



Euro Nouveau: a showcase for fine lighting

Back-to-earth at Waterfall Wilds

Tips for good hotel lighting



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Advances in technology frequently cause upheaval and can have great impact: Aelectronic access to information on traditional printed media, libraries and librarians; machine automation on human workers; new technological goods on the environment; drones on warfare; LEDs on incandescents - the list is endless.

In this issue of *Lighting in Design* we consider another ... in a world of driverless cars will there be any need for the type of street lighting we currently require for visibility? It is an interesting question and one Paul Tarricone put to several lighting specialists. Their responses, though diverse, point to the conclusion that though street lighting professionals are happily not yet on the technology 'hit list' they could be in for some very real changes.

Sticking to the street light theme whether or not for cars with drivers, Johnny Chang and Tim Patel of Littelfuse highlight the importance of protecting outdoor street lighting fixtures from the damaging effects of lightning induced surges. Given the storms we have had in recent weeks in Gauteng, this is an especially relevant article.

Krynauw Nel, designer of the well-known Malapa structure built to protect the Malapa cave site from the elements, is the architect responsible for the architectural design of Waterfall Wilds centre. While it cannot lay claim to such lofty status as that of Malapa, Waterfall Wilds, like the site structure, is designed for – and succeeds in having – minimal impact on the environment. It is different from other developments in the Waterfall area in that it does not 'stand out'. Created around a plant nursery as its principal attraction, it feels distinctly South African and its blurring boundaries of landscape and façade enhance its back-to-earth feel.

João Viegas of Pamboukian Lightdesign, responsible for the illumination of Segera Retreat on the Laikipia Plateau in Kenya and acutely aware of the effect of light on the nightscape, used minimal light when planning for this centre. At night, the internal lighting of the retail outlets is visible through the glazed sections of the external façade and breaks it to create attractive lantern-like light that does not impact on the environment. The ambient lighting is warm and comfortable and the fittings designed to limit glare. Façade lighting is focused onto stone walls and a visual boundary is created for those patrons enjoying a sunset evening by the uplighting of an occasional Acacia along the edge of the property. The external pole lighting in the parking areas combines natural and modern to offer excellent visibility and dark sky friendly light. All-in-all the lighting at Waterfall Wilds is simple and effective, and succeeds in enhancing rather than detracting from its immediate environment.

It is very hard indeed to believe that we have come to the end of yet another year and that this is our final issue of 2016. Adel, Carin and I thank readers and advertisers alike for your support and wish you all a well-deserved end of year break, safe travels over the holiday season if you are going away and good health and prosperity for 2017.

Till next year!

Karen

Editor: Karen Grant (crownmag@crowm.co.za)

Advertising manager: Carin Hannay (carinh@crowm.co.za)

Layout: Adel JvR Bothma

Circulation: Karen Smith

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Waterfall Wilds: a typically South African feel

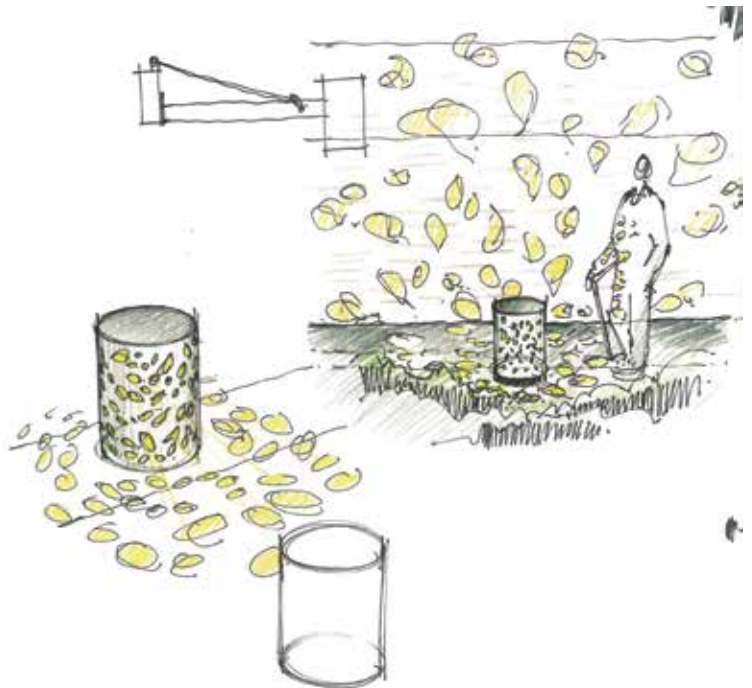
Krynauw Nel, principal architect for the Waterfall Wilds Centre north of Johannesburg, believes that "Architecture allows us to investigate our relationship with our environment and to express it in built form. Architectural objects that unobtrusively encourage the harmonious integration of human and environment, without the negation of either, are the ideal".

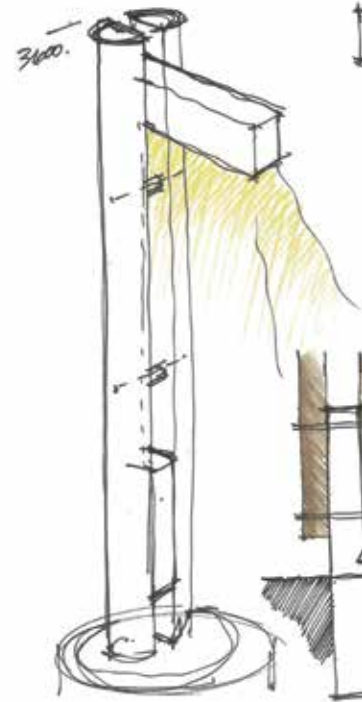
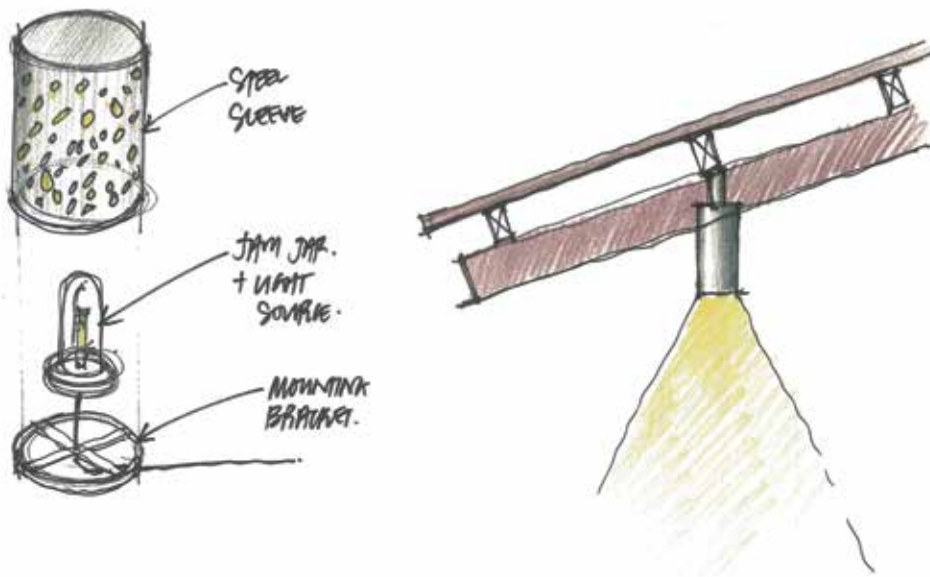
Waterfall Wilds Centre, a recently opened retail centre in Waterfall Estate, is surrounded by grassland on three sides. The building, designed to have minimal impact on the environment, comprises 2900 m² of retail space, and offers patrons a delightful view of the Jukskei River. Created around Keith Kirsten's nursery as its central attraction, the outdoor centre has a typical 'South African' feel about it.

