.g. steam generation) to suit their needs. Energy Partners has built a high quality team of talented individuals and robust processes which offer end-to-end solutions and integrate the different components of energy optimisation to deliver optimum results – including capital solutions that put clients in a positive cash flow positions from day one. Industries in which Energy Partners specialise include: food retail, retail, healthcare, hospitality, food processing and logistics.

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MAKING GOOD cents



Matthew Turner, business development manager for commercial and industrial PV at juwi Renewable Energies.

As the worldwide shift to Renewable Energy (RE) sources continues to gain momentum, South Africa is entering an era in which electricity generated by distributed solar photovoltaic (PV) plants often costs businesses and consumers less than their traditional grid-supplied electricity.

Because of the modular nature of PV plants, solar panels can conveniently be integrated into architecture, design and construction at various levels depending on budget, brief and the project. Even if the original budget doesn't allow for PV, it is advised to plan for its inclusion as it can easily be added at a later date.

According to Matthew Turner, business development manager for commercial & industrial PV at juwi Renewable Energies, there are significant savings to be made by incorporating RE into new builds or into existing buildings. But RE isn't the only intervention that business owners should be considering, with energy efficiency (EE) interventions also providing real savings. Combining energy efficient equipment with RE generation further improves the business case.

"If construction is on a completely new building, whether domestic, commercial or industrial, it definitely makes sense to plan the integration of RE solutions and EE initiatives from the outset," said Turner. "For existing buildings, retrofitting properly engineered RE and EE solutions will also make sense in almost all cases."

Attention to heating, ventilation and cooling (HVAC) and lighting can reduce the amount of energy required for the running of the building. If these are optimized, the long term cost of owning and operating the building will be substantially reduced.

Lowering life-time cost

According to Turner, "The key focus should

be on lowering the life-time cost of the asset rather than looking at the upfront build costs in isolation. Electrical wiring is a good example of this; it is common knowledge that by spending a small additional amount upfront to incorporate thicker copper wire in a new building's electrical reticulation will decrease resistive losses, which can significantly lower electricity costs over time. Yet builders often overlook lifetime savings in order to focus on lower upfront costs.

"At juwi, one of our core business focuses is rooftop PV plants and we advise clients to size a PV plant according to the amount of energy required, since municipalities typically

About the juwi Group and juwi Renewable Energies

The juwi Group is one of the world's leading specialists for renewable energies with a strong presence in sixteen countries. The company was founded in 1996 by Matthias Willenbacher and Fred Jung in German Rhineland-Palatinate. Today, juwi employs more than 1 700 people and had an annual turnover of more than a billion Euro in 2011. To date, juwi has constructed around 540 wind turbines with an output of around 920 megawatts; and, in the solar sector, more than 1 500 solar power plants with a total output of around 950 megawatts.

juwi Renewable Energies has taken part in the bidding rounds that were requested by the South African government for renewable energy power generation. It was already successful as an Engineering-Procurement-Construction contractor as juwi is amongst the so called preferred bidders and will be installing four solar parks in cooperation with other project developers. Altogether the company will install a total of almost 35 megawatt. The construction of the first solar plants are going to start by the mid of this year.

juwi also plans to participate in the bidding rounds to come – not only in the field of solar energy but also in the field of wind energy. The company's vision is a 100% supply of electricity using renewable energies.



don't compensate well for excess electricity that is exported onto the grid. A rooftop plant should be incorporated into an organisation's long term operational plan in order to optimise the business case. We always recommend that we optimise the PV plant size to what the load should be, not necessarily what it is currently," said Turner.

Advantages

There are a number of advantages to incorporating PV into building design at inception:

1. Incorporating solar power into the original concept and plans will result in a system that is aesthetically integrated into the overall design and simpler to install.

"Well-integrated plants can add to the appearance of a building, and by planning ahead, the available roof area can be designed to accommodate the optimal size plant with simplified cable routing, and objects on the roof such as chimneys and aerials can be placed where they won't impact the performance of the PV plant."

2. In roof PV installations, the building will be designed to carry the weight of the PV plant, as well as optimising roof angles to get maximum solar exposure.

"It tends to cost more to add PV post-build than incorporating a PV plant in the original design. When working on existing buildings, if the original roof was not designed to carry the additional load of a PV plant, the cost of strengthening the roof can negatively impact the business case."

3. A PV plant that is planned upfront can be better integrated with back-up power solutions

"By adopting a holistic systems view when designing a building, a PV plant can be better integrated with available back-up generation and storage technologies, reducing costs and

improving operations. This is important as business owners grapple with the challenge of energy security and cost-effective solutions to loadshedding"

4. It is often easier to combine the cost of the rooftop PV plant into upfront asset financing structures than to finance these projects at a later stage.

"Although juwi doesn't cater to the residential solar market, it is probably easiest to use the example of a residential PV system to illustrate this. A R100 000 solar energy solution would be easy to absorb into the original bond amount if it was integrated from conception, whereas financing this amount without a secured loan at a later stage can be more complex. It's almost always cheaper and easier to finance upfront," says Turner.

With the rapidly increasing cost of electricity in SA, RE is the logical next step for those companies that have already implemented all economically viable energy efficiency initiatives. According to Turner, juwi has been able to undercut tariffs of 80 - 90 cents per kWh, which "is exciting, because it opens up a huge market for rooftop solar all over South Africa". ∞

LSFB – the most sustainable construction method around?



John Barnard, director of the Southern African Light Steel Frame Building Association.

'Sustainability', 'energy efficiency', 'green building' and 'carbon footprint', are words that were not so long ago regarded as 'things for the future' in the construction industry. Well, the future has arrived.

"It is clear that sustainability is today a fundamental design requirement across the board in construction," says John Barnard director of the Southern African Light Steel Frame Building Association (SASFA).

According to Barnard sustainability with regard to buildings is essentially based on three criteria: social acceptability, affordability and energy efficiency. He claims that Light Steel Frame Building (LSFB) for low rise structures – and increasingly for multi-level structures – rates highly on most or all of the sustainability considerations:

- Light steel frame buildings appear no different to 'conventionally' built structures, except that the quality of finishes is typically better with the former. It has found rapidly growing acceptance for 'affordable' as well as up-market buildings in South Africa.
- It is a cost-effective building method, with financial savings emanating mainly from significant time savings to complete building projects, less rework, reduced logistical costs – which are of growing importance due to the escalation of fuel prices and general construction inflation – and a drastic reduction of rubble on building sites, when compared with the brick-and-mortar alternative.
- Light steel frame building is significantly more energy efficient than heavy construction methods – both with regard to 'embodied energy' of the materials and components, as well as 'operational energy' relating to heating and cooling of the building over its design life.

Embodied energy

Barnard says that embodied energy of materials and

components used for LSFB is reported to constitute some 20% of the total energy consumption of a 200 m² house, over a 50 year period, the other 80% being the operational energy.

"While the embodied energy of the high strength galvanised steel sheet – used for the light steel frame – is significantly higher per kg than masonry building materials, a significantly lower mass of steel is used per unit area of building, rendering LSF wall assemblies superior in this regard – based on Australian research, double brick walls contain more than four times the embodied energy per square metre when compared with a LSF building.

He adds that the low mass of light steel frame buildings offers another advantage – logistics. "The walls of a 200 m² brick built house will have a mass of some 178 tons including clay bricks, mortar and plaster, compared with the 10,2 tons of an identically sized light steel frame building. The cost savings in transport is obvious, but with another benefit to all road users – a huge reduction in heavy transport traffic on the national roads.

Also, says Barnard, LSFB structures are insulated to specification pertaining to each climatic zone in SA, according to the new SANS 204, they have been found to offer significant saving in electricity used for heating and cooling, when compared with a brick building.

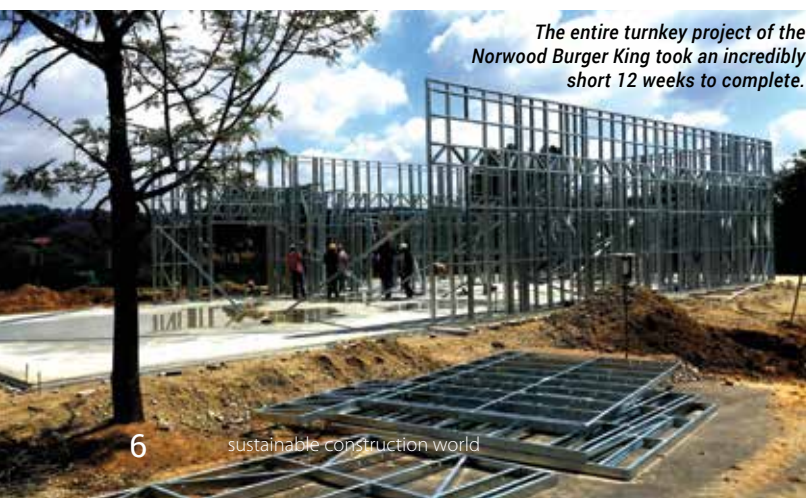
Clients in agreement

Many blue-chip companies agree, including both Burger King and McDonalds. Charl van Zyl, CEO of Silverline Group, who are building LSFB outlets for both of these iconic companies says that the fast-food chains are using LSFB because they support sustainable building methods as far as design, energy efficiency and the optimal use of natural light is concerned and because, by using LSFB, material wastage can be reduced by up to 30%, transport costs by 80% and the carbon footprint significantly reduced.

