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The residential issue: lighting three contemporary homes

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Lighting for **hazardous areas**

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IVELA ACHILLE
PR420

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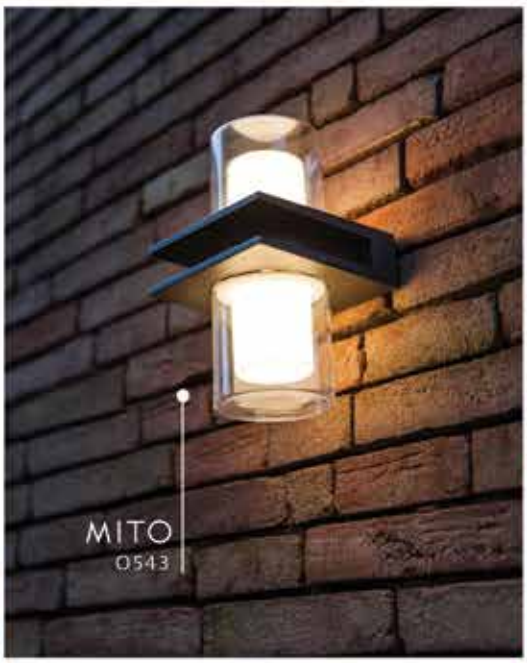

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EdSpace

We are in the midst of the 4th Industrial Revolution, and technology is evolving faster than ever. Companies, and individuals who don't keep up with some of the major tech trends, run the risk of being left behind. I recently came across an article by internationally best-selling author, futurist, and strategic business/technology advisor to governments and companies, Bernard Marr, which looks ahead to some of the imminent technology trends for next year.

He believes that Artificial Intelligence (AI) is one of the most transformative tech evolutions of our times. As he highlighted in the book 'Artificial Intelligence in Practice', most companies have started to explore how they can use AI to improve the customer experience and to streamline their business operations. This will continue in 2020, and while people will increasingly become used to working alongside AI, designing and deploying your own AI-based systems will remain an expensive proposition for most businesses.

Next up, the 5th generation of mobile internet connectivity – 5G – is going to give us super-fast download and upload speeds as well as more stable connections. While 5G mobile data networks became available for the first time in 2019, they were mostly still expensive and limited to functioning in confined areas or major cities. 2020 is likely to be the year when 5G really starts to fly, with more affordable data plans as well as greatly improved coverage. As more street lights and commercial infrastructures are switched to connected smart LED lights, opportunities are emerging to fuse other smart city technologies with smart lighting; one driver is the emergence of 5G.

Marr also picks Computer Vision as one of the upcoming technology trends. In computer terms, 'vision' involves systems that are able to identify items, places, objects or people from visual images – those collected by a camera or sensor, many of which are already being catered for as add-on's in smart-ready street lighting. As we move through 2020, we're going to see computer vision equipped tools and technology rolled out for an ever-increasing number of uses. It's fundamental to the way autonomous cars will 'see' and navigate their way around danger.

Another trend to look out for in 2020 is Extended Reality (XR), a catch-all term that covers several new and emerging technologies being used to create more immersive digital experiences. Virtual reality (VR) provides a fully digitally immersive experience where you enter a computer-generated world using headsets that blend out the real world. Augmented reality (AR) overlays digital objects onto the real world via smartphone screens or displays (think Snapchat filters). Mixed reality (MR) is an extension of AR, which means users can interact with digital objects placed in the real world (think playing a holographic piano that you have placed into your room via an AR headset). We have already seen AR used by looking lighting companies – for instance BEKA Schréder's AR App, but in 2020, expect businesses get to grips with the wealth of exciting possibilities offered by both current forms of XR. Virtual and augmented reality will become increasingly prevalent for training and simulation, as well as offering new ways to interact with customers.

It is all quite exciting and we cannot wait to see what next year holds for the lighting industry. Until then the *Lighting in Design* team wishes all our readers and advertisers a good break and a prosperous and busy 2020!

Gregg

Editor: Gregg Cocking (lighting@crown.co.za) • Advertising manager: Carin Hannay (carinh@crown.co.za)
Layout: Adel JvR Bothma • Circulation: Karen Smith
Cover: House Hall, Photograph courtesy Inhouse
Published by Crown Publications (Pty) Ltd
PO Box 140, Bedfordview, 2008 - Tel: +27 (0)11 622 4770 Fax: +27 (0)11 615 6108 - Website: www.crown.co.za
ABC 2nd quarter: 3 475 • Printed by: Tandym Print

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INside ...

Illuminating a contemporary family home

The brief for this project to Inhouse Architectural Director, Jacques van Niekerk, was to provide a five-bedroom family home that took full advantage of the Atlantic Seaboard views and north-facing site, whilst providing privacy from neighbouring stands.

Chris Charlton. Pushing the envelope, the edgy interior finishes are steam punk reminiscent and make for an arresting juxtaposition of raw steel, timber flooring, raw concrete, and exposed brick face. Voluminous glass-cladding ensures expansive views of the courtyard, the Atlantic Ocean, and Lion's Head can be enjoyed from anywhere in the home. A highlight of the dining area is a dining table made with two engine blocks, while the contemporary kitchen's focal point is a custom-made art piece by Ana Kuni.

The triple-volume residence is a calculated juxtapositioning of raw materials set into the face of a sloping hill in Bantry Bay, Cape Town. It comprises five en-suite bedrooms, a generous open-plan living area and kitchen, a rooftop terrace with a bar, and a double-volume courtyard that functions as the centrepiece.

Because of its north-facing plot, the residence is in a prime position to catch both sunrise and sunset. Large sliding doors surrounding the courtyard and terrace stack in concealed pockets, creating a seamless connection between the indoor living area and the courtyard, which is flooded with natural light. Massive overhangs counteract the summer sun by creating pools of much-needed shade, helping to regulate the home's temperature. Up top, the entire roof functions as an expansive entertainment terrace complete with sheltered bar, built-in seating, and sunset viewing platform.

"By working closely with the owner, a dynamic dialogue was developed between the architecture, raw materiality, and furnishings that represent the character of the owner," explains Project Architect

Lighting brief

The brief for the lighting of this project was based around the layout of the house and its focus on natural light, which is brought in from the house's north facing side and large glass openings around the courtyard. General down lighting was designed on a linear axis basis, drawing the eye of the user to specific architectural focal points. In addition, specific down lighting positions for art and feature walls were positioned throughout the house. LED strip lighting was used extensively to highlight and light wash architectural elements, such as stairs and off shutter concrete soffits.

The house consists of various levels and volumes, each with its own unique requirements. Double volume areas, such as the lounge and bar areas, received a custom industrial-inspired chandelier that visually links to the internal Juliet balcony. The balcony looks into this space, while three downlights wash the double volume off shutter concrete wall reflecting ambient light into this zone.