João Viegas of Pamboukian Lightdesign (PLD) was the lighting designer on the project, working with the architect and Eksteen and Le Roux, the consulting engineers. The brief was to create a lighting effect that would draw attention to the exterior landscape and illuminate features of the building in such a way that the building itself would not be the focus of attention but would instead glow from within, creating a lantern-like effect.

When designing the building Nel, contrary to the design of most buildings in the area, went 'back to earth' following the contour of the hill – blurring the boundaries of landscape and façade with stone, colour and tonal qualities. The various retail outlets are reminiscent of enormous sheds with bifurcating columns – extending up across the roof – holding each structure.

When contemplating the lighting design, PLD took its cue from the architect and used minimal light. The inside of each of the retail outlets is illuminated by LED spots focused onto the columns and metal planes. At night, darkness shapes the space and the internal illumination, which is visible through the glazed sections, breaks the façade to create attractive, effective after dark lighting that does not impact on the night-scape.



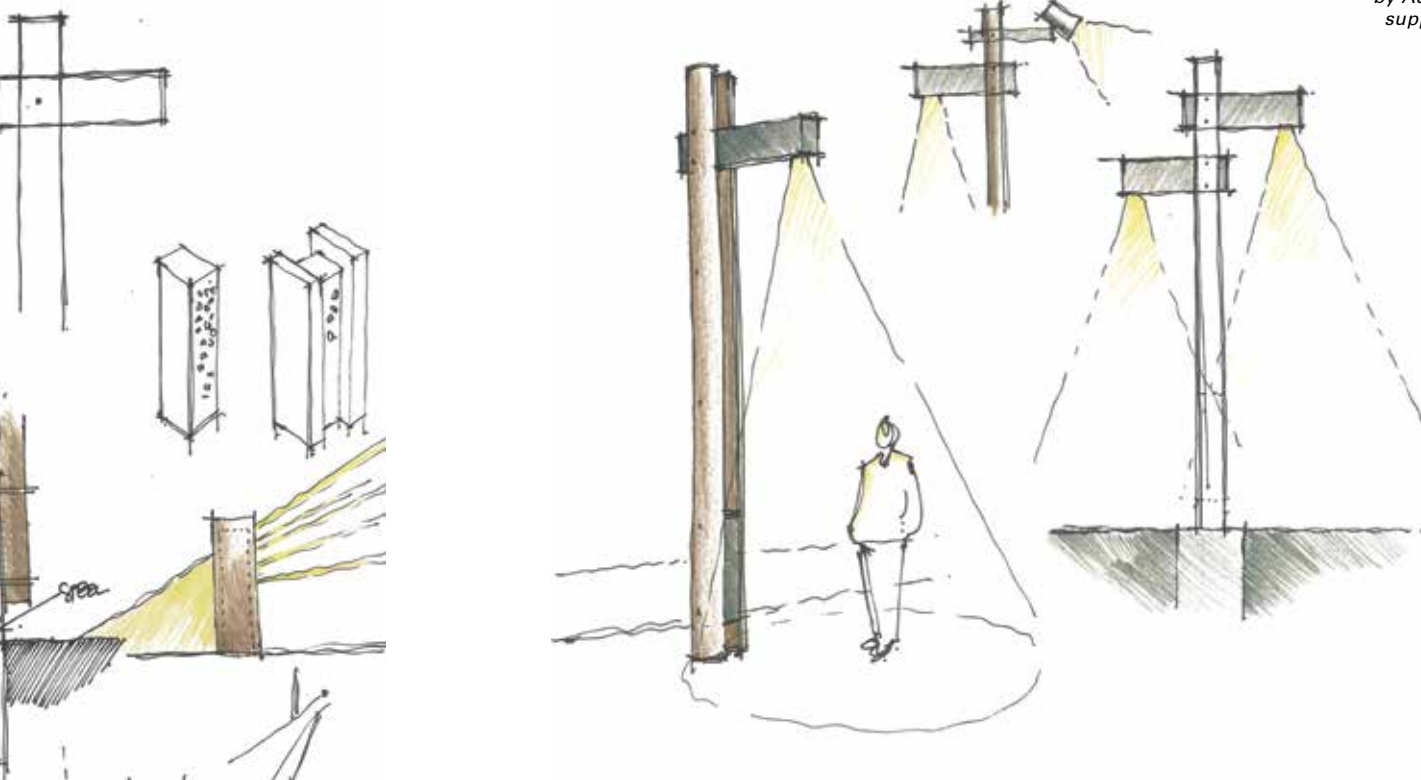


Ambient lighting around the centre is supplied by custom designed adjustable, tubular downlights, manufactured by Regent Lighting. In order to limit any possible discomfort through glare, the lamp is set back in the fitting and the 18 W 2700 K LED source provides excellent, comfortable illumination helped, says Viegas, by superior LEDiL optics and lenses.

Viegas explains that, in harmony with the earthy, outdoor composition of the centre, façade lighting is focused only onto the stone walls – not onto any material, such as corrugated iron, that is not natural – and it is in the illumination of this feature that the blurring boundaries of the façade and pavement are highlighted. LED tubular downlights and Gobo Floor

Luminaires are used for this purpose. Designed by PLD and manufactured by Regent Lighting, the floor lights are 500 mm high and 400 mm in diameter. The fittings have a series of individually sized holes through which the light emits a gobo-like effect when switched on at night. Custom designed for Waterfall Wilds, the circles of light are warm and generate an attractive interplay of light and shadow to create an interesting dynamic along the stone wall façades.

Restaurants have views to the horizon and João Viegas has created a visual boundary by uplighting occasional Acacia trees along the edge of the property with warm white LED spikes. The effect



Photographs courtesy
Regent Lighting.

of the lighting with the sunset view is one of peace and tranquillity as intended.

To satisfy the requirement for a natural feel and the need to structure the parking space while supplying safety and security, the lighting in the parking areas combines natural and modern in custom made external street lights using gum poles as the support structures for modern light fittings. Also designed by PLD and manufactured by Regent Lighting, each gum pole is sliced lengthwise, replicating the bifurcating columns of the interior. This allows the fitting to be clamped between each 'slice' at the top of the pole. Known as 'Kazo', the fitting uses 27 W warm white single and double

fittings specially fabricated to double volume height in order to house the LEDs and driver separately and to create an enhanced and more prominent visual effect. The result is excellent visibility that is directed to the front and back of the poles and is Dark Sky friendly.

The positive effects of a lovely twilight or a beautiful landscape on the human soul are well documented. In a city of malls, it is a welcome relief to visit a retail centre that settles into the landscape and offers sunset evenings and appealing views. The lighting installation at Waterfall Wilds is simple and effective and thus enhances rather than detracts from what nature has to offer. **LID**



In a world without drivers ...

will there be a need for the same type of roadway lighting?

In this article by Paul Tarricone of LD+A, a roundtable panel speculates on the implications of driverless vehicles.

NBC News recently asked the question: 'What jobs could driverless cars eliminate?' Among the endangered species are those working for body shops, car insurance salespeople, driving teachers and attorneys who make a living off automobile accidents. Happily, roadway lighting professionals were not on the hit list, yet changes in the lighting industry might be around the corner.

LD&A, the magazine of the Illuminating Engineering Society of North America, asked several researchers, manufacturers and stakeholders what driverless vehicles might mean for the future of roadway lighting. The panel included:

- Jim Frazer, Gridaptive Technologies, and vice chair of the IES Roadway Lighting Committee.
- Leo Smith, Outdoor Environmental Lighting Consultant.
- John Bullough, director of transportation and safety lighting programmes at the Lighting Research Center.
- Mario Romero, marketing specialist, SOURCE Lighting Education Center, Eaton.
- Tom Salpietra, president and COO of EYE Lighting International.

Their responses touched on the technical, the aesthetic and the financial.