"On top of this, the construction period required is significantly less than with traditional building methods, allowing the franchise to be trading that much quicker," Van Zyl says.

Meanwhile LSFB as a building method continues to grow rapidly not only in South Africa but also in the entire SADC region. "SASFA is receiving an increasing number of enquiries from neighbouring countries and has now signed up members in Namibia and Zambia, and is in contact with several other countries in the region. Overall the LSFB market is growing significantly and indications are that this trend will continue into the future," Barnard concludes. ∞

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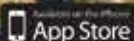
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MOVING BEYOND GREEN BUILDINGS

The engineering principles for creating green buildings are both well understood and have been widely applied. Where to now?

“We have earned our ‘stars’ in the art of green design, literally, and while innovation will continue to make further advances, our focus is shifting to ensuring sustainability in the face of almost overwhelming urbanisation,” says Aurecon’s national green buildings expert, Martin Smith.

“We’re entering a new age of green design that explores the development of sustainable precincts in large cities and urban areas,” comments Marni Punt, environmentally sustainable design consultant and landscape architect at Aurecon. “This means moving outside of the more traditional engineering ‘comfort zone’ that entails designing and constructing an environmentally-sound building, to collaborating with a wide range of organisations and competencies to address socio-economic issues and the ‘liveability’ of an environment.”

In this article, Smith and Punt attempt to define this latest wave of thinking; explore how to achieve greener precincts; and discuss the rating tools that are being developed to add value to the precinct concept.

Defining the concept

The rapid growth in population and increased urbanisation of countries throughout the world

creates both a challenge and an opportunity to learn from the failures and success of urban design to create smarter, more efficient, and more liveable communities.

The concept of sustainable precincts is still evolving. It merges the design of sustainable buildings, urban design and infrastructure.

“What’s the point of working or learning in a 5 star Green Building if people are leading 1 star lives once they leave the building? Sustainable communities help people lead more sustainable, healthy and connected lives,” explains Smith.

Sustainable precincts present a range of benefits to stakeholders and affected communities throughout their life cycles, from providing safe, attractive facilities and a healthy living environment to contributing to diverse, vibrant and evolving communities.

“Sustainable precincts suggest more than just environmentally-friendly buildings. They enable a lifestyle choice that enhances quality of life for residents and can be used as a market differentiation strategy by investors who wish to gain a competitive advantage within the burgeoning market that is environmentally-conscious construction,” says Smith.

New (and revitalised existing) sustainable communities

In Australia, the Green Building Council of Australia’s (GBCA) Green Star Communities National Framework rating tool has established five principles on which to shape the evolution of new, and revitalisation of existing, sustainable communities. The principles test a precinct project by asking whether it:



Century City.



Melrose Arch.



Black River Office Park.



TOP: Marni Punt, environmentally sustainable design consultant and landscape architect at Aurecon.

ABOVE: Aurecon's national green buildings expert, Martin Smith.

- Enhances liveability?
- Creates opportunities for economic prosperity?
- Fosters environmental quality?
- Embraces design excellence?
- Demonstrates visionary leadership and strong governance?
- The tool provides detailed metrics under each of the above principles to shape and benchmark the development of new communities or the enhancement and 'retrofitting' of existing communities.

In addition, South Africa is pioneering broader economic and social performance criteria that considers challenges such as the alleviation of poverty, unemployment and poor health, in addition to more traditional environmental issues related to green building, through the Green Building Council of South Africa's (GBCSA) pilot Socioeconomic Category (SEC) for Green Star South Africa (SA) rating tools. This tool is currently being tested across several construction projects and has advanced beyond traditional green building criteria to assess the social and economic elements of construction projects, and how these contributed to broader sustainability and poverty alleviation objectives.

Achieving greener precincts

Developing sustainable communities starts by seeking to embed sustainable design principles into the way in which streets, parks and buildings are laid out.

It is the spaces between buildings that determine the liveability and value of a community, and good planning and urban design are the fundamental building blocks of a sustainable community.

Creating places for people is the key ingredient in designing successful and thriving communities. This must include places for people to work, rest and play, with high quality urban design connecting smart and sustainable buildings.

Passive design as central to greening

In principle, the buildings within a sustainable precinct should be resilient and adaptable to the ever-changing natural environment. We can save money and enhance value if we can orientate the streets and buildings to take best advantage of solar orientation and prevailing winds. This principle has been known since the start of architecture, but it is often ignored in the design of our cities.

From an energy viewpoint, this can be achieved through the universal application of passive design. Buildings designed using solar design principles use the sun to heat them in the winter whilst they exclude the heat of the sun in summer, using insulation and shading. Passive solar buildings require only 10% of the energy used by conventional buildings.

The 'father of architecture', Vitruvius, wrote over 2 000 years ago that the first step in successful town planning was to identify the major winds and from which direction these came and then mark the centre of the city accordingly.

Cold winds were disagreeable to man and were to be avoided. Likewise, hot and humid winds were unhealthy.

All roads were to be laid out on an axis between two quarters so that the winds would be funnelled down the streets and alleyways. The laying out of roads in this manner also prevented winds from blowing head on into the façades of the buildings lining the streets, and thus kept the winds out of the dwelling spaces.

We can now use sophisticated precinct modelling tools to enhance our fundamental design knowledge of climate, topography and environment and seek to optimise the design of our communities.

In addition, with the rapidly falling price of

photovoltaic (PV) panels, we are seeing wide spread take up of this technology by households. Over one million homes in Australia are providing for a significant amount of the power they need using PV panels installed on their roofs, and this number is expected to grow

Precinct energy systems

For some high density communities, it makes good economic sense to look beyond servicing buildings using standalone electricity, heating and cooling systems and to provide these using centralised precinct energy systems via co-generation and trigeneration systems with district heating and cooling that is monitored and controlled by a precinct wide smart grid.

In addition, communities can use their collective buying power to drive down the cost of installing PV panels – there are many examples of this in Australia.

Water management, on a precinct scale, should aim to create a balance between water risk and allocation through water-sensitive urban design. Sustainability can be achieved on three levels: by installing infrastructure for the efficient collection, treatment and distribution of the various water systems; by having an active management system for the infrastructure that is able to optimise water balances between different uses; and through educating and motivating communities to maintain water services.

Driven by the sheer scale of urbanisation, there is also a necessity and considerable scope for innovative waste management. While waste-to-energy initiatives are a viable method of waste management, Smith suggests that sustainable precincts will benefit more from strategies that prevent waste rather than for disposing or recycling it.

On a precinct level, a recent innovation that breaks out of the mindset of refuse collection vehicles is the development of Automatic Waste Collection Systems (AWCS), or pneumatic collection systems, which are able to transport refuse through a vacuum in underground pipes to a central waste handling facility. This enhances the liveability of the local community whilst reducing the energy used in waste collection and disposal and makes recycling easier.

Liveability and walkability criteria

Within precincts, the emphasis often lies on 'liveability' and 'walkability'. Interestingly, ways of evaluating the value of the activity walking and walkability – the quality, safety, comfort and convenience of being able to walk in a precinct – have been developed.

The contention with walkability is that walking is an important but underestimated component of all people transport systems and should be addressed, rather than purely focusing on faster, cleverer motorised movement.

Precincts that are conducive to walking are conducive to people and walkability carries the extra rewards of being greener, healthier and a significant contributor to liveability.

Competing for 'stars' – precinct rating tools

"Rating and certification systems have become a helpful point of reference when it comes to green design, as

they help define the market and remove subjectivity from green developments," says Punt.

There are various rating tools that are being developed with a specific focus on sustainable precinct design. In addition to the recent Green Star Communities National Framework rating tool, and the Socio-economic Category (SEC) for Green Star South Africa, other initiatives include the Building Research Establishment Environmental Assessment Method (BREEAM), Leadership in Energy and Environmental Design for Neighbourhood Development (LEED-ND) and the One Planet Living scheme, which will soon be widely adopted in South Africa.

Stakeholder motivation will shape the way forward

"The value of sustainable precincts cannot necessarily be defined in financial terms," says Smith.

He goes on to say that investment and input from governments and private stakeholders will be vital in ensuring the successful integration of these precincts into existing areas whether through revitalisation, renovation or retrofitting.

Smith further predicts that fast-developing, sustainable precincts will gain popularity and traction globally over the next few years.

He adds that current business systems and organisational processes that are continually focused on least-cost, 'business-as-usual' infrastructure development can prove extremely challenging to the development of sustainable precincts.

"Despite inevitable challenges, the benefits of the development of sustainable precincts remain evident," claims Punt. "Greening on a precinct and city scale will allow the construction industry and government to deliver large-scale socio-economic priorities such as energy security, job creation, social stability and effective resource management, as well as the mitigation of climate change."

Designing smart, sustainable communities makes good business sense because it has already been seen that people and businesses are looking for safe and liveable places to live, work and play, with good quality urban design and buildings. Furthermore, by embedding these principles of good design right from the start we can also make them affordable communities.

