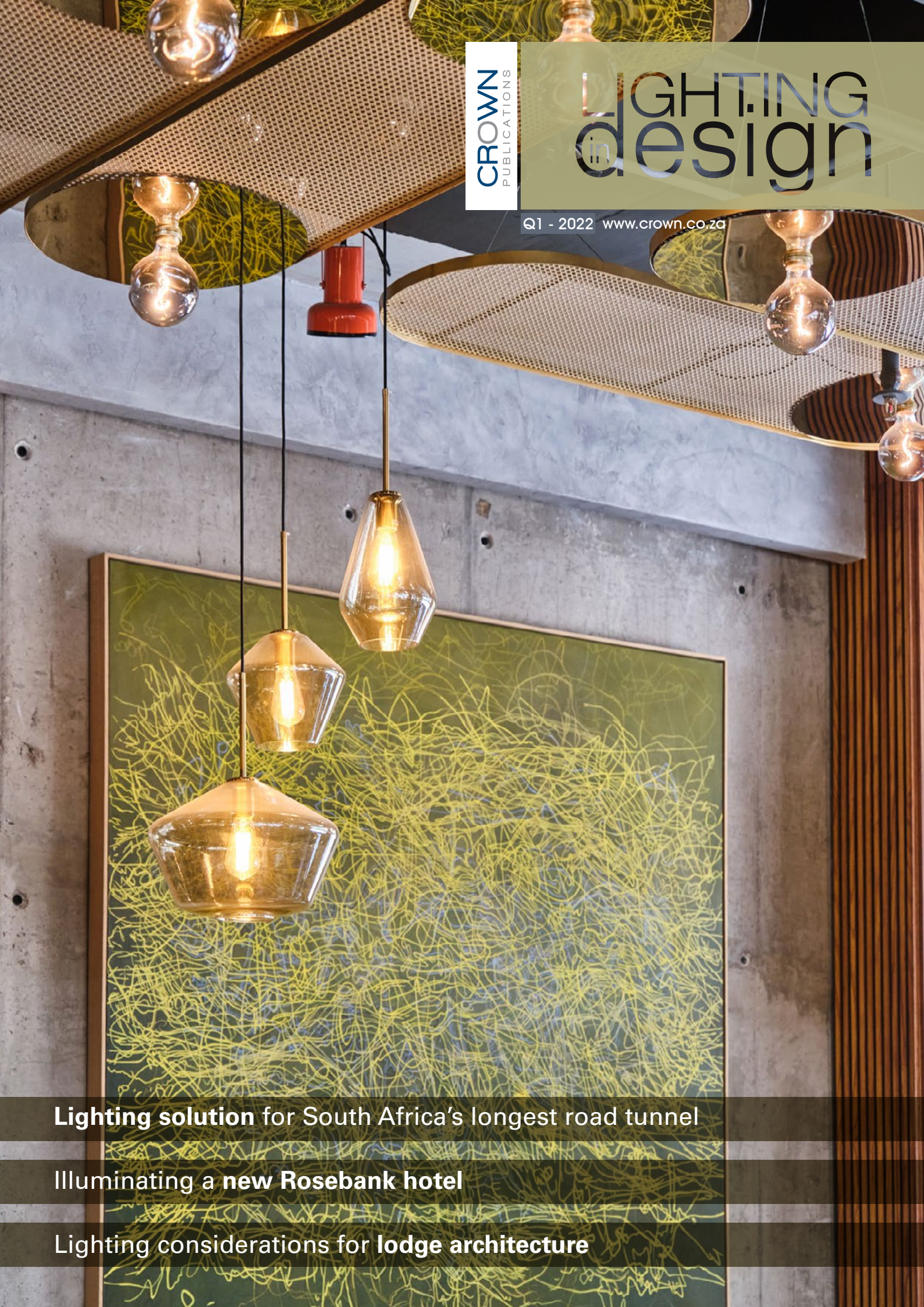

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In a recent chat with lighting industry stalwart, Drew Donald, he opened up on what has been keeping him busy in recent years. Emergency lighting and, in particular, escape route lighting and markings are perhaps the most neglected aspect in adherence to regulatory requirements in buildings.

Donald and his colleagues at Genstar Emergency Lighting Services have been conducting research over the past two years on a national basis, which clearly illustrates that the majority of installations fall short of complying with compulsory National Building Regulations. More worrying, is the lack or misunderstanding of the requirements of the Regulations. This being the case in both the private and public sectors.

"Many building owners seem to be under the impression that they are compliant, which is mostly not the case. Neither are Regulatory Authorities executing their duties to do inspections and insist on corrective action to improve the status quo. The respective insurance entities that we have thus far engaged seem to be more property and asset focused and less concerned about the safe evacuation of people from a building experiencing an emergency," said Donald.

The confusion comes with the various specifications and permits. The primary specification being SANS10400-T: Fire Protection, to be read in conjunction with SANS 10114-2, VC8055 and SANS1464-2. VC8055 is a compulsory product specification meant to be strictly enforced by the NRCS. Sadly, there seems to be no evidence of this being the case.

Recent happenings where fires occurred clearly illustrate that emergency and escape route lighting and signage were either not working or non-existent; the Mmabatho Palms Hotel in Mahikeng, the Charlotte Maxeke hospital and the Parliament buildings all come to mind. People's lives are being placed at risk because those who are custodians of ensuring compliance, for whatever reason, are not fulfilling their responsibilities to the levels required.

"No matter where we go, lack of knowledge, lack of education and therefore lack of application is overwhelming," says Donald. People in government, the head of the fire services and the head of national disaster are all in agreement that this needs to change, but the resources are not available.

With this in mind, the company is embarking on an education programme and has recently made a breakthrough with the Fire Protection Association which runs training for fire services and fire inspectors. It is certainly a step in the right direction, although the onus lies at the feet of building owners to ensure compliancy. Let's hope they heed the warnings before a significant tragedy occurs.

On that merry note, we at *Lighting in Design* would like to take this opportunity to wish all our readers the best for 2022, and hope that the year ahead brings new beginnings, opportunities and some respite from the seemingly relentless challenges of the past two years.