Custom made downlight boxes were designed

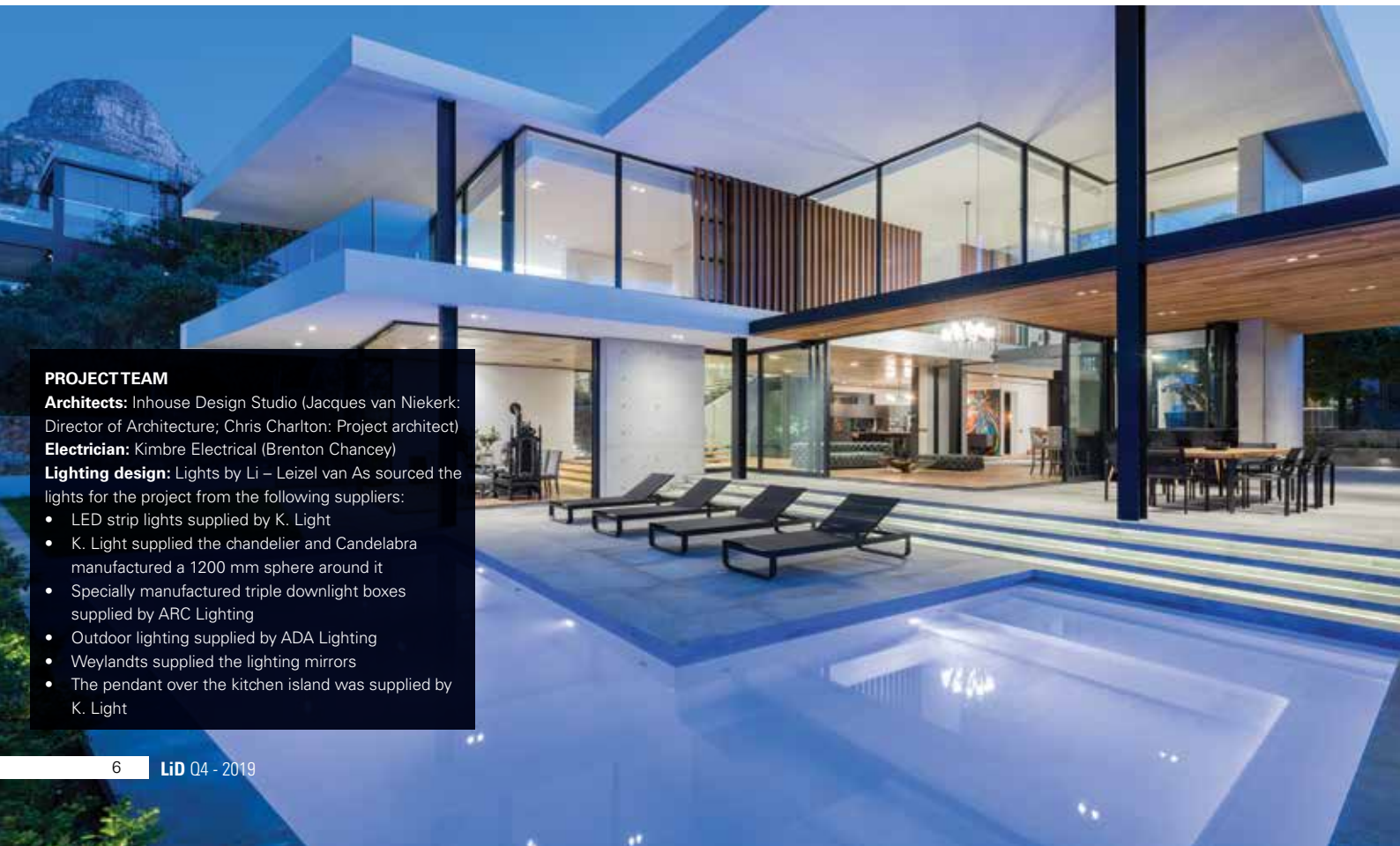
and recessed into the exposed RC concrete soffits over the kitchen, dining and living spaces to create a monolithic surface and feel to this open plan area, while a dropped feature pendant designates the kitchen island.

Minimum, moody lighting was used in the guest bathroom, which received an all-black palette, reflective glass wallpaper and a feature pendant to set the tone. Downstairs in the car showroom, commercial lighting was used on a grid pattern to cast light over the pristine car collection. Softer, warm lighting was used in the mezzanine level bar area, perfect to sit and admire the collection.

A challenge in designing the lighting for a residence of this nature was the coordination of the layout at an early stage to ensure the lighting was correctly executed. Because a large portion of the lighting was recessed into the concrete, the aforementioned custom boxes had to be designed and positioned between the steel reinforcements and co-ordinated on the soffit, prior to the concrete being cast. This was made easier by a hands-on client who was able to visualise the effect of the end product, and make decisions on site as the project unfolded.

Another lighting challenge was executing the floating timber staircase. Each tread has an LED strip light positioned on the underside. To achieve this, a micro level of detail was necessary to ensure that each tread that was being manufactured off site had the correctly routed slots and tolerances. The electrician had to connect each tread, LED drivers had to be hidden inside the steel stringer with removable hatches to access and, lastly, the steel stringer had to be wired prior to the contractor installing each section together. Without monitoring and guiding the design of this detail, the staircase would not have been successful.

According to Charlton, the use of lighting to highlight architectural features (such as the internal and external stairs, feature trees and concrete soffits) added a level of finesse to the design of the project. A combination of downlights, spot lights and LED strip lights was used in the project. "Lighting in a residential project is critical, especially natural light, as it creates a homely feeling. As the sun rotates around the house from sunrise to sunset the user experiences a variety of moments as the shadows and light penetrate the house, either warming or cooling the interior. This is then further enhanced with the use of strategically planned lighting that creates atmosphere and functionality," he says.



PROJECT TEAM

Architects: Inhouse Design Studio (Jacques van Niekerk: Director of Architecture; Chris Charlton: Project architect)
Electrician: Kimbre Electrical (Brenton Chancey)
Lighting design: Lights by Li – Leizel van As sourced the lights for the project from the following suppliers:

- LED strip lights supplied by K. Light
- K. Light supplied the chandelier and Candelabra manufactured a 1200 mm sphere around it
- Specially manufactured triple downlight boxes supplied by ARC Lighting
- Outdoor lighting supplied by ADA Lighting
- Weylandts supplied the lighting mirrors
- The pendant over the kitchen island was supplied by K. Light

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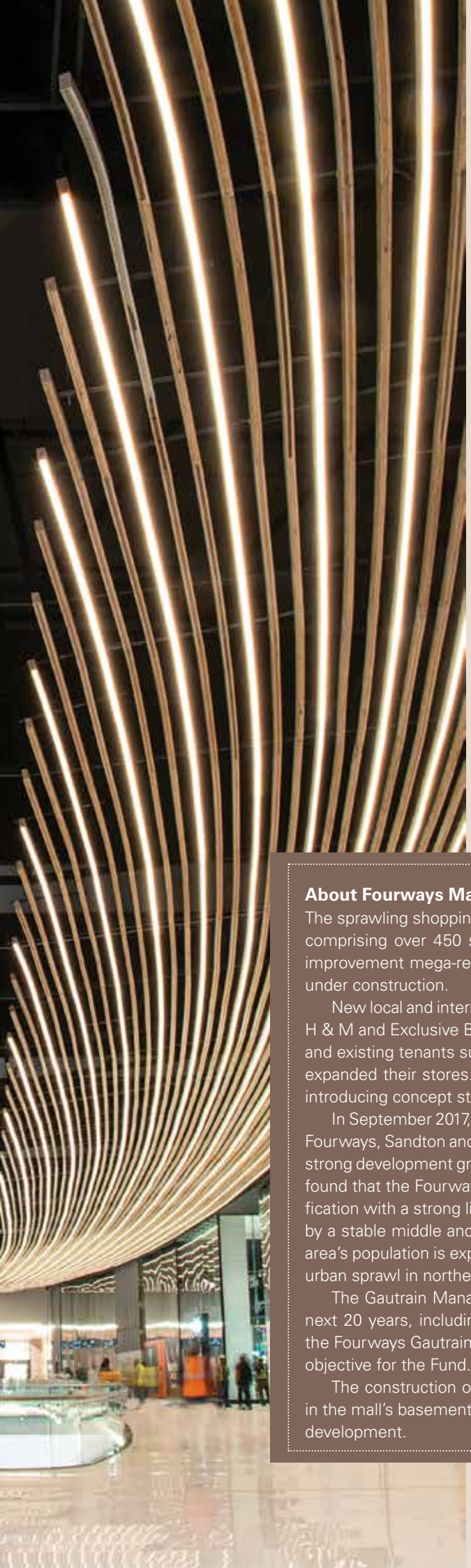
TRILUX

Lighting creates visual hierarchy at Fourways Mall

Fourways Mall, now the largest mall in Southern Africa, has opened its doors after a massive extension and renovation project that's doubled the size of the mall. Special attention was paid to the lighting to create a vibrant and fresh look.