"As with many modern design initiatives, sustainable precincts require the right amount of investment from stakeholders," concludes Smith. "The engineering industry has the capability and thrives on innovation, but we need investors to champion the cause of creating more liveable, desirable places for people to live." ∞

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PRINCIPLES OF MATERIAL CHOICE

with reference to the Green Star SA rating system

By Coralie van Reenen, professional architect and researcher for CSIR's Built Environment Unit.

According to the South African Constitution's Bill of Rights, every citizen, including future generations, has the right to a safe and healthy environment, and to have the environment protected. In response to this right, the South African government as well as each citizen have the responsibility to ensure the protection of the environment. This right, and the associated obligation to protect the environment, is translated into the built environment by the promotion of green, or sustainable, buildings.

The concept of green buildings is in response to the built environment's high negative environmental impact, including its contribution towards greenhouse gas emissions and the resultant climate change. At its core, the green building movement strives to create buildings that are designed, constructed and operate in such a way as to reduce the direct and indirect negative impact of development on the environment and its inhabitants.

The Green Building Council of South Africa (GBCSA) was established to promote and guide green building design and defines green building as follows: "Green building incorporates design, construction and operational practices that significantly reduce or eliminate the negative impact of development on the environment and people. Green buildings are energy efficient, resource efficient and environmentally responsible." [1]

The Green Star SA rating system was developed by the GBCSA as a means of assessing and scoring a building's level of transformation from the conventional (traditional) way of building construction and management to a more environmentally responsible solution. There are Green Star SA rating tools available for various building types

as well for interiors (currently in Pilot). Issues pertaining to the environmental impact of a building are addressed in categories under which various credits are available for factors that potentially improve a building's environmental performance [1].

Significant value in terms of credits available is placed on the choice of materials, which has a dedicated category. However, it is almost impossible to address any component of a building without considering the material aspects associated with it and some credits falling under other categories must be considered in the choice of materials for a green building.

When viewed with reference to the GBCSA definition of green buildings, the following principles regarding material choice can be identified: materials are to be assessed according to their impact in all stages of a building's life – design, construction and operation (including end-of-life); materials are to be assessed with regard to their *energy efficiency, resource efficiency and environmental responsibility*.

The energy efficiency of a specific material can refer to the energy efficiency of its production (pre-installation) or the energy efficiency of its performance (post-installation). The Green Star SA rating system only recognises a material's energy efficiency in its pre-installation phase. This is relevant when looking at materials individually, though the designer should also consider the energy efficiency of the building as a whole during operation.

Embodied energy

Development and manufacturing processes pose a risk to the environment in the way that they damage or alter ecosystems at ground level and – arguably, more significantly – in the way that they lead to greenhouse gas emissions, which in turn lead to climate change. The construction process as well as the extraction, manufacture, transport and disposal of building materials require energy, usually in the form of carbon-based fuel. This amounts to the embodied energy of a product, which is directly proportional to the environmental impact as the burning of fuel releases greenhouse gases.



Although the quantification of the embodied energy of materials is not required in the Green Star SA rating tool, there is recognition for reducing the use of identified materials that have high embodied energy (e.g. cement). This is achieved through the reduction, reuse or recycling of such materials.

Local sourcing

Part of the embodied energy of a material product is contributed by transport emissions. This is specifically addressed under the *Materials: Local sourcing* credit.

The reduction of transport emissions by using materials and products that are sourced within close proximity to the site is recognized and encouraged in an effort to lower the embodied energy of a building. In the Green Star SA Interior Pilot tool, the use of products manufactured within the country is recognised, with additional merit where products are also extracted, harvested and processed in the country.

On a finer scale, the other Green Star SA rating tools award merit where 20% or 10% of the building materials are sourced, from extraction to dispatch, within 400 km or 50 km of the site respectively.

Resource efficiency

The concept of resource efficiency is aimed at limiting the amount of virgin material used in construction to mitigate the environmental impact and resource depletion.

Resource efficiency can be achieved through reduction of material use, reuse of materials or recycling of materials.

Material reduction

In mitigating the exploitation of virgin materials, the Green Star SA rating tool encourages the reduction of the amount of material, and the reduction of the damaging components of a material.

Dematerialisation

The *Materials: Dematerialisation* credit addresses

resource efficiency by encouraging designing for less material. This credit addresses good design more than choice of materials and is crucial for the responsible designer to consider. This Green Star SA rating identifies specific areas that can be considered to achieve dematerialisation:

- Designing to achieve the building's structural requirements and integrity with 20% less steel, concrete or timber.
- Designing ventilation with little or no ducting.
- Designing space efficiently to lower the ratio of gross floor area to usable area.
- Minimising the application of finishing materials, leaving the structure exposed.
- By making use of dual function cladding (e.g. photovoltaic panels serving as cladding).
- By reducing piping through, for example, the use of water-free toilets.

Although not recognised by the rating tool, a responsible designer will also design efficiently to reduce the amount of unusable off-cuts of products on site.

Substitution

When an environmentally damaging material cannot be avoided, it is sometimes possible to reduce the harmful component by substituting it with an alternative. This is the case with concrete. The *Materials: Concrete* credit recognises the reduction and substitution of Portland cement in concrete, which has a very high embodied energy. The Portland cement content can be reduced by making use of a percentage of acceptable industrial waste substitutes (such as fly ash) or using oversized aggregate. This needs to be carefully engineered to ensure that strength is not compromised, requiring more structural elements as this would be counter the goal of material reduction.

Reuse

Perhaps the most effective way to reduce virgin material usage is to rather reuse existing materials. The reuse of materials and buildings is encouraged by the rating tool as a means of mitigating resource depletion. Reuse of materials should be used in preference to recycling of materials.

Building reuse

The Green Star SA *Materials: Building reuse* credit acknowledges two levels of building reuse – either by reusing the structure (or part thereof) and stripping the façade, or by reusing the structure and the façade (or part thereof). The benefit of reusing a building is not only an efficient use of materials but also of land and finances.

Material reuse

Materials: Designing for disassembly facilitates the reuse of materials. Elements such as framework, cladding or roofing can be reused in future projects if they are detailed in such a way that they can easily be removed without damage. This reduces demolition waste as well as emissions associated with demolition and removal.

For this to be practical, the end-of-life must be considered at the design and detailing stage. Instructions for disassembly must be included in the building's Operations and Maintenance Manual and elements must be marked with their date of manufacture and inherent properties to enable correct reuse.

The Green Star SA Interiors Pilot rating tool credits the reuse of furniture, assemblies, walling coverings and flooring, where there is also creative opportunity to reuse demolished structural elements in furniture and fittings.

The *Materials: Steel* credit encourages the reuse of structural steel that is extracted from the building and put to a new use. Steel elements that remain in the building being refurbished fall out of this credit and into the credit for *Materials: Building reuse*, while non-structural elements, such as roof sheeting, that are reused will fall under the *Materials: Reused and recycled materials* credit.

Timber structural elements may be best reused in cabinetry or other interior fittings, or re-milled and used in the structure or cladding, as recognised under *Materials: Timber*.

The *Materials: Concrete* credit does not recognise reuse, but rather recycling. However, it would still be good practice to reuse concrete elements wherever possible, such as precast lintels or pavers.

Recycling

When choosing building materials to specify, both the recycled content and the recyclability of the material waste should be considered in terms of its environmental impact.

Construction materials

Of the commonly used building materials – concrete, timber and steel – all can be recycled to some degree and points are awarded for the recycling of these materials specifically. Recycling is distinguished from reuse in that recycled materials are re-manufactured, having been deconstructed (crushed, chipped or melted) and processed to produce an entirely new product.

Under the *Materials: Concrete* credit, the use

of recycled aggregate is recognised. Processed concrete waste can be used as fill, aggregate or concrete fines, depending on its structural capacity as determined by a suitably qualified engineer.

The *Materials: Steel* credit encourages the use of steel with a certain percentage of post-consumer recycled content. This needs to be verified by the supplier and includes structural steel as well as concrete reinforcing. Note that post-consumer content refers to content that has been returned from the end-user and not content that is waste from within the processing plant.

The recycling of timber *Materials: Timber* is recognised, although this must be used with caution as recycled timber is most often in the form of particle board, the use of which is discouraged under the *IEQ: Formaldehyde* credit.

Construction waste reduction

The recycling of material is also addressed in the *Management: Waste* management credit, encouraging the minimisation of construction waste going to disposal. Points are awarded where demolition and construction waste is reused or recycled. In this case, the specification of materials that can be recycled is merited, though the material may not contain recycled content.

Environmental responsibility

The environmentally responsible material is one that does not cause harm to the environment or to people. Three factors that are to be considered here are sustainability of materials and hazardous content.

Sustainability

Although in some cases the reduction of virgin material use is difficult to achieve, the impact can at least be reduced if the resource is sustainable. Sustainability essentially means that a natural material resource is able to be maintained at a certain level by renewal, preventing depletion. The means of extraction should also not cause unnecessary, avoidable damage to the environment. Timber is the only renewable resource acknowledged by the Green Star SA rating tool.