Gregg

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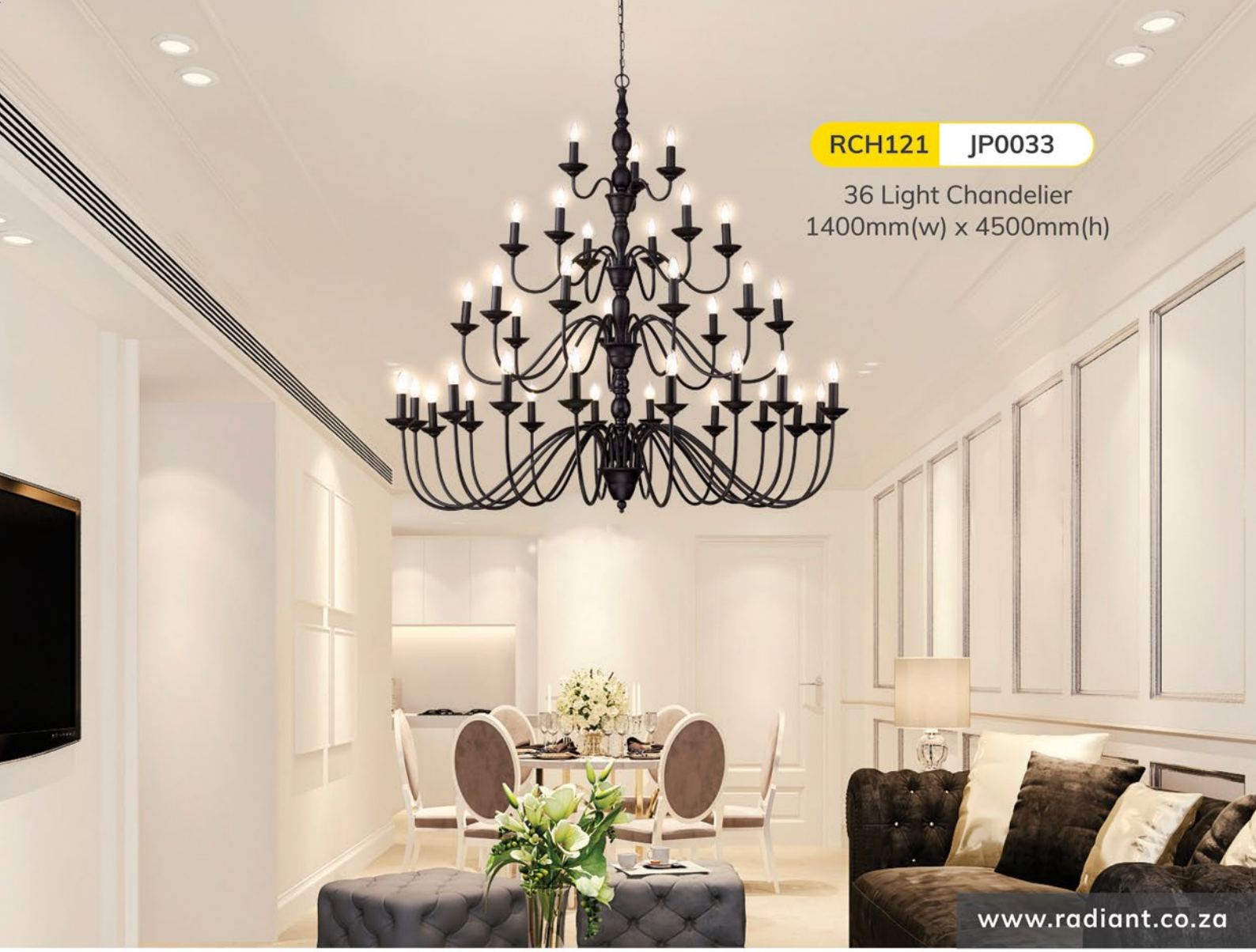

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A city nightscape as lighting inspiration

Parama is a modern, minimalist apartment in Cape Town, with lighting which mimics the city's evening lights

This Cape Town pied-à-terre, near to the V&A Waterfront's Silo Precinct, was conceptualised as a blank canvas for the owner's growing collection of South African and African art. The precinct is anchored by the Zeitz MOCAA, which is not only the most significant art museum in the world dedicated to artists from Africa and the diaspora but is also a local architectural landmark designed by the UK's Thomas Heatherwick. Much of the district's artistic and creative character derives from its presence.

Other significant cultural and geographical markers include views overlooking the marina on one side of the apartment and natural landmarks such as Devil's Peak (part of the city's iconic Table Mountain) on the other. Inevitably, these contextual prompts flavoured ARRCC and OKHA's approach to the interiors.

The client brief specified a strictly minimalistic approach. With the long rectangular shape of the apartment in mind, ARRCC opted to create a unified inner shell rather than a series of separate rooms. Integrated cabinetry makes it possible to conceal storage and present sleek, uncluttered

surfaces throughout the apartment. At the same time, this approach created opportunities for ARRCC to redefine the interior architecture with variations in scale and volume, subtly sculpting into the living spaces to define distinct areas within the larger open-plan space.

Perhaps the most clearly legible of these is the champagne aluminium-clad kitchen, which appears as a unified insertion within the larger white interior. Similarly defined volumes, however, have been created for the dining and lounge areas. This approach has been reprised using different materials in different areas in the apartment: joinery in the living space and sandstone in the bathrooms, for example, while maintaining their monolithic appearance. The transitional spaces between rooms are conceptualised as aesthetic 'palate cleansers', using variations in materials, texture and pattern.

When it comes to the lighting, natural light from both sides of the apartment – both the marina side and the city side – played a big part in adding natural light to the apartment. The challenge was to carry the light through in the evening, achieved

by the datum level on the sides. The idea was to mimic the city lights on the side with a drop-down pendant above the dining table (almost as if urban is lighting coming in to mimic the background).

The main lighting piece was designed by a custom fabricator. It appears linear to draw the eye through the apartment and helped to extend the visual width of the apartment. The light fittings were made of the same feature material as the kitchen i.e., the champagne aluminium. While some of the lighting was purely functional, the laser cut mesh diffusers were added to break down glare and simultaneously play on the idea of the city light motif brought into the apartment.

Elsewhere, the white horizontal surface of the ceiling wraps down onto the vertical surface in lieu of cornices. Following that, the joinery elements wrap along the apartment with the lighting detail giving the impression that the ceiling is floating away from joinery items and thereby extending the height of the apartment.

As much as a thematic or conceptual motif is possible within the pure functionalism of a minimalist brief, ARRCC devised a series of running lines integrated into the design of the joinery and lighting. These lines stop short of connecting, creating a sense of implied connectivity between spaces and elements of the interior architecture.

The custom-designed light fitting in the living area, on the other hand, not only functions as a 'holding element' but also serves as a metaphor for the approach ARRCC and OKHA took in the design of the apartment itself. Its component parts are clearly expressed high-tech refined industrial detailing such as the mesh shades, yet the natural, organic walnut blocks that connect the linear sections juxtapose a contrasting natural, handcrafted aspect of the design. Such details

add a layer of sensory and emotional richness to the design without compromising the refined functionality of its concept.

As much as the interior architecture is an exercise in carving into space, the design of the furnishings was about creating sculptural forms. The custom furnishings, such as the monolithic limestone coffee table in the sitting area, anchor and articulate the spatial experience, sustaining the approach in an inverse expression of the same formal language.

Once again, there is warmth in their elemental materiality and detailing. The coffee table in the living room might be reduced in its form, but its sandblasted and acid-washed finish is textured.

From the ribbed marble finish on the TV unit and the fluting on the base of the dining room table to the chamfered edge of the tabletop, there is a sensory layering that does not impose on the clean, calm character of the minimalism.

The apartment's sense of serenity is maintained through a deceptively simple limited material palette, which becomes satisfyingly apparent only with familiarity and time. The bespoke drinks cabinet, like the feature light fitting, holds a symbolic key to the apartment's design philosophy. Its asymmetrical doors contrast a purely minimalist mirrored surface with a heavily hand-worked, pitted and patinated metal door. Its complex texture expresses the level of detailing that goes into the creation of minimalism, which only properly reveals its nature when you interact with it.

This restraint enables a gallery-like quality that allows the art full expression, while simultaneously

remaining comfortable and liveable. The apartment might appear as an enclosed unit, complete in itself, but it remains open to its context, whether the sparkling lights of the marina and the yachts on the water, or the broader artistic identity of the precinct. LiD

PROJECT TEAM
Interior design: ARRCC INTERIOR
Design team: Michele Rhoda, Daniel Du Toit, Maajidah Sait, Anna Lisa Cunningham Cooper, Leigh Daniels
Interior decor: OKHA
OKHA design team: Adam Court, Luka Parkin
Feature light manufacturer: All Designs
Other lights: Made Studio
Photographer: Niel Vosloo

Complete lighting solution for South Africa's longest road tunnel

BEKA Schréder is proud to have supplied the LED lighting solution for the Huguenot Tunnel near Paarl, Western Cape. It is South Africa's longest road tunnel. This installation will result in energy, maintenance and cost savings. The upgrade also has positive impact on the safety of road users.