1. Will the traditional definition and requirements of 'roadway lighting' change with the emergence of driverless vehicles? Will safety be less of a concern, since 'driver error' would become less of a factor, or none at all?

Frazer: Roadway lighting systems' design and deployments will still be driven by safety and economics. What is changing are the answers to the question: "What tools and technologies do we have that can increase safety?"

In the not-too-distant future, pedestrians, bicyclists and vehicles will all interact dynamically with the infrastructure. Crosswalks may brighten as a pedestrian approaches, roadway lighting may be dimmed or even extinguished in times of low to very low traffic. Colour temperature changing fixtures may be employed. All these scenarios are being envisioned by standards developers, as without communications and other interoperability standards none of these sensors could talk to one another.

When we look at vehicles, specifically, it's a two-step parallel process. First, there are 'connected vehicles', which you drive. What's added are alarms that warn you if you're too close to another vehicle or pedestrian, and braking systems that automatically engage if you ignore the warning.

At the other end of the technology continuum, the autonomous vehicles of today contain tens of

thousands of dollars of sensors, radars and vision systems. Autonomous vehicles are much more sophisticated and are quite a way from mass adoption, but signs and pavement markings are used by autonomous vehicles, and these need to be 'seen' by the vehicular-based sensors, so lighting will still be required for humans and for the machines.

Smith: A distant tidal wave is approaching the street and roadway lighting industry. Not next year, or even within the next decade, but 20 to 30 years from now the market for streetlights will face serious and adverse consequences from the disruptive technology represented by the saturation of fully autonomous vehicles on our roads.

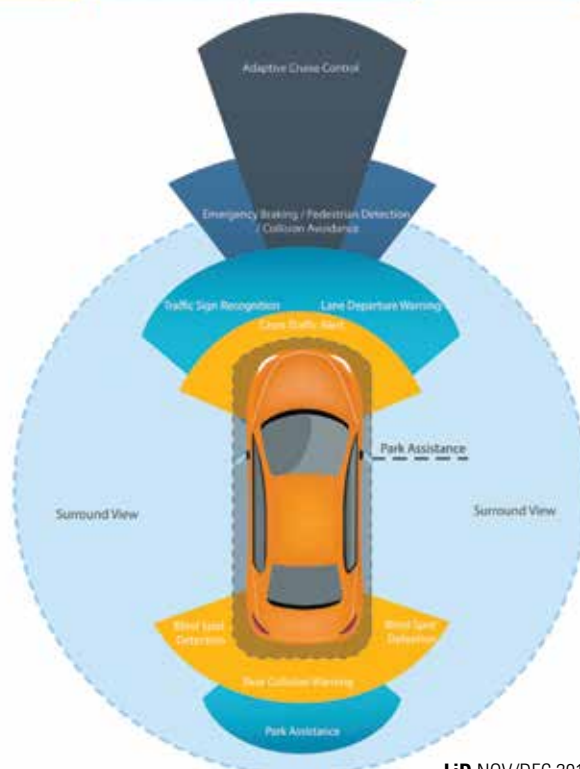
In April 2016, the Ford Motor Company issued a press release whose title started with the words 'No Lights, No Problem', referring to developments in Ford's autonomous vehicle that use a navigation system called LiDAR (Light Detection and Ranging) for 'seeing' at night. Tests at Ford's Proving Grounds in Arizona concluded that vehicles could be operated at night in complete darkness.

In addition, technological improvements to automatic emergency braking (AEB) systems over the coming years will result in all systems being fully operational in total darkness – another step forward in removing the need for optical street lighting for vehicle crash avoidance. More than 20 automobile manufacturers, working with the National Highway Traffic Safety Administration, have committed to making AEB a standard feature on all cars by 2022; 99 percent of new cars will then come with AEB and by 2025 all trucks on the market will be AEB equipped.

Technological disruption to the market for streetlights will almost certainly be gradual – until after the predicted point of 2040 when most cars sold are fully autonomous, according to IEEE. Lighting for toll plazas, tunnels and limited access highways will become unnecessary. Eventually, remaining streetlight inventory will be limited to two primary functions. The first will be street lighting dedicated

to pedestrian and bicyclist safety and security. The second will be street lighting used for aesthetic or architectural reasons to promote a desired ambience – such as turn-of-the-century globe lighting in an urban centre.

Romero: Lighting [will be] focused on the pedestrian's needs. The main reason for roadway lighting within a city is to increase the sense of safety, and for drivers and pedestrians to be aware of one another. Although automated cars will not require lighting to necessarily 'see' pedestrians, uniform lighting will still be needed in pedestrian areas and cityscapes for safety and visibility of vehicles and hazards.





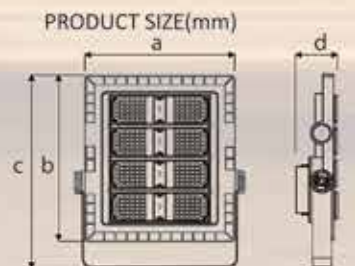
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Salpietra: Roadway lighting will continue to evolve at an even more rapid rate, with technology delivering higher quality light, which will make camera (both CCTV and on-board) more efficient. Population trends show that people are moving towards city centres, which will put pressure on superior lighting design for pedestrians and vehicles. We suspect that safety will forever be a top tier issue, and we will see increased redundancy in both driverless vehicles and street lighting systems.

Bullough: There is no doubt that the requirements for roadway lighting will change with the advent of driverless cars, but until or unless dedicated facilities for autonomous vehicles are set up akin to slot car or train tracks, even driverless driving will require vision, and vision requires 'lighting'. Such lighting systems won't necessarily deliver 'light' in the traditional anthropocentric sense, but could include bands of nonvisual optical radiation. Still, as long as human and machine drivers coexist on the same roads, visible light will remain essential for safe night-time driving. And even in the machine world, the principles of good illuminating engineering will still apply. Cameras are in no way immune to glare, for example. Common sense measures like shielding lights from view will always be helpful.

The rise of driverless cars may be an opportunity to refocus scientific enquiry on pedestrians, a woefully neglected part of our transportation environment. Indeed there is an emerging science of night-time aesthetics that also addresses needs for visual performance, perceptions of safety and security, and that recognises that the night itself can be beautiful and functional. If by RP-type metrics one

means simply 'road surface luminance/illuminance' then these are not inherently scientific in and of themselves. At the Lighting Research Center, we've been exploring science-based metrics to provide leverage to balance quantity with spectrum and distribution to support functionality and aesthetics. And the sooner we accept that painting building facades in saturated colours does not guarantee aesthetic success, the better.

2. Will fewer luminaires be needed as the number of driverless vehicles increases?

Salpietra: No. Street lighting luminaires are as much for passengers and pedestrians as they are for the driver of the vehicle. And since driverless vehicles will always have human override options, I believe we will continue to design for maximum safety and human control.

Another aspect of higher luminance is the fact that we are an aging society. As we age, we need more light to see than when we were younger. Having the ability to adjust light in certain areas (i.e. retirement communities) will have a positive impact on society.

Bullough: The short answer is "yes," but more importantly perhaps will be the where and how of those luminaires. Even in the present era of human-driven vehicles, the performance of vehicle-mounted lighting is increasing. Autonomous luminaires, also known as adaptive headlights, allow drivers to use their high beams all night long without guilt. That's because they use cameras to locate other vehicles and dim their intensity specifically in the direction of those other

drivers, thereby minimising glare. They're already a reality on cars outside North America and likely to become a reality in the US soon. Keeping lights on the vehicles rather than the roadside could provide a terrific opportunity to reduce unwanted impacts of night-time lighting.





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Romero: The illumination level may be lower, but we will still need to pay special attention to the uniformity. The uniformity of the lighting is even more important than the amount measured on the ground. In some cases, there may be fewer streetlights, or we may only illuminate dangerous intersections or high traffic areas. Higher illumination levels and control of fixtures will still be needed in areas where crime may be a problem and street lighting with smart systems will be the best option.