The *Materials: Timber* credit encourages the renewal of depleted resources, requiring all timber used to be certified by the Forest Stewardship Council (FSC), meaning that it is sourced from a sustainable forest. This applies to all timber used on a project including structure, cladding, joinery, furniture (for Interior tool) and formwork.

Hazardous content

Apart from the impact of materials exploitation and production on the greater environment, the green building movement is also concerned with the health of the indoor environment and its occupants. The removal and minimisation of materials with hazardous content is dealt with in various credits of Materials and Indoor Environment Quality (IEQ) due to human health risks.



Hazardous materials

The IEQ: *Hazardous materials* credit is mostly applicable when old buildings are reused, since most hazardous materials are no longer used in modern products. A hazardous materials survey should be carried out in an existing building and all identified hazardous materials should be removed and disposed of according to the relevant standards for that material. The materials specifically identified in the Green Star SA rating tools are asbestos, lead and Polychlorinated Biphenyls (PCBs). Each of these materials has known adverse health effects for humans.

Asbestos is a strong, insulating, heat-resistant mineral that was commonly used in roofing, cladding, pipes, insulation and many other building products. The asbestos fibers can be breathed in causing potentially fatal lung diseases such as asbestosis, mesothelioma and lung cancer [2]. Although the fibers are only released when the product is worked (cut, sanded, drilled, etc.) the health risk is high enough to warrant a total ban on the use of asbestos in many countries.

Lead in buildings is most commonly found in paints. It can be absorbed into the body by breathing in paint chips or dust [3] and can cause health problems as it inhibits the transport of oxygen and calcium in the body. Lead-based paint has now been largely phased out of use.

Polychlorinated Biphenyl (PCB) is a man-made organic chemical used in many industrial and commercial applications. It has good electrical insulating and dielectric properties, making it useful in transformers, capacitors and heat transfer fluids. It was commonly used in fluorescent light fixture ballasts, which the Green Star SA rating tool identifies and condemns.

The United States Environmental Protection Agency views it as a probable human carcinogen and there are strong indications of effects on the immune system, reproductive system and nervous system [2]. PCBs accumulate in the body and health risks thus increase with exposure. If discovered to be present in a building it must be removed in accordance with the Department of Water Affairs and Forestry. Minimum requirements for handling, classification and disposal of hazardous waste.

Since reuse of buildings and materials is promoted by the Green Star SA rating system, it is important to ensure that no such hazards are inherited in a building.

VOCs

Volatile Organic Compounds (VOCs) are carbon-based products that off-gasses at room temperature [4] and include a wide range of chemicals used in the manufacture of various materials, such as paints, paint strippers, solvents, wood preservatives and detergents. The chemical emissions vary in toxicity and may cause membrane irritations, headaches, nausea or damage the liver, kidneys or central nervous system [5]. Because of their toxicity, the use of materials containing them is limited under the IEQ: VOCs credit of the building rating tools of Green Star SA and under the IEQ: Pollutants credit of the Interior Pilot tool.

The Green Star SA rating tools address engineered wood products (only in Interior Pilot tool), paints, adhesives and sealants, and carpets and flooring. VOC limits are specified and the use of materials that boast low VOC emissions or are VOC free is encouraged.

It is important to note that this requires acutely detailed specifications to ensure that a good choice of material is not compromised by a poor of specification of paint, adhesives or sealants to be used with the material.

Formaldehyde

The IEQ: Formaldehyde credit specifically deals with formaldehyde, although it is a VOC. Formaldehyde is a chemical produced from methane that is used widely in glues, resins, laminates, cleaning agents, dyes, ink, disinfectants and many other products [6]. It is a colourless chemical that is a gas at room temperature with a pungent odour.

In a poorly ventilated area, the effects of formaldehyde gas on humans range from respiratory effects (eg. Asthma) to eye, nose and throat irritations, skin irritation and fatigue and is classified as a probable human carcinogen [5].

In terms of building products, formaldehyde is most commonly found in the binding resins of composite wood products and in glues. While formaldehyde is present in numerous building

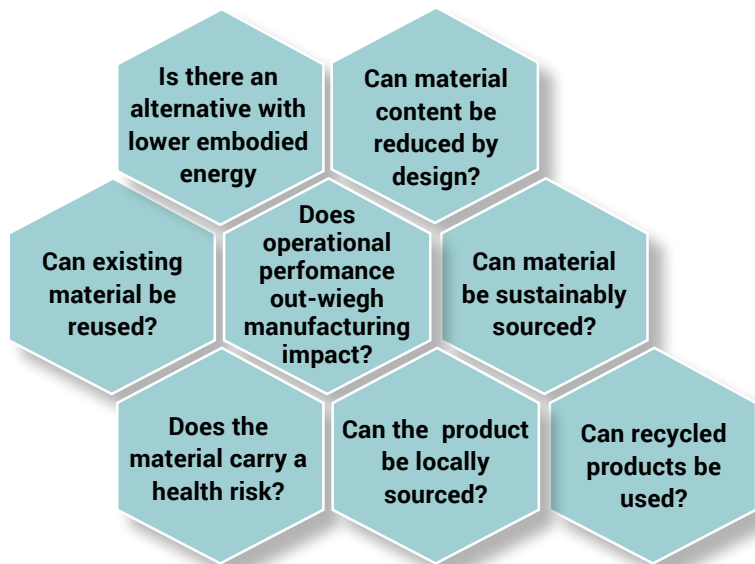


Figure 1: Material choice decision questions.

products, the Green Star SA rating tool singles out composite wood products and discourages their use, regardless of whether the product is exposed or concealed. This includes applications in interior fittings and furniture, such as cupboards, flooring and paneling.

While the Green Star SA tool condemns the use of formaldehyde in the form of composite wood products, the effects can be minimised by ensuring good ventilation or specifying a lower formaldehyde content product. Different kinds of formaldehyde compounds contain varying levels of the toxin. Urea-formaldehyde releases formaldehyde more readily than melamine- or phenol-formaldehyde. It is therefore preferable to use pressed wood products that contain phenol-formaldehyde, for example softwood plywood and orientated strand board, that are intended for exterior construction, than those containing urea-formaldehyde, such as medium density fibreboard [7].

PVC

Materials: PVC minimisation is in response to the known health risks associated with the manufacture and use of PVC products. Polyvinyl chloride (PVC) is a plastic used in pipes, conduits, carpets and backings, vinyl flooring and cladding, window frames, cable coatings and many other products. It contains chlorine, which results in the release of dioxins during manufacture, and often contains phthalates (to make it softer or more flexible) or Bisphenol. These three chemicals respectively are known to carry health risks and thus the use of PVC in buildings is discouraged.

PVC products should be replaced with alternatives, for example, PVC window frames could be replaced with timber or aluminium. However, great care must be taken to consider all factors together so as not to replace one hazardous material with another as many alternatives may contain VOCs.

Conclusion

It is evident from this paper that the choice and use of materials for construction and operation has a high impact on the environment.

The principles extracted and discussed give guidance regarding material choice and are to be considered simultaneously when choosing a green material. While the Green Star SA rating tool credits certain material choices, there is no single material that can check all the boxes. However, these principles will enable the designer to analytically motivate an environmentally responsible decision.

One should also bear in mind that the major portion of a building’s embodied energy as a whole is contributed by the operational phase of the building, implying that although a material may have a high environmental impact in its manufacturing phase, its performance during the operation of the building could outweigh the benefits of an alternative material. ∞

The chart in *Figure 1: Material choice decision questions* is a collection of questions to answer when making a choice of materials.

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To download a digital version of the Green Building Volume 7: Materials and Technologies Handbook (where this article was already published) go to: <http://alive2green.com/publications/green-building-handbook/>



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SA'S FIRST SOCIO-ECONOMIC IMPACT CERTIFICATION

Green Building Council of South Africa (GBCSA) recently announced Karl Bremer Office Block in Bellville, Cape Town, is the first project to achieve a Socio-Economic Category (SEC) Pilot rating in Africa as part of its 5-Star Green Star SA rating, achieved at the same time. The office block is a project of the Western Cape Department of Transport and Public Works.

World-first

The Socio-Economic Category Pilot is a world-first for rating tools. The GBCSA has taken the lead in developing a set of socio-economic criteria for green building rating tools. Simultaneously it has developed an International Socio-Economic Framework for the World Green Building Council, which can be used by other green building councils to apply to their rating tools.

Socio-economic factors are particularly relevant in developing countries such as South Africa, and extend green buildings to encompass not just environmental sustainability but also socio-economic sustainability.

The Socio-Economic Category allows the socio-economic achievements of new buildings and major retrofits, new buildings and major retrofits to be recognised and rewarded under Green Star SA tools. It is a separate optional category for which projects can be rated alongside their standard Green Star SA certifications. The development of the rating tool category was sponsored by Old Mutual Property. The socio-economic category is in its pilot phase and being tested before it is converted into a 'version one' rating tool category.

A growing force ... for good

Brian Wilkinson, CEO of GBCSA, says: "Our property sector is truly becoming a growing force for good in

South Africa, not only for the environment but also for people and business too. Societal challenges such as poverty, unemployment, lack of education and skills, and health can all be addressed, at least to some degree, through the way we design, build and operate buildings."