The Huguenot Toll Tunnel provides a route through the Du Toitskloof Mountains which separates Paarl and Worcester. The 3,9 km long tunnel was opened in March 1988, and is 11 km shorter than the route across the pass. According to the Average Annual Daily Traffic (AADT), more than 12 000 vehicles travel through the tunnel daily.

It was decided to replace and upgrade the tunnel's old fluorescent lighting and control system for the first time since construction. The requirement was for a complete design, supply and installation solution, including a lighting management system.

More than 6 000 LED striplights and more than 200 LED adaptation luminaires were supplied and are managed by the Advanced Tunnel Solution (ATS) control system.

With the upgrade of adaptation luminaires, the adaptation light levels have improved drastically. This eliminates the black-hole effect when approaching the tunnel during bright daylight, much to the benefit of motorists, who are now able to see clearly when entering the tunnel.

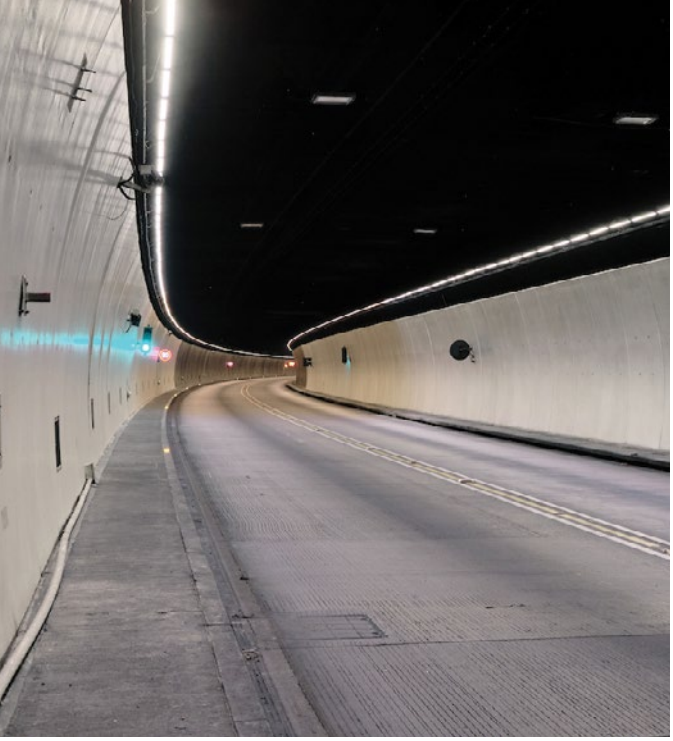
Furthermore, overall uniformities across the road surface of more than 85%, and longitudinal uniformities of more than 95%, were achieved. Experience the new lighting installation by viewing this video: https://youtu.be/vI5ocomQYjo

Lighting to improve visibility with less energy

BEKA Schréder has developed a customised LED striplight, perfectly suited for this tunnel lighting application. This South African designed and manufactured luminaire incorporates the latest LED technology and consists of an aluminium extrusion body and die-cast aluminium endcaps creating the best thermal environment for LEDs. Various light distributions are offered to provide the right amount of light, exactly where it is needed. The request for a continuous line of light throughout the tunnel was achieved with this unique luminaire design.

The right light where, when, and how it is needed

The tunnel is divided into different lighting zones as per CIE88 and shown in Figure 1. Each tunnel zone requires a different luminance level. The ambient lighting conditions and tunnel entrance as seen by an approaching motorist in the Access Zone is measured by a specialized luminance meter (typically referred to as an L20 camera). The L20 camera provides input to the control system which adjusts the light levels for each zone to follow the



The new lighting solution achieves exceptional uniformity

CIE curve (as per CIE88). The luminance level at the Threshold Zone is highest at the entrance of the tunnel and then decreases as you move into Transition Zones 1 and 2. Whilst driving through these zones, it gives the eye time to adapt to the lower light levels on the Interior Zone. As this is a bidirectional tunnel, both sides are treated as entrances with L20 measurements controlling the adaptation lighting.

Schréder's advanced luminance calculation software analyses all aspects of a tunnel environment to provide the right luminance level in all tunnel zones. During the study, the number of luminaires to be installed in the tunnel and their orientation are calculated to create a curve as close as possible to the CIE normative curve for an efficient and economical light installation.

An uncompromising quality

Tunnel luminaires are often subject to harsh environments. Vibrations, flying debris, car fumes, water leaks, and electrical surges can damage luminaires. BEKA Schréder's manufacturing processes are rigorously controlled in their facilities to guarantee design excellence. Their products are tested and certified in accredited laboratories to resist these harsh conditions and ensure robustness and quality over time.

ATS control system, the solution for tunnel automation management

The Advanced Tunnel Solution (ATS), a co-development between Schréder and Phoenix Contact, is an all-in-one central control system designed to easily manage all tunnel lighting parameters remotely.

The ATS receives a signal from the L20 cameras installed outside the tunnel at the Safe Stopping Distance (SSD), then communicates with all local

Figure 1: CIE Curve adjusted for bi-directional tunnel traffic.

controllers installed in the tunnel luminaires. It collects information from the LED drivers, but also from hard input triggers installed inside the tunnel. ATS is also capable of switching between relay circuits to ensure long life of LED and driver components in the luminaire, while saving energy.

This innovative tool is capable of constantly adapting the light levels according to specific tunnel conditions like weather, day mode, night mode, maintenance and emergency sensor inputs. The system also controls the light levels using a constant light output (CLO) function, which takes into consideration lumen and dirt depreciation.

This intelligent system permanently monitors the power consumption and reports any BUS communication or power failures. It integrates the initial tunnel lighting study while the industrial BUS system enables individual auto-addressing, to speed up the commissioning process, saving valuable time and resources during installation.

In addition, a Tunnel Control System (TCS) unit facilitates and manages the communication between multiple ATS devices as well as the seamless upstream exchange of data and commands to a higher SCADA level system. Complete redundancy was achieved with ATS to ensure an always ready control system.

Conclusion

BEKA Schréder is delighted to have provided the lighting and control solution for this tunnel. The high-efficiency and long lifespan of the luminaires will enable the South African National Roads Agency Limited (SANRAL) to reduce its operating costs while delivering a much better service for commuters. This new lighting installation has not only improved the driving experience for motorists but will also ensure less closures and hold-ups due to maintenance for a more pleasant commute.

BEKA Schréder, leading local manufacturer of LED luminaires, is part of the Schréder Group. BEKA Schréder locally develops and manufactures sustainable LED lighting products, designed and suitable for local conditions.

BEKA Schréder, in partnership with Phoenix Contact, are proud to be associated with SANRAL, Innovative Transport Solutions and LEAD Engineering Projects in providing a complete lighting solution for this prestigious project.

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Rosebank hotel exudes old-world charm

The Bank Hotel is located in the epicentre of cosmopolitan Rosebank. This mixed-use development houses restaurants, retail, offices, and a sanctuary to rest your head after a draining workday or a long day of sightseeing.

The Bank in Rosebank, a striking 13-storey black brick building designed by architect Enrico Daffonchio, that rose from the remains of the former FNB, includes a hotel and co-working space. Adjacent to the popular Rosebank Mall, the interior concept was to provide a moment of respite from all the hustle and bustle; a sanctuary to pause and relax. The muted palette and plush material finishes are easy on the eye and encourage visitors to the space to get comfortable while enjoying good food and luxury surroundings.