3. Will driverless vehicles be a boon for certain segments of the lighting industry? For example, will the controls market benefit due to the need for vehicle-to-infrastructure communication?

Frazer: Absolutely. V21 is not just the vehicle-to-infrastructure but also the connected pedestrian and connected bicyclist. These last two will use a mobile phone as a proxy for a person, so yes, there will be a plethora of new data points available to system designers. This information can be used to better provide the right amount of light at the right time.

Bullough: Certainly, driverless vehicles will expand market opportunities for communications systems between vehicles and the environment. But who exactly will reach these new markets? My magic eight-ball says, "Cannot predict now." If vehicle lighting and sensing systems displace some of the traditional roadside illumination currently present, those opportunities might not involve a lot of luminaire control except of autonomous headlights themselves. But I am confident that we will see more V21 communication telling both human and machine drivers about their environments – from work zones, to dangerous curves ahead, to masses of pedestrians leaving sports arenas late at night. Despite many questions about how this game-changing technology will ultimately be implemented, autonomous vehicles clearly offer opportunities for safer and more economical movement of people and goods, and for commercialising the support systems and technologies they will use.

Romero: The integration of controls and Li-Fi in fixtures will definitely be the future. With Li-Fi communication, we can view a map in real time with exact locations of each vehicle with information input from fixtures, people, etc. This will increase visibility for use in traffic reports, construction,

emergency vehicles, etc. The communication between fixtures and central public safety systems over the Internet is a huge opportunity to expand fixtures and controls capabilities in this market. Li-Fi Internet speeds reach up to 250 GB per second, allowing the concept of a smart city to become a reality. Personal gadgets and wearable devices, cars, smartphones, streetlights, homes and other devices could be interconnected.

Salpietra: The most successful lighting companies in the future will be the ones that have the greatest expertise in control technology. V21 systems will be part of the next generation of lighting control technology, and outdoor luminaire manufacturers will have to control delivery of light in increasingly unique and creative ways.

Smith: The controls market will certainly benefit from autonomous vehicles, in response to the need for V21 communication systems. Yet it seems unlikely that streetlight poles will be used to support communications infrastructure. Other signalling devices may involve the eventual elimination of traffic lights and stop signs, replaced with other stationary signalling devices that use laser or sonar to control traffic. Even a police officer directing traffic at a construction site may end up using a hand-held signalling device to control the AVs.

Pole maintenance costs, together with competing methodologies for dealing with communications over unlit roads, will likely drive states to employ vehicle-to-infrastructure systems that do not rely on existing pole locations dedicated to streetlights. ^{LID}

This article was first published in the September 2016 issue of LD+A and is reprinted with the kind permission of the Illuminating Engineering Society of North America.



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Ensuring safer streets for outdoor LED lighting

by Johnny Chang and Tim Patel Littelfuse, Inc.

Cities and towns around the world are progressively replacing old high-intensity discharge street lights with new LED luminaires. LED street lights produce whiter, cooler light than the yellowish light cast by high-pressure sodium lamps, and this reduces the potential for collisions by enhancing drivers' depth of field and peripheral vision.

Installing new LED fixtures, however, requires a substantial initial investment. Planners must justify the expense by getting a payback on their investment within a reasonable period of time based on the LED's lower wattage demands, lower maintenance costs, and longer operating life.

Financial analysis for any municipal project is critical to evaluating the project's feasibility. This is especially true for projects that receive the level of attention LED lighting projects do. Around the world, various groups have created tools to aid in this financial analysis. One such example is the Street and Parking Facility Lighting Retrofit Financial Analysis Tool. This was developed by a partnership between the US Department of Energy (DOE), Municipal Solid-State Street Lighting Consortium (MS-SLC), the Clinton Climate Initiative (CCI)/C40, and the Federal Energy Management Program (FEMP).

At least one-third of the total savings attributable to switching to LED street lights result from the extended lifetimes these lighting fixtures offer. To ensure long-term cost-effectiveness, it is essential to take advantage of their potential for reducing maintenance costs. Protecting outdoor LED lighting from the damaging effects of lightning-induced surges requires diverting high voltage/current transient interference away from sensitive electronics in the luminaire fixture, specifically the LED drivers. In order to suppress surge energy and minimize surge impact, various surge protective devices (SPDs) are incorporated into the outdoor LED lighting during the design and testing phases. LED lighting equipment manufacturers rely on a variety of SPDs, including carefully chosen metal oxide varistors (MOVs), fuses, and transient voltage

suppression (TVS) diodes to meet important safety standards and regulatory requirements related to overvoltage transients.

Figure 1 illustrates the various circuit protection elements typically incorporated into a street light surge protection circuit including overcurrent protection via fuses and thermal protection within the SPD.

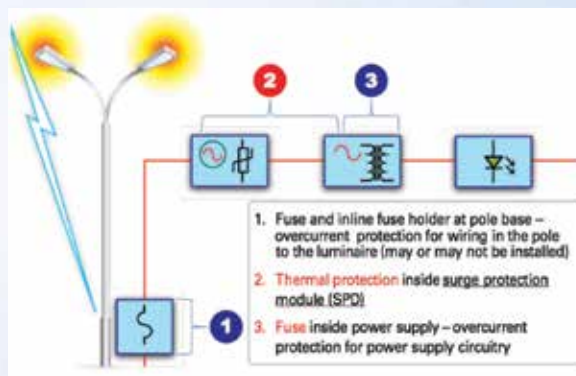


Figure 1. LED street light circuit protection scheme.

While some LED luminaire designs feature surge protection devices that are embedded within the power supply unit, circuit protection device manufacturers will frequently recommend that the surge protection circuit be kept separate from the luminaire power supply. By doing so, LED luminaire manufacturers can market the same luminaire fixtures anywhere by using different surge protection modules to meet differing surge level requirements, based in part on regional lightning strike frequency data.

Because of their compact size, high surge energy handling, fast response times, and cost-effectiveness, MOVs are widely used in surge protection circuits for LED luminaires. However, after MOVs absorb a certain number of surge strikes, they will start to degrade and can no longer provide the same protection as new ones. Using a separate surge protection module in the design allows for easy replacement when the original SPD module reaches the end of its useful life.

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Power Factor:	0.9	0.9	0.9
Total Light Output (lm):	675	750	720
Beam Angle (deg):	100	100	100
Lux at 1m (lux):	270-340	270-340	270-340
CCT (K):	3,000	4,000	6,500
CRI:	80	80	80
Efficacy (lm/cctW):	75	83	80
Lifetime (hrs):	30,000	30,000	30,000
Diameter (mm):	108	108	108
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MOV technology offers an effective and affordable way to suppress transients in numerous applications, such as power supplies, and the SPD modules are often located in front of an LED driver. While they are designed to clamp overvoltage transients within microseconds, when they are built into SPD modules, MOVs can be subject to temporary overvoltage conditions caused by faulty installation wiring or by loss of neutral. These conditions can severely stress an MOV, causing it to experience thermal runaway. This can result in overheating, smoke, and possibly fire. Robust SPD designs feature thermal disconnects to protect the MOVs from thermal runaway.

MOVs tend to degrade steadily after exposure to a large surge or several small surges, which leads to increasing MOV leakage current. This degradation will increase the MOV's temperature, even under normal conditions. A thermal fuse element (Figure 2) placed next to the MOV can be used to sense the increase in MOV temperature as it continues to deteriorate. When the MOV reaches the end of its operating life, the thermal disconnect will open the circuit, remove the degraded MOV from the circuit, and prevent its catastrophic failure.

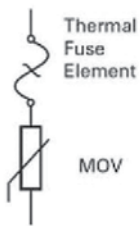


Figure 2. A thermal disconnect can open a circuit and prevent a degraded MOV from failing catastrophically.