He adds: "We encourage property owners, developers and designers to use the Socio-Economic Category to assess, improve and certify their project's socio-economic features. Social and economic factors are important to address broader sustainability issues in our communities and businesses."

Karl Bremer Office Block

The design for the Karl Bremer Office Block has achieved a 5-Star Green Star SA Office V1 Design rating. It is on the Karl Bremer Hospital site, on the corner of Mike Pienaar Boulevard and Frans Conradie Avenue. The Department of Transport and Public Works, Provincial Government Western Cape owns the building under construction, which will be occupied by the provincial Department of Health.

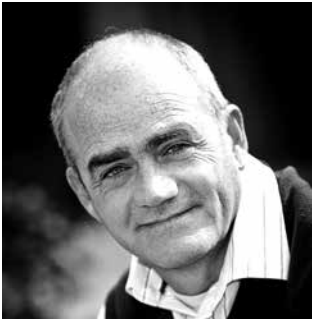
The Green Star SA Accredited Professional on the project is Nick Gorrie from Agama. He says: "Karl Bremer Office Block is developing into an exciting and innovative project. On one hand, there are multiple innovations and sustainable designs that have been incorporated into the base building. On the other hand the entire Project Team is dedicated to achieving a Socio-Economic Category rating. It has been a challenging project so far but, with the commitment and drive of the whole team, it is aiming for a positive result."

A building that previously stood on the site was demolished and the new offices are under construction for completion in mid-2016.

The new building is designed to have a footprint of 1 927 m² and gross floor area of 7 520 m² on a site area of 14 046 m². It's landscaped area, including a 98 m² roof garden, covers 4 761 m², or 32% of its total site area. It comprises a north and south wing, connected by a common core, with a single security-controlled access point. It has a basement, as well as offices and meeting rooms on its ground to fifth floors, and a mechanical plant on its roof.

Leading by example

Head of Western Cape Department of Transport and Public Works, Jacqui Gooch, says the building fits in with the Western Cape Government's 110% Green



Brian Wilkinson, CEO of GBCSA.



Nick Gorrie from Agama.



Head of Western Cape Department of Transport and Public Works, Jacqui Gooch.

initiative, launched on World Environment Day 2012.

Gooch explains 110% green calls for a paradigm shift to connect environmental preservation and economic growth. She adds it aims to be a catalyst to build a critical mass of activity that puts the Western Cape well on the road to becoming Africa's Green Economic Hub.

"The Department of Transport and Public Works is 110% committed to ensure the properties we build are in line with the 110% Green Initiative. We aim to provide a platform that stimulates people and organisations to build an innovative and dynamic green economy and this project is an example of our commitment," says Gooch.

How it works

There are seven possible credits for the Socio-Economic Category to recognise achievements across a priority set of factors. They are: employment creation, economic opportunity, skills development and training, community benefit, empowerment, safety and health and – only applicable to multi-unit residential projects - mixed-income housing.

For Karl Bremer Office Block, its employment creation targets at least 10% or more of total labour employed during the construction to comprise of disadvantaged people who are collectively from the target groups of youth, women or disabled people. It will measure this by percentage cost of the contract value.

When it comes to economic opportunity, it targets three main impacts. The first is a minimum contract participation goal of 5% of the total project value on selected contracts to be undertaken by joint-venture partners or sub-contracted to developing contractors that are also beneficiaries of enterprise development support from the main contractor. The second is a minimum 30%, or 25% of contract value, of the procurement of project-specific goods and services during the construction phase from any SMEs or SMEs that are either black owned or black women owned respectively. Third, the project is targeting a minimum of 70% of the contract value for materials, products and services produced or generated within South Africa.

The project's skills development target is to be compliant with Construction Industry Development Board Standards of Developing Skills through Infrastructure Projects. It aims to do this by providing different types of workplace opportunities and mentorships for learning and skills development over the project period, which lead to recognised qualifications.

For safety and health, the project aims to improve the primary health of construction workers and promote better safety practices. Besides standard construction regulations, the project's contractor will have to conduct full medical screening tests and basic health awareness programmes for all construction-related employees. The Karl Bremer Office Block design team also conducted Hazardous Identification Risk Assessments of their designs.

As the starting point for its positive impacts, the project's design delivers green benefits that are good for the environment. These include zero discharge to sewer through a blackwater treatment plant and re-use of treated blackwater for supply to HVAC cooling towers. It will also have zero stormwater discharge to municipal storm water infrastructure through multiple Bioretention areas.

Wilkinson says, "We applaud the Karl Bremer Office Block development team for committing the project to the Socio-Economic Category Pilot and achieving the first pilot project certification. Projects such as this are set to have a hugely positive impact in South Africa."

Wilkinson adds the GBCSA hopes to issue many Socio-Economic Category certifications in the future. "We are confident the Socio-Economic Category will not only acknowledge leadership in social and economic upliftment but also inspire more and more positive socio-economic impacts and benefits in the property sector." ∞



LESSON IN SUSTAINABLE DESIGN

by Lood Welgemoed, Boogertman + Partners.

Boogertman + Partners was privileged to be part of the team that designed the new head office for the Department of Environmental Affairs. This was not our first green building but the firm's only completed six star rated green building to date. The following is a brief summary of the building and its features, followed by a more personal introspective look at lessons learned.

expressive feature water collectors and a photovoltaic (PV) farm covering most of the roofs. Material selection was largely driven by sustainability, longevity and ease of maintenance.

Project overview

The building comprises 27 422 m² of office and circulation space, housing 1 305 people and providing parking for approximately 600 vehicles. The overall building concept is reflected in three distinct elements through the masculine/utilitarian machinelike office wings, the feminine/ organic central reception building, and finally the 'bridge structure' that links all of the elements together.

Introduction

The new 6-star GBCSA Office V1 designated headquarters for the Department of Environmental Affairs is located in Pretoria, capital city of South Africa. It is procured as a Public Private Partnership project – essentially leased for a 25-year period by the Government from Imvelo Concession Company Proprietary Limited (RF) (the Private Party) who designed, constructed, financed and will operate and maintain the building during that time. The project is a good example of how Government can lead by example through forefront sustainable innovation.

The design brief called for a maximum energy consumption target of 115 kWh per squarer metre per annum, giving rise to innovative design processes through Building Information Modelling (BIM) and extensive energy modelling in order to achieve and maintain this threshold. Innovative technologies include night flushing to enhance passive climatic strategies, while natural resources are conserved through water harvesting, solar power and hot water etc.

The Department's environmental and sustainable ideologies was communicated through the architectural language while it demonstrates aspects of sustainable design, energy and resource efficiency through the extensive use of outdoor and indoor planting,



On the cover: the head office for the Department of Environmental Affairs – a six star rated green building. All pictures courtesy of Boogertman + Partners.

The Interior Design Response reflects a modern African feel that is based on the sensitivity of sustainable and environmentally friendly spaces without resorting to the usual highly literal pastiche. The primeval nautilus shell motif, based on naturally occurring fractal geometry, speaks of birth and origin, growth and progression. This is also reflected in the landscape design including a four storey high feature vertical garden.

Social responsibility

The project had about 962 employees, of those 462 were sourced from Pretoria and surroundings. Skills development was provided for Engineering, Reinforcement, Shutterhand GR III, Concretehand GR III, Bricklaying, Plastering and Painting to about 29 interns.

The project facilitated the training process similar to the Expanded Public Works Programme successfully used on previous projects in the City of Tshwane where unemployed people from local communities were first trained at training facilities where





they undergo on the job training on site in various trades. This was done under guidance of permanent staff members on a rotational basis. Twenty three local community members received and completed adult basic education and training providing conceptual foundation towards lifelong learning and development, comprising of knowledge, skills and attitudes required for social, economic and political participation and transformation.

Summary

The architectural design represents a coherent response to a host of complicated requirements by the client team, including spatial, cost, environmental, operational and security considerations. The architectural team believe that we have not only met but exceeded the requirement and simultaneously created a beautiful building which will inspire all who work and visit there.

The real value of this building lies in the fact that this is the first rated/measurable manifestation of sustainability policies within Government that have been years in the making. By achieving the 6 star accolade, the Department of Environmental Affairs firmly sets the bar for other Government departments and also challenges the private sector to follow their lead. It also serves as a positive example to other African states where sustainability policies are only starting to emerge and regulatory bodies are non-existent.