The aesthetic emulates traces of old-world charm bringing forth feelings of nostalgia, familiarity, and homeliness, encouraging visitors to relax. Tying it all together is an air of Afro-chic style that is inspired by the arts and culture community in the Rosebank area. Lighting, throughout the diverse areas of the hotel and its components, plays a significant role in the overall aesthetic.

A brief history

IHG Hotels & Resorts, one of the world's leading hotel companies, has opened voco The Bank Rosebank – the first voco property in Africa. As one of IHG's newest hotel brands, voco combines the reassurance of a global brand with the informality and charm of an individual hotel.

Originally the site of FNB in the 1970s, 24 Cradock Avenue is now home to a formidable successor, The Bank. With its vibrant pedestrian and café culture, art galleries, tree-lined avenues, and thriving commercial life, Rosebank is a unique combination of Art Deco charm and contemporary metropolitan style. The Bank seeks

to be representative of this rich heritage. The use of local materials to create a landmark that fits into its context was done through the careful use of colour, volume, landscaping, and texture.

By building with custom-made black bricks that were locally manufactured specifically for The Bank, the façade retains its strength and stoicism, whilst giving warmth and charm through texture. The subtle use of brass on the façade, art-deco-inspired steel and balustrade detailing as well soft landscaping and lighting meant that the building exudes a metropolitan art-deco aesthetic. To enhance the impact of the building, the form begins to defragment at the top into a minimalist contemporary crown, which creates deep landscaped roof terraces and balconies in which to enjoy the sweeping views of the Johannesburg city skyline.

The 131-room hotel embodies the characteristics of voco with exclusive features and distinctive hallmarks, setting it apart for a memorable stay. Every guest will experience the voco signature 'come on in' warm welcome, promising a swift and simple check in, with dedicated voco hosts available throughout the guest's stay as resident experts, and a locally inspired welcome treat. Double volume ceilings, chic modern bathrooms and valet parking complete this distinctive upscale experience. Lighting is thoughtfully and carefully considered. Where decorative lighting was required to highlight a space – for instance at shop entrances and in the lobby – pendant lighting and an embellished 'light wall' were used. Above the reception in the lobby, 15 suspended circular pendants, arranged in five rows of three fittings, provide a clear focal point for guests on their first visit to the hotel.

In the rooms, a selection of bedside and table lamps, hanging pendants and above-bed linears offer guests a range of lighting options. In the bathrooms, the hanging pendants are carried through and add a further decorative element to complement the more conventional task lighting above the sinks.

Regent Lighting Solutions supplied a range of exterior lights to The Bank; Beam single and double 27 W LED 4000 K luminaires were used to light up the façade of the building. The Beam is

a modern designed luminaire with cylindrical body which provides a stylish solution to wall mounted fittings. It is suitable for various facade lighting requirements, including accent lighting, building column lighting or architectural highlighting.

The Geo bulkhead 16 W 220 V was used on the outside of the building on the ground floor as well as for emergency on the staircases. The Geo is a square wall or ceiling mounted sconce with a UV stabilised high impact opal acrylic diffuser. Elsewhere, the Linear Mini was used to highlight the entrance of the building.

For a taste of 'voco life', the exciting and modern mid-century inspired all-day eatery, Proud Mary, is located on the ground floor of The Bank building, while Workshop17, a haven for remote working, can be found just one floor up. voco Johannesburg Rosebank also features a fully equipped gym. Statement lighting at Proud Mary includes circular pendants suspended below mirrors which diffuse the light throughout the space.

The ground floor contains high-end retail and an open restaurant concept with an integrated coffee shop that spills out to the streetscape, followed by four floors of vibrant co-working spaces, with an additional two floors of premium penthouse office. The remaining programme houses a contemporary business hotel with a unique South-African luxury aesthetic.

The building has revitalised a site that was for all intents and purposes dead, so much so that the landlord across the piazza had built a wall to hide it from view. It reactivated this part of Rosebank and its surroundings. In terms of form following narrative in the design of The Bank, the architects

PROJECT TEAM
Architects: Daffonchio Architects, Imbewu Design
Lead designer: Enrico Daffonchio
Design team: Robert Dos Santos
Photography: Juane Venter

tried to bring back in a contemporary fashion a lot of the heritage of Rosebank that had been lost because all of the Art Deco buildings in Rosebank and Oxford Road had been bought and demolished over time.

"Technically this was an incredibly difficult project because we retained the structure and built around and on top of rather than demolishing it, so the engineering of this project was extremely complex. The energy aspect was also challenging because we didn't have enough reliable power available to the site so we had to come up with innovative solutions such as trigeneration, solar, HVAC and insulation to make sure that the insufficient existing power supply could be upgraded and moved off the grid enough to make the whole building function," explain the architects.

This was a very challenging, highly complex project that has been resolved technically and aesthetically with respect to the heritage and history of the area while breaking ground aesthetically in its environment on the Highveld. LiD

Lighting for lodge architecture

Mellet & Human Architects recently designed a home in the bush which required specific attention to be paid to the estate's lighting guidelines.

Residence Vermeulen, at Likweti Bushveld Estate, close to White River, Mpumalanga, is located on a 1.17 hectare site. The estate features savannah like vegetation, clusters of acacia and other indigenous trees, typical Lowveld boulders, and free-roaming animals. The stand itself has a northern slope with beautiful views over the valley, and views onto the 'koppie' to the south. Large boulders are found centrally on the stand, surrounded by mature indigenous trees.

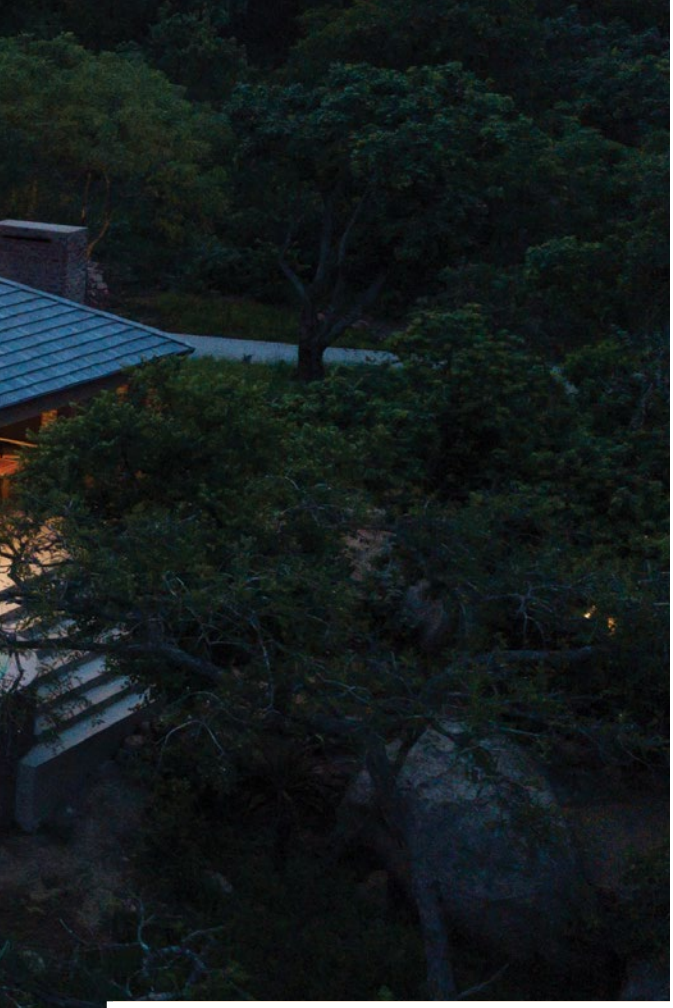
The nature-loving clients required a 'lodge style' design with a relaxed living, open plan layout, taking most of the views into account. Accommodation requirements included interior and outside living spaces, three en-suite bedrooms, and connecting garages.