Once the thermal disconnect removes the MOV from the circuit, the SPD module can no longer provide surge suppression. Therefore, it's important to provide visual indication so that maintenance personnel will know the SPD is no longer functioning and requires replacement.

When to use parallel or series-connected SPD modules

LED luminaire specifiers have a choice of two main types of SPD module configurations based on their maintenance strategies: parallel- or series-connected surge protection subassemblies.

Parallel connection (Figure 3a)— In this configuration, the SPD module is connected in parallel with the load. When an SPD module reaches end-of-life,

it is disconnected from the power source while leaving the ac/dc power supply unit energized. While the lighting remains operational, the protection against the next surge to which the power supply unit and LED module are exposed is lost. In a parallel-connected SPD module, a small LED is added as a replacement indicator for the maintenance technician. Options for a green LED indicating an online SPD module or a red LED indicating an offline SPD module are available. Or, rather than an LED indication at each lighting fixture, the need for SPD module replacement could be indicated remotely to a light management centre with SPD module end-of-life indication wires connected to a networked smart lighting system.

Series connection (Figure 3b)—The SPD module is connected in series with the load, where the end-of-life SPD module is disconnected from the power source, which turns the light off. The loss of power to the luminaire indicates the need for maintenance and isolates the ac/dc power supply unit from future surge strikes. General preference for this configuration is growing rapidly, because the luminaire investment remains protected while the SPD module is awaiting replacement. It is far less expensive to replace a series-connected SPD module than the whole luminaire as in the case of a parallel-connected SPD module.

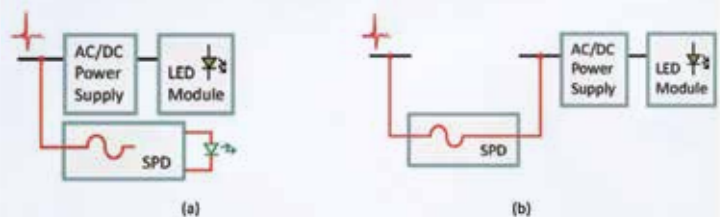


Figure 3. Example SPD module using either parallel (a) or series (b) connection to a luminaire.

LSP thermally protected varistor SPD modules from Littelfuse are designed specifically for outdoor and commercial LED lighting applications. A built-in thermal disconnect function provides additional protection from catastrophic failures and fire hazards, even under the extreme circumstances of MOV end-of-life or sustained overvoltage conditions. LSP05 and LSP10 modules are replaceable. The LSP10 series-connected version has a special indication function that turns the light off when it is activated.



Euro Nouveau: Innovative showroom concept

Eurolux has announced the launch of Euro Nouveau, a bespoke showroom concept that sees the designs of some of the foremost European lighting manufacturers exhibited in a luxurious new space at the Eurolux Head Office in Cape Town.

Euro Nouveau showcases the work of 12 to 14 hand-selected lighting designers, ranging from classics by Fontana Arte to the quirky pieces of modern Italian brand Slamp. The showroom's custom design creates a stage for each brand's work, showing off its functionality and style, while complementing the other pieces in the space.

Stepping into Euro Nouveau is not unlike browsing the fantastical collections at some of Europe's foremost lighting shows, ultimately demonstrating

Eurolux's position as an industry trendsetter that understands the needs of the most discerning buyers.

From elegant styles of the 1930s and 40s to ultra-modern architectural designs, Euro Nouveau presents a carefully curated selection that ranges from the Bohemian Crystal Chandeliers of Iris Cristal to the natural inspired designs of Manooi and the minimalist work of Inarchi, working collectively to form a space that is sophisticated and innovative.

The simplicity of the Euro Nouveau concept adds to its exclusivity. More than a showroom, it is an exhibition hall meticulously designed to showcase some of the finest lights in the world.

The collection caters to every taste and style, from sophisticated old-world inspired pieces in





crystal and glass, to modern architectural styles in marble, chrome and steel. The diversity is not limited to styles and materials, but is embodied in the colours of the pieces. Whether a toned down, natural palette or a striking pop of colour in a statement piece, Euro Nouveau has considered nearly every aesthetic.

It was important to Eurolux to have a South African brand represented in the new space. It found a strategic creative partner in Carrol Boyes, the renowned local designer whose high-end home and lifestyle designs have been coveted by discerning buyers across the world for more than 25 years.

For Euro Nouveau, Carrol and her team have turned some of her most iconic designs into an exquisite range of floor, table, wall sconces and pendant lights. The pieces are distinctly African and quintessentially Carrol Boyes.

Eurolux has taken great care in selecting distribution partners for the Euro Nouveau products across South Africa, and in Namibia, Botswana and Zimbabwe. These are typically lighting and decor traders

that serve the niche categories to which the Euro Nouveau pieces appeal. To enhance the purchasing experience for the client, each Euro Nouveau distribution partner will have its own showroom with bespoke pieces from the new range.

Euro Nouveau features lighting by the following European manufacturers:

Fontana Arte	www.fontanaarte.com
Slamp	www.slamp.com
Iris Cristal	www.iris cristal.com
Manooi	www.manooi.com
Inarchi	www.inarchi.com
Ivela	www.ivala.it
Lombardo	www.lombardo.it
Panzeri	www.panzeri.it
Karboxx	www.karboxx.com
Serien	www.serien.com
Bomma	www.bomma.cz

Euro Nouveau:
www.euronouveau.co.za or contact
Mandy Hayes on +27 (0)21 528 8400





2008 Haute Lumière winners:
Carson Smuts and Anja Zajackowska

The experience gave us some insight into how people operate in a 'design-build' environment. One gains a deeper understanding of the realities of design, as well as the thought processes required. It's about learning how to explore the space of a problem, as opposed to trying to solve it. The experience encouraged us to explore other aspects of design and led both of us to New York shortly after our trip. The hands-on approach allowed us to engage directly with hardware in the field. We have come to realise that good design is one that addresses both software and hardware. This then led to lecturing digital design at Columbia University, lighting installations for the AIA and, most recently, augmented projection systems and hardware design at MIT's Media Lab.

Title of workshop project:
Waterfront

2009 Haute Lumière winner: August de Wet
Alingsås was a totally new adventure that expanded my frame of reference with regard to light, experience, architecture, design and culture. Having that exposure to the world of light in an environment where it is appreciated and encouraged made me see things very different. I now work as a lighting designer and also develop thinking and objects that relate to light in my personal capacity.

Title of workshop project:
Urban Nature Skate Park

2009 Haute Lumière winner: Hester Claassen
It was amazing to see the locals' appreciation of our work. By changing mundane scenery with state-of-the-art lighting equipment we re-awakened their imaginations (and ours). We drew inspiration from the history of the site; there was once a weaving factory located next to the bridge. Our concept combined the past with the present by using light to remind passers-by of their history. As an Industrial Designer it is always fun to find new materials to work and design with. It is challenging to use light as a material to tell a story. I like the idea of designing with light: because it is not a physical material it piques my exploratory interest.

Title of workshop project:
Interweaving Reflections - Väveri-Bron Pedestrian Bridge

Haute Lumière winners: their work in Alingsås

The Haute Lumière Light Competition, in its ninth year, is a Paul Pamboukian initiative to grow awareness of the importance of light as a design tool and to encourage young designers to rethink artificial light as a crucial, primary aspect of design. The competition is held annually and is open to anyone living, studying or working in South Africa.