Not only is the impact of this building measurable in terms of its reduction in energy use, water use and waste generation, but the socio economic implications through work creation, local labour force and education. ∞

FACT BOX

- 27 422 m² Gross Lettable Area
- 82 Green Building Council of South Africa green star points (6 Stars)
- 115 kWh/m²/annum maximum energy consumption target
- 30 654 m² Gross Floor Area
- 70% construction waste recycling/reuse
- >1 000 m³ water storage
- 30% reduction of potable water consumption
- 2 200 m² PV panels generating 760 000 kWh/annum (in excess of 20% of the daily demand)
- Up to 8 degrees Celsius reduction in stored temperature as a result of passive night flushing
- 52,2% average reduction in cement usage
- 95% of steel used is from recycled sources
- 62% reduction in lighting energy as a result of glazing selection & daylight and lighting controls
- 2.1 U-value for façade – thermally broken double glazed façade and insulated walls, roofs, floors

Lessons

The following observations follow from the experience of having designed and built this project:

1. Get the basics right. It cannot be overestimated how important this is – if the building's orientation is correct and the elevations are treated accordingly, it not only solves direct sun heat gain issues but also ensures optimal visible light transmission, leading to a reduction in electrical lighting load. The problem with getting it wrong is that you will end up trying to create costly solutions for things that should never have been problems in the first place.
2. Go for the easy (read inexpensive) points: Often the basic properties of the building site and its surroundings result in automatic Green Star points. The balance of the points required for the various ratings can then be considered and weighed up against cost. In this building the energy reduction targets set by the brief dictated that our focus would be on energy points. We ended up achieving all possible points.
3. Whether or not the project brief includes a green star requirement, each building should be designed to be green. This does not have to add any cost to the budget, and should rather be seen as 'best practice'. We have had success on another project where our building was awarded with a comfortable five star rating despite there being no client requirement for a green rating. The DEA brief was for a four star building, and yet six stars were achieved through the team carrying the momentum and all working towards a common goal.
4. To expand on the previous point, we believe that no one particular design feature of a building can make or break a green star rating. Instead it is a combination of various disciplines all contributing and working as a team to make the most of a design.
5. Each building project calls for a unique design solution, factoring in aspects such as siting, local microclimate, site history, client brief etc. What works for one project will not necessarily work for another.
6. Just because a building is sustainable does not necessarily mean that it has to look strange or even ugly. Basic architectural guidelines and old fashioned good design must not be sacrificed. The fact, for instance, that a particular product or material cannot be locally sourced should be weighed up against the 'greater good' that using it will achieve, for instance low long term maintenance, better performance, etc.

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EC Metro gets SA's first BIOREGIONAL PLAN gazetted

The gazetting of South Africa's first bioregional plan – for the Nelson Mandela Bay Municipality (NMBM) in the Eastern Cape – is a milestone on the road towards the more sustainable development of SA towns and cities, according to SRK Consulting (SA) principal environmental scientist, Warrick Stewart.

"This plan sets a notable benchmark, and it is certainly fitting that it has been achieved by a municipality with such rich biological diversity – where five of SA's nine biomes converge," said Stewart. "The area boasts the Fynbos, Albany Thicket, Forest, Nama Karoo and Grassland biomes – a level of diversity that is globally unparalleled for a city."

He emphasised the social and economic value of biodiversity, such as attenuating floods, providing clean water of a drinking quality standard, facilitating the pollination of important agricultural crops to support food security, and providing primary sources of food like fish from the wild.

"Ecosystems provide a range of valuable services that we take for granted because we often don't pay in full for the services they provide," he said. "When inappropriately located, development results in the loss of important ecosystems, and communities often end up paying for the long-term costs of losing these important ecological assets. Good planning means retaining our priority ecological assets when we develop our new settlements and roll out associated services. If we undermine ecosystem services like flood attenuation, for instance, we will have to pay more to install and maintain expensive flood attenuation infrastructure."

The bioregional plan

The bioregional plan was gazetted on 30 March 2015 and now provides clear priorities

and guidelines for all decisions that impact on biodiversity, including land-use planning, environmental assessment and authorisations, and natural resource management in the municipal area. SRK Consulting produced the Conservation Assessment and Plan for the NMBM in 2010, which underpins the gazetted document, and also assisted with the gazetting process.

Stewart said that bioregional plans assist local municipalities in spatially identifying priority sensitive areas. This information is crucial to enabling municipalities to effectively develop their Spatial Development Frameworks, as per the Spatial Planning and Land Use Management Act (SPLUMA) 16 of 2013.

"One of the most exciting and challenging achievements of the conservation plan was to minimise the potential conflict between biodiversity and other forms of land-use," said Stewart. "This involved a lengthy process of engaging a range of players from town planners and property developers to municipal service departments, to understand their needs and to reconcile conflicts."

He said the National Environmental Management: Biodiversity Act (NEM: BA) 10 of 2004 requires all government bodies – including municipalities – through the gazetting of the Bioregional Plan to take biodiversity into account when planning and implementing service delivery.

"A bioregional plan like this makes development decisions easier, as the biodiversity conservation priorities within the municipal area are clearly specified," he said. "In this way, the plan supports the principles of integrated development planning and sustainable development set out in the National Environmental Management Act (NEMA) of 1998. It is also fully integrated with the Municipality's Spatial Development Framework to achieve the best balance between conserving priority biodiversity and accommodating the needs of other sectors."

Biodiversity plans

While broader biodiversity plans have been conducted at provincial level, a municipal level plan like this can show fine-scale detail of critical biodiversity areas. These are terrestrial and aquatic features that are vital for maintaining



About SRK Consulting

SRK Consulting is a leader in natural resource and development solutions, providing independent technical advice and services through over 50 offices in 22 countries, on six continents. With an African presence in Angola and Cameroon, and practices in the Democratic Republic of Congo, Ghana, South Africa and Zimbabwe, the global group employs more than 1 500 staff in a range of engineering, scientific, environmental and social disciplines.



Albany Thicket, Grassland and Lowland Fynbos within the Nelson Mandela Bay Municipality.

a representative proportion of functional ecosystems, and the associated goods and services they provide to the Municipality's residents and visitors, and which therefore need to be kept in their natural state.

"Examples of these features in NMBM include the lowland fynbos in the southern part of the metropolitan area," said Stewart, "as well as river systems such as the Swartkops River and estuary, which is SA's top temperate estuary for subsistence value and a vital nursery for fish stocks."

Having detailed these critical areas, the plan goes on to provide accompanying land-use guidelines for avoiding loss or degradation of natural habitat and good development practice at appropriate natural sites outside of the network of critical biodiversity areas.

The NMBM's bioregional plan will now be put to work in guiding reactive decisions on environmental impact assessment, agricultural land-use and development control. It will also be used in proactive forward planning – in integrated development plans, spatial development frameworks and zoning schemes – as well as conservation initiatives such as biodiversity stewardship and expanding protected areas.

According to Stewart, SA is fortunate to have been part of a global focus on biodiversity conservation because the country is home to a number of 'biodiversity hotspots' as identified by environmental organisation Conservation International; these include the Succulent Karoo region, the Cape Floristic region and the Maputaland-Pondoland-Albany region. ∞



Peter Shepherd, partner and principal hydrologist, SRK Consulting (SA).



Briony Liber, partner and environmental scientist, SRK Consulting (SA).



Warrick Stewart, principal environmental scientist, SRK Consulting SA.



The Swartkops Estuary is the top temperate estuary in terms of subsistence value in South Africa.

BRICK BUILDINGS for a better world

Simple clay brick construction, the long-time benchmark for all that is good about housing and social infrastructure buildings in South Africa, goes beyond the important fundamentals of durable, low maintenance structures with enduring aesthetic integrity to afford comfortable thermally efficient accommodation in which South Africans live, work and play.

Addressing all the basics for affordable quality living, with safety and security a given, clay brick in construction has demonstrated the flexibility to work well with all design styles to bring authenticity and appealing human scale to buildings. But it goes much further than that to afford opportunity for lowest heating and cooling energy requirements that translate into low total (embodied + HVAC energy) Greenhouse Gas emissions over a 50 year lifecycle. To this end, the world's consuming focus on energy efficiency has led the clay brick industry to research how designers may simply and cost effectively better work with nature to take the wonderful thermal properties of clay brick in construction to new levels of thermal comfort and lower heating and cooling energy usage in all six major climatic zones of South Africa.

The net conclusion from all the research is that clay brick walling can be specified to deal with the peculiarities of the different climatic zones in ways that insulated lightweight walling cannot. This provides brick walling options that will outperform insulated lightweight walled buildings specified in compliance with SANS 204 Energy Efficiency Standards and SANS 517 required for Light Steel Frame building.

In that process and following deemed to satisfy requirements, clay brick walling can be specified to offer the highest levels of thermal performance this facilitating lowest lifecycle energy costs and low total lifecycle carbon footprints. This can be provided using insulation with a lower R-value than

required for lightweight to ensure best returns for the cost of any insulation applied.

The thermal mass inherent in clay bricks is what brings the 'X' factor to the thermal efficiency equation as shown in Figure 1.

The net benefit of the slow transfer of heat (6 to 8 hours) to the inside is that the hottest part of the day will have passed before the heat impacts on the inside. This facilitates superior day-time thermal comfort conditions and lowest cooling energy usage compared to insulated lightweight walls that have no propensity to self-regulate. In the case of insulated lightweight the outside heat impacts on the inside in approximately one hour, the heat flux on the inside coinciding with the hottest part of the day outside leading to comparative discomfort and greater need for cooling energy.

Clay bricks on the inside add further function to slowly absorbing and storing heat from the internal air as day time temperatures rise this further moderating internal temperatures, helping keeping the house comfortable for longer, requiring less cooling energy.