Likweti architectural guidelines regulate designs to blend with the environment, thus featuring low pitched tiled roofs resembling clusters of acacia trees. Designs should be energy efficient, have mostly north orientation, sufficient sun control, and provide cross ventilation. External finishes as far as materials and natural colours are prescribed and the use of solar energy and rainwater encouraged. Furthermore, houses should be positioned inside a 'hard landscaped' area pre-determined by the developers for each site, and existing trees and boulders be retained.

The resulting design of 303 m^2 is positioned between existing trees and the natural boulders as focal points. The high-volumed living area forms the central core of the house, with north and south sliding doors providing good cross ventilation during the hot summer months. It consists of a kitchen, living, dining and workspace. This central area leads north onto the covered patio and pool area, and connects with the three privately situated en-suite bedrooms, each with unique views over the landscape. To the south, the living area opens to a vegetable courtyard and views to the southern 'koppie'.

Internal spaces are covered by low pitched tiled roofs, linked by flat concrete roofs, creating a fragmented external architecture with low environmental impact. External natural colours let the house blend with the natural surrounds; finishes include plastered facebrick walls, and local natural stone as prescribed in the guidelines.

In terms of the lighting, due to the location of the house, the estate requires external lights to



be low impact with positions approved prior to construction. Lighting also needed to be sensitive to the privacy of neighbouring properties and all lights are to be switched off by 10 pm.

Internal lights were chosen along the theme with the 'lodge' architecture. Low impact and carefully positioned downlighters, as indicated by the architects, were installed on dimmer switches in order to create atmosphere when required.

Focal pendant lights are positioned strategically over the dining area, covered patio and main bathroom. LiD

Energy-efficient lighting: entering a new era

From the moment the first artificial light bulb was introduced, 'energy-efficiency' was a major focus area for the lighting industry and significant progress has been made over the years in making lighting more efficient.

Since the invention of the incandescent lamp, the lighting industry has always been focused on improving the efficiency of its products. For decades this focus rendered little results. The oil crisis in 1973 gave a boost leading to the introduction of the Compact Fluorescent lamp. The conversion from analogue to digital technology (LED) combined with legislation like the ban on the inefficient incandescent lamps changed the energy landscape for lighting and resulted in a significant drop in percentage used for lighting as part of the global electricity consumption, from 19% in 2006 to 13% in 2013 with a further reduction on the cards. This achievement created a perception that lighting has done its part in reducing energy-use in the fight to combat climate change. Nothing is further from the truth as there is still a large potential to further reduce energy-use for lighting. The lighting industry must intensify its efforts in promoting the most efficient LED solutions in combination with control systems, align itself with the trend towards green – and net zero carbon buildings and reach out to other industries to realise potential spin-off effects. This article is part of this awareness creating effort.

Lighting and efficiency

From the moment the first incandescent lamps were introduced the lighting industry focussed on increasing the efficiency of the lamps. The unit to measure the light output of a lamp is the 'Lumen' and the lighting industry uses the 'Lumen/Watt ratio' to indicate the efficiency of a light source.

As the light generating principle of an incandescent lamp is intrinsically inefficient (it generates more heat than light) the increase in efficiency over time was limited with the 'invention' of the halogen lamp as most important step forward. The introduction of a new light generating principle being the gas discharge principle delivered better results. Fluorescent tubes and High Pressure Sodium lamps used in street lighting are examples of gas discharge lamps.

The end of the 70s and the 80s of the 20th century saw an acceleration in new energy-efficient lighting products. This was the result of the 1973 'oil crisis' in the Western countries, people realised how dependent they were on oil for energy and transport. This renewed focus on energy-efficiency resulted in the introduction of Compact Fluorescent Lamps, more efficient fluorescent tubes and more efficient (electronic) control gear. Some markets adopted all these new products, other markets considered them too expensive.

Another major event took place in the early nineteen nineties when Shuji Nakamura developed the blue LED. This resulted in the commercial use of LEDs (Light Emitting Diodes) in general lighting as it allowed the creation of white light (either by combining blue LEDs with green – and red LEDs or by adding yellow phosphors to blue LEDs). The last 20 years has seen a dramatic increase in efficiency of LEDs (increased Lm/W ratio) while prices have dropped, making LEDs the technology of choice and transforming lighting from traditional

(analogue) to modern (digital) technology, at the same time making lighting more efficient.

Coupled with the conversion to LEDs the lighting market also witnessed a fast increase in the use of lighting controls, devices able to switch off or dim the lighting, further reducing energy-consumption. Concepts like motion sensing (switching off the lighting when no presence is detected) and daylight harvesting (reducing artificial light in case of incoming daylight) are widely used.

The role of legislation and government incentives

Legislation and government incentives play a large role in realising the energy-saving potential of new lighting technologies and products. In the years 2006/2007 the Eskom mass rollout of 40 million Compact fluorescent lamps as replacement of the inefficient incandescent lamps contributed greatly to 'keeping the lights on'. Mass roll outs of LED downlights in later years (subsidised by Eskom) further reduced energy-use in the private sector.

Minimum Energy Performance Standards, basically prohibiting the use of inefficient lighting is an example of legislation enforcing the use of more efficient products. The ban on incandescent lamps from 2014 is the best example of MEPS.

Achievements

In the year 2006 the International Energy Agency (IEA) published a book called 'Light's Labour Lost, Policies for Energy-Efficient Lighting'. A key figure from this book is that in 2006 worldwide, grid-based lighting consumed 19% of the total global electricity consumption.

That same figure is estimated to be 13% in 2018 and this drop is the result of a wide implementation of energy-efficient lighting combined with legislative policies. An ambitious target of 8% has been set for the year 2030 (*Signify: "The LED lighting revolution" 2018, page 9*).

The same International Energy Agency has developed a Sustainable Development Scenario (SDS) which is fully aligned with the Paris agreement on climate change. Lighting is one of the few technologies on track to follow the SDS trajectory by 2030.

Where to from here?

Based on the significant steps made in increasing the energy-efficiency a perception might be created that lighting has done its job and we all can sit back and relax. Nothing is further from the truth as a lot of work still lies ahead. Some reasons behind this statement are:

- The gains in energy-efficiency have been supported by a rapid increase in efficiency of LEDs in the last two decades with sometimes double digit increases per year. However, the days of this rapid increase are now a thing of the past. The efficiency increase will continue however at a much lower pace.
- There is a strong perception by influencers and end-users that 'as long as it is LED, it is efficient'. Although this is correct, there is a strong case of 'good, better, best' when it comes to LEDs for both consumer – and professional LED products.

Concerning the second point the lighting industry needs to up its game when it comes to communication and promotion of LED based solutions. A habit of the industry is to use 'Wattage' as reference for the brightness, instead of the correct parameter 'lumen'.

This habit hampers the use of the more efficient lighting products and can even be counterproductive as end-

users choose products with a high wattage thinking these are products generate a lot of light, which is not always the case.

Packaging of LED bulbs reflect the focus on 'wattage'. Although packaging always includes the amount of lumen, an explanation for laymen that lumen represents the light output is missing or poorly illustrated. Communication and explanation of the efficiency of the product (Lm/W ratio) is omitted for almost all LED bulbs. Although the well know energy labelling (from cat E to A++) is visible on the packaging a good score is not being promoted by the lamp suppliers.