The primary brief for the lighting design at the recently renovated Fourways Mall was to create a fresh look, according to Siddarth Mathur, Partner at Studio Lumen, a Dubai-based lighting design and consultancy practice which was part of the team that was asked to design a world class mall with a unique shopping experience. "In addition to the new mall areas that were designed from scratch, existing areas also received a facelift



and we set out to ensure that the effect and accent lighting provides the ambient lighting within all mall spaces. This creates a vibrant and fresh look and feel." To ensure that the lighting could be layered, careful product selection was required.

Different areas within the mall have received varied lighting interventions, while there is a constant effect that binds all of them. "This achieves uniformity while creating a visual interest for the viewer, and, from a lighting perspective, it is the most noticeable aspect. This said, it is also true that some viewers might not even notice the intervention, which is ultimately a compliment to the lighting," he notes.

From the perspective of lighting requirements, all areas were the same, says Mathur. "The functional lighting requirements were the same, but the challenges they overcame and results they achieved are diverse. The vertical circulation courts are positioned where the malls intersect and we assigned a different colour to each of these spaces to act as wayfinding 'landmarks' that guide the consumer through the space." As a rule, the lux levels of the general mall circulation are lower than the surrounding shops to keep the focus on the shopfronts and merchandise.

There are different coloured LED disc luminaires in the courts, and the design team reinforced this

About Fourways Mall

The sprawling shopping and entertainment complex boasts a gross lettable area of 178 000 m^2, comprising over 450 stores. This will grow to 200 000 m^2 with the launch of French home improvement mega-retailer Leroy Merlin, with its box, to be linked to the main mall, currently under construction.

New local and international stores such as Lindt, Hamleys, Cotton On, Nike, Adidas Starbucks, H & M and Exclusive Books complement the extensive food court and entertainment offerings, and existing tenants such as Mr Price, the Foschini Group stores, Edgars and Woolworths have expanded their stores. All new and expanding stores will be first of their kind in South Africa, introducing concept store offerings that will be exclusive to the Fourways Mall.

In September 2017, Dr Dirk Prinsloo of Urban Studies undertook a comparative analysis of the Fourways, Sandton and Waterfall nodes and concluded that the Fourways node was experiencing strong development growth, which was dominated by the extension of Fourways Mall. The study found that the Fourways node is a dominant retail node characterised by high residential densification with a strong living-standards measure (LSM). The Fourways LSM profile is categorised by a stable middle and upper segment, especially in the highest (10) LSM brackets (53%). The area's population is expected to grow around 3% annually, largely as a result of urbanisation and urban sprawl in northern Gauteng.

The Gautrain Management Agency is planning to extend the rail route by 150 km over the next 20 years, including routes through Randburg, Fourways, Lanseria and Soweto. Locating the Fourways Gautrain station adjacent to Fourways Mall remains a key medium-term strategic objective for the Fund.

The construction of 3000 additional parking bays, along with the taxi holding area situated in the mall's basement parking, is bolstered by vastly improved road infrastructure adjoining the development.

concept through the introduction of hand-blown suspended glass sculptures in each court. Each of the sculptures consists of between 800 and 1 300 individual pieces suspended from purpose-made steel structures under the skylights, which flood these spaces with natural light and bring the glass to life.

Since the lighting concept revolved around effect-based lighting, a primary challenge in the project was to source products that could achieve this. "By not using standard light sources a layer of complexity was created, which required careful consideration when the lighting calculations were being drafted," says Mathur. "Another challenge was being able to source these light sources within the South African market to remain sympathetic to the project's budget."

Mathur believes that good lighting design is crucial to retail. Modern retail environments have become quite complex spaces which cater to different needs, for example, entertainment/shopping/leisure, etc., and good lighting is imperative to the look and feel of these spaces. "The lighting at Fourways Mall enhances the overall visual hierarchy within all spaces of the project and creates a seamless transition between spaces. Accentuating the material palette, and rendering the interior design finishes is another achievement of the project," he says.

Mathur looks back at the project with a sense of pride. "This was a very complex project with multiple companies involved, and it was quite a challenge to meet expectations," he says. With the glowing reception that has been received from both tenants and customers for the revitalised mall, it is clear that the expectations were exceeded.

PROJECT TEAM
Client: Accelerate Property Fund
Architect: Boogertman + Partners
Main contractor: Mota-Engil Construction South Africa
Project manager: SIP Project Managers
Engineer: WSP Africa
Lighting design: Studio Lumen

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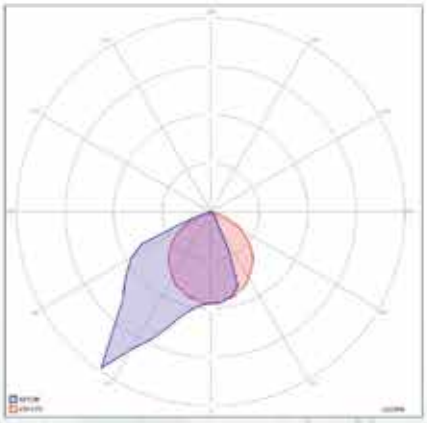

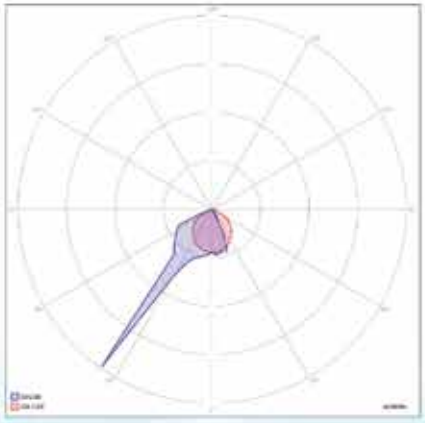

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Email: freddie@giantlight.co.za; glenn@giantlight.co.za; mark@giantlight.co.za; derek@giantlight.co.za

Quiet opulence

OKHA's latest interior project, Clifton 301, is a seasonal two-bedroom apartment in a sophisticated contemporary complex designed by SAOTA. Flanked on either side by Table Mountain's legendary Twelve Apostles, it looks out over breath-taking panoramic views of the Cape Atlantic Ocean and is in equal parts luxurious getaway, relaxed coastal retreat and entertainer's dream.

The architects designed the complex with deliberately pared-down, monochromatic interior shells. Not only was OKHA responsible for the interior decoration, but also designed key items of bespoke handmade furniture throughout the apartment.

The client gave OKHA *carte blanche* on every design element, including lighting "Our first objective was to individualise the space by modulating the internal colour palette," says OKHA director Adam Court. He and the OKHA team set about customising the apartment's interiors to create a cool and restful space in contrast to the bright, sunlit exterior.