The winner of Haute Lumière gets to attend the light workshop, Lights in Alingsås, which ran as a cooperation between Alingsås Kommun and the Professional Lighting Designers' Association from 2000 to 2014 and since then has run as a cooperation between the Kommun and the International Association of Lighting Designers (IALD). It is conducted by seven leading European lighting designers in the town of Alingsås in Sweden. The seven designers or workshop leaders are each given a site within the city to illuminate, and are assisted in their design and build by 65 international, mostly architectural, students. The light installations form part of the two month Alingsås festival (one of three major regular light festivals in Europe), which is an important event in the city's calendar. Over the years, Lights in Alingsås has become immensely popular. The week long workshop finishes with a symposium on light as the installations are handed over to the city so visitors can walk the tour themselves or in guided groups.

Anthony Tischhauser of Pamboukian Lightdesign asked the Haute Lumière winners who have had the opportunity to take part in this exceptional event what they gained most from their experiences.



2010 Haute Lumière winner: Michael Forst

It was amazing working with experienced team leaders in a design centric Sweden. In order to understand how light is going to behave in the real world you need to get your hands dirty. It was wonderful to see how it is possible to alter an environment through subtle changes in light.

Title of workshop project: *Big Tree*



Articulight by Bianca Barnard

Articulight creates a dialogue between sculptural and dynamic lighting, providing a different vantage to the spectrum of task illumination. The design invites interaction and encourages the user to articulate the cordless luminaire to suit his or her changing environment. Bianca is this year's winner and will attend the workshop in 2017.



2012 Haute Lumière winner: Mandi Botha

Alingsås was where I realised that I enjoyed using light as a design medium. The Alingsås experience opened up a world of opportunities and introduced me to a whole new discipline that I didn't know existed, that I didn't know would be so captivating. Working with people from different countries and cultures can be very challenging. The hands-on approach taught me how to achieve great results in different environments through the application of light. The workshop led me to pursue a Master's degree in Lighting Design in Germany and an internship in the Netherlands.

Title of workshop project:
Water Site



2011 Haute Lumière winner: Eduard Claassen

With the completion of the group project in Alingsås workshop each member was asked to summarise in his or her mother tongue what a good 'light experience' would be. My impression was "Good light design is like a friendly smile." It creates an atmosphere that sparks/ignites something inside a person.

Title of workshop project:
Church of BeLeaf



2013 Haute Lumière winner: Amy Phillips

The Alingsås workshop exposed me to a world of design I would have never known. It taught me the value of good lighting design but also showed me there's a whole education on lighting design that we do not yet have access to in South Africa. Now I'm always more aware of a space and how it is effected by the designed lighting.

Title of workshop project:
Skogen



2014 Haute Lumière winner: Claudine Park

Lights in Alingsås was the most incredible learning experience I have ever had. It completely broadened my thinking on all things lighting and design. The vast number of different lighting technologies we worked with have inspired me to use light in ever more interesting and innovative ways. It opened up a completely new realm in my mind when considering possibilities for lighting and the experience it creates in interior design.

Title of workshop project:
The evolution of light in nature

2015 Haute Lumière winner: Braam de Villiers

The goal of our project was to Reduce Inequality, in the line with the United Nations 17 Global Goals for Sustainable Development. The installation had to tell a story whereby viewers could be engaged to form their own stories about the installation and context. The narrative played off in an abandoned house, home/shelter to people that came from another place, refugees.



Tips for hotel lighting

Research conducted by Osram in 2014 found that guests regularly criticised lighting quality when giving hotel feedback. Hotels in London for example were subjected to nearly 10 000 reviews specifically on lighting, with many travellers complaining about dim, bad and sparse lighting in their rooms. Hotel lighting expert Heinrich Böhm, Senior Designer and Associate at JOI-Design, shares some tips.

1 Ask a light planner

According to Böhm, when hotel lighting is done well you don't necessarily notice it, "but when it isn't, you most certainly do." He explains that lighting layout and design are often left to electrical engineers, meaning style isn't always at the forefront of plans. Having a light planner define the appearance of lighting – especially in public areas – is essential to avoid negative first impressions.

3 Maintain your concept

There's a fine line between standing out and looking out of place. Statement lamps can create a great focal point for guests; however, it is important that they fit the overall design concept of a hotel. This applies to hotel rooms and public areas alike. As well as being a design feature in themselves, lamps should also be used to highlight architectural or decorative aspects that give a hotel its individual flair or define its concept.

5 Keep room lighting flexible

One room, a multitude of purposes. Hotel room lighting needs to be bright enough to work, but also cosy enough to relax. It is therefore important that guests have sufficient fittings. According to Böhm one of the most important fittings is a reading lamp. His other must-have? "A master switch to turn off all the lamps in one go."

2 Adapt lighting to changing hotel layouts

"Hotel foyers are changing," explains Böhm. And with that so too is foyer lighting. The traditional format of a separate foyer, restaurant, bar and check-in area is increasingly being replaced by free-flowing spaces where different functions take place in one room. Lighting therefore needs to be adjustable in order to fit the changing primary use of the space throughout the day. In the morning, for example, cool lighting might be used during breakfast, whilst in the evening warmer lighting can create a cosier atmosphere. Other areas such as the bar might need to be zoned out using lighting contrasts when not in use.

4 Make sure all areas have good lighting

There should be light in the tunnel, not just at the end of it. As Böhm explains: "Corridors are often overlooked when it comes to lighting design." As they form an important part of the journey from the foyer to the rooms, they should link the different areas of the hotel in a way that reflects the atmosphere experienced elsewhere. Whilst sufficient lighting is required to aid orientation, there shouldn't be great differences in the temperature of lighting as you pass through different spaces.

6 Don't make it complicated

It is annoying having to spend ages trying to find the bathroom light switch in a hotel room. Lighting systems that are not intuitive for guests to use should be avoided. If using IT-based systems, Böhm recommends installing touch panels with international symbols and icons. Avoid text. When it comes to rooms, systems that use tablets and phones are being introduced to help guests manage everything from room service to lighting. Guests often don't even need to download an app: they can simply scan a QR code and access all lighting controls from their devices. Again, usability is key.

7 Invest in quality

Quantity needs quality. Think how many guests pass through a hotel every day, every week, every year. The result is an extensive use of light fittings, particularly when it comes to hotel rooms where guests control the lighting themselves. As Böhm points out, "this can lead to quicker deterioration of lamps and luminaires, so be sure to use robust and durable materials designed specifically for hotels".

8 Provide lighting for diverse events

Hotels can provide the setting for diverse events, from business meetings to weddings. As people are unlikely to want to celebrate the best day of their life in a venue that reminds them of work, the best thing to do is to provide options. From a wide choice of colours to adjustable dimmers – guests need to be able to light the room to fit their needs. If holding a room viewing, ensure the right light for the event being considered is in place. Pre-defined settings for different functions can save time, enabling a quick switch from 'evening reception' to 'conference' for example.

9 Bring back natural light

Gone are the days of hotel conferences with no daylight to be seen. In the past, rooms without windows (and therefore without natural light) were often regarded as highly useful for work events – reducing potential glare from the sun and maximising wall space for projections, for example. Nowadays however, no daylight equals no booking, meaning where possible, natural light should always be incorporated into plans.

10 Think efficiency, think LEDs

No discussion: when it comes to lamps, LEDs are now the number one choice for hotels. They are "state of the art" when it comes to design, says Böhm. The energy benefits are clear, so as prices drop, more and more hotels are replacing existing lamps with LEDs.



Osram illuminates The Westin Excelsior in Rome on the occasion of its 110-year anniversary (Source Osram).



Radisson Blu Hotel Cologne (www.radissonblu.com).



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CrossAfrica Lighting and Lifestyle

On October 1 this year, Verbatim – a wholly-owned company of Mitsubishi Chemical Corporation – transferred its South African entity to CrossAfrica Holdings as a going concern. According to Manny Cross, Group MD of CrossAfrica Holdings and former general manager of Middle East, Turkey and Africa for Verbatim, the restructure offers numerous benefits including greater flexibility, improved customer service and the opportunity for B-BBEE compliance. The company will operate from South Africa where it has an established logistical hub with warehouse facilities, a distribution chain and an experienced local team, which has been key to its success.