A concrete example underpinning the 'good, better, best' statement is in interior lighting (offices, schools etc.). A popular choice for these applications based on its affordability is the so called 'side lit' panel, where LEDs are arranged on the inner edge of the panel and light is then bounced downwards through a diffuser. As light passes through a lot of material this is not a very efficient solution and the average side-lit panel generates ca 100 Lm/W.

The same applications (office, school) can be lit using recessed luminaires where LEDs are mounted at the back of the luminaire and the light is directed with minimal losses due to efficient optics. These luminaires can generate up to

150 Lm/W while also offering visual comfort.

Translating the above into a 'real life' example of an office space with a surface of 400 m^2 and a light level of 500 lux we see the following:

Key parameters for a concrete lighting project

By simply choosing a more efficient LED luminaire we can achieve an energy-savings of 24%. Truth be told, generally the more efficient luminaires require a higher initial investment. However, this will be recouped based on the savings on the electricity bill. And for those with serious budget constraints a concept called 'Light as a Service' might be a solution.

Light as a service

According to Wikipedia 'Light as a Service' or 'LaaS' is a service-based business model in which light service is charged on a subscription basis rather than via a one-time payment. In the case of LaaS the lighting suppliers retains ownership of the lighting equipment and offers a lighting – and energy audit, lighting design, installation, operation and maintenance of the lighting equipment against a monthly – or quarterly fee. For the end-user this means that capital expenditure changes to operational expenditure, generating free cash flow. For energy-efficiency LaaS means removing the most important roadblock, the upfront investment.

Accelerators for energy-efficient lighting

Sustainability is becoming an extremely important global topic driven by the need to fight climate change. 'Green Buildings' are one of the ways to make the building environment more sustainable. Rating tools are used to determine how 'green' buildings are and reduction of energy-use (realised by account of the implementation of energy-efficient lighting) generate many credits in those rating tools.

The next step after Green Buildings are climate neutral buildings, called 'Net Zero Carbon Buildings'. NZC buildings are realised by first making the building ultra-efficient and then generating the energy used in a climate neutral way (via solar, wind, or another sustainable method). This again will call for the most energy-efficient lighting to be installed. A legislative accelerator is the local introduction of the Energy Performance Certificate for certain buildings.

Spin-off to other technologies

An often-overlooked fact of energy-efficient lighting is the impact on other technologies. Increasing the efficiency of the lighting means more power is converted into light and less into heat hence implementing energy-efficient lighting leads to an energy-reduction in air conditioning. Quantifying this reduction is complex but an often quoted 'rule of thumb' is that a Watt saved for lighting translates into a 0.3 W reduction for air-conditioning.

The lower installed power of energy-efficient lighting often translates in cost-savings for the electro-technical installation (e.g., less cables and other devices). These cost-savings help in compensating for the higher initial investment for energy-efficient lighting. What we see in practice however is a 'silo-approach' when designing a new building where the designers of the electro-technical installation and air conditioning work with outdated installed Watt/m^2 parameters for lighting leading to an 'oversized' installation. As a result, the possible cost-savings are not realised.

Conclusions

Lighting has made huge gains in reducing its energy-use mainly supported by the conversion from analogue to digital technology (LED). To seize the huge potential for further energy-savings the lighting industry must step up its marketing and communication efforts. The perception has been created that as long as it is LED it is energy-efficient while there are large efficiency differences between the various LED based solutions.

In order to fight climate change and contribute to making buildings green and carbon-neutral the most energy-efficient lighting solutions must be used. LiD

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About the author

Originally from the Netherlands, Henk Rotman moved to South Africa in 2010 and has worked in various roles in the local lighting industry ever since. Currently, he is the Gauteng Business Development Manager for Tridonic. He has been the Chairperson of the Gauteng branch of the Illumination Engineering Society of South-Africa (IESSA) since 2017. His passions in lighting are Energy-Efficient Lighting and new lighting technologies.

Design observations for lighting façades

Each city speaks of its character in the daylight. Come night; it is illuminated to full glory, getting a new avatar. First impressions last. Whether it is a person or a building, the emotions evoked at first sight are of prime importance. That's why so much effort goes into the design of the facade of a building.

Although facades are self-evidently about the exterior of a building, they cannot be considered as a separate entity. From a practical, aesthetic, even branding point of view, they are informed by the building as a whole, particularly the interior. A widespread example of the latter is the lantern effect – where the interior of glazed buildings provides the night-time illumination, or integrated lighting in the facade creates a similar effect. However, during an award judging session recently, an eminent lighting designer raised the issue of light pollution where that approach was concerned. Clearly context, consideration and control, as in all design, is key.

The interior is also an important consideration where occupants are concerned. It is all very well having a literally flashy media facade but not when it is keeping hotel guests awake, or when even the most restrained exterior treatment causes glare to late-working employees with inconsiderately positioned light fixtures.

Where historic buildings are concerned the purpose is largely about revelation, literally highlighting the architectural detailing, the columns and crenelations. Where the contemporary structure is concerned it is invariably about shouting its corporate presence in an increasingly visually competitive and cluttered night-time urban environment.

Perhaps the most interesting approach is where the building is considered as much for its daytime as its after-dark image – purposely designed to allow natural light to play on and with its surface.

Façade lighting is a statement that the architects and occupants of the building seek to project to the world – about the building's identity, personality, status & individuality. With LED lights, facade lighting has become a dream come true for structures.

Façade's vis-a-vis architecture

The fascia of building – be it modern or historic – is one of the most essential aspects of architectural design, governing factors from the ingrained identity of a building to the designer's first impression on both the inhabitants and visitors. In the modern architectural world, façades have become an important showcase of technology, branding, identity for owners, designers and building developers alike. New materials, advanced detailing and versatile possibilities are adding fuel to the fire in the dynamic world of BIM driven buildings. Also, the competition to design a better and unique façade is also building up. Taller, grander and complicated the façade is, the more popular the building becomes. However, it is important to note that the night visibility of the building façade is also becoming important nowadays. Such efforts enhance the image of the city which has a rippling effect on the overall lifestyle and visibility of the city. Façade lighting thus has an important role in building a world-class city. The benefit of façade lighting can be seen in all types of buildings – whether old or new.

Light and architecture

Light and architecture are inseparable virtues of built and unbuilt spaces. Light is of decisive importance in experiencing architecture, as one cannot experience form without lighting. Many great architects have underlined this intertwined relationship through theories and real projects including Le Corbusier, Louis Kahn, B V Doshi, Raj Rewal, Charles Correa and many more. Much has been published in this regard and cannot be emphasised more.

Façade Lighting – introduction and need

With unprecedented urbanisation and most of the global GDP growth taking place in the world's top cities, more and more municipalities are investing in lighting to make their cities more liveable by creating vibrant urban activity at night. New lighting on building structures can:

- Create unforgettable visual experiences.
- Increase pride of residents.
- Attract tourists.
- Drive commerce.

Around the world, many large structures are being impressively lit in creative and artistic ways to stand out, building unique and strong identities for them. Making these structures dynamic help them become part of our lives and can define a location, a city or a brand. It can also influence how we respond to a place and our emotional connection to it. And now with the flexibility of remote programming, this lighting can change almost instantaneously, keeping a brand fresh or a destination compelling. This can help attract tourism and drive commerce.