"We used subtle shades of green with delicate natural tonalities that reference the local landscape," says Court. Table Mountain's famous granite, fynbos and dappled woods are evoked throughout the apartment in a rich, raw palette of natural timbers, stones and metals, which are contrasted with plush velvets and linens on the walls, floors and furniture coverings, resulting in what Court refers to as a contemporary "quiet opulence".

"These shades are repeated in the furniture with a strong emphasis on textures and materials," he adds. When it came to designing the custom furniture pieces, Court says, "The designs are pared-back and lean, focusing on strong forms and shapes that communicate simply and directly."

"All the artwork, accessories and objects are from Cape-based artisans and add an essential level of layering and local character," he adds. Dream Emperor Marble and Absolute Black Granite tabletops are paired with steel bases in the side, coffee and balcony tables. The dining table, barstools and server are hewn from carbon-stained wire brushed Ash timber, also used in the frame of signature OKHA 'Port' mirror, which, with its copper framed recessed mirror carries a nautical tone of a ship's circular windows.

All the pre-existing lighting in the apartment is inset overhead lighting, and OKHA contrasted this by using free-standing custom-made lighting. This also allowed the designers to create new spaces through each area being lit differently. "In the master bedroom and guest bedroom, for instance, we used Icuuci and Frame bedside table lamps respectively, to give a soft light. In the main living area we have used a Studio standing lamp which gives a strong light, which is nonetheless diffused and therefore modulates the space by giving it a visual centre that is bright enough to be productive yet gentle enough to be ambient. We have also used a standing lamp in the office – the She standing lamp – which when used in conjunction with a desk lamp, serves to make a working space more tailored," explains Court. For the dining area

OKHA brought in a pendant by Maxim Décor to create a sense of drama and a central focal point for the entire apartment.

Because Clifton 301 overlooks the beach with wall to wall sliding doors, the sunlight plays a pivotal role in the mood and lighting of the apartment. "Lighting is equally important for all environment types, from residential to hospitality, for the spaces to work," notes Court. "Each of the roles these places play in a person's life contributes to the total success and happiness a person can achieve. It is important that lighting is tailored to each environment's activity, for instance, you want an even bright light in your working environment to promote consistent energy levels, whereas you want a soft intimate light in your bedroom to allow you to read while you relax for a good sleep. Lighting is a wholly psychological factor and we are largely able to manipulate our actions and moods by the lighting we choose." Court believes that lighting operates as a powerful directive of what to focus on, how to move through a building as well as where the pause points are and what the designated activity in each space is.

PROJECT TEAM
Interior design: OKHA
Architects: SAOTA
Design team: OKHA Creative Director, Adam Court and OKHA Project Manager, Janine Saal
Photography: Niel Vosloo, Adam Letch, Peter Bruyns, Melissa de Freitas

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Lighting complements architecture at minimalist home

As evidenced by this modern home, gone are the days when lighting was merely an after-thought, installed in a house for the sole purpose of providing light at night.

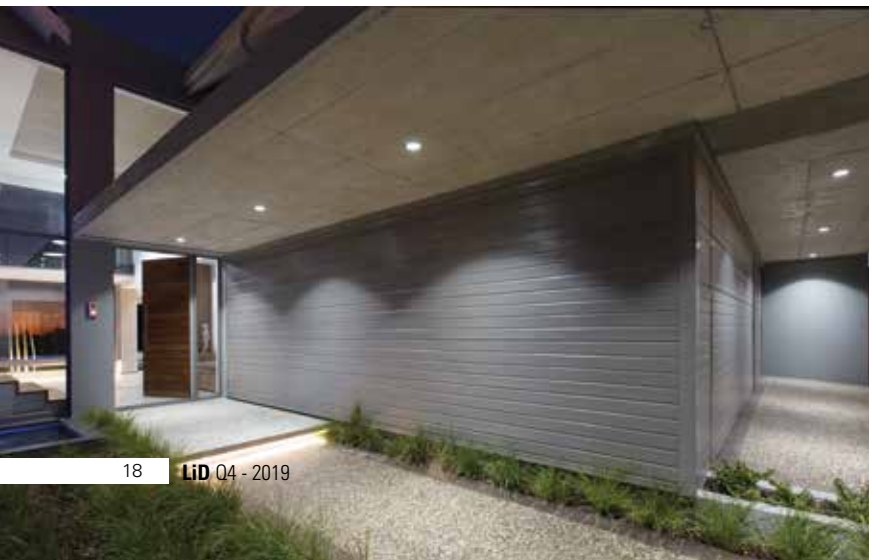
When lighting needed to be installed at a modern, minimalistic house in Pearl Valley, Willie Mongie from Hyper Lighting and Fires turned to Spazio Lighting and the results are phenomenal.

The owner of the house wanted the lighting supplied to be LED energy saving and, where possible, from one supplier notes Mongie. "We decided that the range of lighting that Spazio has to offer would be the perfect fit," he says.

Due to the design, features and finishes of the house, Hyper Lighting and Fires had to find light fittings that were modern and minimalistic and would not be over-powering, but rather complement the design of the house. As such, downlights were used throughout most of the house (2218 Spazio antiglare downlights were used for a uniform light distribution), while there was a request for pendants to be installed in the entrance hall, the kitchen over the counter and over the dining room and pool tables. "The exterior of the house needed to have lighting that would cast light beams on certain architectural focal points," he says.

"Nearly all the lighting products used for this project were supplied by Spazio Lighting," explains Mongie. "Slimline Tube LED pendants installed over the kitchen counter give focused

light to the work surface, and the two large Roma pendants in white with custom fit red canvas cable, suspended from the ceiling of the double volume entrance hall, make an incredible statement as you enter this beautiful home. Soho pendants in matt copper and dark grey were installed over the dining room table as well as the pool table while Block two light exterior fittings in silver give off an up and down facing light beam to accentuate certain exterior design elements. Finally, Minitommy garden spots from Fumagalli give life to certain focal points in the garden."



Mongie believes that the minimalistic design of the Spazio light fittings complements the design of the house very well and brings the picture together at night. "Lighting is one of the most important aspects to consider when building or revamping your home. You want the lighting that you choose to complement the design of the house, whilst still being practical and providing sufficient light to accentuate certain areas. I am more than satisfied with the outcome of this project and I look forward to collaborating with Spazio on future residential projects," he says.

SPAZIO LIGHTING

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Lighting and the Circular Economy

By Henk Rotman

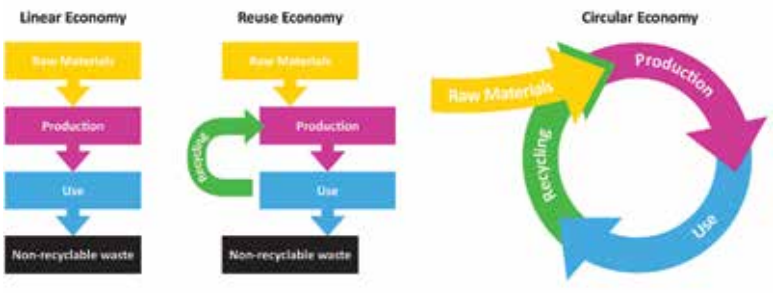
Both the Global Lighting Association and Lighting Europe publish 'road maps' for the lighting industry. The road maps from these organisations mention well-known developments such as intelligent and human-centric lighting, but also indicate an increased role for a lesser known concept, the 'Circular Economy'.

Traditionally, economies are based on a one-way or linear model of production and consumption, meaning goods are produced using raw materials, sold, used and then thrown away or incinerated as waste. The realisation that there are limits to the linear economy is growing.