Under CrossAfrica Holdings, the three Verbatim entities will operate independently as CrossAfrica Technologies; CrossAfrica Water Solutions; and CrossAfrica Lighting and Lifestyle. Cross says the new structure will allow each entity to adapt more quickly to changing markets across Africa, explaining that trading conditions have evolved and since Africa is not as aligned to European markets as it once was, it is no longer the case that African businesses are governed by European strategies. He says local markets have developed their own business cultures which present different challenges and opportunities.

“In Africa, with its diverse demographics, business and product requirements, there is great energy and opportunity. We also need to understand local perceptions of value and be in a position to adapt to changing economic and financial conditions” says Cross. As compared with the previous Verbatim/Mitsubishi Chemical Corporation multinational structure, the new entity provides for greater flexibility and will thus also be able to employ expertise more geared towards the different market sectors. In addition, it will be able to

collaborate with existing customer structures so as not to reinvent the wheel. As Cross explains, “We will offer value to an existing solid infrastructure with top end technologies”. He believes that eventually the African market will default to premium brands, this as the market matures and the price difference between cheap products and premium brands becomes less significant.

As an independent entity, CrossAfrica Lighting is in a position to customise its solutions to maximise opportunities with new partners. “For example,” says Cross, “Although we have an effective LED offering through Verbatim, should we find there is a demand for solar LED, which Verbatim does not offer, we can broaden our portfolio or work with a local partner to become solutions driven and target a broader market sector. It is a win for all parties”.

CrossAfrica Lighting and Lifestyle will continue to offer a wide range of high quality LED lamps for professionals and consumers while expanding its portfolio of LED luminaires and track lights for daily use. Verbatim lighting products are known for their high quality electronics, their optics, visual comfort and light distribution. The LED performance lamps provide a direct replacement for current incandescent and halogen lamps. They offer excellent light performance, a wide range of beam angles, long lifetime and colour temperatures to suit all applications. The company recognises the market’s increasing need for dimmable products and provides a number of compatible combinations of dimmable LED lamps and luminaires.

By the middle of next year CrossAfrica Holdings hopes to establish a centre in Dubai as a gateway into North and East Africa. LiD





Using light effectively to accentuate the quality of fine food

Casa Tió is a small chain of delicatessen supermarkets in and around Barcelona, offering mostly meat specialities but also milk, cheese, eggs and wine from the Catalan region. Opened in 2015, the store on Avinguda Borbó in the heart of Barcelona was conceived with an entirely new interior design as a prototype for other Casa Tió stores.

The zonal lighting solution, which forms part of the concept, relies entirely on ERCO LED lighting tools for maximum flexibility using a single range of luminaires. To blend in with the store's black ceiling, Optec spotlights finished in black were mounted on a black ERCO track system. The result is a sophisticated display of gourmet foods and products perfectly presented in light that remains virtually invisible to the customer.

The lighting concept builds on the principles of perception-orientated lighting design devised by Richard Kelly, who separated qualitative lighting design into three basic functions – ambient light, focal glow and play of brilliants. Accent lighting draws attention by emphasising certain objects and spatial zones, whereas secondary aspects are toned down by applying a lower lighting level, thereby creating hierarchies of perception that facilitate orientation. The black ceiling of the new Casa Tió store recedes altogether from the customer's perception, as does the black track system on which the Optec spotlights can be flexibly aligned – leaving the light to direct focus entirely onto the Casa Tió delicatessen.

Almost 70 per cent of the gourmet food at Casa Tió is meat products – fine hams and sausages, cuts of chicken, duck, goose, rabbit, pork, lamb, veal and beef sold in fresh, vacuum-packed portions. To help customers distinguish between the

different kinds of meats and products presented in professional lighting for maximum appeal befitting the stylish interior, a primary concern in the lighting design for the new stores was superior light quality to ensure faithful reproduction of the various colours. The lighting tools used in the store – Optec spotlights in 24W warm white light at 3000 K – offer superior colour rendering properties ($R_a \geq 90$) as a feature, guaranteeing that the products are shown in their true colours. With flood distribution, the lighting tools achieve optimum ambient lighting in the store, whilst the oval flood characteristic accentuates the products on the wooden shelves and in the cooling cabinets lining the sides.

Casa Tió has built up a visual identity with rich crimson as part of its corporate colours, and the new store features walls and flooring painted in this dark shade of red. The flooring therefore added to the challenge of efficient lighting design. To ensure the highest standard of visual comfort for the customer whilst eliminating glare from unwanted reflections of light on the painted surface, the Optec spotlights in 24 W warm white light with oval flood distribution were aligned precisely to illuminate the shelving and cooling cabinets along the sides, ensuring that no light is emitted onto the floor.

The modern style of the sophisticated interior and lighting design at Casa Tía enhances the quality of its foods and products whilst keeping true to the natural quality of the brand. Bright, welcoming and clearly presented: the new Casa Tió store in Barcelona is an ideal example of what attractive product presentation of a high-end food brand can look like today.

ERCO GmbH: www.erco.com

All images: © ERCO GmbH, www.erco.com. Photographer: Sebastian Mayer

Para Cone luminaires

SLV Para Cone luminaires form part of Magnet's extensive range of SLV pendants. The conical shaped luminaires are designed for surface ceiling mounting and are available in various colours, including brushed copper, black high gloss, white high gloss, brushed aluminium and black/gold duo. The steel luminaires are fitted with a round ceiling rosette and have a 150 cm pendant length. According to Sheldon Payne, national sales manager – SLV, a cloth covered cable adds a stylish finish and offers functional protection against damage.

The Para Cone series is suitable for energy efficiency class A++ LED and energy saving lamps. There are over 3500 products in the German-engineered SLV range, all with a contemporary design and new illumination technology in line with constantly changing global lighting trends. The range encompasses lighting fixtures with elements that are individually adjustable to enhance the aesthetics and area illumination of any environment.

SLV lighting products are available in South Africa through the Magnet Group's SLV Pro-Partners and also through the recently established SLV online store (www.slv-lighting.co.za), which provides the ideal platform for safe and convenient online shopping.

The easy-to-navigate website showcases SLV's extensive portfolio, with different categories for indoor and outdoor products, accessories, lamps and electrical and

mechanical components. The site includes pictures and descriptions of products, as well as pricing and delivery information.

The new SLV catalogue – Big White 2017 – will soon be available to the local market. The comprehensive product directory highlights newly launched products and provides relevant information on how to select the right lights, lamps and perfect lighting concept for every setting.

SLV: +27 (0)11 397 7936



SLV's extensive portfolio of German-engineered interior and exterior lighting products encompasses Para Cone luminaires, designed to enhance the ambience of modern living areas.





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www.radiant.co.za

Smart lighting solution

BEKA Schröder supplied an holistic exterior and interior lighting solution for the recently opened St Elizabeth Hospital Resource Centre in Lusikisiki in the Eastern Cape.

Built by the Eastern Cape Department of Health in collaboration with Walter Sisulu University, the centre has a multi-purpose function: It serves as a training centre for medical students and offers library, conference and video conferencing facilities. The fifth resource centre in the province, it is also available to the community for conferences, meetings, workshops and community outreach programmes.

BEKA Schröder's locally designed and manufactured LEDlume-midi street light luminaire illuminates the parking area to provide effective lighting for safety and comfort. The LEDpost, an LED bollard, lights up the walkway in a stylish and efficient way. The entrance of the building is enhanced by the LEDduo up- and downlighter, and the Accento in-ground uplighter and the exterior of the building is accented by the Series 21 bulkhead.