In winter the energy from lower angled sun radiates in through the windows, the internal thermal mass then functions to slowly absorb and store radiant heat during the day that is then released in the evening as the cold night air impacts on internal conditions, helping keep the house warmer for

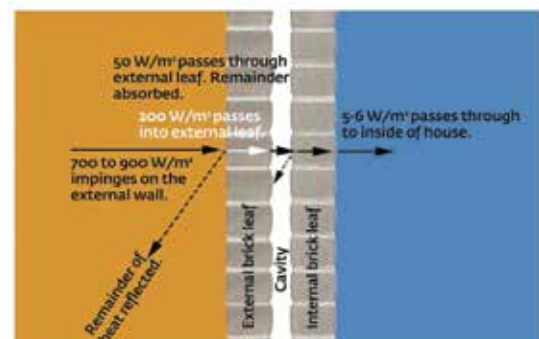


Figure 1 represents the heat flux through a double skin cavity brick windowless wall in summer. Of the 700 to 900 W/m² that impacts on the outer surface just 5 to 6 W/m² finally passes through the wall to the inside. The thermal lag played a key role in limiting the magnitude of the maximum and minimum internal temperatures. The study showed that cavity brick reduces the heat transfer by absorbing and storing the heat in the external brick leaf, then radiating it back to the outside environment, thereby reducing the net heat flux across the wall.



**Thermal modelling of verdant and sirocco house plans:
average HVAC green house gas (kg CO₂-e) emissions over 50 years,
extracted from Energetics Full Life Cycle Assessment**

Location	Orientations	Uninsulated double brick	Insulated double brick (R1.3)	Insulated timber frame	Insulated timber more/(less) GHG than double brick	Insulated timber more/(less) GHG than double brick insulated R1.3
Newcastle Climatic Zone	N,S,E & W	54 137	51 236	60 457	11,67%	18,00%
Melbourne Climatic Zone	N,S,E & W	73 050	63 641	72 570	-0,66%	14,03%
Brisbane Climatic Zone	N,S,E & W	64 924	65 010	72 554	11,75%	11,60%
Average GHG	N,S,E & W	64 037	59 962	68 527	7,01%	14,28%

Summary of operational energy greenhouse gas emissions over 50 years.

longer. Should heaters be required the clay bricks continue to function, absorbing and storing this heat that is then released to counter the inroads of the cold, extending the thermal comfort conditions for longer.

Research further shows that clay brick partition walls, used in lieu of lightweight, further enhances a buildings thermal performance no matter the external wall construction type. It was a conclusion of the University of Pretoria study that “there is a significant cost premium associated with the use of lightweight partitioning systems in all three building typologies modelled”. The University of Newcastle, Australia, empirical study found that clay brick internal partition walls improved the energy efficiency of the insulated lightweight external walled building by 20%.

With regard to facilitating a low lifecycle carbon footprint the substantive thermal modelling done as part of a Full Life Cycle Assessment (LCA) by Energetics in Australia highlighted the contribution of thermal mass to greater thermal efficiency, lowest operational energy usage that in turn translated into low to lowest total (embodied energy and operational energy) Greenhouse Gas emissions over a 50 year cycle. Cavity brick walls (R0.65) provided lowest total GHG emissions in most situations modelled while insulated cavity brick walls (R1.30) provided lowest total emissions in all situations.

As shown in the table above, the energy savings provided by double skin cavity walled house translated into 7% less GHG (kg CO₂-e) emissions and the cavity brick with insulation into 14% less GHG emissions

In South Africa, the University of Pretoria study modelling of a 130 m² house produced similar findings. Notably, cavity brick walls outperformed SANS 517 compliant lightweight in most situations while cavity brick with insulation R1 applied in the cavity, to give a wall R-value of 1.3, well outperformed insulated lightweight R1.9 and R2.2.

The University of Pretoria study reported the following key findings:

- The most efficient South African walling system for residential buildings is a 280 mm insulated cavity brick masonry wall.
- The most efficient South African walling system for a commercial or institutional building is a 220 mm solid clay brick masonry wall (or for Climate Zone 4: a 270 mm clay brick cavity wall, as is the norm for the Southern Cape condensation problem areas)
- Light steel frame wall construction specified SANS 517 is not as thermally efficient and use more heating and cooling energy compared to clay brick masonry cavity walls in all climate regions.
- That there is a significant energy cost premium associated with the use of lightweight partitioning systems in all three building typologies modelled.

When all is said and done, clay brick in construction has so much more to offer than lightweight IBTs for achieving sustainable, energy efficient buildings. This sustainability extends to clay bricks having mineral properties that meet all necessary requirements for healthy living and to clay brick being one of a few building material that is both reusable and recyclable. On top of that of course, are the enduring maintenance free attributes as a face brick that help mitigate future carbon debt associated with replacement, refurbishment and painting associated with less durable lightweight walling materials.

As was highlighted in Energetics full Life Cycle Assessment, today’s environmental paradigm requires we build buildings able to endure with little maintenance, and definitely no materials’ replacement, way beyond the 50 year life cycle. Clay brick buildings in all their forms have proven themselves over the centuries to be more than up to this task.

In retrospect, it may be considered most fortunate that South African building has been founded on a masonry tradition that endures to this day; a simple building methodology that science now proves so relevant for achieving a more sustainable future and keeping our world a better place. ☺

Asphalt gets progressively greener

Much Asphalt has upgraded all but two of its 17 static plants in South Africa to include recycled asphalt in new asphalt mixes. These plants can now incorporate between 10% and more than 50% recycled asphalt. The two plants not enabled for recycling are located in remote areas where recycled asphalt is not freely available.

Asphalt pavement is 100% recyclable and reusable, with recycled asphalt (RA) milled out of the surface layers of an existing asphalt paved road and then crushed, screened and combined with virgin asphalt mixes for new surfacing applications. RA is added to hot or warm mix asphalt in different quantities depending on the engineering design of the project and the capability of the manufacturing plant.

Mobile plant

Much Asphalt's new Amman mobile plant, which was acquired in 2015 and brings its fleet of mobiles to four, is also capable of handling 40% RA. This unit is already in full production on a N1 contract near Bloemfontein.

According to Much regional manager Francois van der Spuy, the capability of this plant was a major factor in securing the contract between Glen Lyon and Sydenham. "When we acquired the new mobile plant we were expecting SANRAL (the South African National Roads Agency Limited) to specify more 40% RA work and it has paid off for us in this case," he said.

The new plant will supply 240 000 tonnes of bitumen treated base (BTB) with A-P1 binder, 40% RA, rejuvenator and adhesion enhancer; 38 500 tonnes of ULM surfacing; and 2 000 tonnes of medium wearing course with 20% RA, rejuvenator and adhesion enhancer.

The first trial was produced on 18 May 2015 with a target to average more than 900 tonnes per day.

Financial savings

There is a strong case for higher percentages of RA

in new asphalt mixes as the aggregates and bitumen used in the production of asphalt are non-renewable and increasingly rare resources. The ongoing shortage of bitumen in South Africa necessitates expensive long distance hauling when local supply is unavailable.

Reclaiming asphalt offers financial savings in material costs, energy costs and total job costs. In addition to saving the cost and carbon emissions involved in extracting and transporting aggregates and bitumen, the reuse of milled asphalt saves on waste and landfill space.

Adding to the benefits of recycling is the fact that mixes with RA have shown similar performance to conventional mixes.

According to Herman Marais, plant and technical director at Much Asphalt, high percentages of RA were used in new asphalt internationally in the early 80s. Some premature failures dulled its popularity and for several years RA was not used at all, and then only in lower pavement layers. The benefits inherent in the high quality aggregate used in asphalt and the valuable contribution that the recycled binder can make to the new asphalt were overlooked, says Marais.

But advances in mix designs resulted in renewed use of RA some 10 years ago and SANRAL specifies RA content to be included in many major asphalt projects today, he adds. While there is still resistance to the use of RA in some quarters, he believes it is critical to make responsible reuse of resources to reduce our impact on the environment.

Product consistency

"However we need to be careful not to go to extremes without the proper knowledge and technology. It would not benefit the asphalt industry or the drive to sustainability to have a disastrous failure of a high RA mix. I don't foresee extremely high RA contents (above 40%) being employed on remote projects unless RA is freely available and may go to waste."

The recycled material should be properly crushed and screened and Much has invested in several crushing and screening plants around the country for this purpose. The need to crush and screen into separate fractions to ensure a consistent product becomes increasingly important as the RA content of the mix is increased.

Marais warns that it is important to reduce the moisture content of the RA before it is recycled as high moisture content decreases the rate of production. A 1% increase in moisture content can increase the fuel consumption required to heat the RA by 10%.



MAIN PHOTO: Fine RA feeding from the screening plant at Much Asphalt Benoni.

LEFT: Unprocessed RA.

BOTTOM RIGHT: Much Asphalt's new mobile plant produces asphalt containing 40% RA on a SANRAL contract near Bloemfontein.



Much Asphalt started recycling road material in 2007 and the benefits were immediate when a runway rehabilitation contract at OR Tambo International Airport called for 10% recycled material to be included in the bitumen treated base course. This required Much Asphalt Benoni to screen more than 8 000 tonnes of recycled material alone.

In 2011 the Benoni branch commissioned a new impact crusher and a mobile screen, which run between five and six hours a day to ensure a consistent 300 000 tonne stockpile of reclaimed asphalt for recycling. A Finlay 649 triple deck screen was added to this fleet in 2015.