At some point in the future the availability of raw materials will becomesa challenge owing to upcoming depletion of certain elements combined with higher demand due to economic and population growth. At the same time we can expect higher costs for raw materials based on growing demand, the fact that we have harvested the 'low hanging fruit', while environmental concerns will also trigger price increases. Finally, growing concerns regarding the waste generated by the linear economy (with the discussions raging on regarding the plastic waste in our oceans as proof of point) combined with landfills reaching their limits are other important factors for looking to alternatives to the linear economy.

Alternatives to the linear economy

A well-known alternative to the linear economy is an economy based on recycling, where materials are re-used. For example, waste glass is used to make new glass and waste paper is used to make new paper. Recycling is the first step in creating a circular economy that is restorative and regenerative by intention and design.



From a linear to a circular economy

Principles of the Circular Economy

The Circular Economy is based on the following three principles:

1. Products are designed to prevent waste and optimised for a cycle of disassembly and re-use.
   Any product design has to take many things into account: it must do what it is supposed to do, meet relevant safety (and performance) standards, be easy to produce, meet cost targets, etc. The Circular Economy adds an extra dimension to product design, as the product needs to be designed for serviceability, which is the ability to extend both the technical and the economic lifetime of the product.
2. The energy required to fuel the cycle of disassembly and re-use as mentioned under point 1 should be renewable by nature (e.g. generated by solar or wind).
3. The Circular Economy replaces the concept of a consumer with that of a user.

The three principles and their relevance to lighting

The first (and most important) principle of the Circular Economy is that the product is designed for serviceability, prolonging the technical and economic lifetime of the product, after it has been put into service. Examples of the above are:

- Repair of hardware or software (e.g. replace LED module or update LED driver software).
- Replace components or software for better performance or additional functionality (e.g. mount a new LED module with higher efficacy).
- Increase the luminaire functionality by adding a component such as a sensor.

Consumers turning into users is the third principle of the Circular Economy and, when it comes to lighting, this principle has a specific name: 'Light as a Service' (LaaS). LaaS is a service delivery model in which light service is charged on a subscription basis rather than via a one-time payment' (source: Wikipedia). In more popular terms, we can say that LaaS is the 'leasing of light'.

In the case of LaaS, the vendors remain the owners of the lighting equipment and are responsible for maintenance and disposal at end-of-life. They therefore have a strong incentive to look at:

- Durability to minimise failures.
- Easy serviceability.
- Longevity.
- Reduce waste, improve recycling.

LED-based solutions are theoretically ideal for LaaS given their long lifetime. Easy serviceability and reduction of waste can be realised via the use of good quality, modular, replaceable components.

Impact of using modular, replaceable components

Today, many LED luminaires are 'sealed for life', which means that in the case of a failure the full luminaire needs to be replaced. This is especially valid for decorative luminaires for residential use and for professional luminaires with the LED side-lit panel as an example.

Luminaires using modular, replaceable components offer the advantage that in case of an LED failure only the LED module needs replacement. Points of attention when using modular, replaceable components are:

- *Standards supporting easy replace-ability across brands (Zhaga):*
  Sometimes, luminaires use LED modules specifically made for them. In the case of an LED module failure after several years there is a high risk that the specific module is no longer available. As a consequence, the full luminaire will need replacement. Using LED modules based on a Zhaga standard increases the possibility a replacement module being available, if not from the brand originally used almost certainly from another brand.
- *Compatibility between generations:*
  Because of the increased efficacy of LEDs over the years, the relevant parameters of LED modules (including modules based on Zhaga) change from generation to generation. Usually, the light output of the module remains constant meaning that (with increased LED efficacy) the operating current and/or the forward voltage of the module decreases. This can lead to non-compatibility with the installed LED driver. (See the LED driver compatibility section for examples.)
- *Mounting of components:*
  The mounting of components (such as modules, drivers or lenses) must allow easy replacement. Using clips is a good way of making this possible.

- *Impact on warranties:*
  Often warranties given for lighting products, including luminaires, come with T&Cs which include a statement that the warranty is null and void if the original components are replaced or that the warranty is only valid when an LED module and driver from the same manufacturer are used. These T&Cs need to be adjusted for the Circular Economy to take off.

(South) Africa and the Circular Economy

While recycling in South Africa is at a high level, the Circular Economy is still in its infancy. South Africa is committed to its 2030 vision through the National Development Plan of a 'transition to an environmentally sustainable, climate change resilient, low-carbon economy and just society' and for this to enhance the implementation of the Circular Economy.

One of government's initiatives to grow the Circular Economy was the launch of the 'Africa Alliance on Circular Economy', which was the brainchild of Rwanda, Nigeria and South-Africa in conjunction with the World Economic Forum (WEF) and the Global Environment Facility (GEF). The alliance is responsible for fast tracking the adoption of the new module on the continent.

The South African lighting sector and the Circular Economy

Via Lightcycle SA, the lighting industry has prepared a five year Extended Producer Responsibility (EPR) plan, aka 'Waste Management Plan' or 'Lightcycle SA plan'. As a further deliverable of the National Development Plan Circular Economy, obligations will be added to the plan in due course. One of the conclusions of the plan is: 'The Lightcycle SA Plan embraces the Circular Economy philosophy by ensuring that, through the Lightcycle SA Value chain accredited recyclers, all lighting waste components, constituents and materials become available as ' technical nutrients' rather than 'waste'.

LED driver compatibility

The article '*Selecting the correct LED driver*', published in *Lighting in Design* in 2018, highlights the ins and outs of LED - driver compatibility.

The topic is relevant to the Circular Economy because of the recommended use of modular – and replaceable – components. In the original lighting solution, the LED module and the LED driver must match on operating current and forward voltage. In the case where the LED module is replaced after a number of years, it is possible that the originally installed LED driver will no longer match. Because of the increased efficacy of LEDs with each new generation, the operating current of the new module may be lower than the one that needs replacing. In the case where a single current LED driver is used the driver must be replaced by a driver offering the lower operating current. In the case where a programmable driver is used, it may be possible to re-program the driver (e.g. via a different resistor or via re-programming with software). A more likely scenario is that the forward voltage of the new module is lower than the original module. If the originally installed driver offers a narrow forward voltage range the driver could need replacement as well.

In practice, replacement of the driver owing to a failure is more likely than replacement of the module owing to failure. There are a variety of LED drivers available and there is no standardisation although, in certain cases, the drivers of reputable manufacturers have a similar footprint. Some luminaires are equipped with tailor made drivers and offer a very specific operating current. Replacing those drivers after a couple of years poses a real challenge.

Generally speaking, in order to facilitate the serviceability element of the Circular Economy it is recommended that a programmable driver offering a wide operating window be used in the original luminaire, as this increases the possibility that the driver can be used in the event of a module failure and it will also be easier to find a replacement driver in the case of driver failure.

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Lighting for hazardous areas

Hazardous area or explosion proof lighting is one of the most challenging sectors in the lighting industry. Often requiring the ability to perform in extremely harsh environments, safety is paramount. Consequently the sector is relatively slow to adapt to new technologies and use of rigorously tested, and proven, products is necessary.

Hazardous area lighting gives you safe illumination in areas where conventional lighting products cannot be used, either due to safety concerns or a lack of access for maintenance. Common applications include:

- Zone 0 lighting in areas at high risk of explosion.
- Outdoor lighting for docks, oil rigs and other exposed locations.
- Signal lighting for heli pads and bulkheads.
- Inspection lighting for tanks and enclosed areas.
- Emergency lighting for fire exits and escape routes.

Other applications take advantage of hazardous area lighting for its wide range of operating conditions, for example, in locations that experience a high temperature range or frequent sub-zero weather.