The safer and more welcoming a city feels, the more citizens and visitors will enjoy it. Lighting creates exciting spaces, making people spend more time there, eating, drinking and taking in the sights. Using beautiful, energy-efficient lighting to create vibrant social spaces can also have a dramatic effect on a city's reputation. It enhances tourism and nightlife, generating valuable income for hotels, restaurants, bars and shops. Hence the city becomes a more attractive destination for people and businesses. An investment in lighting that practically pays for itself. Over the last twenty years, architectural lighting has become more than simply a means of ensuring security and visibility. It is regarded as an essential component of city planning and development and an excellent way to reveal the heritage and identity of a city, whatever the size. Architectural lighting can give a city a night-time beauty that matches its daytime image. By altering the urban landscape, the relationship between the citizens and their city can be redefined and their living environment can be enhanced.

Design considerations

Lighting effects range from enhancing and highlighting façade elements, to totally transforming the face of a building. Multiple factors affect lighting design, and this article attempts to bring the same perspective to designers who wish to attempt the same. Façade lighting design involves two key approaches:

a. What to light?

It is not necessary to light the whole façade, but to light the most significant areas of the façade, i.e., where the most impact can be created. This is determined by finding out the major viewpoints of the façade from the context – both macro and micro. It is recommended to review the areas of the façade that have the least view blockage due to trees, neighbouring buildings, etc. and maximum impact to viewers.

These viewers can be vehicles waiting at an adjacent traffic light, or people waiting at the entrance and exit of a building, immediate public plazas, or if for high-rises, the people in a larger context. Having water bodies in the periphery can enhance the lighting effect by reflecting it. The peripheral illumination around a building can cause the lighting effect to diminish. Hence it is advised to choose the darker parts of the façade, for e.g., the upper parts and move away from prevalent and ambient street lighting. Also lighting fixtures and effects should also be positioned in such a way that they do not cause glare to viewers.

The design style of the façade can determine what elements (like columns, windows, spires, sunshades, etc.) to illuminate. For example, a building having a specific pattern of solidity and void, through a colonnade in the façade, the columns can be highlighted to highlight this pattern at night.

b. How to light?

Any design activity involves a triggering 'intent' of design, or the story behind the design intervention. It is important to adjudge the intent of façade lighting. This concept then governs every design decision and answers questions like what mood to create what style of lighting to choose, etc.

Identify should be based on the larger context for which the structure is famous, and what kind of spaces and people it caters to. Also determine how your building can add to this image of the city, as a landmark and a point of attraction.

The typology of the building is a major factor for intent of the design. A retail space can be activated by an extravagant and celebrative style of lighting, an office tower can become an icon and a landmark in the city through dynamic and far-reaching lighting style, while a hospitality building can be made more welcoming through lighting.

The original building design and concept can be upheld through lighting design as it enhances elements in a façade. It is recommended to carefully identify if the façade has a unique style, rhythms, patterns, symmetry, scale, balance, contrast and mood of the space which can be highlighted through lighting.

Design observations

The following are the general considerations and precautions one must keep in mind while designing the lighting for a building façade. On the basis of the specific conditions of each lighting project, some of these considerations can gain more importance while others can be neglected.

- Height of the building/elements – This represents the actual height of the lit surface.
- Position of light source – To be practically located, owing to vandalism and maintenance possibility. Also, proximity to people as well camouflaging techniques are important pointers here.
- Width of the building/elements – This has impact on number of light sources and beam angles to be chosen.
- Façade material-texture, reflectance, colour – This is a strong clue to choose the overall lighting strategy apart from the scale of the structure.
- Peripheral light in immediate context – It is important to take note of existing ambient lighting in the surroundings.

Weight of the light fixture

- Avoid light pollution – Façade should not be excessively lit. Carefully choose what elements to be lit. Need to design façade lighting for the most viewed/most prominent sections of façade with least peripheral light.

Lighting techniques

Prevalent lighting techniques of today include:

- Direct view – The fixtures are placed on the façade to be seen, e.g., Media façade – recommended for glazed façades.
- Grazing – The fixtures are placed very close to the façade with high illumination at the base and receding with the height – highly recommended for textured façades.
- Washing – The fixtures are placed little away from the façade uniformly washing the façade – recommended for specular finished and flat façades.
- Accentuating – The fixtures are placed very close to create dramatic effects, especially for columns, openings, etc.
- Flooding – The fixtures are placed far from the façade with uniform illumination of the façade. Hence termed floodlighting.

Conclusion

Façade lighting is not rocket science, but needs a focused and sensitive approach towards the intent. A little bit of practice and experimentation can bear great results and generate high return on investments in this rare category of lighting especially in African context. LiD

The science fiction of light – how modern lighting technologies change our lives

It sounds like a scene out of a science fiction movie: a world where beams of light restore heartbeats to normal, where lasers create realistic holograms in the shape of a telephone caller, and where lighting produces food without sunlight. But this is in fact real life, just not as we know it – yet. These are all inventions currently being researched, due to soon move out of the realms of fantasy and into everyday life.

Light hearted

Scientists plan to introduce light-based treatment for people suffering from potentially fatal arrhythmias – an irregular heartbeat that can cause cardiac death within minutes. Treating a patient undergoing cardiac arrest with light would allow doctors to restore the normal functioning of the heart in a safe and painless manner. Today's defibrillators deliver painful pulses of electricity and can damage heart tissue.

The concept is derived from optogenetics, which combines molecular biology with light stimulation to manipulate the messages that neurons send to each other. Tests have so far successfully been carried out on animals and on computer models of a human heart. The technique now needs to be fine-tuned before it is introduced on humans.

Landmarks across the world light up to raise awareness on World NTD Day 2022

100 landmarks in 32 countries lit up in unity to mark the third annual World NTD Day on January 30, 2022 including The Bell Tower in Perth, Tokyo Tower, Great Wall of China, New Delhi Railway Station, Sheikh Zayed Bridge in Abu Dhabi, Expo 2020 Dubai, Kenyatta International Convention Centre, The Rome Colosseum, Jet d' Eau, Niagara Falls, CN Tower, Jimmy Carter Presidential Library, and Christ the Redeemer.

A special focus was placed on notable landmarks in endemic countries including Bangladesh, Brazil, Burundi, the Democratic Republic of the Congo, Ethiopia, Ghana, India, Kenya, Liberia, Mexico, Niger, Nigeria, Philippines, Rwanda, South Sudan, and Sudan. Originally announced in Abu Dhabi in 2019, the 100 'light ups' aim to shine a light on neglected tropical diseases (NTDs), as World NTD Day supports the goal of the World Health Organization (WHO) to eliminate at least one NTD from 100 endemic countries by 2030.

World NTD Day is a global movement that aims to galvanize the global health community and engage the public in the urgent effort to end NTDs. This year Uniting to Combat NTDs used the Day to launch the 100% Committed movement, which exists to begin securing political and financial commitments in support of the Kigali Declaration on NTDs.

Thoko Pooley, Executive Director of Uniting to Combat NTDs, said: "Today, building on the

Light minded
Doctors may use lasers to perform delicate brain operations. They already use lasers for procedures such as burning away a tumour formed within the skull. Now neurosurgeons hope that laser light can be used to trigger chemical reactions in brain tissue, helping control certain mental disorders. Brain lasers are also being tested to treat epilepsy, with surgeons guiding the laser to use controlled heat to remove the spot in the brain where seizures are thought to originate.

Light fidelity
Li-Fi, a light-based communication technology, could become the next Wi-Fi. For a start, it's 100 times faster. And because light can't pass through walls, Li-Fi is also more secure and results in less interference. The technology makes use of light waves, or visible light communication technology, instead of radio technology to communicate data.

Professor Harald Haas from the University of Edinburgh invented Li-Fi in 2011 when he discovered that flicking a single LED light on and off at extreme speeds could transmit more data than a cellular tower.