In 2013 Much Asphalt set a new benchmark when it produced a trial mix for use at OR Tambo International Airport containing the highest known proportion of recycled material in a warm mix asphalt product in South Africa.

The mix, manufactured using the company's warm mix asphalt plant in Benoni, involved 500 tonnes of bitumen treated base containing 55% RA. The trial mix was successfully paved at the OR Tambo cargo area, resulting in an order for an additional 2 000 tonnes. ∞

Sustainable PRODUCTIVITY



Atlas Copco's Kgothatso Ntsie.

Atlas Copco is a world-leading provider of sustainable productivity solutions. It is organised around the following business units: compressor technique, industrial technique, mining and rock excavation technique and construction technique.

Kgothatso Ntsie, corporate communications manager. South and sub-Saharan Africa, answers questions about the group and its philosophy.

Atlas Copco uses the term 'sustainable productivity'. How is this defined?

The company's definition is 'responsible usage of our human, natural and capital resources', which is achieved by ensuring that it gives lasting results to its customers.

Your website states that 'sustainability is viewed as an opportunity to innovate, reduce cost, mitigate risk and create business opportunities'. What does this mean?

In terms of innovation we do our best to meet the customer half way to ensure that we meet his/her needs. No complete overhauls of our existing product offering are done: that is because all of our products are made to suit as many markets as possible. From time to time we do work with a customer to innovate and to ensure that they can use our products to suit their specific needs.

The company delivers cutting-edge technology in the form of safe, reliable and energy-efficient products designed to optimise customers' productivity and competitive advantage. One such example is the scooptram: a 10 metric tonne underground loader. It has an ergonomically designed operator compartment for unparalleled productivity in any underground mine.

In terms of reducing cost: we are one of the more technologically advanced companies where every single product we produce is geared towards helping the customer save money. The whole idea with research and development (R&D) is that as an organisation we make the customer happy.

In terms of creating opportunities: one of the legs of B-BBEE is enterprise development. We work with a local trust to create opportunities for individuals within the company who want to open up their own business – it has to complement our product offering though.

In the first world the regulations for emissions are very strict, resulting in major technological improvement. How are these transplanted to the African context?

Atlas Copco's R&D adheres to certain standards (such as the UN World Index) for reducing its environmental footprint (which includes reducing CO₂ emissions). We import the same machines – they are not modified to meet the less strict regulations of African context.

What are Atlas Copco's core values?

Our core values reflect how we behave internally and in our relationship with external stakeholders.

The first is *innovation*. Innovation continues to be a core focus – Atlas Copco has 3 100 research and development engineers. In 2014 we spent 43% of our revenue on R&D in an attempt to ensure that the customer has it easy. This innovative spirit is reflected in everything we do and is aimed at delivering products that increase productivity and competitiveness.

The second is *interaction*: with our stakeholders, but also internally and between customer centres. Although we are divisionalised, we all represent the organisation – so we come across as one company to the outside world.

The last value is *commitment*: our pay-off line is 'committed to sustainable productivity'. We operate worldwide with a long term commitment to our customers that we keep our promises and always strive to exceed expectations.

How does the company innovate – is it a top down, from the bottom up approach – or a combination of this?

It is a combination: 60% of innovation is from the top down. We have specialists that come up with ideas – R&D. The remaining 40% is from the bottom up innovation. Once a customer purchases a significant amount of product, Atlas Copco will modify these if needs be. It was done for a South African customer once who needed a very specific solution – and Sweden created it for them.

Employees also have an opportunity, via an innovation website, to send ideas to R&D.

What would you say is Atlas Copco's unique selling point?

We are well-known for our reliable products – it is a premium brand. This is our unique selling point. But, we are not well-known for being top of mind – which is something that is being changed.

We realise that a customer is your customer for ever – it is not just about buying, it is also about looking after them. Therefore an entire service division for each business area was created – service generates 43% of our revenue. We now have almost 13 000 service employees across the world. ∞



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Global Reporting Initiative G4 Standard introduced

Sika has bundled and consolidated its sustainability activities: The guiding principle 'More value, less impact' sums up the new strategy. The company now measures itself against six defined targets and is one of the first companies in Switzerland to report its performance in accordance with the latest guidelines of the Global Reporting Initiative (GRI G4).

The recently published sustainability brochure outlining the 'More value, less impact' campaign provides a comprehensive overview of Sika's sustainability commitment in the next five years.

Sustainability is a driver of innovation and hence of the business success enjoyed by Sika. The new medium-term sustainability strategy bundles activities and systematically gears them to the following six strategic target indicators: economic performance, sustainable solutions, local communities/society, energy, water/waste and occupational safety. In accordance with the guiding principle of 'More value, less impact,' with its products, systems and solutions Sika strives to create value for all its stakeholders that by far outweighs the impacts associated with production, distribution and use. Specifically, in the next five years the company will measure itself against the following targets:

- Economic performance: Operating profit (EBIT) above 10% of net sales
- Sustainable solutions: All new product developments assessed, all local key projects implemented
- Local communities/society: 5% more projects per year
- Energy: 3% less energy consumption per ton and year
- Water/Waste: 3% less water consumption and waste per ton and year
- Occupational safety: 5% less accidents per year

For buildings as well as for industrial applications, Sika aims to continually enhance durability and improve both energy and material efficiency. The company has been guided by a sustainability mindset from the very outset: The breakthrough was achieved around a century ago with the product Sika-1, which

durably sealed the tunnels on the Gotthard rail route against seepage water – an essential requirement for the subsequent electrification of the line.

No company can achieve the goal of sustainable development on its own. That is why Sika actively seeks the involvement of its stakeholders, such as employees, customers, suppliers, shareholders, authorities, governments and associations. In developing its sustainability strategy, Sika consulted stakeholders on what they considered to be the most important sustainability issues. Selection of the strategic sustainability targets is thus based on both an internal and an external perspective.

The revised sustainability strategy was accompanied by a new management and reporting system meeting the G4 Guidelines of the Global Reporting Initiative (GRI G4). This makes Sika one of the first companies in Switzerland to report on its sustainability performance in accordance with this new standard. Compared with earlier versions, GRI G4 aligns sustainability reporting more closely to topics of significance to companies, and factors in the impact of business activities on the entire value chain.

The recently published sustainability brochure on the 'More value, less impact' campaign summarizes the key points and provides illustrative projects and initiatives from all over the world highlighting the six strategic focus areas of Sika. Sika complies with the non-financial reporting standards developed by the Global Reporting Initiative (GRI G4)



Aspect 5 official SA Launch

Launched in Europe before Christmas, Aspecta 5 Flooring was launched in South Africa in July. The function, at the Da Vinci Hotel in Sandton, was held under the auspices of the Pretoria Institute of Architects. Hugh Fraser was the keynote speaker.

Aspecta is a dry back LVT range where the difference is in the detail. This 3,2 mm thick vinyl boasts a superior 0,7 mm Ceramic Bead coated wear layer and super matt Urethane finish.

The real excitement comes from the Diversified Assortment, the unmatched sustainability credentials, world-class marketing support and unrivalled guarantees.

Aspecta offers 33 Stone and Masonry tile patterns that fit seamlessly between counter contemporary and digital design. There are 52 wood grains in a wider range of embossing and textures and larger plank and print width for unparalleled realism. And then there

is the real ground breaking collection of 24 abstracts. This bold alternative to wood and stone offers unlimited combinations and opportunities with sizes and finishes that will bring any project to life.

Aspecta is manufactured from 100% virgin vinyl (which is 100% recyclable) and non-phthalate plasticisers. This together with the manufacturer's social, economic and environmental responsibility programmes has seen the product gain accreditation by the US Green Building Council and Floor Score accreditation for indoor air quality. It is also the only flooring in the world to be granted the ANSI/NSF 332 (sustainability assessment standard for resilient flooring) Platinum certificate for sustainability.

This new dimension in flooring is the perfectly suited to the education, healthcare, hospitality, retail and corporate segments and carries a 25 year full commercial warranty.



KEYNOTE:
JOCHEN ZEITZ



“Knowing what we know today, it doesn't take rocket science and boldness to recognise that a sustainable business from an economic, social and environmental point of view is not only a responsibility and non negotiable but that it offers all of us an opportunity as well.”

Chairman of the Kering board's sustainable development committee, former CEO of PUMA where he conceived and pioneered the ground-breaking Environmental Profit and Loss account (E P&L). Founder of the Zeitz Foundation for Intercultural Ecosphere Safety.

“We do not inherit the earth from our ancestors, we borrow it from our children.” Native American Proverb”

Architect and president of the Center for Regenerative Design and Collaboration. Designer of the patented AGUA “Bottle to Tile” Out Cycling project. A real innovator, committed to changing the face of construction and conservation in Costa Rica.

KEYNOTE:
DONALD THOMPSON



“Whatever you're fighting for: Racism, Poverty, Feminism, Gay Rights, or any type of Equality. It won't matter in the least, because if we don't all work together to save the environment, we will be equally extinct.”

Thought-provoking American spoken word artist and activist passionate about discussing topics that face our people and planet.

KEYNOTE:
PRINCE EA



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