Source lumens vs. delivered lumens

When selecting a luminaire for use in a hazardous area, there are lots of different factors to consider. The lumen output (or power) of the luminaire is one of these important considerations. But are all lumen output figures comparable?

Source lumens: The 'source lumens' value is the total amount of light the luminaire emits at source, before it is transmitted through any lens or diffuser. Lumens are lost with every reflection, refraction or absorption through each material the light passes through, resulting in the value of 'delivered lumens' being less than the stated, emitted figure. The output can also be blocked or dispersed due to the luminaire's mechanical build interrupting the light flow, particularly at the extremities of the beam angle.

Delivered lumens: 'Delivered lumens' is the most accurate measure of how the luminaire will perform once installed. It is the actual amount of light delivered on scene, taking into account all barriers such as lenses, housing, and any filtering effects.

Which figure is used by hazardous area lighting manufacturers?

There is a large degree of uncertainty when comparing lumen output figures from different manufacturers. The 'delivered' value is considered the more equitable figure to use, but with no official standard to follow, there is nothing to say that this is the value all manufacturers are using. Identifying which figure is being used can often be very unclear and difficult to identify. This is especially true if photometric files (which give a true reflection of performance) are not readily available.

Imagine the scenario; you are specifying lighting for a project and are choosing between two luminaires from different manufacturers. Unbeknowns to you, each manufacturer has calculated the lumen output value in different ways; luminaire A is using 'source lumens' and luminaire B is using 'delivered lumens'. On paper, the performance of two luminaires may seem similar, but the reality is likely to be very different. As a customer, do you query the 'delivered lumens' figure when purchasing a luminaire?

Cold storage and freezing rooms

The struggle between light and cold is an on-going issue in the cold storage industry. Since fluorescent lighting does not perform well in cold conditions, businesses have had to install a greater number of low-efficiency luminaires in order to comply with lighting needs. Going forward, LED lighting, which thrives in such environments, is the solution.

Temperatures in cold stores range from 0 to 15 degrees while freezing rooms can go as low as -40 degrees Celsius. Therefore, lamps, operating gear and luminaires need to meet higher requirements for operating conditions.

With conventional luminaires fitted with HID and HPS light sources, energy consumption is high, as is the heat production. Also, lamp shifts are frequent, start-up times are long and hence sensor control systems are less suitable. LED light sources, on the other hand, consume less energy, need no lamp replacement, produce less heat and ignite immediately. They also lose less light compared to many conventional light sources. Finally, the low ambient temperature increases LED light source and operating gear lifetimes significantly. With LEDs, lighting quality is no longer compromised, it is enhanced.

Standard illuminance requirements in cold stores are low, but more light would make labels and storage documents easier to read. Luminaires in damp areas need a high IP rating and should be maintenance-friendly.

Chemical facilities

Chemical engineering facilities provide particularly harsh environments and a variety of work tasks. High temperatures, dusty environments and the presence of damaging gases may pose challenges to the lighting installation. Chemical processes are often fully automated and require constant surveillance. A proper vertical illumination is therefore needed for monitoring. Where screens are present, care should be taken to avoid unwanted glare and reflections. Illuminance requirements vary with the presence of people. Remote-controlled facilities require less light than constantly manned workplaces.

In areas where substances are mixed, grinded or pulverised, luminaires need to be dust-protected. Open containers need to be well illuminated. Some facilities may involve explosive substances, whereby explosion-protected luminaires are needed.

Where soiling is prevalent, enclosed luminaires are needed. Such luminaires offer long-term protection and are resistant to dust, moisture, chemicals, mechanical stresses and extreme ambient temperatures. Nevertheless, the plastic materials used in the enclosures have varying chemical resistance and should fit the application. One should also take care that the gases present do not reduce the lifetime of LED light sources. This is mitigated by selecting durable LED and control gear components.

Linear luminaire systems are suited for ceiling heights up to 15 m. Above 6 m, high-bay luminaires with narrow or medium beam reflectors are an alternative. Where the general lighting is not enough to aid the task at hand, dimmable workplace luminaires give extra illuminance.

Identifying hazardous areas

A hazardous area can be defined as any location where there is risk of an explosion. But every hazardous area is different and each has specific requirements depending on the nature of the atmosphere and the elements that are present.

Fundamentally, for an explosion to take place, flammable or explosive gases, vapours, mists or dusts will be present. Then, the level of risk of an explosion is based on the frequency and duration of the occurrence of an explosive atmosphere. This level of risk is represented by classifying the hazardous area as Zone 0, Zone 1 or Zone 2 (for gas, vapour and mist atmospheres) or Zone 21 or Zone 22 for dust atmospheres.

Below we will look at what defines Zone 0, Zone 1 and Zone 2 hazardous area classifications and the considerations for specifying lighting into each area. But first, we must consider what is likely to cause an explosion in the first place.

There are three necessary components for an explosion to occur;

1. Flammable Substance – this needs to be present in a relatively high quantity to produce an explosive mixture (e.g. gas, vapours, mists and dusts).
2. Oxygen – oxygen is required in high quantities and in combination with the flammable substance to produce an explosive atmosphere.
3. Ignition Source – a spark or high heat must also be present.

Where there is potential for an explosive atmosphere, special precautions are needed to prevent fires and explosions. Electronic equipment, including lighting, needs to be purpose designed for use in hazardous areas to prevent a spark occurring and igniting any flammable substances.

Although every application is different, for the ease of monitoring and specification each hazardous area is classified as a particular level or "zone". As a result, all hazardous area equipment must be designed with hazardous area zone classifications in mind, as the "zone" governs the level of protection and precaution required. It is essential to know which zone you are working in, so that you can specify the most appropriate equipment.

For gases, vapours and mists the zone classifications are recognised as Zone 0, Zone 1 and Zone 2 areas.

* Zone 0 is an area in which an explosive atmosphere is present continuously for long periods of time or will frequently occur.
* Zone 1 is an area in which an explosive atmosphere is likely to occur occasionally in normal operation. It may exist because of repair, maintenance operations, or leakage.
* Zone 2 is a place in which an explosive atmosphere is not likely to occur in normal operation but, if it does occur, will persist for a short period only. These areas only become hazardous in case of an accident or some unusual operating condition.

Lighting a staircase

Implementing staircase lighting takes a fair bit of planning, especially when looking to integrate lights into the steps themselves. You also need to consider what you want to achieve from your staircase. Is it to accentuate its shape and style or is it for practical reasons, such as pronouncing the steps edges for safety benefits?

A dark stairway is extremely dangerous. A single misstep can have a painful outcome. Stairway lighting improves safety and prevents accidents.

Sometimes more is less and concealing your lights underneath the lip of a step, or beside them, can create a minimalistic mystery without even seeing the fitting. The illusion of light is powerful, and in a time when light fittings are becoming smaller and smaller it gives great opportunity to discretely position your lights without the fitting being visible.

Take advantage of the nooks and crannies, bends and edges, because a staircase's structure can be your playground to plot a textured lighting scheme. By implementing concealed lighting you'll make the actual feature glow rather than using a distant and separate lighting location to distribute a beam onto the feature.

One of the most popular selections for discreet and hidden lighting is strip lights. Their streamline and flexible nature allows them to fit into areas where other lighting systems will fail. Another positive perk of strip lights is the fact they come in many different colours, with some of them even providing a colour changing option for people who want to switch up the mood by using varying colourways.

Another option is to install lighting on the wall next to the stairs. Most staircases are adjacent to at least one wall, which makes it very easy to provide wiring for lighting. Recessed and mounted spots are popular wall lighting for stairs. Such spots are quite subtle and models exist that are almost invisible.