The Resource Centre is a Smart building. There are no light switches for the interior lighting installation. The lights are turned on by motion sensors, and all lights can be dimmed remotely. Various interior luminaires illuminate the Resource Centre, amongst them the DARI, an energy efficient LED ceiling panel that ensures maximum visual comfort and even distribution of light. The BEKAQUAD and BEKA CUBO downlights ensure an even lighting level in the conference facilities while BEKARONDO downlights and Series 70 bulkheads provide elegant lighting in the building amenities.

This holistic solution is believed to be the most advanced lighting installation by far in any hospital precinct in the Eastern Cape.

BEKA Schröder locally develops and manufactures LED lighting products, designed and suitable for local conditions.

BEKA Schröder:

Peter Badenhorst +27 (0)43 726 0493



BEKA Schröder supplied an holistic exterior and interior lighting solution.



The BEKAQUAD and BEKA CUBO downlights ensure even lighting levels in the conference facilities.

High-end, versatile and adaptable collection

Larose Guyon is officially launching its second collection of high-end and innovative lighting fixtures, pursuing what it originally started last May with its La Belle Époque collection. The new line is called Le Royer.

For Larose Guyon, creating a luminaire is as much about style as about light. The magic and warmth that create the light and the shadows are as important as the object during the creative process. The lighting fixtures are as attractive as the atmosphere they create.

For the Royer Collection, the designers wished to create elegant and distinctive luminaires that were versatile; products for a wider range of purses and for customised projects.

With seven new products, it is possible to make use of the creations on walls, above a kitchen island or a dining table, as a great hall chandelier, around a bathroom mirror, above a bedside table, a bathtub or a reading armchair.

It is possible to create your own fixture by adding

or removing elements and the collection's endless possibilities are what make it a choice reference for projects big and small. Besides being available in different standard finishes such as matte black or white and satin copper or brass, the high-end luminaires can also be made to cater to each client's specific needs.

By combining the complementary visions of designers Audrée Larose and Félix Guyon, Larose Guyon provides simple, elegant, functional objects. Through an aesthetic of items of blatant luxury, haloed in warmth and humility, they infect daily life with poetry and beauty. As their approach is imbued with refinement and distinction, they get their inspiration from nature, art, past aeons and traditions.

www.laroseguyon.com



Pho

Award-winning battens in visual art showcase

Tobias Rylander, key member of Los Angeles' leading lighting design collective, Seven Design Works, has been making extensive use of GLP's award-winning X4 Bar 20 LED battens to illuminate various touring lighting sets, generating giant colour fields and sweeps from the innovative fixtures.

Such has been the growth in Manchester indie band, *The 1975's* fan-base following its chart-topping album, *I Like It When You Sleep*, that production has had to scale up from the originally booked theatre-sized venues to full-size arenas.

Fortunately, at the time, the band had been recording in LA – just half an hour from Rylander's home – so intense discussions could take place prior to the tour. "We bounced material back and forth and when they talked about visual artists such as James Turrell as influences, it suggested big fields of colour interspersed with monochrome and pulsating, random strobing. It made perfect sense to use the X4 Bars," says Rylander.

To achieve this, VER supplied 28 X4 Bar 20s on the first leg, increasing inventory threefold to 84 battens for the larger arena shows, which continue into the New Year. For the big UK dates, Rylander and his programmer Darren Purves added 56 of the X4 Bar 20s under a graduated floor, as a pool of lighting which comes to life when lead singer Matty Healy steps into the circle. The Bars also feature as additional lip fills in the downstage area.

In a largely monochromatic setting, the lighting juxtaposes with a number of 9 mm LED video pillars, which are used as light sources. Rylander says, "I have lines of X4 Bar 20s on the downstage edge in front of the band to create a wall of colour and one on the upstage edge in front of the main video screen to create and match the colour of the video content. I have different colour fields for the video screen – with solid block colour from the Bars operating seamlessly off the back wall. It's a way to give more depth to the video and to be able to tilt them down and zoom them out to create a field of silhouette." Silhouetting is an integral part of the presentation.

Aside from the X4 Bar 20s' form factor, enabling the sources to be hidden, the production designer is equally effusive about the feature-set. "The FX are extremely easy to program – and unlike a lot of fixtures they deliver a true white and have a good dimmer curve. Also, they colour mix well and smoothly – and it's nice to be able to program a gradient with a wall of light constantly changing colour. With their long throw distance their range will easily fill a whole proscenium."

And with so much video content up against them – particularly with plans to install eight image screens in a constellation at London's O₂ Arena – the X4 Bar 20s need to fight their corner. Up against 1486 m² of 9 mm pixel LED screen, where the video is used purely as light, the X4 Bar has shown not only that it is sufficiently powerful, but that it complements the video very well.

GLP German Light Products Inc:
www.glp.de



Photo credit: Adam Powell & Tobias Rylander

St Peter's Square radiates in new LED light

Illuminating the recently completed and extensive refurbishments to St Peter's Square in Rome, are modern and energy-efficient outdoor LED luminaires which provide an outstanding lighting experience and an energy saving of approximately 70 percent. The project concept by *Direzione dei Servizi Tecnici del Governatorato dello Stato della Città del Vaticano* was realised with support from Osram.

Cooperation with *Servizi Tecnici del Governatorato* was also fundamental to the success of the Sistine Chapel project, carried out in 2014. The new lighting system for the Sistine Chapel featured higher lumen-output and artwork-conserving LED lighting to protect and enhance Michelangelo's renowned frescoes. It also served as a lighting benchmark for artistic, historical and preservation projects.

"We gained worldwide recognition for our state-of-the-art LED lighting of the Sistine Chapel, and we're exceedingly pleased to have demonstrated in Rome once again our strength as a provider of complex lighting solutions with the illumination of St Peter's Square," said Olaf Berlien, CEO of OSRAM Licht AG.

As with the Sistine Chapel project, the lighting solution for St Peter's Square was planned and put into operation through close cooperation between Osram and the *Direzione dei Servizi Tecnici del Governatorato SCV*. "In addition to ideal lighting results, the task included visual aspects such as the discreet integration of luminaires into the architectural setting and incorporating a simple, unobtrusive electrical installation. Saving energy and ecological sustainability were also important," said Eladia Pulido, CEO of the Osram Lighting Solutions (LS) business unit.

The Vatican specified an illuminance level of up to 120 lux at night to provide safety for visitors and to enable reading on the square during events and celebrations. One hundred and thirty two LED floodlights were installed, providing sufficient brightness and homogeneous illumination for the square. The new lighting lends the existing architecture and materials a visual upgrade – the light underlines the impressive columnar architecture and emphasises the innate colour of the marble. Ecological sustainability was simultaneously addressed, and for this reason the lighting concept focused on cutting power consumption and avoiding unwanted light emission. "Thanks to modern LED technology in combination with a DALI light management system we have achieved energy savings of around 70%," said Carlo Bogani, Executive Project Director at Osram Italy.

The 132 LED luminaires installed are a customer-specific version of the Floodlight 20 LED with through-wiring and special plug connections that

enable simple installation and easy inter-wiring of the luminaires. The luminaires are equipped with a DALI Professional control system and feature a 4000 K light colour (neutral white).

St Peter's Square (*Piazza San Pietro* in Italian), located directly in front of St Peter's Basilica in Rome, consists of a trapezoid section and the actual elliptical forecourt with a total area of 48 000 m². Up to 400 000 people gather on the extensive square for celebrations and special occasions, such as the election of a new Pope or at Easter time. Extensive renovation of St Peter's Square began in 2011, and at the beginning of the current year Osram together with *Direzione dei Servizi Tecnici del Governatorato SCV* created the new lighting concept based on modern LED technology that was installed and inaugurated in the evening on October 20, 2016.

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All photographs courtesy Direzione dei Musei.

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*** Please refer to OSRAM Technical Datasheet for relevant lifetimes