Beam me up
Lasers might be used to meet our future energy needs. The idea is that solar-powered satellites will be rocketed into a special orbital position where they will gather energy from sunlight. The energy will power a large laser that will direct a beam back to Earth, where a receiver will collect the beam and then convert it into electricity. A sufficient number of these satellites could cater for a large amount of our energy requirements.

Picture perfect
Remember when that image of Princess Leia floated into view in the original 1977 Star Wars film? Imagine sitting at home and a Stars Wars-style 3D hologram image of your loved one appears when they call you on the phone? Experts believe that we are close to introducing real holograms, thanks to advances using plasma lasers, allowing light to be viewed without having to bounce it off a surface.

Light and healthy
Keep a close eye on your health using medical measurement methods that can be integrated into watches, smartphones or fitness bracelets. Optical sensors allow you to observe your heart rate, pulse rate and even the oxygen saturation of your blood when out running, exercising or going about your daily life. Sensor products, for instance Osram Opto Semiconductors, use high-efficiency chip technology to provide extremely reliable measurements.

Cropping up
Food needs sunlight to grow, right? Not necessarily. Vertical farms are the latest urban development producing leafier greens in less space with less environmental damage than traditional farms, powered by special LED lighting.

Horticulture lighting fixtures, such as Osram's Oslon SSL 660 nm and SSL 450 nm LEDs, efficiently grow fresh produce year-round, avoiding dents in food production brought by seasonal highs and lows and extreme weather patterns, such as droughts and floods. Plants convert the specific wavelengths of the lighting into chemical energy as part of the photosynthesis process.

A smart display
While Organic light-emitting diode technology (OLED) is increasingly being used in displays for smartphones, experts are already talking about smartphone models featuring bendable screens, or even ones that fold in half.

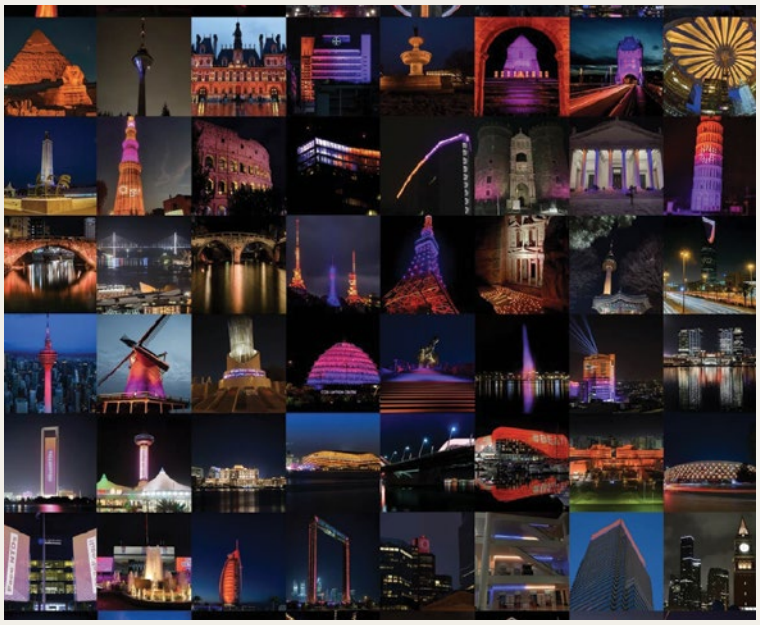
The advanced display technology allows for thinner display and brighter colours, which are less draining on the battery than current phone displays.

www.ledvance.com

success of the London Declaration on NTDs, and recognising the changing global landscape, we are using World NTD Day 2022 as a catalyst for action. We are launching the 100% Committed campaign, a global movement to secure increased resources for neglected tropical diseases, and crucially to facilitate political leadership and ownership of NTD programmes from affected countries, through endorsements and signatories behind the new Kigali Declaration on NTDs."

NTDs are a group of communicable diseases that are preventable and treatable, yet continue to affect more than 1.7 billion people worldwide, including a billion children. There are 20 diseases that cause immeasurable suffering – they debilitate, disfigure and can be fatal. NTDs create cycles of poverty and cost developing nations billions of dollars every year.

www.worldntdday.org



Redesign of Constitution Hill's Old Fort

In an exciting initiative led by Clout/SA and supported by Nando's, three rising local designers have creatively reimagined the Old Fort Meeting Rooms and Coffee Shop at the historic Constitution Hill in Braamfontein, Johannesburg. This recently completed interior design project introduces a vibrant local-led aesthetic to the heritage precinct, thereby enriching its many-layered past and priming it for the future.

Today, the former prison and military fort serves as a living museum and a venue for exhibitions and other events, as well as being the home of the country's Constitutional Court. With the redesign of the Old Fort Meeting Rooms and Coffee Shop – which are now filled with furniture and lighting from some of the most innovative young South African designers – it has also become a window onto the present as well as the future of local design.

With the support of restaurant chain, Nando's, which funded the initiative as a gift to Constitutional Hill, Lynch nominated three interior designers to pitch proposals for the redesign. Afri Modern founder Sifiso Shange, Pinda Furniture and Interior Design founder Siyanda Mbele, and Renaissance Design founder, Glorinah Khutso Mabaso (who invited Omni Design's Nelson Kubheka to collaborate with her on the pitch) were all asked to put forward their concepts for consideration.

"These selected designers speak a language of rebirth and transformation. They have found new ways of expressing our South African heritage, of making creative connections and building community. Storytelling, art and design are their chosen tools," Lynch explains.

Beyond being an interior design project, the challenge turned into a journey of learning for the designers, each of whom had to take a deep dive into the history of Constitution Hill, and therefore, the history of South Africa.

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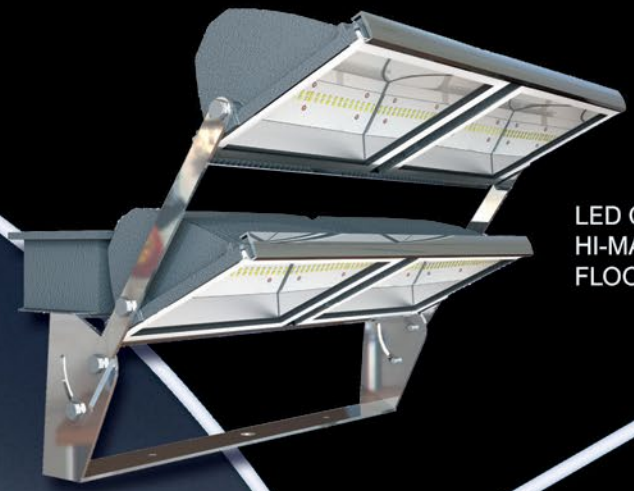

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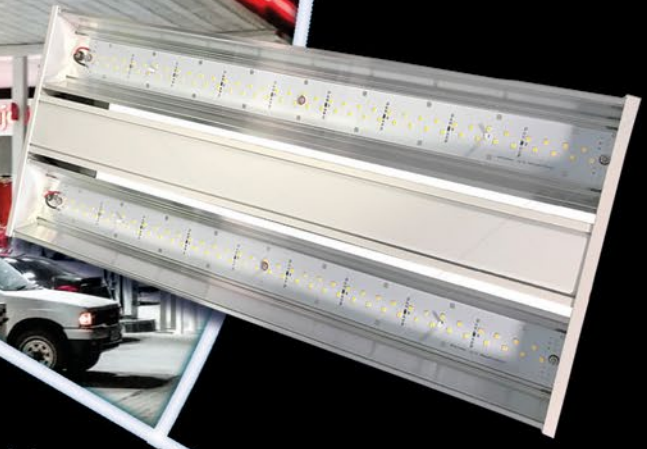

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