A staircase can be also lit from below. This light is blurred and subtle and is visible only in a small part that separates the stairs on the adjacent wall. With this type of lighting, the staircase creates a mysterious atmosphere in the whole house. The last way to light a stairway is from the ceiling. This is only possible when there is no second stairway above the first stairway (this is important for wiring reasons). For example, install recessed spots or mounted spots in the ceiling or use pendant lamps.

Decorative LED lighting solution for Battery Park, V&A Waterfront

BEKA Schréder supplied the decorative LED lighting solution for Battery Park, a new urban park that forms the gateway to the V&A Waterfront, integrating Cape Town's CBD and the V&A Waterfront through a series of pedestrian routes. Against the backdrop of Table Mountain, visitors to the park are able to engage in a range of outdoor recreation, entertainment and retail activities on various levels of public space. The site, which contains the rear ramparts of the historical Amsterdam Battery – one of the oldest structures in Cape Town – is also of archaeological importance.

With their aesthetic appeal and good performance, BEKA Schréder's ZELA post top LED luminaires and LEDpost bollards were the luminaires of choice. The elegant ZELA, with its timeless shape, is ideal for applications where energy saving, low maintenance and precise light control considerations are important factors. This LED post top emits a pleasant, glare-free light, making it the perfect luminaire for architectural spaces. The ZELA offers a cost-effective lighting solution for the creation of ambiance.

The BEKA LEDpost bollard with its distinct design incorporates a highly efficient LED light source. Light pollution is avoided because no spill light is emitted upwards. The easy-to-install, low maintenance LEDpost offers energy savings of up to 70%.

www.bekaschreder.co.za

Enlite changes to Aurora Lighting Group

After five years of success, Enlite, the LED lighting brand established by the Aurora Lighting Group, has been rebranded Aurora from September 2019.

The Aurora Lighting Group is an international LED lighting and technology organisation – renowned globally for its quality, reliability and service – which services the residential, commercial, industrial, retail and hospitality sectors. Combined with award winning marketing and distribution, the Group serves customers through a global network in more than 70 countries.

"Five years ago, Enlite was launched by the Aurora Lighting Group in response to market changes," explains Andrew Johnson, Founder and CEO of the Aurora Lighting Group. "Big performance, high quality and great value is what Enlite stands for, and these qualities have led to sales far exceeding expectations, with the range quickly becoming the number one choice for contractors and specifiers alike."

From its market leading fire rated downlights to the popular Ariah™Pro highbays, Enlite products are now installed in thousands of homes and businesses around the world. During this period, Aurora continued to push boundaries and innovate, becoming a globally recognised leader in smart connected lighting that provides exceptional Value Beyond Illumination™.

To continue on the back of both Enlite and Aurora's successes, and to assist our customers with the sale and promotion of these products in South Africa and internationally, our extensive product range and the AOne™ smart platform is being driven through one brand: Aurora Lighting.

"Bringing all our lighting products together enables greater focus, meaning there's one brand, one catalogue, one website, making our entire product portfolio easily accessible. Therefore, from October 2019, all our Enlite products have been rebranded under Aurora. The product and part numbers will remain the same, just the brand has changed. In addition, look out for new exciting products we launched in October," says Johnson.

www.auroralighting.com

New RLS showroom immerses visitors in a lighting experience

After 15 months of upgrades and renovations, Regent Lighting Solutions (RLS) has opened its interior showroom and exterior rooftop showroom. The company's Johannesburg head office has been completely renovated to create a more interactive and engaging experience for clients.

Aesthetically the building has undergone a facelift; however, the main focus of the upgrade was for clients to physically and visually experience the company's wide range of products with various control integrations. The concept is that once you step through the entrance, you are immediately taken on a visual catalogue walkthrough that shows the history of where the company started in the lighting industry to where it has come, all the while showcasing how light can transform a space.

Two open days were held at the beginning of October where customers and clients could interact with the technology, discuss new concepts and see the products in action. Lasse Ehmsen, OEM Sales Manager at Signify South Africa, delivered an interactive talk on lighting controls and technology which took in subjects such as lighting in the Circular Economy, standardising CRI values and the role China has to play in the LEDs of the future.

www.regentlight.co.za

Lasse Ehmsen, OEM Sales Manager at Signify South Africa, with Randal Wahl, owner of Regent Lighting Solutions. Ehmsen delivered an interactive talk at the opening of the upgraded Regent Lighting Solutions showroom.

Fonroche Lighting comes to South Africa

Fonroche Lighting, a French renewable energy business that has been pioneering renewable energy solutions for more than ten years has set its sights on Southern Africa.

Fredrik Hagelberg, who will be heading up Fonroche Lighting in Southern Africa says, "Having seen the rapid adoption of solar powered solutions in the past 10 years in Southern Africa, solar powered street and public space lighting is another logical step towards addressing rising energy costs and unreliable energy supply, not to mention the positive environmental impact it will have. In the same way Africa has leap-frogged over fixed telephone line infrastructure to adopt mobile phone technology, it just makes sense we leapfrog over expensive, grid-connected infrastructure wherever possible."

Just over 10 years ago, Fonroche identified solar street lighting as a massive need, particularly in the developing world where the costs of solar lighting are often far more competitive than conventional street lighting, considering the energy and installation costs associated with grid connected lights.

Fonroche has been successful in various regions around the world, but has been particularly successful in Africa and other regions that experience extreme heat such as the UAE, due its proprietary storage technology that easily copes with temperatures of up to 70 degrees Celsius. As a recent example, Fonroche was awarded the largest solar powered street lighting contract in the world, supplying Senegal with just over 50 000 solar street lights. This will effectively supply one third of Senegal's public lighting needs. "This is a prime example of what the future for holds for Africa when looking to improve, and build, new infrastructure to help grow its economies," says Hagelberg. "It not only offers a faster way to get much needed light to these areas at the same, or less of a cost, than conventional lighting, but it also creates new employment opportunities."

Fonroche Lighting plans on building its own assembly facility in the future and procuring some of its components locally – such as the steel poles and potentially solar modules – but until then, is looking for partners to distribute its lights throughout the region as it builds its presence locally.

www.fonroche-lighting.com

Solar street lighting in Senegal.

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THINK ELECTRICAL

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Kathrine Barbro Bendixen uses cow intestines to create sculptural lights

Discarded cow intestines are given a new life in the intricate lighting installations of Danish designer Kathrine Barbro Bendixen. The Studio KBB founder cleans and reinflates the intestines, creating translucent tubes that naturally twist around an LED lighting fixture.

Her multi-layered compositions create unusual lighting effects and draw attention to the natural details of the organic material. The designer sources her intestines from a supplier in Denmark. They arrive clean, but she carries out a series of additional processes to ensure they are completely disinfected.

Once prepared, the intestines are blown up like balloons. They naturally curl, which Barbro Bendixen tries to embrace as she hangs them around a light source. Initially the twisted tubes are soft and can be shaped, but after a few hours of drying they become more firm. They are left uncoated, allowing them to naturally 'breathe'.

Her next project will see her transform intestines into a set of stools, for an exhibition she is creating with her grandfather, a 93-year-old cabinetmaker. But she admits that lighting is her favourite use of the material. "You can see all the tiny details and the transparency that you would not notice otherwise," she said.

Nea Studio creates lamps from dried seaweed

Curling edges detail the hanging lamps that New York designer Nina Edwards Anker has created from dried sheets of algae. Edwards Anker, who runs Brooklyn practice Nea Studio, moulded sheets of the marine plant around objects and left them to dry to create the cylindrical pendants. "We allow the raw nature of each individual sheet of seaweed to form its own sculptural piece," she says.

The lamps are made from a dark green algae variety known as Chlorophyta. This is a seaweed that is translucent and able to filter sunlight that hits it, producing a glow during the day. Edwards Anker inserted an electric bulb each of the hanging lights. She chose LEDs because they radiate less heat than standard bulbs. Once the light is turned on, portions of the harden shell glow, while others remain a deep dark colour.

Each individual fixture is unique in its colouration and shape. Some are entirely smooth, while others feature bulges and rigid, uneven edges. "The material retains its original organic nature, translucency and colour, so that each hand-crafted light shade becomes an original sculpture," she concludes.

Lake + Wells turns modular Jax Lighting System into a screen

The latest design from Lake + Wells is the Jax Screen which allows you to create separation within a room or to add more light while defining a space. The modular elements easily lock together thereby powering each of the prism-like crystals to light up. When put together, the Jax Screen becomes a minimalist hanging sculpture that resembles a futuristic constellation of stars.

Both the aluminium and crystal components feature chamfered edges that give nod to cuts you'd typically find on chandelier prisms. While Jax honours the history of crystal in lighting, it also gives it a more prominent role as the source of light.

The series is available in four preset screen formations or it can be completely customised for any space. The fixtures are made from anodised aluminium with a choice of Aged Bronze, Golden Brass, Satin Black, and Satin Silver finishes. The solid optic crystals come in Clear, Frosted, or Smoke.

Plant-based lighting from High Society

High Society, a sustainable design start-up based in Italy, is creating plant-based lighting using post-industrial waste. Hemp leftovers, discarded leaves and stalks from tobacco cultivation, and pomace made using the solid remains of wine production, are each responsible for creating the different hues of the three available versions.

All three lamps are compression-moulded with the help of a bio-based binder, and finished by applying a natural wax coating responsible for protecting their surfaces from moisture. The surface pattern of each lamp is unique and unpredictable.

The Highlight Hemp pendants are made from industrial hemp harvest leftovers. The Ceiling Canopy is made from matte black coated iron and black cotton cord. The Highlight Wine pendants are made from 'pomace', which is the by-product of wine production. These minimal pendant suspension lamps were designed to suit any room and are available in several sizes. For Highlight Tobacco, High Society collects the waste from an Italian supplier who cultivates tobacco without additives. Its natural beeswax finishing provides a smooth and shiny surface and protects it from moisture.

As a responsible bonus, each light sold by High Society supports initiatives against drug dependency in collaboration with *Forum Prävention* in Bolzano, Italy.

Light installation illuminates the East River to test and report on water quality

LED lights on a plus-shaped installation floating on Manhattan's East River change colour based on the water quality conditions. + Pool Light is a public installation executed by local studios PlayLab Inc, Family New York, Floating Point, and Columbia University's Lamont-Doherty Earth Observatory. It tracks and reports the physical conditions of the water off Pier 17 in real-time.

Data collected is displayed on an online dashboard designed by Reaktor that reports whether or not the current water conditions are safe for swimming.

The drifting sculpture measures 15 by 15 m and is constructed with a series of LED lights. Its cross-shape is influenced by the continued progress and efforts being made in New York City to improve water quality.

"The design recognises the '+' sign as a symbol of positivity, indicating the positive steps we have taken to improve water quality since the Clean Water Act of 1972," said Jeff Franklin, designer of + Pool Light and partner at PlayLab, Inc. "Conceptually it is also a symbol of inclusivity in that the water that surrounds us belongs to no one single group, but to everyone." As part of the project, they established non-profit Friends of + Pool, which commissioned the light installation, to educate the public about water conditions in a way that is accessible and immersive.

Benjamin Hubert's lighting for Muuto mimics the silkworm's act of 'self-wrapping'

Back in 2006, Muuto founders Peter Bonnen and Kristian Byrge, who had previously been involved in the beginnings of renowned restaurant Noma, wanted to create a brand that was keeping with the Scandinavian reputation for quality and craftsmanship, but that was also modern and forward-thinking – hence the name Muuto, based on the Finnish word, Muutos, which translates to 'new perspectives'.

For its latest direction, it has created the Strand lighting collection – a series of simplistic yet statement lamps that have a technical formation. 'The Strand pendant lamp is made in a cocoon polymer material that covers its steel structure, imitating the silkworm's act of 'self-wrapping'. The material is applied to the steel frame as it spins, tightly clinging to the ribs, and gives it an almost cloud-like character. When the lamp is switched on, it emits a soft glow through its translucent shell

Get your city ready for the future with Philips RoadCharm

Developed with the aim of becoming a long term partner, the system-ready architecture of RoadCharm enables users to enjoy the benefits of connected lighting systems today and also gets cities ready for innovations to come.

It is designed to achieve better light uniformity and maximum spacing between poles for pedestrian and vehicle road applications. With its die-cast aluminum housing and Philips LED platform, it is easy to maintain, has a long lifetime and a consistency that can be counted on. It offers two housing sizes and a range of beam optics to fully cater to different road configurations and conditions. RoadCharm offers 50% energy savings compared to conventional lamp systems, making it the perfect sustainable lighting solution for any emerging metropolis.

The RoadCharm was a recent winner of the prestigious Reddot Award.

www.signify.co.za

New product releases from Tridonic

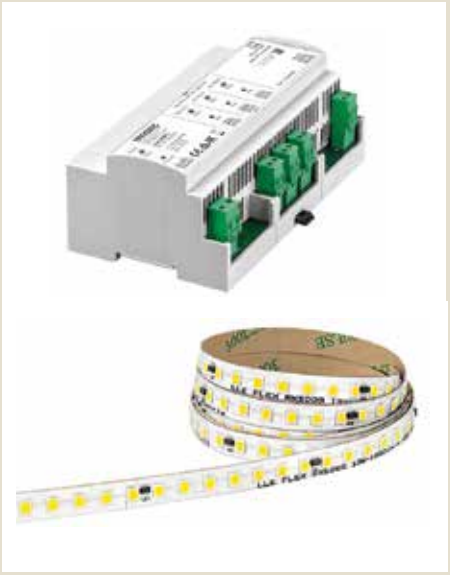
Tridonic completes its portfolio of SceneCOM hybrid controls solutions

With the introduction of the SceneCOM 'S' (in addition to the existing 'L' and 'XL' versions) Tridonic now offers a full portfolio of hybrid control systems. All SceneCOM versions have a wired part (connecting DALI drivers, sensors and power supplies on 1 to 3 DALI lines) but can be wirelessly programmed with an App on a tablet, allowing the programming on site to be done while walking around. SceneCOM combines individuality, safety and dynamics and has been designed primarily for use in offices, hospitality situations, and educational facilities.

Tridonic's flex tape Excite 2 offers High Output versions

The second generation of Tridonic's Excite flex tape offers versions with an extremely high light output per metre, up to 4000 lm, with a CRI of 90. The LED tape offers a continuous PCB, is being produced using the reel2reel method and does not require any solder points at all, ensuring a high quality and easy to use solution. Due to IC control every 5 cm the Excite 2 flex tape offers a constant luminous flux over long distances.

www.tridonic.com



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Abram by Fumagalli, available from Eurolux, is made from IP 55 rated shockproof resin material which is rust and corrosion-free. The Abram lamp has no visible screws and emits light both up and down. It includes an integrated 8.5 W R7s LED long life lamp and is available in black and white.

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